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Jazz's Master Engineer**

**In the Studio
And on the Road
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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™

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The ADAT Group™

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George Petersen
June 93, MIX

BAG END

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The Bag End ELF-1 is the exact opposite of all traditional thinking. It is power *and* fidelity. It will change your basic thinking about bass sound forever. Call today or contact your local Bag End dealer and check out for yourself the biggest little new kid in town.

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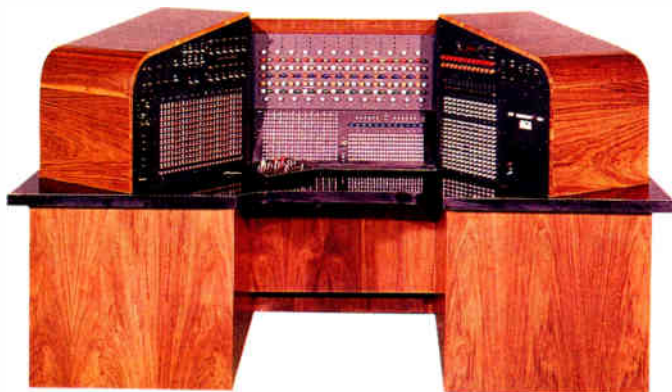
MIX

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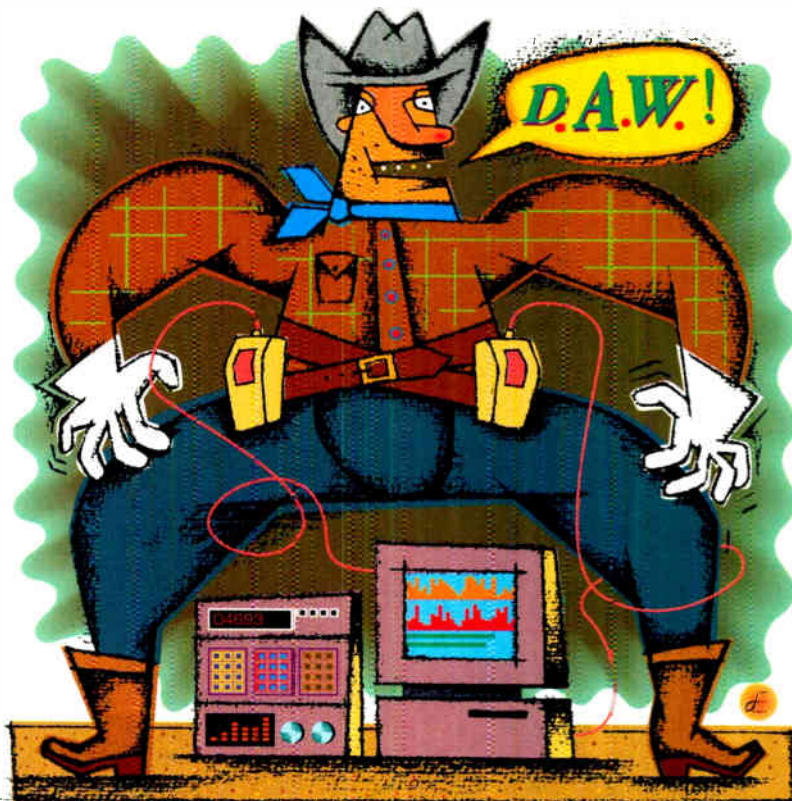
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PHOTO: KATE GARNER

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DIRECTORY

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Cover: Studio A of Manhattan's East Side Audio & Video was designed by Tom Kozalka. The recently rebuilt suite features an SSL 4000G Series console custom-designed by East Side with Ultimotion, a Sony 3324S digital multitrack, NED PostPro workstation, Dolby Surround Sound, and monitoring systems by UREI, Yamaha and Auratone. **Photo:** Robert Walsh.



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

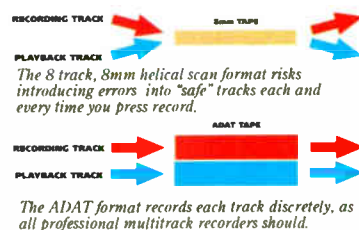


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takes to make the best-selling digital multitrack. The Alesis ADAT® Digital Audio Recorder's sound quality, sample accurate synchronization capability (ADAT Synchronization Interface), fiber-optic digital interface (ADAT MultiChannel Optical Digital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

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

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.



The Alesis AI-1™ 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 DAT, 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.

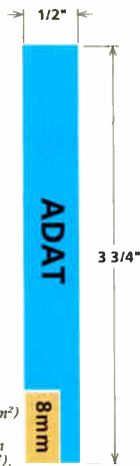
Focus on Compatibility™

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.



Bigger is Safer

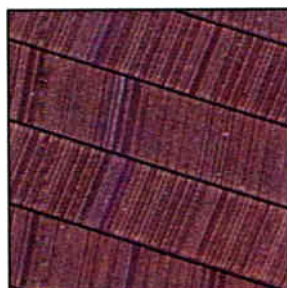
Microscopic contaminants in the studio aren't just probable, they're statistically inevitable. If the format can't overcome them, they'll cause mistracking, noise, distortion, even total muting of the audio. Formats smaller than S-VHS are more vulnerable to contaminants, dropout, and misalignment, especially 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.



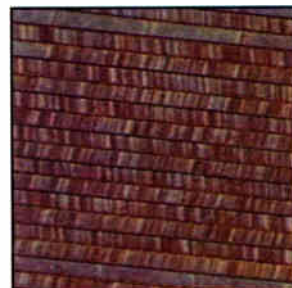
Actual microscopic comparison of the ADAT tape format and the 8 track, 8mm helical scan format (enlarged approximately 100 times).

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



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.

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.

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



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

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.

ADAT/BRC digitally stores important session notes

Instead of scribbling notes on cumbersome studio track sheets, the BRC lets you store 400 autolocator 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.

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 Rouze
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 (twice 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 tap 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. sleazing platinum mixdown 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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ALESIS
STUDIO ELECTRONICS

FROM THE EDITOR

So what's new? Judging from this, our annual AES new product roundup issue, plenty. For starters, 41 new recording devices are previewed this month, along with 58 monitors and loudspeakers. Forty-one new mixing console models are also debuted here, as well as 78 new signal processing devices. All told, 455 new products for audio professionals are being spotlighted in this issue.

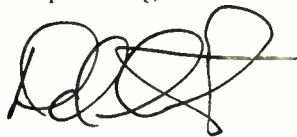
So which are the hottest new products in this year's crop? That's for you to decide. Whether you get the hands-on demo at the AES in New York City this month or have to wait until your favorite toy store gets the gear of your dreams, only you know what is right for your particular needs. We'll do our best, however, to review and comment on the most innovative, well-designed and popular units throughout the year. And then next October, we'll see which of the year's new products rise to the top for *Mix* readers, as measured by their votes at the Technical Excellence and Creativity Awards.

If you are making the trip to AES this month, we hope you plan on attending *this year's* TEC Awards. This is the ninth year that *Mix* readers have voted for their favorite new products, the most talented industry professionals, and the businesses and institutions that set the standard for excellence in professional audio.

A star-studded affair to be held at the swank Marriott Marquis, on Friday, October 8, the TEC Awards aren't just an awards show. The event raises money to support hearing conservation and education by the House Ear Institute and the H.E.A.R. organization. The TECs also generate funds for scholarships in audio education, awarded directly to leading schools and through scholarship programs with the AES and SPARS. So far, over \$200,000 has been raised for these causes since the TEC Awards were initiated.

Celebrate the industry's finest, and support hearing conservation and education, all for the price of dinner in New York (at one of the *better* places, of course).

Keep reading,



David Schwartz
Editor-in-Chief

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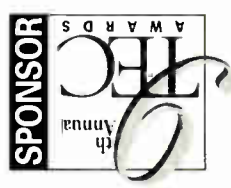
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David Schwartz and Penny Riker Jacob

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METER SCALE ORIGINAL

CH-1

100 80 60 40 20 -10 6 4 1 0 OVER

MACHINE ID

PROGRAM

TIMER MODE

TIMER MODE

TC SET

TC CHASE SET UP

VARI

VARI SET

RESET

METER SCALE REF MARKER OPH MODE SET

INSERTION ← →

SHUTTLE

JOG

CH-1 CH-2 TC

EDIT

ID/CUE MARKER

BEGIN END MARK

MODIFY DELETE INSERT

RENUMBER DATA SAVE

REC READY

IN OUT

REPRO

ENTRY

INPUT

AUTO EDIT

PLAY

STOP

REC

LOCATE

CURRENT

AES TAKES UP DIVERSITY ISSUE

We may be witnessing the birth of a new and much needed Audio Engineering Society committee—the committee on diversity. At the Berlin AES convention in March, the board of governors formed a working group to address the glaring lack of women and minorities in audio engineering and appointed Laurel Cash-Jones, a consulting engineer at CJ Technology, as chairperson. Depending on the board's vote at the New York convention, this working group may become a permanent committee of the AES.

A committee on diversity would explore the reasons why there are so few women and minorities in audio engineering and develop ways to rectify the situation. The ultimate goal is to promote and expand the opportunities for women, blacks, Hispanics and all other minorities within the industry. One idea is to create a student outreach program. The committee would sponsor audio professionals to speak at high schools and universities about a variety of career options and might also arrange for students to visit or intern at pro audio companies.

As one of its first actions, the working group on diversity will be hosting an open forum at this month's AES convention to discuss professional practices and create job strategies for minorities in the '90s and beyond. The forum panel will comprise most members of the working group, including Cash-Jones; Caron Weidner of Eight Ball

Sound, (filling in as acting vice-chair for Marjori Schmutz); AES education committee chair Roy Pritts of the University of Colorado; Les Harrison of Hollywood Sound Systems; AES membership committee chair Wieslaw Woszczyk from McGill University; Zenobia Millet of MTM; Anette Vlacancich of Pacific Title; Joe Martinez of DIC Digital; Morgan Martin of Lambda Unlimited; and Rhonda Wilson of Meridian Audio.

The forum will take place on the morning of Thursday, October 7, and is open to all AES convention attendees. —*Georgia George*

SYQUEST AND DYNATEK JOIN FORCES

SyQuest Technology (Fremont, Calif.) and DynaTek Automation Systems entered into a joint marketing agreement to expand the presence of SyQuest-based storage systems in the sampler and digital recording market. SyQuest manufactures 5.25-inch removable Winchester disk drives (and re-

cently began producing 3.5-inch drives with 110MB cartridges) that DynaTek has used in its line of integrated SCSI mass storage subsystems.

SyQuest has not had any direct tie-ins to the recording market, but DynaTek's Digital Music Storage division was created in 1990 to specifically address the storage requirements of nonlinear digital audio and video applications. "SyQuest products figure prominently in both our TRACK series of rack-mountable subsystems and our general line of products," said Lorne Weiner, director of Dynatek's Digital Music Storage division. "This cooperative effort is a natural progression in DynaTek's relationship with SyQuest and demonstrates our mutual commitment to the audio and video recording industries."

ATI SPLITS, LINEARX FORMED

Audio Teknology Inc. recently underwent a restructuring, splitting into two unaffiliated entities. ATI

will continue to manufacture the Paragon sound reinforcement mixing console, while new company LinearX Systems Inc. will handle the LEAP and LMS products previously distributed by ATI.

ATI is continuing operations in a new Columbia, Md., facility. Founding partner Larry Droppa, who served as ATI vice president, was appointed president of ATI and is now sole owner of the company.

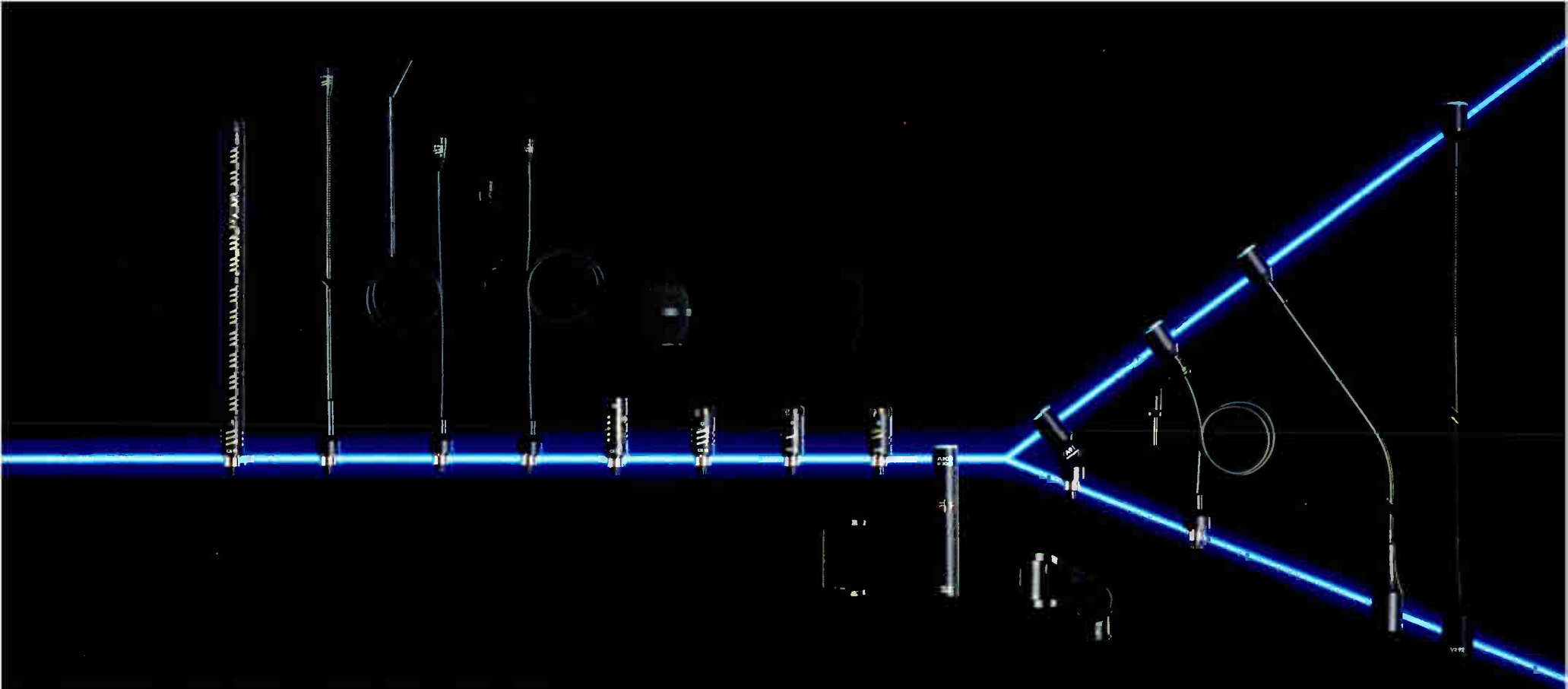
Former ATI engineer and president Chris Strahm purchased the LEAP and

—CONTINUED ON PAGE 16

TEC AWARDS ANNOUNCES PRESENTERS

A stellar group of audio professionals have signed on as presenters for the Ninth Annual TEC Awards, to be held October 8 at the Marriott Marquis in New York City. Presenters include NARAS executive director Hank Neuberger, session drummer Bernard Purdie, producer Phil Ramone, engineer Al Schmitt, incoming SPARS president Howard Schwartz, Lovin' Spoonful's John Sebastian, former E-Street drummer Max Weinberg, and *Mix* magazine's own George Petersen. Creed Taylor will present the Hall of Fame Award to Rudy Van Gelder; Les Paul will present the Les Paul Award to Peter Gabriel.

Tickets are selling fast. For more information, call Karen Dunn at (510) 939-6149. ■



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THE WORLD'S LEADING PROFESSIONAL AUDIO WORKSTATION NOW HAS MAJOR NEW FEATURES, DRAMATICALLY IMPROVED PERFORMANCE, AND LOWER SYSTEM PRICES.

SINCE 1991, THOUSANDS OF AUDIO PROFESSIONALS HAVE COME TO depend upon the power and flexibility of Digidesign's Pro Tools™ for audio post, music, and broadcast production. Indeed, you'll find hits made with Pro Tools on just about any top movie or music chart, just about any week of the year. In many circles, Pro Tools is even considered the *de facto* standard of multichannel professional audio workstations.

Rather than let this success go to our heads, we let it go to our brains. And ears. And hands.

You see, we've been thinking. And listening. And working hard. All to build something even better. Now, it's ready, and it's called Pro Tools 2.0.

Two Point Oh Wow. Pro Tools 2.0 is a new, software-based advanced user interface. Without any modifications or additional hardware, 2.0 runs with all past and present Pro Tools hardware. If you're already familiar with Pro Tools, the first advancement

More Than Speed and Efficiency. The benefits of Pro Tools 2.0 go far beyond the obvious. For instance, we improved Pro Tools' already acclaimed audio quality: Our new digital EQs are as effective and musical as they are clean. We've added a host of intuitive automation, autolocation and transport features. Pro Tools now has a no-wait waveform overview mode. There's complete time-stamping. Enhanced grouping. Better scrubbing. More session management options. Bigger, brighter,



Thanks to our new Apogee-clock-equipped SMPTE Slave Driver, Pro Tools 2.0 delivers ultra high-fidelity, ultra low-jitter, ultra-easy digital synchronization in playback and record, complete with varispeed.

faster, and more accurate VU metering. Improved MIDI sequencing and control. Extensive undo commands. In fact, Pro Tools 2.0 has dozens of new features, and scores of enhancements, for audio post, music, and broadcast production applications.

YOU MIGHT CALL THAT IMPRESSIVE.

you'll notice is that 2.0 combines full-featured recording, mixing, signal processing, automation, along with advanced waveform and event editing — all in one, easy-to-use, integrated program.

There is simply no other interface as fast, as powerful, as flexible, and as complete.



Are you a Pro Tools owner who has been holding your breath as you read this ad? All registered owners will be offered a 2.0 Upgrade Kit, including software, new manuals, and an instructional video. All for just \$49. So breathe easily.

There's Much More To Come. We've become the industry leader by responding to the needs of the people who use digital audio. And by listening carefully to people like you, we have a clear vision of what a professional digital studio should offer.

First of all, it should offer power, flexibility, loads of features, and excellent sound quality. It should be highly cost-effective, without compromising performance or quality. It should be modular, to allow each user to have the power he or she needs, without having to pay for unnecessary features. It should also be

Lower system prices now apply to 8-channel, 12-channel, and 16-channel Pro Tools systems. Four-channel Expression Kits now also cost less. See your Authorized Digidesign Pro Tools Dealer for details. While all Pro Tools systems include built-in "trigger sync" for playback, the optional Digidesign SMPTE Slave Driver delivers the highest-fidelity record and playback sync (call us for the details). DADR uses Digidesign's optional Sound Designer II™ software, which runs with any Pro Tools system. *A US\$49 upgrade kit cost applies to residents of the US and Canada, and includes 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. © 1997 Digidesign. All rights reserved.

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backed up by the best customer support in the entire industry. It's no coincidence that all of this describes Pro Tools 2.0, perfectly.

A Vision To Share. We believe that a truly professional digital audio workstation should have a truly open architecture.

By "open," we mean that you should be allowed to add software-based power when you need it. (DINR,™ our amazing Digidesign Intelligent Noise Reduction™ system, is the first of many forthcoming Digidesign software "plug-ins.")

By open, we also mean that your workstation should have powerful and affordable upgrade paths. (We think Pro Tools 2.0 makes this case quite elegantly.)

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THE NEW PRO TOOLS POSTVIEW™ OPTION INTEGRATES FRAME-ACCURATE, FULL-SCREEN, FULL-MOTION, RANDOM-ACCESS DIGITAL VIDEO* WITH YOUR PRO TOOLS SYSTEM. THE POSTVIEW PACKAGE ALSO FEATURES MACHINE CONTROL* FOR PERFORMING CHASE LOCK OF VIDEO DECKS TO PRO TOOLS AUDIO. CALL DIGIDESIGN TODAY AT **800-333-2137, EXT. 443** FOR MORE INFORMATION.

*REQUIRES SOME ADDITIONAL THIRD-PARTY HARDWARE.



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With our TDM Digital Audio Bus, Pro Tools offers your studio an open door to the future.

should allow you to integrate hardware and software from a variety of manufacturers, and not just us. Which is why, in 1993, we are releasing the remarkable Digidesign TDM Digital Audio Bus™

systems will be easily and affordably upgradable to be totally compatible with the Digidesign TDM Digital Audio Bus.

Now that's what we mean by open.

Make Pro Tools 2.0 Your Reality. Thanks for taking a few minutes to read what we had to say. Hopefully, we've helped you understand better the depth of our commitment to the people who use Pro Tools today, and will be using it tomorrow.

So while we call it Pro Tools 2.0, you might call it exactly what you need. And if so, perhaps your next call should be to us.



For more information about Pro Tools, or about upgrading to Pro Tools 2.0, you can reach us at **(800) 333-2137, ext. 443** (US & Canada), or internationally at **+1-415-688-0600**. Call today, and we'll get you the information you need right away.

We can also provide you with information about DINR and other Digidesign products, as well as Pro School (the ultimate digital training ground). And if you like, we'll be happy to schedule you 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

Audio-Technica U.S. (Stow, OH) appointed Kazuo Matsushita as its new president. Promoted were Philip J. Cajka, to executive vice president and chief financial officer, and Kenneth Reichel, to executive vice president, marketing. Also at A-T, Kevin "Kal" Mullens joined the pro sales staff...Roscoe Anthony was promoted to the newly created position of director of marketing communications for JBL Professional (Northridge, CA). He will be responsible for the worldwide coordination of all advertising, trade shows and other marketing programs...Alesis Corp. (Los Angeles) opened 16 regional service centers to support owners of ADAT recorders. The company is also producing two ADAT newsletters and an ADAT training video. For information on these items or to locate a service center in your area, contact the company at (800) 5-ALESIS...Creative Labs of Milpitas, CA, opened an expanded support center in Stillwater, OK. Open seven days a week, the facility can be reached at (405) 742-6622...Allan Nichols was named director of sales and marketing for the Mark IV Pro Audio Group (Buchanan, MI)...Amek/TAC (North Hollywood, CA) expanded its sales staff, appointing Dave Lewty as the new sales manager for the Northeast and Mid-Atlantic states...Fostex Corp. (Norwalk, CA) reorganized its sales and marketing management. Vice president of sales Steve Cunningham is now also responsible for marketing. David Oren will act as vice president of product development...Two hires in sales and marketing at Crest Audio (Paramus, NJ): Sam Spennachio is regional sales manager for the Crest console division. Lisa Vogl is the company's new marketing service manager...Apogee Electronics of Santa Monica, CA, hired Greg Laney as its new sales engineer and Angie Orduno as additional

sales and marketing support...Manufacturer Jiri Donovan of Hollywood can now be reached at (213) 960-9472; fax (213) 461-7391...Celestion Industries (Holliston, MA) promoted Brian Coviello to pro division sales and marketing manager...William Snow is Emu Systems' (Scotts Valley, CA) new vice president, marketing...BASF (Bedford, MA) reorganized its technical service groups. The Audio/Video Technical Services Group will be consolidated with the Computer Products Applications Engineering Department under the direction of Gerrit Nijssen...New reps for Audix Corp. (Tulatin, OR): Ross Associates will handle Audix products in Massachusetts, Vermont, New Hampshire, Maine, Rhode Island and Connecticut; GMS Sales will cover Minnesota, Nebraska, Iowa, and North and South Dakota; Bob White Associates represents the company in West Virginia, Ohio, Michigan, Kentucky and Indiana...Sound Associates of New York City hired noted technician and manager Tony Marra to head up the company's new service center...Pro audio/video and MI equipment rental company The Toy Specialists opened a new office in Tampa, FL, headed by Mark Prater; phone (800) 445-3330...Altec Lansing (Oklahoma City, OK) recently reorganized its marketing department. Akira Mochimaru and David Schultz are now applications managers for architectural spaces, including houses of worship and auditoriums, while Tracy Cranton and Gary Jones are applications managers for distributed systems, encompassing markets such as airports, theme parks and meeting facilities. Other Altec appointments include David Humphries to the position of manufacturing manager, Roger Hawthorne to customer services manager and David Read to technical service manager. ■

—FROM PAGE 12, CURRENT

LMS products, which are supported by his newly formed LinearX, for which he serves as president and chief engineer. Vickie Sheppard, former business manager of ATI, is vice-president and general manager of LinearX. The company operates out of the former ATI offices in Portland, Ore.

CONFERENCE NEWS

The Society of Motion Picture and Television Engineers will hold its 135th Technical Conference and Equipment Exhibit, titled "Integrating Technologies in the Digital Era," October 29 to November 2 at the L.A. Convention Center. Contact SMPTE at (914) 761-1100.

The fifth annual ITA Magnetic and Optical Media Seminar will be held November 4-5 at the Nikko Hotel in Atlanta, Ga. Contact the ITA at (212) 643-0620 for more information.

The 1993 Professional Loudspeaker Workshop will be held October 28-29 in Pasadena, Calif. More than a dozen loudspeaker clusters will be rigged in 4,000- and 1,000-seat auditoriums, and TDS analysis and double-blind listening tests will take place. Call David Kennedy & Associates at (714) 895-7221, ext. 701.

The National Association of Broadcasters issued a call for papers for the NAB Broadcast Engineering, NAB HDTV World and MultiMedia World conferences, to be held in conjunction with NAB '94, March 20-24, 1994, in Las Vegas. Contact the NAB at (202) 775-4981.

The summer Consumer Electronics Show (June 23-25 at the Chicago Hilton) will revert to a three-day, trade-only show. Call (202) 457-4900.

Finally, it has been confirmed that next summer's NAMM show will again be held in Nashville, July 30-31. This past summer's show attracted 270 exhibitors and more than 10,000 attendees. Sounds like a possible new tradition in the making. ■

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 Shangri-la called Tura.

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.

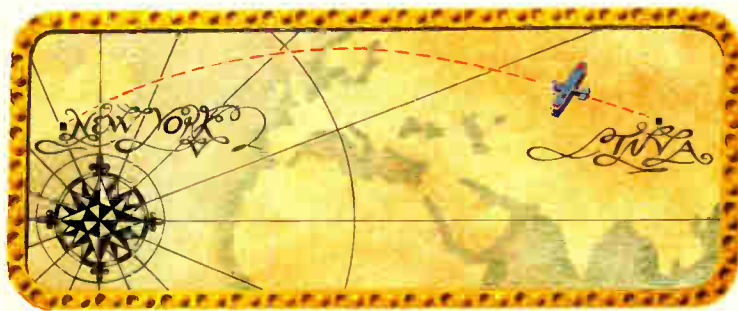
In fact, the DISQ System is so flexible that mixing board functions can be changed with a mere tweak.



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.



To arrange a listen, see us in New York at the Audio Engineering Society Convention this October, Room 3D05. Who knows? Maybe you'll see a Turan or two there.

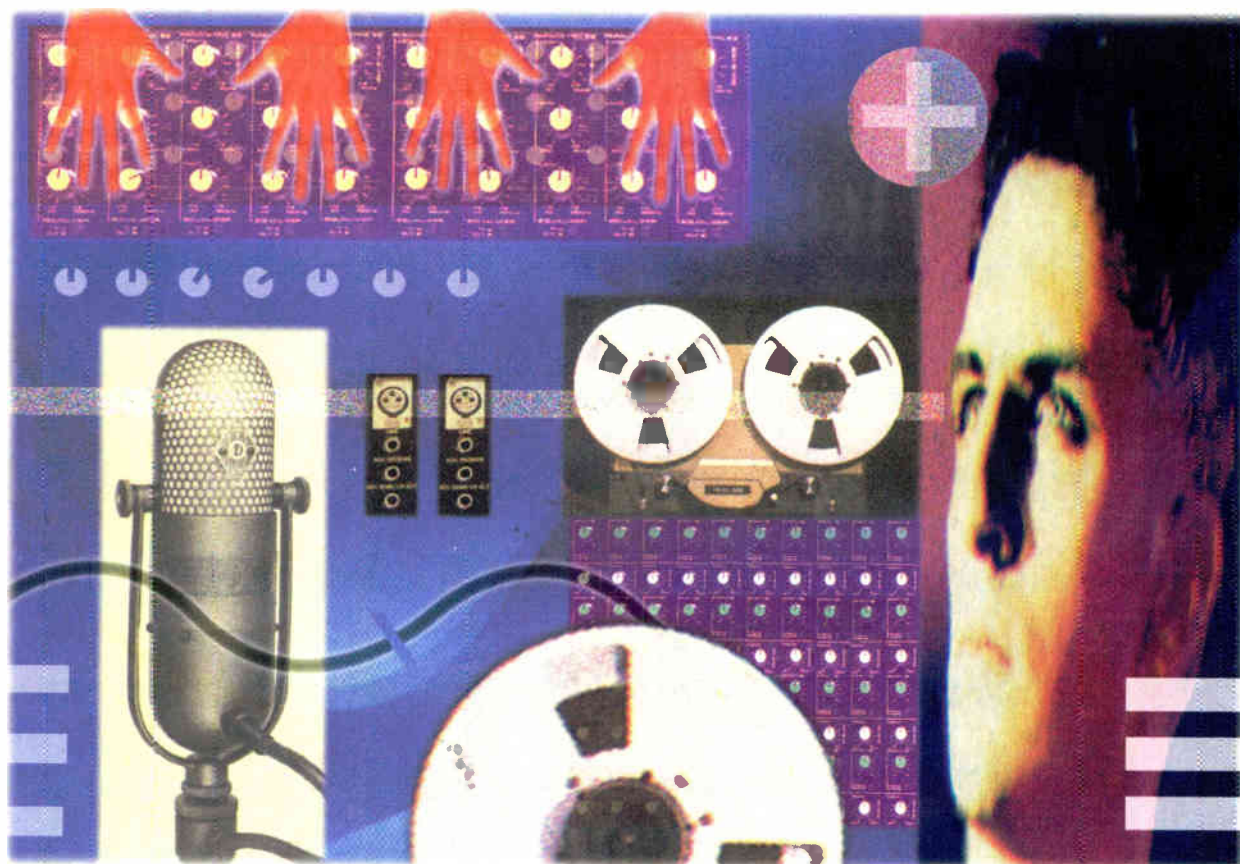


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FSE: READER SERVICE CARD FOR MORE INFO

World Radio History

by Ken C. Pohlmann



THE DERIVATIVE OF CHANGE

Our distant past was recently made available to us. The images are still very fresh to all veterans in the recording studio business. An in-line mixing console stood in the center of the control room—perhaps 36 inputs. Tracking and overdubbing were both easy affairs, but complicated mix-downs often required several pairs of hands: the engineer, the assistant, the producer and maybe a bandmember or two to manipulate all the knobs and faders. Great fun. The open-reel tape recorders were lined up across the back of the room. The master recorder laid down 24 tracks on 2-inch tape. The 2-tracks used ½-inch tape. Of course, all machines were equip-

ped with noise reduction, but controversy still surrounded the issues of whether noise reduction involved sonic sacrifice, and which tape speed (15 or 30 ips) was best for a particular application. Your assistant engineer was finishing high school next spring. There was always a supply of razor blades and a sticky tape dispenser nearby for splicing. The art of editing certainly took considerable experience, not to mention dexterity. The musicians were a fine bunch of fellows—occasionally a little picky on microphone selection. You always kept a few direct boxes handy in case someone was using an electric instrument.

ILLUSTRATION: GORDON STUDER

Power Users Prefer Sonic

SOUND ONE CORP.

New York / JOHN PURCELL

"Investigating digital workstations for feature film and television work, we had three critical requirements: a powerful editor, complete flexibility, and inexpensive expansion. Only Sonic Solutions addresses all of our concerns. We're thrilled with our choice."

SAUL ZAENTZ CO.

Berkeley / JIM AUSTIN

"We were the first to install the SonicNet for film sound post. We're impressed with the SonicNet's true network capabilities, having experienced the bottlenecks of stand-alone workstations. The dialog editing is much faster than conventional cutting and provides superior sound with substantial savings."

"We use Sonic systems for a wide variety of projects—from radio and TV spots to documentaries. Our clients are amazed at how fast we can edit and how easily we can make changes. With two systems and SonicNet, we can share soundfiles and collaborate in a way that has never been possible before."

Houston / DWIGHT COOK

"After shopping around for a year, it was clear that the Sonic systems would give us the biggest bang for the buck. Our four systems were already booked before they were installed. The SonicStation II and the Quattro are the most sophisticated pieces of hardware in their price range."

New York / RON BOCHAR

SOUND WORKS

CS, INC.



SONIC SOLUTIONS

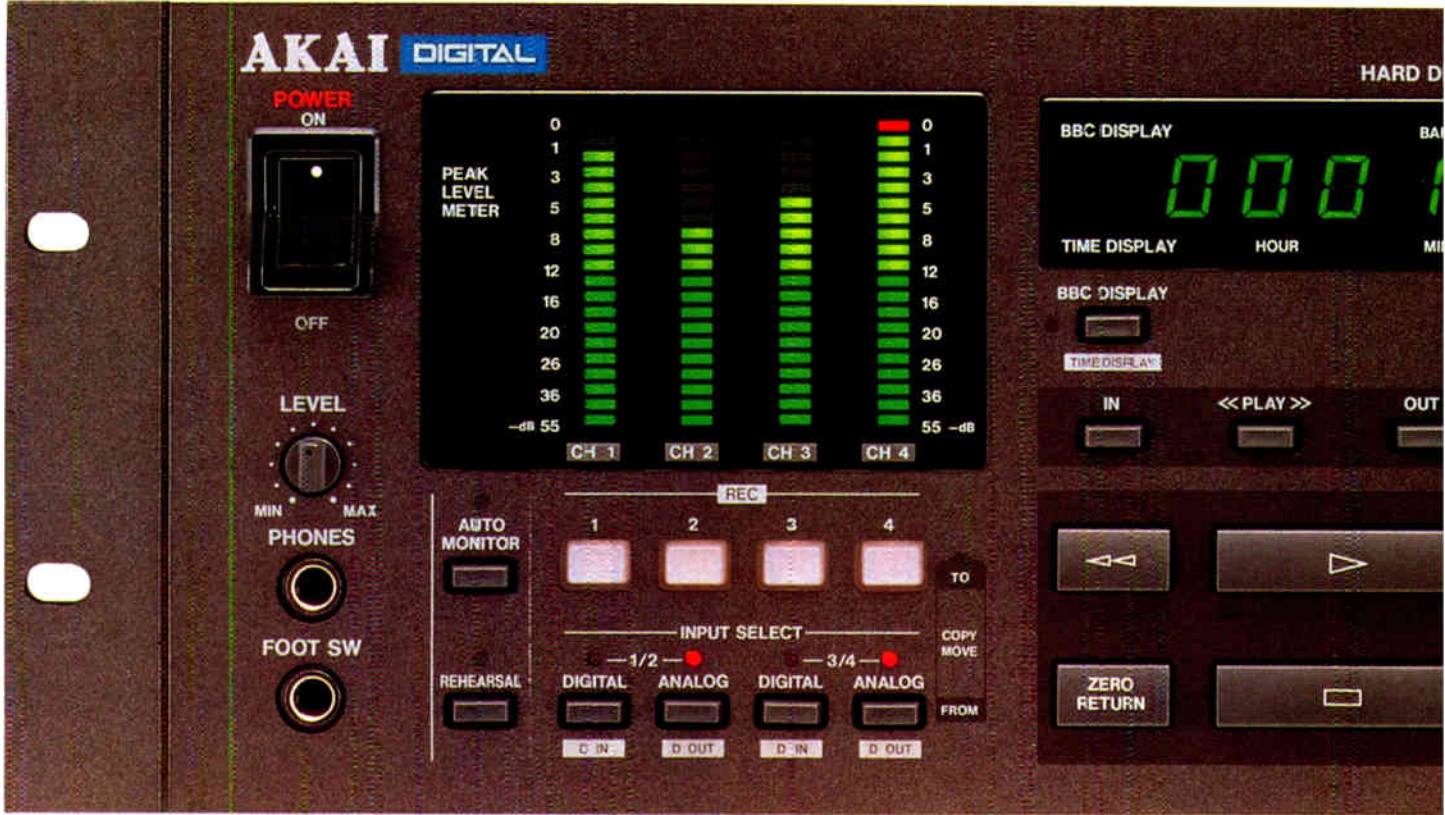
Main Office

1891 East Francisco Blvd., San Rafael, CA 94901 USA Tel. 415.485.4800 Fax 415.485.4877

Sonic Europe

Brugwachter 19, 3034 KD Rotterdam, The Netherlands Tel. 31.10.414.7354 Fax 31.10.414.7365

World Radio History
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Ten Reasons Why You Should Choose

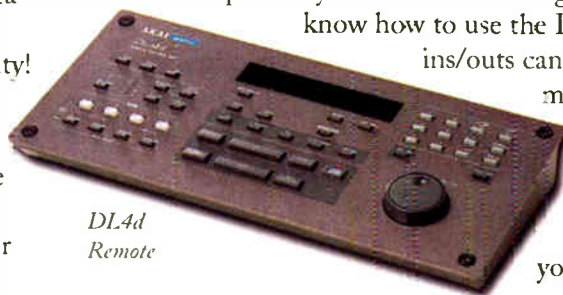
1. TAPELESS EDITING The DR4d can simultaneously record 4 tracks directly to standard SCSI-compatible hard disks, not tape. Tape recorders which use a cassette format (VHS, 8mm, etc.) have a huge problem: without at least two machines, you can't edit. But even a single DR4d allows random access editing 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

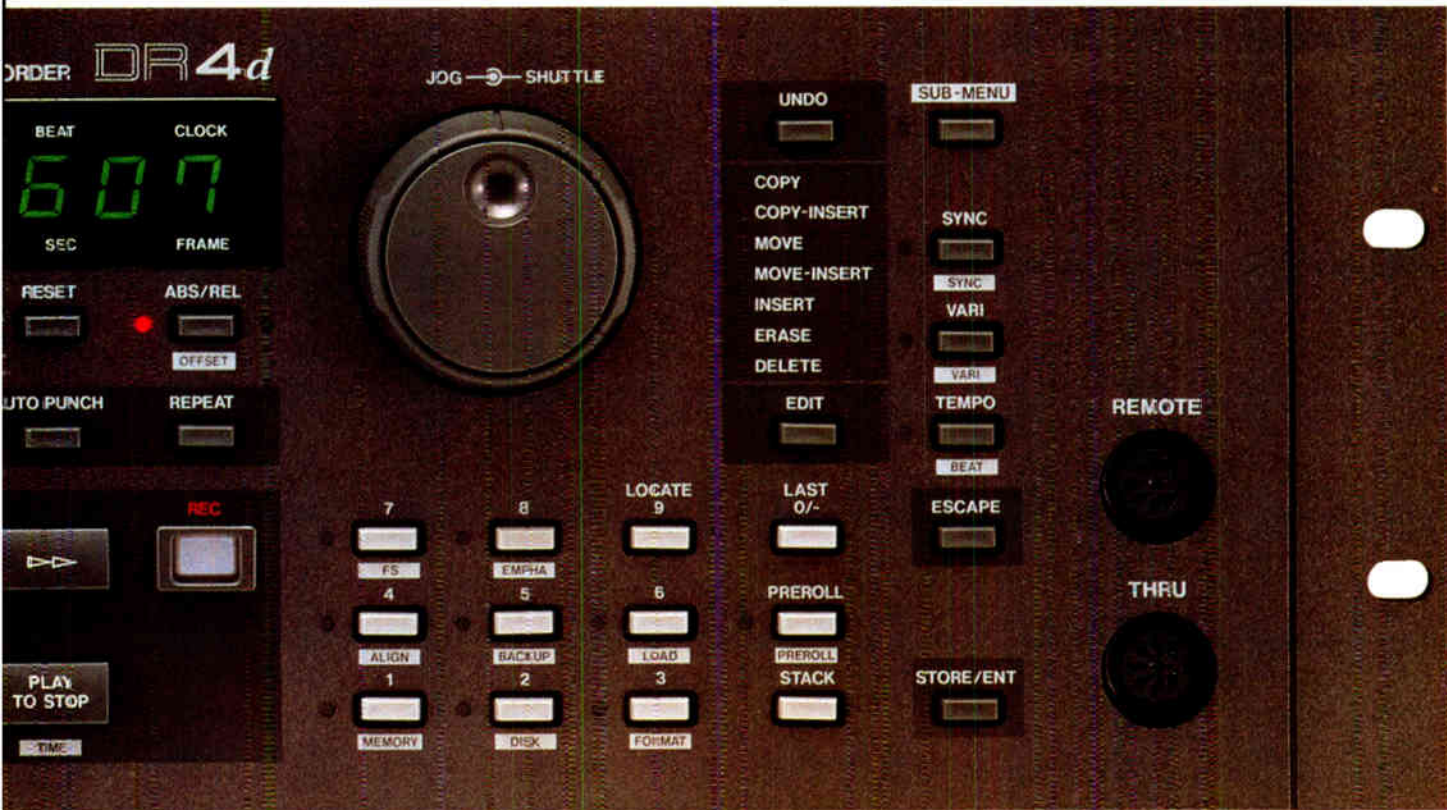
know how to use the DR4d. Punch-ins/outs can be performed manually or



DL4d Remote

automatically from the front panel, or via footswitch. Like you'd expect.

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 convertors 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.

Today the studio is a far different place. The Macintosh computers host the hard disk recorders, and IBMs host the automation and test equipment. Young men and women sit at workstation terminals, swaying to the music in their headphones, the sound of typing occasionally fills the air. Digital tape housed in cartridges passes unseen through modular digital multitracks (128 tracks) and DAI's. The razor blades are housed in disposable BIC shavers, back in the medicine cabinet in your apartment (your microwave pancakes are in the freezer). Time code runs throughout the room, as does MIDI. You check your e-mail every morning. You just bought a CD recorder for \$4,000. Your next purchase will be a Video Toaster. OMF looks good. Then you'll have to decide on whether to install FDDI or CDDI. Your room has many more software controls than hardware ones. You're sifting through assistant engineer resumes looking for a good C++ programmer. The very definition of the word "tool" has changed. Musicians are a fine bunch

of fellows, unless they had a head crash last night.

The era of multitrack analog recorders passed into oblivion with the widespread availability of professional digital audio technology. In fact, the advent of digital audio changed

**Ours is a business of
technology, and thus it is a
business of change. Those who
intuitively understand the
nature of change profit from it;
those who do not understand it
do not profit for long.**

everything about audio. Recording, editing and processing were all reinvented, and networks and multimedia were introduced. Dig deep to find a decade-old issue of *Mix* and you'll see advertisements for the old equipment—sheet metal, knobs and meters—now appearing as anciently

quaint as dinosaurs. Now look at the ads in this issue—manufacturers would suggest that you examine them very carefully—and you'll observe that the product categories are mainly digital and mainly did not exist ten years ago. Ours is a business of technology, and thus it is a business of change. Those who intuitively understand the nature of change profit from it; those who do not understand it do not profit for long.

The changes in your control room are as obvious as the wrinkles on your face, but the timeless force of change, insidiously working every day, conceals its own magnitude and destiny. You do not notice your wrinkles but are shocked when you see how withered a long-lost acquaintance appears. Change is not easy to accommodate because its intent is to make us old, to push us aside, to make room for the next, younger generation. We intuitively enjoy change, we adapt to it, we benefit from it, but we are afraid of it, because change is immortal, whereas we are not.

The youngest adapt to everything that is new because they do not know the old. They do not even rec-

WHY PUT UP
WITH AN
ORDINARY
CONSOLE?...



ognize change, because it requires perspective that they have not yet acquired. Everything that is presented to them is immediately accepted as correct—that is, never, never questioned. They are enamored of technology because it is modern, because it offers change. They intuitively know that change is a code word for opportunity, for them. Their capacity to learn is undiminished, because the capacity has not yet been taken. A display may show a picture of physical controls, but they are quite comfortable manipulating knobs with a mouse. Even then, the picture of controls was devised for the older generation, to ease their transition by giving them the familiar; soon, to satisfy the new market majority, those displays will be replaced by icons selected by the younger generation. Open-reel digital tape recorders were designed to accommodate analog-style razor blade editing, but blade editing disappeared in favor of electronic editing. Then the open-reel machines disappeared as well. That is how change works—incrementally obliterating the old, until the old has been completely erased.

As the young grow older, they begin to recognize change and become accustomed to it. They reach a stride in which change is the engine in their careers and their lives. Change moves them to a better life. Their command of knowledge is impressive. They are the reason we idolize youth. They are said to be children of the new generation, but in reality they are its masters because they are the ones inventing change. They wield technology well, leveraging every old invention into a dozen new ones. They work long hours to conceive, design, engineer and manufacture change. Instead of adapting the old, they discard it and invent something quite different. The strongest icon of the past, the reel of tape, is repudiated. With a smile, they know their new invention is shocking, radical, better. By directing change, they make their mark in the world. They have a pact with change—selling their future security for their present enthusiasm. For most, their lives peak.

They grow older. Experience becomes less of an asset and more of a burden. Their once-flexible ability to

adapt becomes arthritic. They have seen too much change. They can't keep up any longer. They prefer to remember the good old days—2-inch tape, razor blades, that sort of thing. They are more concerned with preservation of principle than with new income and growth. Their job descriptions change. Artists become investors, engineers become managers. Fast-moving technology passes them by. Career opportunities are passed to a younger generation. They decide that they have adapted too many times, that they cannot learn any more new tricks, that they have no more skins to shed. The music is foreign, the technology is foreign. They choose to get off the ride. They pass their invaluable wisdom to the younger generation, who hardly listen. They are noble in their preservation of the old, but they pass into history, remembered for the changes they enacted when they were young. ■

Ken Poblmann is author of Principles of Digital Audio and The Compact Disc Handbook and co-author of Advanced Digital Audio.

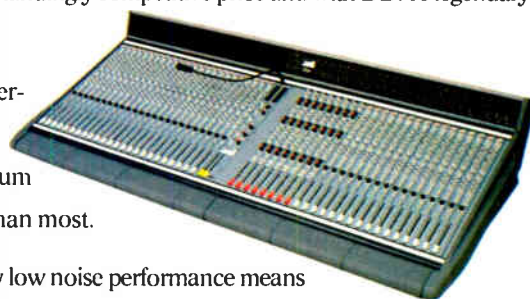
....WHEN
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USE READER SERVICE CARD FOR MORE INFO

by Stephen St.Croix

REDRUM

You wouldn't listen to your music backward, would you? Okay. We all did listen to our music backward for a few years there—so we could find out that Paul was dead, or that the devil was living in Burbank, or that we should cut our parents up with an axe. Yeah, yeah. So we did all of those things. Well, I'm out now, and I immediately spent a few days trying to get my new Metallica CD to play backward so that I could get my new instructions, but...

Now my CD player is back from the service department, and I'm relaxing by the pool as I write this column for you, and a thought passed in front of me: If you don't listen to your music backward anymore, why are you willing to listen to it upside down?

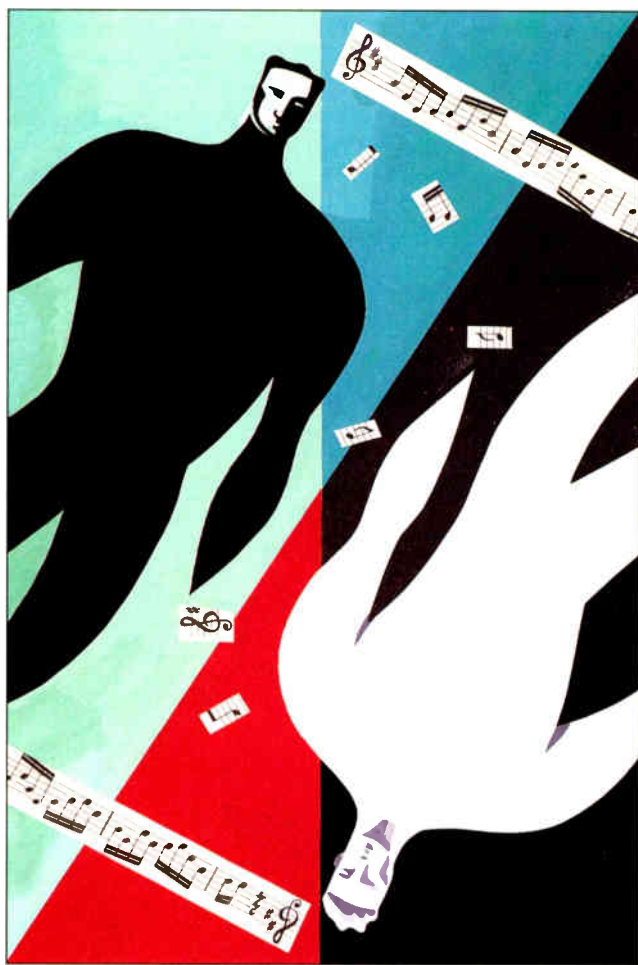
For you science dweebs out there, let me pose a question. Most adult males in the United States of America shave, and they do this in front of a mirror, so they have learned how to deal with the image reversal. But think about it for a moment: Why does a mirror reverse left and right, but *not* up and down?

Anyway, back to the question at hand. Listening to music upside down bites. It sounds terrible. Why do you *do* it? Why do you *record* it? Maybe upside down isn't the right term. Maybe I should say inside out. I guess it depends on where you look in the audio reproductive chain.

Let's go to the top (look—I got here *much* faster than I usually do). Upside down music. You record a vocal and look at the waveform on a scope or in the editing window of a DAW. Nice wavy lines. Not the same on the top as they are on the bottom. Right? Vocal takes are a really good example for my point here, because they are in fact highly asymmetrical and always have been.

What does "always have been" have to do with it, you might ask? Well, speech evolved as a method of communication. As humans learned

to speak, they learned to listen and understand. Bear with me here. Most humans vocalize using expelled air, and they all do it basically the same way. The resultant asymmetrical waveforms (speech) have a great many common factors, not the least of which is predictable asymmetrical



waveforms. Human ears have been training to listen to this very speech, in its original, acoustic, noninverted form since the first word was spoken. That word was, by the way, "Mine!"

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You'll notice it uses superior Hi 8mm tape, giving you a full 108 minutes of record time. What's more,

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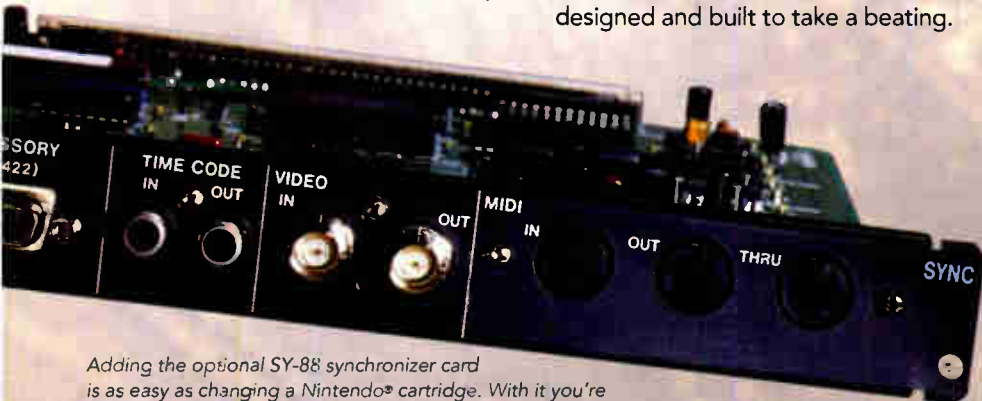
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Adding the optional SY-88 synchronizer card is as easy as changing a Nintendo® cartridge. With it you're SMPTE and MIDI compatible. And no matter how many DA-88s you have locked up, you need only one sync card. Other optional accessories include AES/EBU and SDIF2 digital interfaces allowing the digital audio signal to be converted for direct-digital interfacing with digital consoles, signal processors and recording equipment.

Even more impressive is the transport's responsiveness. Take a look at the front panel. Notice the shuttle wheel? Turn it just a bit and the tape moves at one fourth the normal play speed. Turn it all the way and it flies at 8 times faster. Do it all night if you want. It's quick, smooth and it's precise. Need to get to a location quickly? Accurately? Shuttle a bit and you're there. The location is easily viewed on the DA-88's 8-digit absolute time display — in hours, minutes, seconds and frames. With the optional SY-88 sync card it displays timecode and offset, too.

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s Machine



Take punching-in and out, for example. You have three easy ways to do it. You can punch-in and out of single tracks on the fly. Just hit the track button at the punch-in point. Hit it again to punch-out. You can use the optional foot switch, if you like.

Or, for multiple tracks, simply select the track numbers you want to punch, push play, and when you're ready, hit record to punch-in, play to punch-out.

Finally, for those frame accurate punch-ins, you've got auto punch-in and out. In this mode you can rehearse your part prior to committing it to tape.

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There's more. Add the optional SY-88 synchronizer card to just one of your DA-88s and you've got full SMPTE/EBU chase synchronization. The best part is, you can record time-code without sacrificing one of your audio tracks. You also get video sync input, an RS-422 port to allow control of the DA-88 from a video editor, and MIDI ports for MIDI machine control.

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LISTEN TO THE REST

Of course, the sound quality is stunning. With a flat frequency response from 20Hz to 20kHz and dynamic range greater than 92dB, it delivers the performance you expect in digital recording.

So get to your authorized TASCAM dealer now. Check it out. Touch it. And listen to it. Once you do you'll know why the TASCAM DA-88 is the serious machine for digital production. The TASCAM DA-88 is the choice of studios worldwide. And at only \$4,499, it should be your choice.



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another pass through the mixer, maybe a little offboard EQ, and on to the 2-track. How many times do we have the potential for a little good old American phase reversal? Enough, considering that very few people even know that it matters.

Scientific studies (done by actors playing scientists) have shown that intelligibility drops dramatically if recorded human speech is inverted. This is fact, kids! If you think about it, there is no surprise here. Humans never experienced inverted speech in the wild, at least not until politicians and TV evangelists were invented. So all learning was optimized to take advantage of any and all information that could be extracted, including phase-sensitive data.

So the next time that you love your mix and the vocal is exactly where you want it, but you just can't seem to understand the words, try inverting the vocal. If that doesn't work, try inverting the vocalist. While my experiments have shown that there is no real-world gain whatsoever to be had from inverting the vocalist, it looks funny, and everybody in the control room generally enjoys it. We use gravity boots on cables suspended from the ceiling.

Hey, film guys! The same goes for you. You would not believe the improvement that you get in certain situations with this cheap (well, free, actually) trick!

Drums. Come on. Listen to a snare inverted and noninverted. One sounds like a recording, and one sounds real, assuming that you have some basic miking skills. And kicks? If you are the audience, a kick drum is supposed to crush your rib cage, clean, sharp and fast. Compression front. If it is inverted, it feels totally silly, simply wrong. The only person in the world who is supposed to hear a kick as an atmospheric rarefaction is, of course, the drummer himself. Think about it.

Again, you film guys: Harleys don't suck air in through their exhaust pipes. .44 Magnums don't inhale fire and eat lead through the ends of their barrels, and all airplanes push compressed air out the back, unless they are in some very serious trouble. Let's keep it that way. ■

Stephen St.Croix is a Mix contributing editor.

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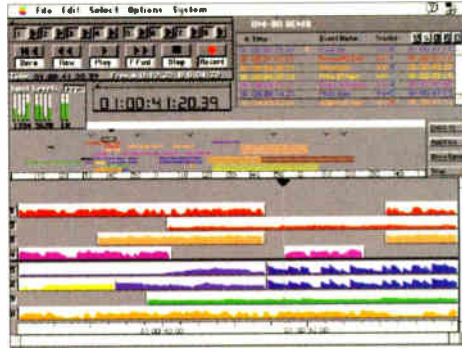
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the Word.

Problem is, many DAWs just can't give you all of these things.

Here's why:

Problem: Some systems use a single computer for graphic user interface *and* for audio information processing. This slows the whole system down, and makes you wait.

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The Answer: First, call around. Check the reputation of DAWs. We have DM-80s working every day all over the world in high volume production environments. Our customers will tell you they're reliable.

Problem: Some systems don't give you a user interface that's familiar and easy-to-use.

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Problem: Some DAWs are the weakest link in the audio chain. The DAW you buy should deliver sonics as good or better than any piece of audio equipment you own.

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Who Pack DAWs in Their Holsters



BY TED PINE

In the beginning, there was the studio, and if you worked in film, you worked for a studio—or you didn't work. If you were an audio editor, you showed up on the studio lot and worked in the room with the equipment that the studio supplied. Slowly over time, as directors, producers and stars gained control—and Hollywood sought to trim costs—the old order broke down, and more and more work was done on the outside by independents. By the late '70s, the trend extended to audio, as prominent supervising sound editors opened their own facilities, and the studios shut down their in-house ed-

itorial departments to concentrate on mixing.

Today the audio post-production workload is divided among freelancers, large independents, smaller independents, project studios and, once again, the major studios, which are reopening and revitalizing their sound departments. Within this changing landscape, a new species of freelance editor has evolved: One who supplies not only the talent, but the equipment, which often includes full-blown digital audio workstations.

For example, to cut music tracks on last summer's TV mini-series *Queen*, New York-based music editor Todd

Kasow packed up his Sonic System and five gigabytes of disk storage, checked it onto a transcontinental flight, and set up shop at Larson Sound in Burbank. "I've got the whole system mounted in a portable rack," he explains. "I put two covers on it, and I can be anywhere in the world in two days." Call it B.Y.O.W.—bring your own workstation.

Freelance supervisor/sound designer Jeff Sandler traces the origins of the B.Y.O.W. phenomenon to the late '70s, as freelancers and independents became ascendant in Hollywood: "A lot of guys started to show up with their own amplifiers and

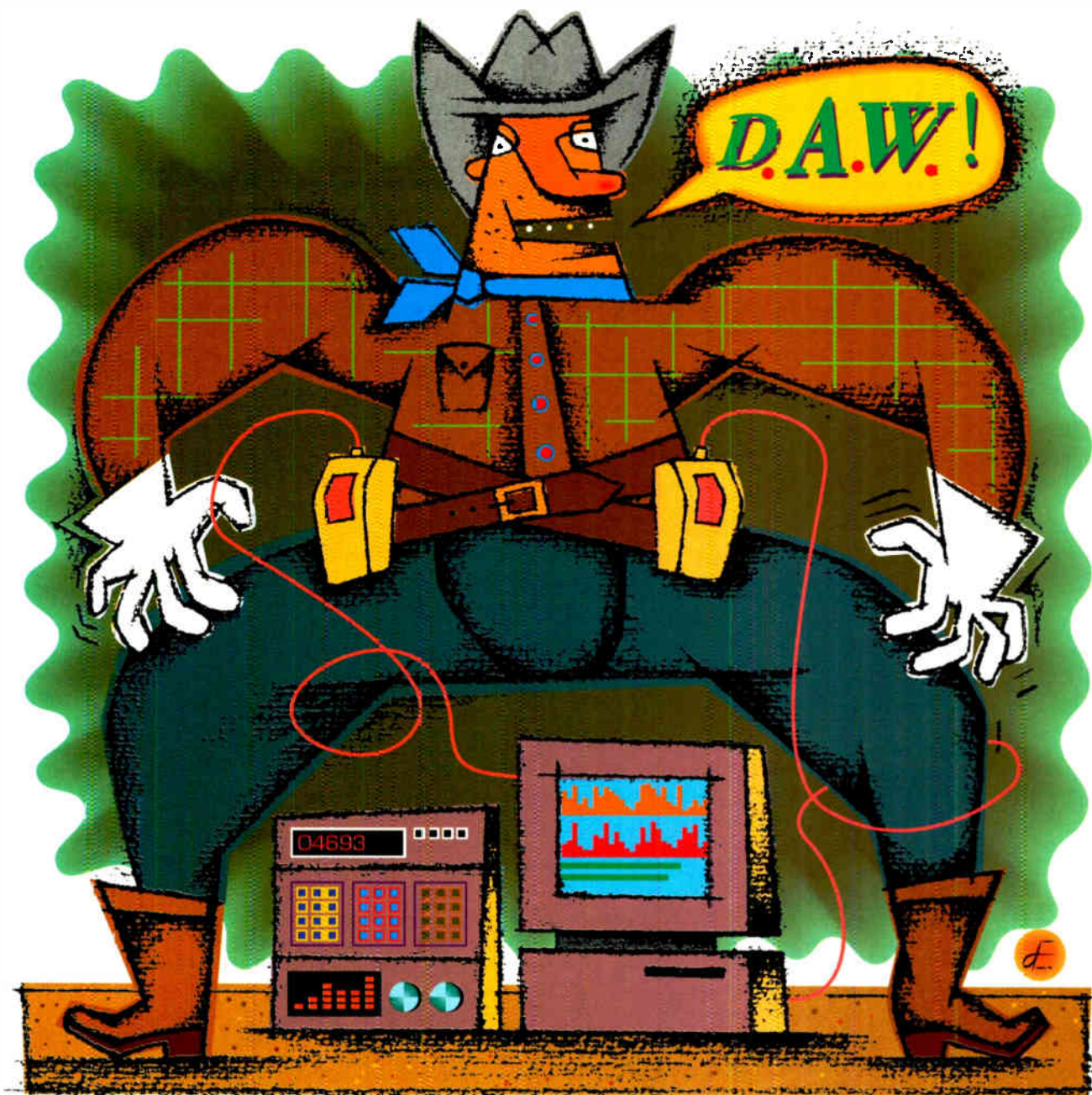


ILLUSTRATION: DAVE EMBER

headphones," he explains. "Since the studios were required by the union contracts to provide facilities, it was something that wasn't talked about much. But a lot of people owned their own Moviolas and got a rental income from them. When I was editing on mag, I brought along a six-gang synchronizer with a disconnect on the first gang so I could freewheel. I have always wanted to have the tools to do the job right."

So when digital workstations appeared on the scene in the mid-'80s, Sandler made a decision to educate himself in the new technology. He left a staff position at Sound Storm in

Glendale, Calif., bought a Hybrid Arts ADAP-1 disk recorder and hung out his shingle as a freelancer. The gigs came steadily, and one ADAP quickly became two, then three. By the end of last year, as Digital FX acquired first Hybrid Arts and then Waveframe, Sandler had upgraded his ADAPs to Digital F/X Master 2-tracks and added two 8-track Waveframes: a Waveframe 400 and a Waveframe DCS. "I can now bring 22 tracks of digital input and output to the gig," he reports, "because I tandem up the systems. And I now have to move everything around in a truck."

For those with dreams of instant

wealth, however, buying a workstation and going freelance is not exactly the equivalent of an Instant Lotto ticket. In fact, Sandler characterizes his equipment as a double-edged sword.

"Creatively, this is the edge that cuts for me," he says. "I have total creative freedom, because I am confident I can do anything. I am never stuck for what I want and need in my work. And with this gear, I'm also compatible with hundreds of other machines in town. If a studio or independent has got the contract, and they suddenly need more staffing, I can offer the equipment and the talent in one package. That's the good side."

"On the negative side," he adds, "I'm so well-equipped that it becomes difficult for a studio to hire me. I look like competition. There is a fear that if I let my client near this guy, he may want to stay with him. I have often witnessed people walking away with other people's clients. So I can't say it's an unreasonable fear, but all I can say is it's something I've never done."

For some freelance editors, an investment in workstation know-how and technology has provided the entry into a full-time position at a studio. Rob Sephton, who recently made the transition from freelance editor to Disney staffer, explains: "In late '89, I was brought in as a sound editor on *New Jack City*, doing group ADR and some effects. I went out and bought Sound Tools for the job, because I could see the potential of the technology for film: For example, the ability to preview and audition all the tracks prior to the mixing stage and then reducing the need to order reprints.

"This gave me a creative edge and possibly a foot in the door at the time with the independents [studios] who were willing to see how production could work in the digital domain," Sephton continues. "For the next two-and-a-half years, I was travelling all over the place. As the technology got more and more visible, the major studios started thinking, 'Let's bring in these guys and lease their equipment and see how this stuff works.' That's basically how I came to Disney."

However, music editor Carl Zittler, who uses a 4-track Digidesign Pro Tools system in his work, cautions that equipment alone does not make for career advancement: "I never even considered that I was investing for career reasons. I never thought, 'If I buy this, it will look like I'm up to the moment, then people will hire me.' I did it because I could do better work faster. If the result of that is that people like what I do, then the investment was worthwhile. But far more important than investing in any equipment is investing the time to see what works for you. Only then should you consider spending the money."

The term "investment" crops up frequently when editors talk about their equipment. Unfortunately, the problem with an investment in capi-

tal equipment is that it behaves like a car rather than a certificate of deposit: The value drops as soon as you take it off the showroom floor.

Presumably, the payoff comes in terms of better gigs and increased rates. But with the rapid pace of technological change, many freelancers seek to measure the payback time in months, rather than years. Sephton's experience is typical. "When I first invested in a 2-track Sound Tools, it cost something like \$6,000," he explains. "I got that back within eight to ten months of working on shows. As the technology kept advancing, I traded the first system in on a 4-track Pro Tools, and then I upgraded to eight tracks. It was money out of my pocket, but it got me gigs—good pictures. I can say that, in the long run, I was able to grow and continue investing in the system from the initial cost. I have never quite caught up to what I've put in, but I have paid back quite a bit."

One of the ways in which a system can pay for itself is in terms of increasing the workload a freelancer is able to handle within a given time frame. ("I am able to do a couple of jobs at a time," Kasow reports.) Another source of revenue is in rental income for the equipment above and beyond the creative fee. But Sandler warns, "You can't always charge for the equipment. As an entrepreneur, you often have to flat rate the bid and include both facilities and services in it." In such cases, of course, the bet is that the time savings and reduced transfer costs that a DAW can offer will make the flat bid a profitable one.

Sandler also cautions that this very speed of the new technology can just as easily backfire on a novice unused to pricing digital domain services. "The biggest problem is with the guy who has what he thinks is a year's worth of work in an analog medium," Sandler says. "So he goes and buys a couple of systems, and what once took him a week now takes him a day. Now he's in a situation where the amount of billable hours is less, because he's working less and the stock charges have all but disappeared. So what can he do? He can't charge more than the market will bear."

The resurgence of the Hollywood studios is creating additional competitive pressure among freelancers. Major studios such as Sony, Universal, Disney and Warner Bros. have revived sound departments that were moth-

balled in the '70s—and are equipping them with workstations. With more work going to in-house facilities, the competition for freelance work is becoming fiercer; and with workstation technology becoming more widespread and commonplace, equipment is less likely to provide an edge.

According to Sandler, this development is a natural outgrowth of the freelancers' success. "The swing is going back to the studio owning the equipment, because the private entrepreneur has sweated out the bugs," he says. "The technology is proven. The studios are coming off the sidelines based on our work."

Sephton agrees, but notes, "There are still studios and independents out there who haven't invested that will hire you and your system. But if you do lock on, they will eventually get tired of paying for both you and the rental. Then it's decision time."

For freelancers, the options (with apologies to Lee Iaccoca) are basically threefold: to lead, follow or get in the way. The pathway of leadership consists of continuing to pioneer new services and markets. Sandler speculates that film editors displaced from the coasts will increasingly make their ways toward growing markets in the country's heartland. "I just spent some time in the Midwest, Texas and New Mexico, and the opportunities I saw there were incredible," he explains. "Whatever happens with the studios, the day when L.A. exports all the film and TV product to the world is through."

Joining a studio sound department is an increasingly attractive option. After a year as a full-time contractor, Sephton is joining Disney full-time and negotiating to sell his equipment to the studio. Sandler hopes for the same opportunity. "If a major studio said, 'Jeff, come aboard,' I'd do it," he says. "I enjoy being a member of a team and contributing to the creative process. I don't particularly like finding the work and holding onto it."

The other alternative—getting in the way—consists of abandoning the nomadic, freelance life in favor of setting up an independent shop. Skip Lievsay, cofounder of C-5, a major New York independent, recalls that this is exactly how his business began. "My partners and I started out being freelancers, buying dubbers

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4.0 let's you arrange the user interface to suit the way you prefer to work. The Mixview, DAWN's scrolling tracksheet, can be displayed both horizontally, for editing, or vertically, for dubbing - the DAWN is the only editing system which offers this choice of modes. And in 4.0 the Mixview is DAWN's only window - all editing and track-laying tasks, however complex, can be performed in this one window.

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and effects libraries and dragging them from editing room to editing room," he says. "Every time we'd make some money, we'd buy more equipment to do a better job. C-5 was a natural progression, born of the desire to stop schlepping everything home every six months."

Despite the preceding cautionary tales of freelance life, the idea of going it alone no doubt still appeals to those rugged individuals among us who tire of staring at the same four walls every day. But in this world of shrinking budgets and tightening deadlines, does saddling up your

workstation and hitting the trail still make economic sense? Is the workstation-slinging freelancer an endangered species?

Sephton offers these cautious words of encouragement: "For the person that's out there contemplating the large investment, it's still wide open. There are still movies being made independently. It's a very historic time in terms of the way this is being integrated into the film arena. If this is what you want to pursue, computer savvy is going to be

the ticket. But I don't know how much longer somebody who has their own equipment will really have an advantage. In the end, people want the driver, not the car."

Zittler echoes these concerns. "Obviously, I would advise people to do this, because I've done this," he says. "But keep in mind, two years ago if you wanted to rent a Pro Tools, I don't know if anyone would have known what to rent you. You had to buy the equipment because the technology wasn't well-understood. But that is all changing. Rental houses are now renting the complete package: hard disk, videotape, transport, speakers. I don't know if you can rent hundreds of them like you can with Moviolas. Nevertheless, the hardest part of becoming a music editor is not getting the equipment; it's breaking into the business."

Kasow remains firmly committed to his independence. "I look at it this way," he explains, "this is probably the first time in history that we, as freelancers, can even afford to buy a system that is complete: \$50,000 replaces what hundreds of thousands bought no more than six years ago. But in the future, I'm sure the technology will also weed out a lot of people. For now, it's made my work fun again. When I get up in the morning, I'm excited. When I make a mistake, so what? And I think that it makes my relationship with directors and editors a lot easier, because if somebody wants to make a change, its fine; no problem."

Sounding another note of optimism for freelancers, Lievsay, from the vantage point of distant New York City, views the centrifugal forces currently emanating from Hollywood as a rather short-lived trend—proof of the cyclical nature of the film business. "It's like the seven-year itch. Suddenly everybody has to go back to the soundstage," he says. "Two years from now, a major talent like a Jim Cameron or Steven Spielberg is going to say, 'I can't work here; I want to work with this guy, and he's not on your staff,' and the cycle will break, and people will go independent again." ■

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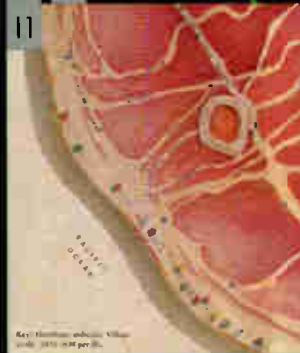




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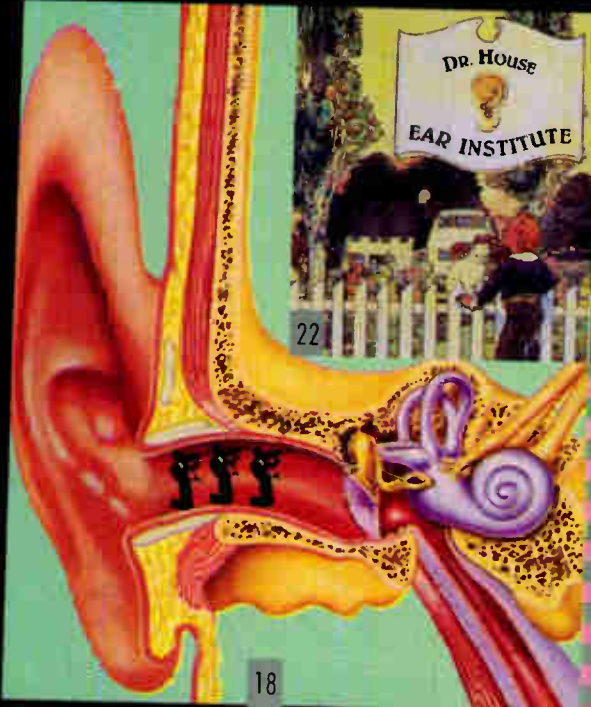
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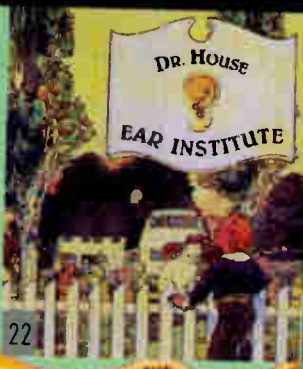


Rayl Hamilton, amblyopia, 1910 (left); 1910 (right)

... ..



18



22



13



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2



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3



24



14



25



15

Willy Russell • Ch  
 David Byrne • Phil S  
 Tina Turner • M2 Sab  
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To Be Continued... *Worms* ...



**I**t was in 1990 that the virtual audio buzz began to rise above the noise floor in the pages of *Mix* and other magazines. A *Mix* two-part series on 3-D audio by Dan Daley in February and March of that year was followed in October, '91, with "Psychoacoustic Satisfaction: Exploring the

Frontiers of 3-D Sound" by Linda Jacobson. These articles helped to bring the subject out of the realm of the acoustics laboratory and into the recording studio, alerting readers to a set of new products that promised recording engineers a "virtual world" of sonic possibilities. And soon, 3-D sound localization was touted not only as the coolest effect since the fuzz box, but also as a possible replacement for the panpot and mixing console!

Since that time, some 3-D sound companies have folded; some new products have appeared; and some of the companies are putting out new, smaller, cheaper versions of their 3-D sound processors that make the technology more accessible. For example, Crystal River Engineering (Groveland, Calif.) has introduced a new version of the Convolvotron called the Beachtron, aimed primarily at inexpensive virtual reality applications. Roland (Los Angeles) is incorporating some of the sound localization technology found in its RSS processor into a "dimensional space delay" (SDE-330) and a "dimensional space reverb" (SRV-330); these de-

vices are single-rackspace-size and are much less expensive than the original RSS processor. And some of the technology embraced in AKG's CAP 340M, which was almost the size of a refrigerator and capable of most anything having to do with 3-D sound, now appears in its BAP 1000 (as yet unavailable in the U.S. as of this writing). Its function is

to provide a "virtual recording studio" environment for the headphone listener. And still other companies are planning to put the technology on inexpensive chips, aiming their sights at the video game market.

The trend seems to be to develop "special purpose" devices for manipulating spatial sound, rather than "general purpose" machines. Why is this? Simply because the larger devices couldn't really

# The Evolution of

BY DURAND BEGAULT





ILLUSTRATION BY STEWART STANYARD

**The effects of binaural recordings, either made with dummy heads or with binaural mixing consoles, are undeniably more impressive than normal stereo when heard over headphones.**



produce all of the effects that they claimed, especially over loudspeakers. More to the point, manipulation of the controls of a general-purpose, 3-D audio device inferred that the recording engineer could *control* or *predict* all of the spatial percepts a listener of the processed sound might have. Although credits to the wonder of Q-sound, RSS and other 3-D sound technologies appear on CDs, the net effect of the processing seems to be more in the realm of a vague sort of "spatial enhancement," rather than of creating virtual sound sources at many different locations around the listener. Furthermore, the

cost of a device can be greatly reduced (and the number of units sold increased) if the sophistication of the human interface and the levels of signal processing are limited in scope.

This isn't to say that 3-D sound technology is a misnomer or hype. The effects of binaural recordings (either made with dummy heads, or with binaural mixing consoles such as those produced by Head Acoustics of Norwalk, Conn.) are undeniably more impressive than normal stereo when heard over headphones. In the psychoacoustic research I conduct with Elizabeth Wenzel at NASA-

Ames Research Center (Moffett Field, Calif.) and in similar studies from university and government research laboratories, we've actually found that virtual sources over headphones are almost as accurately localized as real sound sources, if you eliminate "reversed" judgments (hearing sound from the back instead of the front is still problematic under some circumstances).

Furthermore, we've all probably experienced "supernormal" spatial experiences over stereo loudspeakers with "pre 3-D sound" technology. For example, many electronic music composers—for example, Maggi Payne's release *Crystal*, on the Lovely Music label—have produced wonderful spatial effects over loudspeakers that required none of the current 3-D sound technology. So the problem isn't with 3-D sound technology itself. Rather, it has to do with the fact that it's difficult to *harness* that 3-D spatial imagery over loudspeakers in such a way that the imagery can be transported to a number of listeners. Why is this?

First, consider the use of crosstalk cancellation and variants on the original theory proposed by Schroeder and Atal in 1966. Three-dimensional sound effects truly depend on being able to predict the spectral filtering occurring at each ear. But each loudspeaker is heard by both ears; this crosstalk affects the spectral balance significantly. Crosstalk cancellation compensates for this by supplying a 180° out-of-phase signal from the left speaker to the right speaker, delayed by the time of arrival to the ear, and vice versa. But for this to work over the entire audible range, you need to know exactly where the head and speakers are, and even the effect of the person's head on the crosstalk signal. No 3-D sound system allows inclusion of the listener's head size, although they should since smaller-headed people require less interaural delay to move a sound to a particular position as compared to larger-headed people. Some progress in the area is being made (read "Prospects for Transaural Recording" by D. H. Cooper & J. L. Bauck, *Journal of the Audio Engineering Society*, 1989). But despite the best efforts, crosstalk cancellation probably requires further development for most contexts; the 3-D sound system needs input about details of the listening space and location of speak-

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ers and listener to be effective.

Auditory localization involves more than pinnae filtering and interaural differences in day-to-day experience; there are spatial aspects to reverberation, expectation and comparison to previous knowledge, Doppler shift, and the interaction of the other senses, especially vision. Perhaps most important is the fact that spatial hearing involves movement of the head to clarify an auditory source's location; in other words, virtual sources positioned without head tracking aren't as virtual as ones that are.

One of the most significant features of virtual reality is the fact that one can move relative to a virtual auditory or visual source, and the source remains fixed in space independent of the user. This gives a VR system its immersive quality: Sources stay fixed in space in the virtual world just as in the real world. A loudspeaker is a real source that remains fixed; but hearing 3-D sound over loudspeakers with crosstalk cancellation requires sitting at the "sweet spot" at a certain distance. So far, head trackers are only used for

headphone-based 3-D sound systems; current tracker technology only allows movement within a limited space.

In the future, someone *might* figure out how to make trackers good enough (and light enough, without cables) so that a computer could calculate your position relative to several sets of loudspeakers and provide compensatory signal processing. But the most formidable barrier may be that the culture surrounding home stereo listening seldom favors

a single listener—the "audiophile"—who actively listens while facing the loudspeakers. More often than not, loudspeakers are heard as background music, and/or by multiple persons perhaps watching a television monitor.

Finally, there's the notion of *transferability of experience*, whereby a naive person may assume that there is a single reference standard for a sound recording, but the truth is that recorded sound is a highly malleable art form. Most profession-

It's difficult to *harness* that 3-D spatial imagery over loudspeakers in such a way that the imagery can be transported to a number of listeners.

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al recording engineers have the ability to "hear" their mix independent of the differences in tonal coloration (timbre) between different speakers and different listening environments. Even within a single control room, the virtual sound source positions resulting from a stereo mix will be different—in the absolute sense of how many degrees separation there are between the hi-hat and the keyboard track—when switching between the Yamaha monitors placed on top of the console and the JBLs mounted on the wall.

The key here is that the *relative placement* of sources remains constant with amplitude panning. But 3-D sound involves frequency-dependent time and amplitude differences that are very "fragile." In other words, the relative placement of imagery doesn't transfer between different speakers or rooms very well. The dependence of frequency-dependent time differences in 3-D sound brings up the issue that most loudspeaker systems are not time-aligned; rather, higher frequencies are differentially weighted between different brands of speakers. Essentially, the time-alignment characteristics of each speaker system will contribute in an unpredictable manner to the spectral transformation of sound at the eardrum, as will the reflective characteristics of the environment.

So, 3-D sound processing is available and usable, but in its current form still seems best suited to headphone playback. Those who are mixing with current technology will have to realize that the ability to harness 3-D sound effects in a transferable way to loudspeakers means attempting to predict what their listener will actually hear. As long as the demands of the engineer or listener aren't too specific, there will be a guarantee of success; but by demanding improvements, engineers and designers will produce better products. The worst thing would be to put listeners in a position to be disappointed by promising too much. Since we're building a virtual world, we ought to be more honest about what occurs within it. ■

*Durand R. Begault works at the spatial auditory display laboratory at NASA Ames Research Center, developing and psychoacoustically evaluating 3-D auditory displays.*

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# V ERMONT'S NEW ENTRY IN THE HIGH-STAKES STUDIO GAME

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by Dan Daley

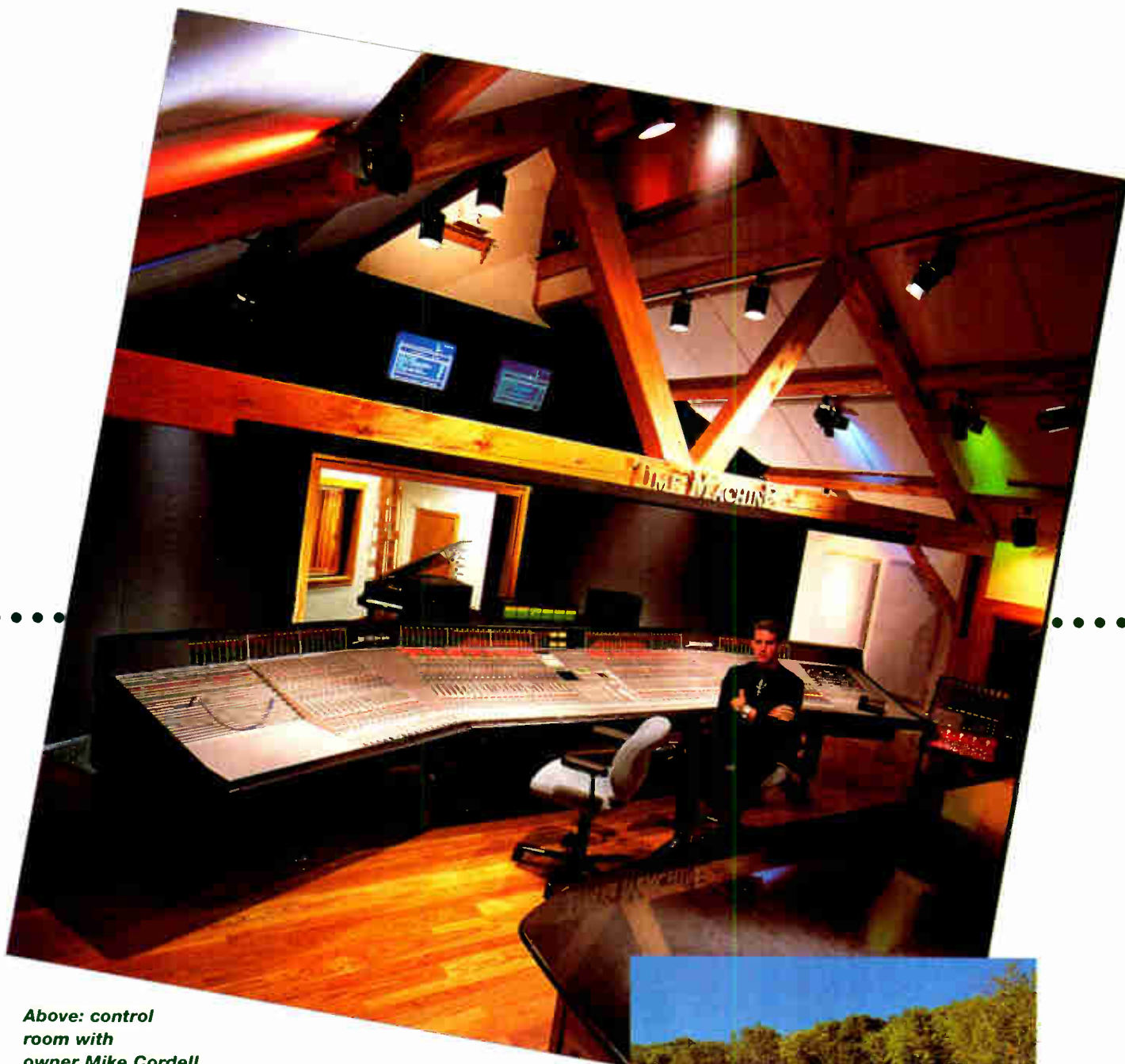
The Atlantic North Airlines Beechcraft 15-seater's transponder is clearly visible up through the aisle as the aircraft

passes over southeastern Connecticut. Already set to the default squawk of 1200, it means we've left the New York City area's radar control behind, heading north-northeast

toward Rutland, Vt. This quintessential downeast hamlet has the closest usable field to Time Machine and Time Capsule, a pair of rooms within a building situated on a breathtakingly beautiful and serene 85-acre estate, which was chosen to be the site of the latest entry in the major-studio/offbeat-location sweepstakes.

Owner Michael Cordell is tall and wiry, with a closely cropped head of dark brown hair and a GQ sort of insouciance that belies the intensity with which he regards music—his own and music in general. A graduate of NYU with a music business degree, the 26-year-old Cordell might be the template for the Generation X studio owner. The project studio revolution began during his adolescence, and the idea of musicians having their own studios was a given rather than a novelty.





**Above: control room with owner Mike Cordell**

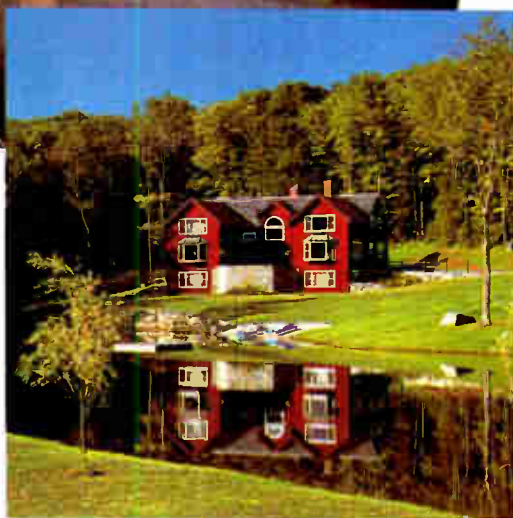
**Right: view of the studio facility from the outside**

**Left page photo: indoor pool at the living accommodations**

Time Machine is a residential studio, of the Caribou Ranch era, which evolved from a personal recording environment to a megadollar, top-dog-equipment commercial studio, yet remains anchored in the personal musical ambitions of its owner.

"Time Machine began because I wanted to record my own music."

says Cordell, who has a band with his brother. A native of Jacksonville, Fla., Cordell, whose professional background includes recording local college bands in Georgia, came upon the site in central Vermont in 1990 and fell in love with it. He began building the structure that now houses two control rooms the following year, first putting in a self-designed control room with a DDA console and a 24-track analog deck, with a small, ad-



ja cent recording space.

But Cordell's aspirations quickly outgrew a single building, and he embarked on a recording complex





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that now features two control rooms—Time Machine and Time Capsule—sharing a common isolation space. In addition, there is a New Englandish residential building, dubbed the Lake House, which fronts on a man-made trout pond and can sleep a dozen comfortably in tastefully appointed bedrooms; Cordell's residence; and the Pool House, with a huge, heated swimming pool, racquetball court (which will double as a live reverb chamber once fiber-optic connections are made) and Jacuzzi, all connected by a web of graveled roads that are traversed by golf carts in the dry season and snowmobiles in winter.

The Currier & Ives-picturesque opulence of Time Machine's grounds was capitalized by Cordell and his family, a subject on which he bristles slightly. But with the access to money apparently came a genetic predilection to technology and creativity: His father devised the automotive airbag. "Time Machine is not about making money," Cordell asserts. "It's about making music, for me and for other people. It's intended as a profitable venture, but the prime principle behind it is music, not money."

The main room—Time Machine—is a classic New England bare wood motif with cross beams and pegs instead of nails. It has an 80-input SSL G-Plus Series desk with Ultimation and 22-degree angled wings rather than the usual 45-degree ones. There are 72 E Series and eight G Series EQ modules onboard. Ted Rothstein custom monitors serve as soffitted mains, while a hydraulic riser moves behind the console to bring up an array of close-field monitors. A combination of new and vintage signal processing gear, including Fairchild 670 stereo compressors, sits in racks beneath a polished Vermont granite-topped producer's desk, which sits in front of the custom-cut, flutter-free diffusors lining the back wall. "Most of the materials used in here are of local origin and were often milled locally," explains Bruce Marshall, Time Machine's chief engineer.

Time Machine faces onto a sizable, sunken, high-ceilinged overdub room, with a 7-foot Yamaha grand sitting on marble tile floor and a glassed iso booth with a drum cupola atop it.

Directly opposite the booth is Time Capsule, the second control

room, which shares the overdub area and is intended now to be Cordell's personal studio. It has a Euphonix console with the CS-2000 software update, although the most striking feature is that it is suspended from the ceiling by heavy-gauge wires like an SR array, as are the near-field speakers. Genelec I037As are the soffitted mains. The tower for the console is directly below the room, downstairs in the reception area. A movable outboard rack is designed to slide under the suspended console at precisely the right height to prevent swinging when in use. While Cordell considers it his room, both rooms will

be available for rental. "I'm transparent here, except as the host," he says.

Time Capsule's design and the renovation of Time Machine were handled by John Storyk, who tried to keep the Vermont architectural vernacular intact. "It's a long, deep room," he says, "and after analyzing it with our CART Ray Trace software, we were able to position the rear-wall diffusion and add parallel, downward-sloping windows to either side of the room. That allowed for a 17 to 18Hz room but kept the natural-light motif."

Time Capsule's design was more complex, he says, requiring more

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construction, such as adding an internal stairway. "It's a more typical 25Hz control room, but we managed to keep the natural light and unusual shape," Storyk says.

Cordell decided against putting in a tracking room, at least initially, because, he says, it would have negatively affected the aesthetics of the studio building. But one could be added in the future, and there are also contingency plans to be able to cover the 60-foot-by-15-foot pool and use it as a tracking room once fiber-optic lines have been laid down. The studio will also be getting its own propane generator, as at least one other building already has, to ensure uninterrupted power during the winter.

On the bottom floor of the labyrinthian building is the central machine room, with a pair of Studer A820 MkIIs, an Otari MTR-90 and a Sony 3348, as well as several 2-track decks. All wiring runs through the lower level's ceiling and was designed and installed by Robert Knox, Time Machine's chief tech and late of Criteria, The Plant, Sigma and Compass Point. All machines and console wiring converge on a large 120-pin

plug board, allowing any machine to talk to either room. The same goes for the AES, MIDI and time code information.

"None of the AES or other potentially noisy signal carriers ever show up in the console patch bay," says Knox. "Everything is video-referenced, and all the cable runs are bundled and separate from one another." A TimeLine System Supervisor and a computer route machine control, and any console or remote can run any machine. "Everything is house-synched," he says. "I basically looked to see what the limits of wiring could be." And the research into wiring the entire compound for fiber-optic cables is nearly complete, adds Bruce Marshall. "If someone wants to do guitar solos from the gazebo or beside the lake, they can," he says.

Marshall was a freelance engineer working at Platinum Post in Orlando when he met Cordell last year. Marshall's extensive connections to studios throughout the country became Cordell's network as the two went on a tour of facilities, including Logic in Milan, Peter Gabriel's Real World,

London's Abbey Road and Conway Recorders in Los Angeles, looking for the technologies and approach for Time Machine.

In seeking to accommodate his own musical ambitions and the needs of commercial clients, Cordell formulated a balanced marketing plan, one that he acknowledges is still evolving. "The place is project-oriented," he says. "And by the nature of the equipment and the location, it has to appeal to larger bands and budgets. Word-of-mouth is a big part of how the studio will be marketed. There have already been a number of substantial inquiries about the studio, from record labels and engineers.

"I knew I wanted a major facility, one that would address my needs and those of a wide range of musicians," he says. "It had to be a place where creativity was primary. But it also had to be sensible. It could have been [South African mega-studio] BOP in the backyard, but it's not. There's a trend toward looking at what big studios cost. I'm more interested in how good the music can be." ■

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*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.*

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# RUDY VAN GELDER

**A** one-time optometrist and ham radio operator, Rudy Van Gelder started recording jazz musicians in the living room of his parents' Hackensack, N.J., home as a hobby. Later, he became jazz's premier recordist, with musicians not only crossing the Hudson from Manhattan but coming from all over the world to record at his self-designed studio in Englewood Cliffs, N.J.

Known particularly for his Prestige and Blue Note recordings, Van Gelder has recorded the best from his home studio: Duke Ellington, Count Basie, Miles Davis, John Coltrane, Art Blakey, Jimmy Smith, Ray Charles, Thelonious Monk, Sonny Rollins and countless others. Always the precise technician, Van Gelder became known for capturing jazz instruments with a clarity and accuracy not known before in the idiom, and great musicians sought him out.

Van Gelder's studio became known not only for its sound but also the comfort and feeling of its setup. Van Gelder's first studio was built into his family's home by supportive parents. He had a small control room with a glass window overlooking the living room, where the musicians played. In fact, sleeve photos from classic LPs by Ho-

Silver and Bud Powell show family lamps and trinkets.

Van Gelder was such an integral part of the jazz scene that even the titles of some classic tunes carried specific references: "Chasing the Trane"



got its name because Rudy sometimes chased John Coltrane around the studio with a microphone, since the tenor saxophonist wouldn't stay on mic. And the tune "Klook's Corner" referred to drummer Kenny "Klook" Clark's practice of always setting up his drums in a favorite corner.

When listening to the classic sessions Van Gelder engineered 30 or 40 years ago, the music still sounds timeless and alive because the musicians are really blowing and the music is so well-recorded. This year, Van Gelder is being inducted into the TEC Hall of Fame to commemorate his past accomplishments, but Van Gelder's career is more than the stuff of history. It's on the cut-

ting edge of recording technology and great jazz music—the two loves that inspired him in the first place.

*What was your first experience with jazz?*

When I was a kid, my friends played instruments, and they would come over to my house—my parents' house—and have jam sessions.

**BY JEFF FORLENZA**  
**PHOTO OF RUDY VAN GELDER**  
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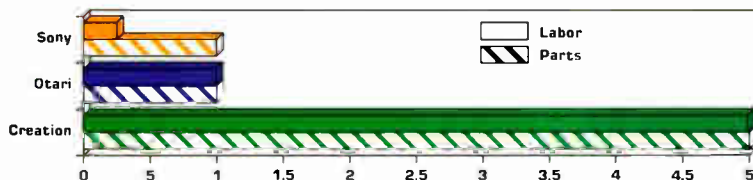


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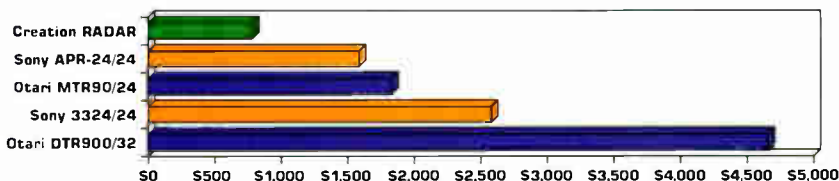


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*Were your parents musicians?*

No. Well, actually, my father was a trumpet player in his early years. I had uncles who were professional musicians all their lives.

*You were an amateur musician yourself, weren't you? What instrument did you play?*

Yeah, sort of, in the high school years. I played trumpet in the marching band.

*When did you start fiddling with electronics and ham radios?*

I think about the same time: pre-teens and through the teenage years. That was my interest in amateur radio. And then, of course, the music, too. And they sort of came together into this recording thing.

*Was there any singular event in your life that solidified in your mind that you wanted to be a recording engineer?*

Yeah. It wasn't specifically a recording engineer. When I was in college, I was going to school in Philadelphia [for optometry], and I was in a professional school learning a profession, and on our off hours we used to go to various clubs in Philadelphia to hear music. Then, I don't remember exactly why, we ended up going to a radio station, WCAU in Philadelphia. I walked into their control room, and the environment there gave me a very strong feeling. It was that "this was the sort of place that I'd like to be." I felt strongly attracted to the sort of things that were happening in this beautiful new radio studio, as compared to the kind of activities I would be engaged in in the profession I was studying. It was a very strong feeling, and I do remember it. But that didn't result in "Now I'm going to do that," because at that time there was no profession known as recording engineer.

*Most parents would rather their children be optometrists, but your parents actually built a studio for you in their home. Your parents were very supportive of your aspirations.*

Yes, extremely so. They knew I was interested in that, and they sort of lived with the inconvenience of hav-

ing musicians come in the later years to record there and just take their space away. They were very good about it, and I couldn't have done it without them.

*How long did this go on at your parents' home in Hackensack?*

Well, prior to that I was just doing it as a hobby—you know, kids playing with toys. But in Hackensack, the

**R**udy lived over in Hackensack, New Jersey, so we recorded right there in his living room: It was a tight little room. That's where most of the Prestige records were done until later, when Rudy had another big studio built...I did *Walkin' for Prestige* there, and, man, that album turned my whole life and career around. We knew when we finished that session that we had something good—even [producer] Bob Weinstock and Rudy were excited about what went down.

— Miles Davis

phone started to ring, and people wanted to record. So that must have gone on for nine years.

*And you constructed all the gear for this early studio?*

In the early years, yes, because there weren't any console manufacturers: If you wanted a console, you built your own. At that time, there were three major record companies, and they also built all their own stuff. The thing about my place was that it had a very nice sound.

*Did you know about acoustics and studio design at the time?*

Not in the sense of studying it, no. I had no formal education in that. At the time, that was also hard to come by. So I just went to places and listened to music—both classical and jazz music—and got a feeling for the way the rooms sounded, and that developed into a desire on my part to have a little place of my own. Prior to that, when it came to doing certain types of projects, I had to do it as a remote. I had to pack up some very heavy, awkward, unreliable portable equipment and go to a place and record it. And that instigated the desire to get my own place where I could make a true studio out of it.

*What was your first professional recording?*

A fella came to me with a trio. It was Joe Mooney, an organ player; Lucky Pizzarelli, a guitar player; and a bass player by the name of Bob Carter. This person—I don't remember his name—had a label called Carousel, and he liked Joe Mooney and wanted to record him. So that trio came to Hackensack, and we set 'em up. I remember the organ coming in, since at that time I didn't have an organ. We made a nice comfortable setup in that space, and we did two songs. They took the tape that I made and went to RCA Studios and did a master, and that was the first commercial release. There was a disc jockey on WNEW [New York City] named Al Collins, and he had a program called "Collins on a Cloud" that was on at 4 o'clock every afternoon, and he loved that record. He played it all the time. That was the first time I ever heard anything that I had done played on the radio. It was quite a thrill. I still remember it. It's still a good record, too.

*How did this session come about? Did you know the producer or the musicians?*

It was, I believe, on the recommendation of the musicians, who had heard about me and been to the place, liked the kind of thing I did, and so the people in the trio said, "Let's go to Rudy's," and that's how that started. Of course, that's been the motivation ever since.

*Were those first sessions cut directly to 78 rpm discs?*

No. Now remember, you said "commercial" recording. At that time we



had tape. So it went to a tape, which went to RCA, who did the mastering on their Scully lathe in New York City.

*But some of your first recordings for your own personal use were to a transcribing turntable?*

Yes. Of course, that was years prior, when I just did it as a hobby.

*Have you ever done mastering?*

Yes. I've done thousands of masters—of my own work and others. Particularly classical. I worked for Vox Records for over ten years doing nothing but mastering. The recordings would come in from Europe, and I'd make masters for all the plants in this country and exports that used to go to Spain, South Africa, France, Germany. I had two lathes going constantly for at least a decade. I can remember I did 14 in one day.

*Since you have a background in mastering, how do you feel when other engineers master your recordings?*

As the years went on and I had enough control of the situation, I would recommend to the client that I would prefer not to do a session at all unless I did the mastering. This is not to say that these people who do

**R**udy Van Gelder had a great deal to do with the Blue Note sound. Rudy is such a great engineer. And Alfred Lion, the owner at that time of Blue Note Records, also had a great deal to do with the Blue Note sound. Alfred had a certain sound in his head that he wanted to hear and he used to tell Rudy how he'd like different things to sound and him and Rudy would work together. So I think a lot of that Blue Note sound comes from them getting their heads together.

—Horace Silver

ny—and they knew how I felt about that, and I wouldn't have accepted the job if I had known what they were going to do. I did the mix, and the producer and the musicians themselves liked what I did, and everybody was happy. Then they took it back to Paris, and somebody added a little reverb to it and changed this and changed that, and I am very unhappy about that.

*How about recent remastering of*

with a little better understanding of how it should sound. But, of course, it's their vaults, their tapes. So they have their own people do it.

*Let's talk about your recording, without getting into techniques or specifics. Did you know that the sound on jazz recordings could be better?*

Oh yes. I always felt that. Of course, I enjoyed the music, myself. And I sort of had a rapport with the musicians, and I tried to understand what they were trying to do. I always felt that jazz musicians should be treated in a way that was a little more as if it were a major effort than the way they had been treated in other places. But that was a strong feeling on my part—that I could allow certain types of clients who came to me and had faith in me—to allow them to compete on a quality level with the biggest companies. And particularly with jazz.

*Horace Silver once said that you set the standard for a piano sound in jazz. Was that your doing? [Blue Note producer] Alfred Lion's? Horace Silver's or a particular pianist?*

That was me, mainly.

*And Muse Records owner Joe Field said you're the one to record B3 organs; everyone else is an impostor.*

Well, I guess I'm guilty of that, too. [Laughs] Jimmy Smith has said that. He's one of the creators of the modern jazz organ sound, and he's often said that I did it better than anyone. This all started when Alfred Lion brought Jimmy Smith to me to

**I**t's funny, people always talk about a "Steely Dan sound." All we were trying to do was reproduce the kind of clarity that Rudy Van Gelder used to get on his Prestige jazz records in the late '50s: very little reverb, with all the instruments pretty much equal and very dry.

—Donald Fagen

nothing else but mastering are wrong. That's just not the way I operate. I just feel that's a part of the process that I really should do myself in order to assure the producer and the musicians that what they came to me for in the first place is going to be executed. And that is very often contradicted. Well, not very often lately. But just recently I had a problem with someone who came to me—a European compa-

*ny—your early recordings? Does that bother you?*

Yes and no. Yes, some of it is very incompetent. Some of it is getting better now as time goes on. I feel it's just remarkable that people still want to hear the things I've done in the distant past and that they are still being made available. So in that way, I'm sort of grateful to the companies that control them now. But I still feel that I could probably do it

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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.

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record. At that time, with one or two exceptions that I know of, jazz organists were not recorded properly. A lot of jazz fans didn't consider an organ to be a jazz instrument. I remember in those times there was a lot of resistance to that. I remember one session in particular where we were having a little trouble recording Jimmy, and Alfred said to me, "Rudy do something," and I did. So I must say the motivation for the recording of that type of jazz organ came from Alfred Lion. I would never have gone out on my own and said, "I would like to do it this way." Although I do and I have felt that way about piano. It's just a coincidence that the first commercial record I made had a Hammond organ—that Joe Mooney thing. But I did have an affinity for the keyboard instruments at the time.

*How about brass instruments? Like with Miles' trumpet, did you feel you had to improve the sound of his trumpet on those Prestige sessions?*  
I don't think I had anything to go by. On those Prestige sessions with Bob Weinstock—who is really one

of the best producers of that time and really kind of an unsung hero and to a large extent unappreciated—Bob had a way of eliciting a certain wonderful, relaxed, loose

jazz feeling out of a group of musicians, rather than the very, very perfect kind of attitude that Alfred Lion had. It's not a question of good or bad—it's just that he had a different

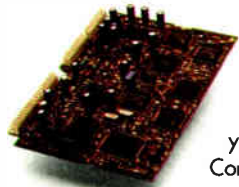


**A good engineer is so important. Rudy Van Gelder is right up there. He was, and is, avant garde in forms of sound reproduction.**

**I can remember doing a record for Atlantic, which was the first one away from the Blue Note situation: I went into the control room, which is very rare for me, to listen to a take, and the engineer had me sounding like I was somewhere down a tunnel. Up to that point I'd been in Van Gelder's studio exclusively, and that experience made me not want to make any records for any other label or engineer outside of Rudy Van Gelder's. It made me appreciate him that much more.**

**— Joe Henderson**

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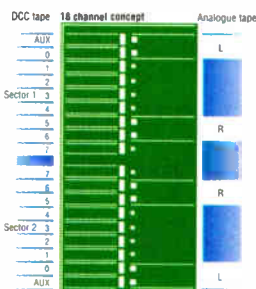
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way of approaching it. So when Bob brought Miles, it wasn't a question of what had been done before, because I don't think Miles ever recorded like that before Bob brought him to me. Miles and I had a certain kind of feeling going. I knew what he wanted, and I appreciated what he did. At that time, it was breaking new ground for me, too. So I used to think about it like, "How am I going to do this when he comes in next week." I just sort of felt the necessity to get it right and understand what he was trying to say. I think it came together. A lot of the little bits that Bob Weinstock put on the record, like Miles speaking to me before the takes, sort of captured the mood of those dates.

*You've said that you don't like to speak in technical terms—like dB and Hertz—with the producer. What is your ideal interaction with a producer? Would it be along the lines of "I want this to be brighter?"*

Yes, that's right. When they talk about dB, like "Give me +3 dB at such and such frequency," I don't get along with people like that. I like to hear what they feel and not to tell me how to do it. And now, very few people come to me and talk like that. I guess I'm lucky.

*Speaking of producers, how was it working with Bob Thiele?*

I haven't seen Bob for many years, but Bob is responsible for bringing me some of the greatest people, like Duke Ellington, John Coltrane—though I had recorded Coltrane years before. I think the Johnny Hartman *Lush Life* sessions with John Coltrane is one of the best things I've ever done, and Bob is responsible for that. I did some things with Coleman Hawkins with him. And many, many things outside of the jazz field. I had a lot of fun with Bob. It was an interesting period, and Bob had a way of bringing interesting people around.

*How about Creed Taylor?*

I've been working with Creed since he was with labels like Bethlehem and A&M—all those Wes Montgomery things, Quincy Jones for A&M Records, Jobim's record *Wave*, and then the MGM/Verve years, and then, of course, the CTI period. He's really a great creator—I have the greatest respect for Creed. He has a

way of dealing with the whole situation that brings out the best in people, and the records become trendsetters.

*How about Mark Feldman at Reservoir Records?*

Mark's one of the new guys on the block. He's got a little company called Reservoir, and he does piano-oriented things. He's not in my past—I'm working with him right now.

*Well, you're not just part of history; you're working into the future. I hope so. Right now, I'm having my difficulties with the digital workstations, just like everybody else. If the wind stays right, I should be proficient on the Sonic Solutions system in about three months, maybe six.*

*How about digital recorders?*

I've had them for years now. Since the early '80s, I've used nothing but digital recorders. I have a pair of Sony 3324s and 3402s, 1/2-inch DASH. I've been using those. Of course, the 1630 DMR 4000 combination for mastering. There are some new and very interesting developments in that field happening right now, which I'm really on top of and very excited about. Of course, we have DATs.

*Is it hard to convince jazz musicians that digital is the way to go?*

It is. In the beginning, it was impossible. No one even understood what it meant. That move in my situation came totally from me. No one asked for that. The only time was much later when Creed Taylor was doing a film and he wanted the final mix to be digital, and I did that. Creed was the only one to ever ask me to do anything digital. Everyone else didn't care, didn't like it, or didn't want to pay anything extra for it.

*What gave you the spark to go digital?*

Very simple, the sound. At that time, 1983 or 1984, I had made a lot of records, and I had been battling the technology for a long, long time. This was after the PCM 601 days, and I got my first digital recorder, a Mitsubishi X-80, which I still have if anyone wants it. After listening to the digital recordings, I was just to-

**I'm a jazz lover from way back. I used to buy Blue Note and Prestige records when I was in high school in Virginia. Rudy Van Gelder was the engineer even on those albums I was buying in high school. When I started my own label, CTI, the bulk of the recordings were with Rudy. It's almost like I don't have to say anything to him, and he doesn't have to say anything to me. We just nod. Over the years of working with somebody like that, you think like each other. I'm a die-hard digital fan. And I'd better be, because otherwise I wouldn't get along with Rudy at all. He's a staunch supporter of digital recording. He's absolutely right, it sounds better than anything.**

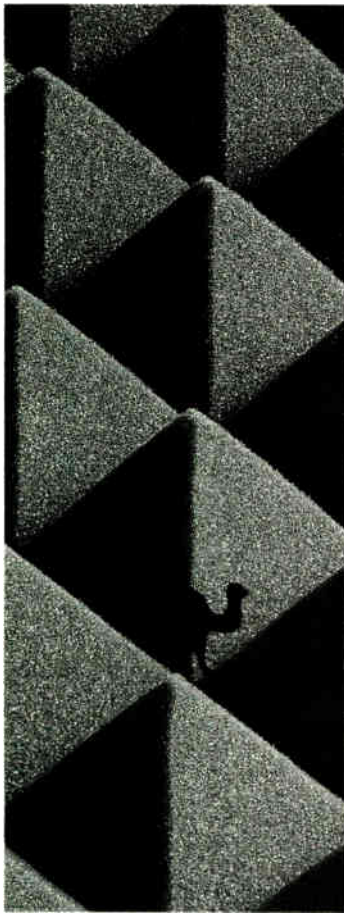
**— Creed Taylor,  
owner/producer  
CTI Records**

tally turned around by that. All you have to do is just hear that—just hear a 1k tone on a digital machine and compare that to anything. I felt there was nothing else worth expending any effort with. All the other attributes of the digital recorders were just gravy compared to the improved sound.

*Have you tried any of the digital mixing consoles?*

There was a thing I did with Creed a couple of years ago where we used a digital mixer, which was absolutely unusual for the time. Now, I understand Dave Smith at Sony Classi-





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cal is putting together a 24-track digital mixer with another manufacturer. I believe strongly that's going to happen and should happen.

*Along the digital theme, how do you feel about digital effects and digital signal processing?*

I don't know if my attitude is typical, but as a matter of fact, there's a project I'm involved with now where what I do is slightly remove myself from that, and I let the musicians handle that part. It's a lot of synth tracks, and the producer hires a programmer and works it out, or they do that someplace else, and if they want to record anything acoustic to go with those synth tracks, then they come here. It's not that I don't do an occasional pitch change or something like that when necessary, but I consider that more of the musician's part of it than the engineer's. And the room here is built with that in mind. We have more acoustic space than we do control room space. And the trend nowadays is just the opposite.

*You did remote recordings of Art Blakey from Birdland and John Coltrane from the Village Vanguard. How did the bands' playing differ from when they played in your studio? Was there a fervor on the bandstand that wasn't there in your studio?*

I think there was an equal fervor, but different. There were things that I did in the studio for Art that they are repeatedly reissuing that just sound great now, musically and sonically. The Birdland remote had [Birdland's MC] Pee Wee Marquette and all the ambience of the room. But when Art came to my studio, he had the African percussion people on one side of the room and his band on the other side of the studio—that was something else. I don't think that one is better than the other; they're just different.

*Tell me about your classical recordings. Do you approach a classical session differently?*

Oh sure. There are different requirements, different people, different personalities. It's difficult in a different way. I haven't been doing too much of that recently, but I spent a decade of my life doing that. I really am glad I have experienced that. Sonically, it's very rewarding. I like the sound of an orchestra. I did a

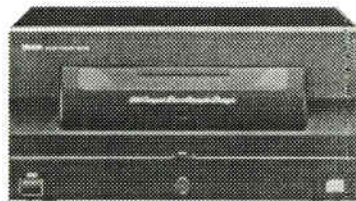
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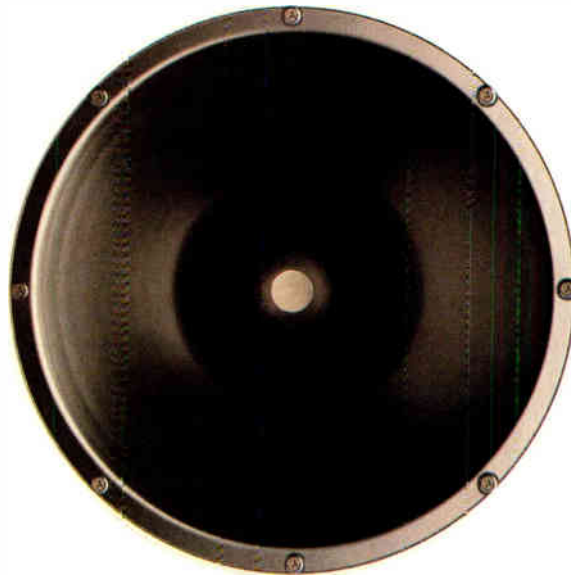


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# Daniel Lanois

## And the Art of Sonic Manipulation

**B**y now, Daniel Lanois is practically a household name in music circles. His engineering and production credits with Brian Eno, Peter Gabriel, U2, Robbie Robertson, the Neville Brothers and Bob Dylan are shining examples of his expert craftsmanship. Named (co-)producer of the year at this year's Grammys,

by Jeff Forlenza

Lanois is not one to rest on his laurels, and most of 1993 has seen him touring with his virtuosic trio, promoting his superb, critically acclaimed second solo album, *For the Beauty of Wynona*.

An avid sound compiler, Lanois is constantly reinventing familiar melodies with his sonic "menus": project-specific sounds and effects filed

and categorized for endless combinations and possibilities. His productions stand out for their out-of-the-ordinary sounds, deep bottom end, moody ambient fields and passionate performances from the artists. When he's not working with other musicians, Lanois is busy writing, tracking, mixing and manipulating his own evocative, sultry songs. We talked to this multitasking musician/producer as the tour drew to a close.

*Were there any records that inspired you when you were younger—great productions that you drew inspiration from?*

There certainly were. Hendrix records were pretty inspiring to me. For different reasons than now. Back then, I just was fascinated with the energy and the guitar playing. As I hear them now, I realize that they're a fantastically useful reference for sonics. They're very powerful records, and yet the drums are not loud. [Mitch Mitchell's] drums are supplying melody, believe it or not—it's melodic drumming. The power is really coming from the guitar. So for me, it's forever useful to refer to that. For that matter, the same thing applies with a lot of funk music: James Brown as an example. The drums aren't loud. The rhythm is coming

—CONTINUED ON PAGE 69





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## Lanois Live **An Interview With Engineer Mark Howard**

by Jeff Forlenza

**K**nown for recording bands in remote places with portable equipment, Daniel Lanois applied this same modus operandi when it came time to tour with his own band. The band—a soulful power trio consisting of bassist Daryl Johnson (of Neville Brothers fame) and 21-year-old drummer Brian Blade—carted their own console, recorders, monitors and effects to each date. In fact, Lanois' tour bus also served as a mobile studio, since they mixed each night's show on the bus with equipment held steady with bungee cords.

Supporting his latest release, *For the Beauty of Wynona*, Lanois played smaller clubs in the States and 1,000- to 2,000-seat theaters in Europe. We caught up with Lanois' engineer Mark Howard, another Ontario native, when the tour played San Francisco's beau-

—CONTINUED ON PAGE 82



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—FROM PAGE 66, DANIEL LANOIS

from the network: the bass, the guitar and the drums are just minor components. I'm of the opinion that it's still that way. Even with modern records, my favorite ones have that rhythmic network. And I like to make records that way as well.

***You like to have everybody playing together when you record rather than tracking one instrument at a time and overdubbing. Is that correct?***

I love to get people playing together, and I love to know *immediately* whether we've got something or not. I don't like to live with the promise that we're going to come up with something by overdubbing and overlaying. For me, it's essential to have the drums, the bass and at least one harmonic instrument—the foundation—or else you just don't know what you've got.

***Does that ever cause problems with tracks bleeding onto other tracks, or other difficulties down the line?***

Bleed is only a problem if you need to repair things or make changes. What I usually try to do is get people physically close together and then try to isolate the amplifiers and the drums the best that you can so that, in the event that you need to do a repair on the bass, for example, you can, and you're not going to have a bleeding problem. The technique that works out pretty well in that way is to keep the musicians together and have two sets of amplifiers: have an amplifier in the vicinity of the musician that becomes like a personal monitor that allows feedback to happen naturally, and then you have another amplifier, identical to it, around the corner or down the hall in a little room, and that's the one that you might choose to use in the end. So I double-mike: I mike a close amp and a distant amp. That way, you're not going to have other instruments bleed into those amplifiers.

***A lot of your productions have sounds coming out of instruments that we don't usually expect to be coming from those instruments. Were those sounds created by the player, or you, at the time of tracking, or do they come up later in the process? Like on U2's Achtung Baby, The Edge has a lot of different guitar sounds. Did he come up with those sounds when you first recorded him, or did you discover those sounds later in the project?***

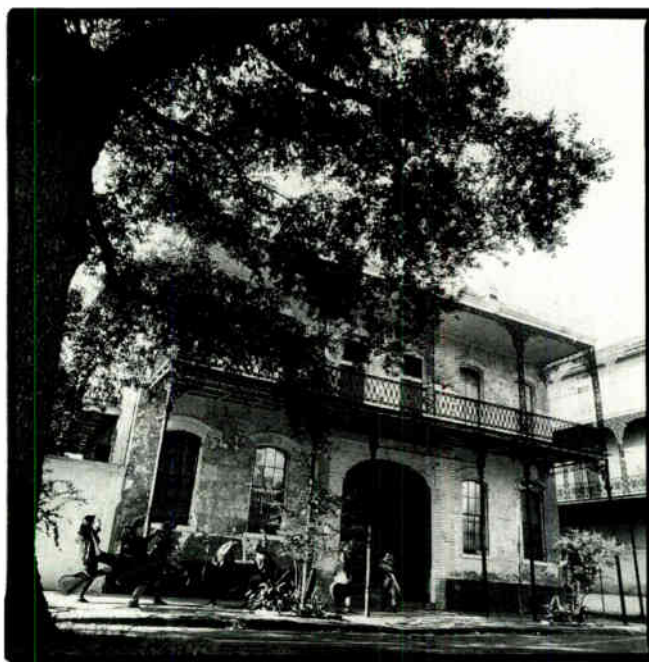
People I've worked with like ma-

nipulated sounds. And there's a general encouragement in the air to weird things up. Some of it happens at the source: In the case of Edge, he usually goes through some type of signal processor—not all of the time, mind you, some of the time. So some of it will go down on tape already weirded out. Other times, we'll just experiment on the console and try to introduce a lot of processing gear. What usually happens with that is you embarrass yourself nine times,

pretty early on in a project—the first third of a project—during the reckless part of a record.

***Would that be considered pre-production?***

No, just early days in a record. For me, there's no such thing as pre-production. Everything gets recorded all the time. Pre-production usually means working under less pressure, and a lot of nice things come out of that period. I don't want to lose that loose creativity, so everything goes to tape.



KAREN KUEHN

**From  
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and then that tenth time you hit on something. And I usually print that on the 24-track, and it's never forgotten, and I have access to it.

***Do you keep extensive notes and track sheets, so you know where these different sounds are?***

What I like to do is keep a list of unique sounds to a specific project. So if we hit something that everyone is going "wow" about, then we lay out very detailed notes on how to get that sound. So that becomes part of what you might call the "menu" for that record. And it goes for guitar sounds and also vocal sounds: If you're doing a sweet vocal and there's a particular echo that is inspiring to the singer, well, you give that vocal sound a name—maybe it becomes "sweet heavenly vocal sound"—and then you have another that is the "down-dirty, aggressive vocal sound," which might be processed through a Korg A3 and distorted back through an amp. This menu gets developed

***Do you have any favorite effects or processing gear that you like to use on vocals or guitar?***

I currently like the Eventide H3000; it's really good.

***How about vintage processing gear, like various pedals and boxes that you come across?***

Yeah, it's forever inspiring to find these footpedals. I use a Chandler tube driver as a kind of overdrive pedal for guitar. To this day, I love the Korg SDD 3000, a rack-mount digital delay unit. It's a great box for recording because it elevates the output of the guitar by about 10 dB, so you're hitting your amp a little harder. Even if you don't have any effects dialed up, even in bypass you get the advantage of that [signal] elevation. I quite like that silver digital delay pedal by Boss. Some of the crazier ones are pretty good: the Small Stone by ElectroHarmonics—"the bad Stone"—kind of stupid-sounding, but good. Envelope followers are fun. I used to use this



Roland chorus echo—a tape-echo machine—although it's pretty unreliable. It's a bit like the Echoplex concept.

**Where do you like to listen to mixes? In the control room, a car, another room?**

I like using small speakers a lot of the time, near-fields; EV has got some good little ones. I used to have a pair of these Advent speakers that were actually taken from mono radios, so it was like two mono radios, but they were real nice-sounding speakers. I like back speakers also in studios. You get tired of hearing your near-field references or your front speakers. You shut them off and have some speakers in the back of the room someplace, maybe in the lounge area. So you get to hear your music from 20 feet away, and that tells you a lot about vocal balance and bottom.

**Tell me about vocals. A lot of engineers say that's the hardest element to get right on a project. Do you have any special methods to get a good vocal performance?**

Having a very good vocal sound early on is real important. I generally use dynamic microphones when tracking, because you can get close to them without a lot of leakage. Like a Beyer 88 or a Shure Beta 58. They're really useful, because you can really lean into them—scream into them, and they don't distort. I like to equalize the vocals a lot and compress them quite a bit. It makes the vocals more exciting and makes people sing better and feel better about their singing, and you get a snowball effect: As confidence builds up, you get better performances. For more delicate vocals, I like to use tube microphones. I've got a couple of Neumann U47s, and they're good. I've got a whole mess of unusual Neumanns I don't even know the model numbers of. They're weird old things, like something that should've been used in the military. I've also got a bunch of these pencil-sized Neumann tube mics from the '50s that are also great.

**How do you mike pianos?**

I like to use ribbon mics on piano; an RCA 77. It's delicate, but it's pretty reliable on piano—a nice, full-bodied sound, always musical. I always mike the piano in mono with that microphone. It's one mic, one track, and you can put it wherever you want in the stereo image. But I think the fact that it's a mono source gives it a sort of pinpointedness, a

definition in the blend.

**How about drums? How do you get such a big, melodic drum sound without it being overpowering in the mix?**

I treat the drumkit as a kit, rather than as components. When you walk into a room and somebody's playing a drumkit, there's not any particular drum that is jumping in your face—it's going to be balanced. Where that balance works, I like to use it on records.

**When working on a new song, do you track the rhythm section first?**



**Or do you work with a click track and get the vocal down first? Or does it vary every time?**

Depends on the record and the group. In the case of U2, I would say 60 percent of the time—recently, like on *Achtung Baby*—Larry [Mullen Jr.] used a time reference. Sometimes it would be a loop of some kind, sometimes it would be a click. He likes to do that because it makes it easier to edit. So if we get a great take but we've got to redo the end, then he knows that, as long as he's listening to that click, we're going to be able to make it work in the control room. It's also real good for manipulations. We did a lot of drum manipulations over the years. If you're playing to a click, then any echo you dial up is going to remain consistent from beginning to end. But there are those times when time reference is not a friend, and you want to cut loose and play something that wavers around, and that's why you like it.

**How do you like to record acoustic guitars?**

For acoustic guitars, I have a Lawrence pickup in the soundhole; it's an older, early '80s model. I send that

pickup to an amp—a nice, sweet-sounding amp like a little Fender Tweed amp, for example. And that gets put in a closet or down the hall, and it becomes the sound you depend on if you get into trouble—the nonleakage sound. And then you put a microphone on the guitar as well. I usually try to compress and equalize quite a bit. Now, if somebody's singing and you decide to dump that vocal later, then, of course, your miked acoustic guitar recording is ruined. So that's when that safety amplifier comes in handy. On the Bob Dylan *Oh Mercy* record, all the acoustic guitars were amplified by a pickup like I described, and we would just have the amp six feet away but with a whole bunch of blankets and gobos around it. People were singing in the room. Bob did all of his vocals live. We ended up doing punch-ins and got no leakage from the guitar.

**Can you tell me about your modular, recording-on-the-go setup? You can record wherever you want. How has that affected how you work?**

What's happened with me over the years is that I've combined performance and recording. I've not separated the studio from live performance. So wherever you happen to be set up, given that you're already miking that band for purposes of P.A., then you have license to record. The equipment these days is compatible, and it's easy to interface recording equipment into almost any setup. So whether we're on stage or in a rehearsal room or in the studio, it almost doesn't matter. "How can we hook up a tape recorder to this rig?" becomes the question. And it's usually a matter of a few hours' work.

**And that must help in your songwriting if you always have tape rolling during rehearsals and live shows.**

Very much so. Jam sessions often bring about song ideas or certainly grooves or music beginnings. The same thing applies to U2: A lot of their writing comes out of these fiery, spontaneous jams. There's a reason for [that music] to be. It came out of joy, or it came out of feeling right about a groove at that moment. And those are very reliable sources.

**And later you might add lyrics to those jams?**

Later, you might say, "That's a great jam, a great groove. Now let's write some chords and build a song around it." Even if you end up redoing it, the fact that you have documentation of



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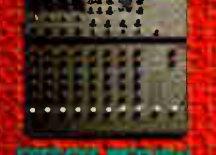
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preamps also have extremely high headroom and a natural, uncolored, masked sound. In fact, the 1202 is becoming the ever-widening choice of audiophiles for A-B to D/AI recordings. Our secret? Instead of cheap, off-the-shelf integrated circuits, Mackie preamps use discrete circuitry with 11 components per large-signal geometry preamp — the highest peak/valley quality available. The result: virtually undetectable EIN even when you're running a channel at extremely low gain levels.

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- Scrub back & forth to external video, or scrub with a mouse, trackball, or scrub wheel?  Yes  No
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the initial seed is really helpful.

*How much of your musicality do you bring into productions for other bands?*

I usually try to play along with people, on guitar or percussion. By doing that, you're developing a musical rapport. It means you're already part of the team, so it's not like an outsider barging in and making people uptight.

*Let's talk about the ambient fields that so many people associate with your work. Does that come from your work with Brian Eno?*

The whole ambient sound and textural manipulation of sound is really Brian Eno's idea. He got interested in this world in the late '70s, and I hooked into it with him about 1980. I think a good conclusion of that kind of work is a record called *The Pearl*; it's a Brian Eno and Harold Budd collaboration, and I'm credited as producer and collaborator. It's a wonderful record: It's Harold Budd's music with Brian Eno and Daniel Lanois manipulations. It's a great source of reference, a landmark.

*Your work with Robbie Robertson is a great example of that type of moody, textural recording. Did those ambient beds come about at the start of a song with Robbie, or did they come later in the creative process?*

Quite often, the textural manipulations are done after the fact. Some of the parts are played that way. On Robbie's first record, there's a song called "Fallen Angel" that's got some great textures on it. And those textures were played by a guy named Bill Dillon. It's actually a sound I developed with Bill, and I brought it to the Robbie project. I'm not really doing that sound currently, but we were excited about it back then, about '86, '87.

*Your productions seem to be experimental or unorthodox. It seems as though other producers don't take as many chances as you do. Why do you think that is, and how do you get away with it?*

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you've got to work harder in terms of marketing and so forth. One of my favorite current strange records is

he's a great engineer. If he has to rummage through the closet and pull out cables and be soldering stuff, and

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ital recorders is that they seem to be more troublesome. And when they do present you with troubles, it's the kind of troubles that you don't want to have—like dropouts, glitches—weird stuff that you have to bring people in for. I haven't got time for that.

*How do you keep the inspiration and fervor up during a long recording project? How do you keep everybody inspired and focused?*

Records have highs and lows. It's a dynamic range of enthusiasm as well as music. In my experience, enthusiasm will be rekindled by a chance to look at the music from a different point of view. So quite often, if somebody has enough steam left to present the whole operation with a different angle, then that will often keep people going for a couple of days. To give you an example, when Brian Eno and I were working with U2, they would take weekends off; we would work weekends. We would come up with other angles to look at a song. So when they came back we'd say, "Here's another blend, another mix. Here's another way to look at the rhythm." If it got a vocal out of Bono, then you can't put a price on that.

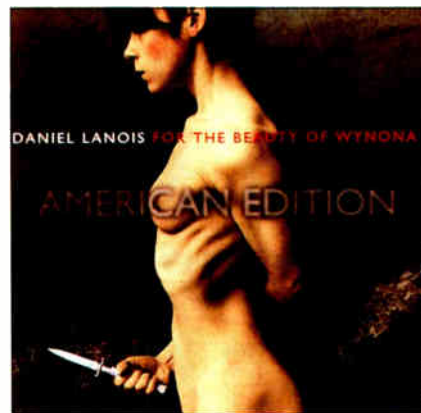
*Tell me a little about your solo albums. They seem to be in the genre of folk records, but their sonics and production are a league above the traditional folk record. For your own creative process, what do you draw upon? Is it those Hendrix records? Is it your own background in songwriting and personal history?*

I draw upon personal experience for my story-songs. Sometimes I use very old, traditional-like melodies, because I believe that melody is timeless. Even on some of the Hendrix records, some of the tunes on there, if you play them on a dulcimer, they would sound real folksy. But he applied his sound to those melodies, and he takes it to another place. I like that challenge of taking melody and reinterpreting it. Like this record I just got yesterday, "Creep" by Radiohead—what they've done is a reinterpretation of a traditional melody. So what they've got going for them—as the English usually do—is a great production, a heavy guitar sound and an attitude. But if you were to study this thing, melodically and the chord changes, it might as well be the Roy Orbison song you never heard. So it's just reinterpretation, reinvention.

*Like your song "Jolie Louise" [from*

*Acadie], that sounds like a traditional folk song with futuristic sonics layered on top of it.*

That's a melody I stole from my dad. He used to play that on his violin. It's from a jig. The fact that it's melodic makes it memorable, makes you want to hear it again. The sonics really are aesthetics. Sonics are emotion:



**Lanois' sonic masterpiece, For the Beauty of Wynona**

A sound can make you feel a certain way, but I think melody makes it last.

*Tell me about the studio you've been using most recently, Kingsway, and how New Orleans has affected you.*

I work with two guys from New Orleans now, drummer Brian Blade and bass player Daryl Johnson. I'm very excited about working with these guys. That's the New Orleans influence that's affecting my life right now. I set up a studio down there called Kingsway, and it's fantastic. Exotic location—it's in an old mansion, and it's full of wonderful-sounding rooms and staircases and hallways. As well as being aesthetically unusual and wonderful, all the rooms sound good. One room's got a wood floor, high ceiling, marble fireplace; you can play an amp in there, and you don't want to leave. Drums sound great: We've gotten real tight drum sounds in there. Ranging from that to recording drums at the bottom of the staircase to get a more powerful Led Zepelin-type sound.

*How about bass? It seems that your productions have a great bass response that other recordings don't have. Is that something you decidedly strive for on a project?*

I made the decision a long time ago that I was going to go after bottom end. As a teenager in my first studio, I wasn't very good at nailing bass. I didn't know how to do it, and

the initial seed is really helpful.

*How much of your musicality do you bring into productions for other bands?*

I usually try to play along with people, on guitar or percussion. By doing that, you're developing a musical rapport. It means you're already part of the team, so it's not like an outsider barging in and making people uptight.

*Let's talk about the ambient fields that so many people associate with your work. Does that come from your work with Brian Eno?*

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you've got to work harder in terms of marketing and so forth. One of my favorite current strange records is *Bone Machine* by Tom Waits. That's a record that a lot of people have never heard, and it's one of my faves. I think not only sonically but lyrically that's a great record.

**How much engineering do you do on your own records and productions for others? Is it a combination of you and Mark Howard engineering?**

It varies a lot. In the mid-'80s, I was doing all my own engineering. The first record I did with U2, *Unforgettable Fire*, I engineered. I'm doing a little bit less of it now, but I still like to get my hands dirty. I still like to process and manipulate sound: That thrill is never going to go away.

**What qualities do you look for in an engineer?**

The engineer who impresses me is the engineer who's got a microphone in his hand, and he's speaking into it as I walk into the room, and there's a sound happening. If I say to an engineer, "See that guitar amp over there? The guy's playing something really nice, why aren't we recording?" and he tells me, "We are recording,"

he's a great engineer. If he has to rummage through the closet and pull out cables and be soldering stuff, and meanwhile the guitar player's falling asleep, then that engineer might as well collect garbage or something.

**Why did you choose Mark Howard to be your engineer?**

Mark Howard has a taste for the unusual, and he's a hard worker.

**Mark told me about his method of recording straight from preamps to tape, bypassing the console, when he was recording up in Canada. How do you feel about that method of recording?**

That came out of necessity. We carry a preamp rack around with us, and sometimes it's hard to know if you can trust a cheap-ass console that you may be presented with. Carrying your own preamps, you can punch right into tape. It just ensures that you got a sound to tape that you can work with later. It's a matter of convenience, and it's something that you trust and know. The API preamps and EQs are fantastic, and the Neves are pretty good as well.

**Most of your recordings were done with Dolby A noise reduction.**

**Do you prefer that over tracking with digital machines?**

We made some good records with Dolby A. That's why we like it. I like all tape recorders. *Yellow Moon* was done on 24-track analog with transformers and Dolby A, and it's a really warm-sounding record. For vocals, digital machines are great because they punch better: You get in and out of tracks that you won't be able to on an analog machine. But to be honest with you, the slight personality shift that you're going to get in a multitrack tape recorder is not nearly as important as the ideas and the grand approach to capturing music.

**You just finished a tour. How did it go?**

It was a real success. Nice events, nice people. We couldn't have asked for more.

**You were recording every show?**

We were recording two ways: We had a 24-track Fostex for a while, then we had an Alesis ADAT; we've gone through two of those already. That little 24-track Fostex is a real work-horse: We dragged it all over the world, and it ran fine with no problems. My biggest complaint with dig-

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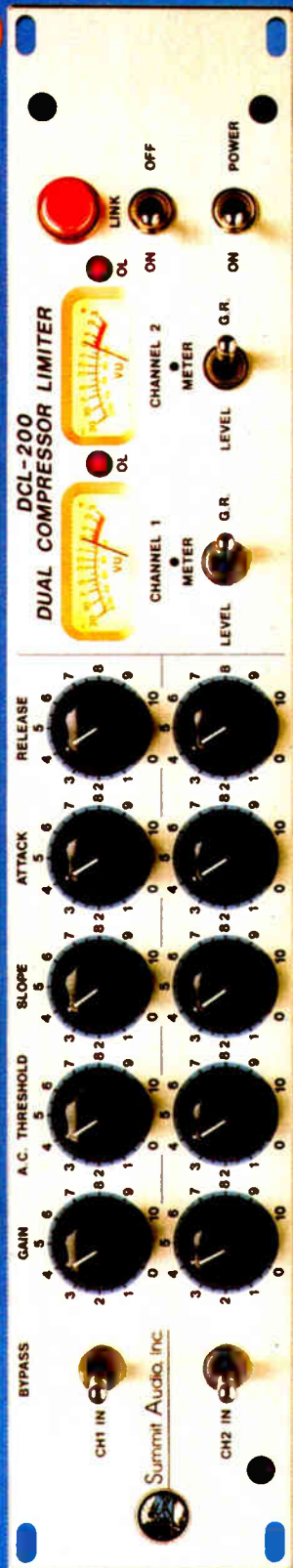


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ital recorders is that they seem to be more troublesome. And when they do present you with troubles, it's the kind of troubles that you don't want to have—like dropouts, glitches—weird stuff that you have to bring people in for. I haven't got time for that.

**How do you keep the inspiration and fervor up during a long recording project? How do you keep everybody inspired and focused?**

Records have highs and lows. It's a dynamic range of enthusiasm as well as music. In my experience, enthusiasm will be rekindled by a chance to look at the music from a different point of view. So quite often, if somebody has enough steam left to present the whole operation with a different angle, then that will often keep people going for a couple of days. To give you an example, when Brian Eno and I were working with U2, they would take weekends off; we would work weekends. We would come up with other angles to look at a song. So when they came back we'd say, "Here's another blend, another mix. Here's another way to look at the rhythm." If it got a vocal out of Bono, then you can't put a price on that.

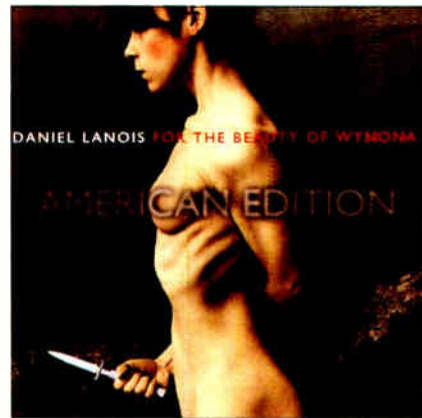
**Tell me a little about your solo albums. They seem to be in the genre of folk records, but their sonics and production are a league above the traditional folk record. For your own creative process, what do you draw upon? Is it those Hendrix records? Is it your own background in songwriting and personal history?**

I draw upon personal experience for my story-songs. Sometimes I use very old, traditional-like melodies, because I believe that melody is timeless. Even on some of the Hendrix records, some of the tunes on there, if you play them on a dulcimer, they would sound real folksy. But he applied his sound to those melodies, and he takes it to another place. I like that challenge of taking melody and reinterpreting it. Like this record I just got yesterday, "Creep" by Radiohead—what they've done is a reinterpretation of a traditional melody. So what they've got going for them—as the English usually do—is a great production, a heavy guitar sound and an attitude. But if you were to study this thing, melodically and the chord changes, it might as well be the Roy Orbison song you never heard. So it's just reinterpretation, reinvention.

**Like your song "Jolie Louise" [from**

*Acadie], that sounds like a traditional folk song with futuristic sonics layered on top of it.*

That's a melody I stole from my dad. He used to play that on his violin. It's from a jig. The fact that it's melodic makes it memorable, makes you want to hear it again. The sonics really are aesthetics. Sonics are emotion:



**Lanois' sonic masterpiece, For the Beauty of Wynona**

A sound can make you feel a certain way, but I think melody makes it last.

**Tell me about the studio you've been using most recently, Kingsway, and how New Orleans has affected you.**

I work with two guys from New Orleans now, drummer Brian Blade and bass player Daryl Johnson. I'm very excited about working with these guys. That's the New Orleans influence that's affecting my life right now. I set up a studio down there called Kingsway, and it's fantastic. Exotic location—it's in an old mansion, and it's full of wonderful-sounding rooms and staircases and hallways. As well as being aesthetically unusual and wonderful, all the rooms sound good. One room's got a wood floor, high ceiling, marble fireplace; you can play an amp in there, and you don't want to leave. Drums sound great: We've gotten real tight drum sounds in there. Ranging from that to recording drums at the bottom of the staircase to get a more powerful Led Zepelin-type sound.

**How about bass? It seems that your productions have a great bass response that other recordings don't have. Is that something you decidedly strive for on a project?**

I made the decision a long time ago that I was going to go after bottom end. As a teenager in my first studio, I wasn't very good at nailing bass. I didn't know how to do it, and

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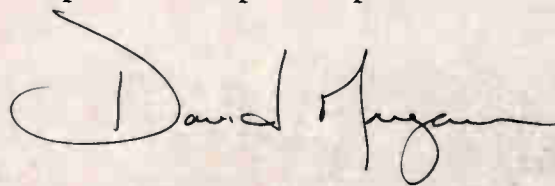
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there weren't a lot of great teachers in my neck of the woods. Maybe out of that frustration came a will to learn how to do it. It often comes from the source and the approach. You're not going to get a great bass sound if you don't have a good angle on how to play a great bass. It's also the equipment, the amp. Sometimes I get a good sound going direct. I like to use these Taurus Moog pedals [which bassist Daryl Johnson uses live], and they sound really good direct: To this day, people are still sampling their sound.

When you speak of records lacking the bottom, it's so hard to place the responsibility on any individual. It's really a philosophy. To say that Bob Marley records have great bass and what a genius the engineer was, well, that would be unfair because the bassline and the way the guy's playing is really the whole thing. So you gotta look at your bassline, and maybe it should be played on keyboard, maybe it should be played on pedals, maybe it should be on a Music Man with flat-wound strings, maybe it should be on a Fender Jazz with round-wound strings. It's good to have a good bass menu of sounds.

*Do you work a lot with organs, like the B3, for keyboard bass?*

I love keyboard bass. The Yamaha CS80 is an old synthesizer that I used to use for bass. Organ is a real nice bass sound. You know what's a good bass sound if you play it really soft? The Wurlitzer electric piano, if you just put it through a bass amp and play it real softly, you get this BOMMM-BOM-BOM-BOMMM-BOM-BOM [sings the bassline] like the bassline to "I Heard it Through the Grapevine." Sometimes double basslines are good. I doubled the bassline on "Fallen Angel" from Robbie Robertson's album. It's the bass, and then I asked the bass player to play the same thing on the bass strings of a guitar, so it's like an octave bass. The bass sound on "Sledgehammer" from Peter Gabriel's record is one of those little octave pedals and a whole bunch of EQ and compression on the console.

*Do you like to do a similar manipulation with vocals, like duplicating a vocal and then pitch shifting it or delaying it and stacking layers of vocals to get a chorus effect?*

I guess the most interesting vocal manipulations recently have been

stranger things than that. It's like over-driving vocals through, as an example, the Korg A3, and then taking that distorted processed signal and doing yet another generation of manipulation perhaps through a repeat echo. So you still have your clear foreground and this strange, dirty, more unusual sound in the background.

*When you play live, are you trying to re-create what you've done in the studio, or is there a different approach?*

We're trying to make it work live. And quite often, it turns into something different, and I just accept that

it does. That's just the feeling musicians get with their instruments on stage, and we just take it to another level if we need to.

*You just finished up a long tour supporting For the Beauty of Wynona. What's next for you?*

I'm listening back to all the jam recordings from the road and just assessing what I have. It's very exciting. Then I'll use those ideas for songwriting and arranging. I'm looking forward to making a record with Daryl Johnson and Brian Blade. I'm doing a soundtrack for a film called *Camilla* with Bridget Fonda and Jessica Tandy.



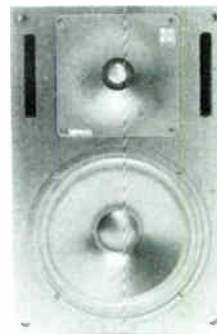
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**When you do soundtrack work, do you see picture before you score?**

Some of it I did based on the script, and some of it I'm doing to picture. I have a fantasy that I could assemble a band and have themes, and we would watch picture and do renditions of those themes right on the spot. It's sort of old-fashioned, but I'm trying to find a way of taking it into the future. ■

*Jeff Forlenza would like to thank engineer Andy Taub of Coast Recorders for his help researching questions for this interview.*

—FROM PAGE 67, *LAVOIS LIVE*

tiful, ornate club, the Great American Music Hall.

**How many inputs are coming off the stage from this three-piece band?**

There are 15 mic inputs coming off the stage. Of the 32 channels I'm using, I'm using a lot of those for returns in stereo. It's really quite simple: Brian has a small jazz drumkit; Dan uses two amps, a Fender Bass Man and a Vox AC30; and Daryl has Peavey TNTs with 15-inch speakers and a graphic EQ and amp built into it. Daryl also plays Moog bass ped-

als. So coming off the stage I have 15 inputs: six on the drums; two for the bass 'cause he's got bass pedals and bass guitar so I separate those; and Daryl's also using a Djembe—a drum from Senegal, which he got from Peter Gabriel's studio—so I have a little condenser Shure 93 attached onto the drum. And I have two inputs for Daniel's guitars—tonight he's using the Vox amp, and I just use Shure SM57s on it. Then there are three vocal sends, and I do a trigger off of the kick drum and return the trigger here, and all my effects return in stereo—H3000, Prime Time, SPX. I do a lot of sending effects into separate effects to get different kinds of weird feedback loops.

**What are some of problems you find on the road?**

A lot of these P.A. systems are out of phase. I carry phase boxes with me, and I check all the systems. And pretty often, I'll find one or two speakers out of phase. In the U.S. the standard for the systems in the clubs is really bad. In Europe, the standard is much higher, the equipment is well-kept, and I haven't found anything out of phase in Europe yet. Current can be a problem in Europe, but we carry our own transformers. I don't seem to have as many guitar problems in Europe. In the States, I get a lot of buzzes.

**Tell me about Daniel's vocals.**

Daniel is very fussy about his vocals. I use Neve preamps and Beta 58s. I get a really nice low end from them for Dan's vocal. It's great because he likes that breathy sound. I managed to capture that live with these mics. At soundcheck today, I was having a problem with his vocals because they had old 58s. So I switched to a Beta, and suddenly it was clear with a nice midrange.

**What about processing on his vocals?**

It's mainly AMS-type processing—delays. I tried to stay away from reverb. Mostly his vocal sound was done through a Neve 1081 preamp or API 550A preamp.

**Do you try to re-create some of the ambient textures that Daniel is famous for on his records in the live situation?**

Yeah. I did all those sounds for the records, and we reproduce them live. It's all processing. Over the years, you come up with different effects and sounds. On this tour, it's mostly

—CONTINUED ON PAGE 245

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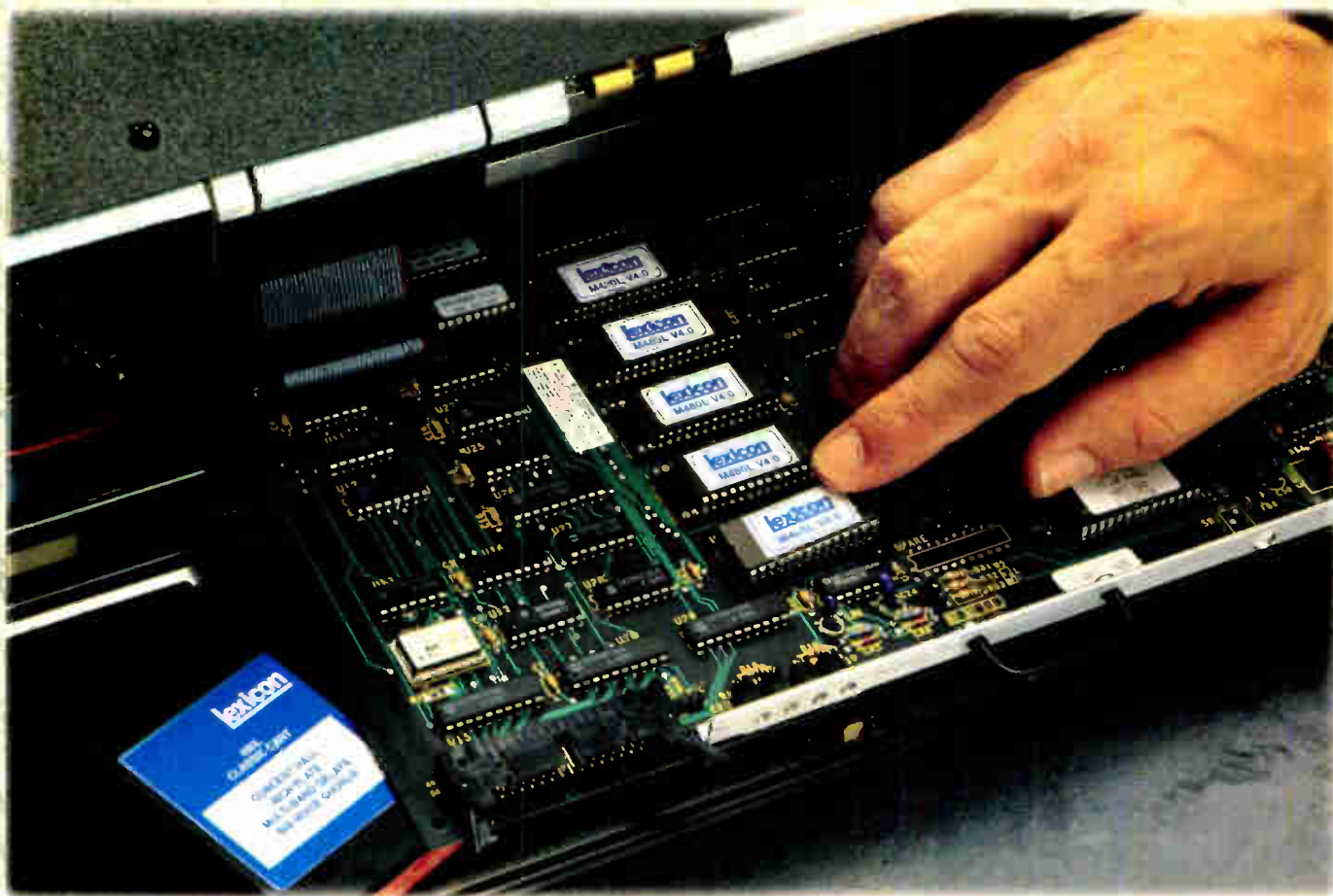
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World Radio History





PHOTO: KAREN KUEHN

**I**S it a blessing or a curse to have a hit album the first time out? Consider the case of Marc Cohn. The immensely talented New York-based singer-songwriter burst onto the scene in 1991 with a brilliant debut album (titled *Marc Cohn*) that wasn't merely "a promising first effort," but a work that displayed a mature artist in full creative bloom. The album yielded a bona fide hit single—the tuneful, anthemic "Walking in Memphis"—on its way to going Gold, and in early

1992 Cohn was awarded a Grammy for Best New Artist.

The upside of this sort of success is that, as Cohn put it, "It's wonderful to finally know that there is an audience for what you do and that you will probably be able to carry on with this career in the way you always dreamed you would." The downside is the *pressure*, both externally—from record company types who, quite naturally, are always looking for artists to keep topping themselves commercially; and internally—artists invariably want to expand their creative palette while also expanding their fan base.

# Diary of an Album

BY BLAIR JACKSON

The fabled “sophomore slump” often occurs when artists either try too hard to reproduce their first album (always tough, considering they’ve usually had years to hone their song-writing skills before their debut album, and then just a few months to come up with songs for the second record) or bend over backward to show a different side of their talent, usually alienating a lot of their hard-won fans in the process. Cohn says, “I wanted my new album to connect in some way with the last one, so it wasn’t a complete departure. At the same time, I didn’t want to make this my debut record, part two.”

When he was ready to start recording his second album last fall, Cohn enlisted the two key members of the team that made his first—producer/engineer Ben Wisch and multi-instrumentalist John Leventhal—to co-produce the record with him. Using Quad Studios in Manhattan as their home base, the trio began a recording process that

**CO-PRODUCER  
BEN WISCH  
OFFERS A  
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INSIDE THE  
MAKING OF  
MARC COHN’S  
SUPERB  
SECOND  
ALBUM,  
THE RAINY  
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**L-to-R: John Leventhal,  
Marc Cohn and Ben  
Wisch at Quad Studios,  
NYC during the  
recording of  
The Rainy Season**





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would eventually consume six months but result in the release this past June of an album that clearly surpasses Cohn's maiden voyage.

To get a slightly different view of the making of *The Rainy Season*, we talked to co-producer Ben Wisch at three different times during the album's construction: First in November, when just a few tunes had been laid down; then in February, by which time the bulk of the record had been recorded, though not completely mixed, and once in May, after the record was finished. Following the project this way allowed us to get a glimpse of how the intentions of the artist and producers matched up with the reality of what happened in the studio, while also gaining a sense of the pace of work.

#### NOVEMBER

"We've worked on seven songs so far, and we haven't run into any major problems yet," Wisch cheerfully reported during our first conversation in November '92. At that point, the record company deadline of February 17 was four months away. "Last time around, when we ran into a problem, we had to search for the answers. Sometimes we didn't even know what our options were. This time around, because we experienced so much making the first album, when we run into an obstacle, we usually know it's this or that thing. Like if we try to cut a track with a rhythm section, and we listen back and it sounds very stilted, or Marc's emotion isn't cutting through on the tracks, we know what to do—how to make it so Marc really leads the tempo until you get to the chorus, and then you get more exact with the tempo.

"We've been trying to go for a little more of a band sound on this record," he continued. "So far on four songs we've used a band of Marc, John [Levanthal], Jim Keltner on drums and Hutch Hutchinson, who works with Bonnie Raitt, on bass, and they really sound great together; it fell together easily, and we may go back and do some more songs that way."

Of the decision to record mostly at Quad Recording in New York City, Wisch said, "It's old, it's funky, but Marc and I both really like the vibe of the place. It feels like a place where you can work. It has a great-sounding piano, although interest-

ingly enough, of the seven songs we've worked on, only two are piano songs, whereas last time, he wrote primarily on piano. But Marc's a great guitar player, too, and that's what he's been writing on."

On the first album, Wisch said, "almost every performance was live, and on this one there have been a number of tracks where we've edited parts of various performances, hopefully keeping the feel of a whole performance. I'd say we're trying a little harder on the technical end to make everything sound really good, just taking more care all the way around. When I listen to the last album, I can pick out things that were less than perfect or sonically not high-tech enough, but I think those are the things that in ten years, when we look back at Marc's first album, people will think it's 'charming.' First albums aren't supposed to be perfect. Not that we weren't trying to make it perfect—we were—but we were learning along the way, too."

According to Wisch, "Marc is an all-night kind of guy in the studio. In the past three days, he's written two new songs, one of which we recorded last night. He woke up in the middle of the night and wrote it down. It's called 'Mama's in the Moon.' We recorded it with him on guitar, John on mandolin and Mino Cinelu on clay pot. So far my inclination is to just leave it like that. We'll see.

"He's got another new song that he really likes that I haven't even heard yet, called 'Baby King.' He says in his head he hears a tuba instead of a bass, and he wants to sing all the background parts himself. I don't know—he brings in these ideas, and we'll talk about them and usually try them out. He has a real good sense of what he likes and what sounds good."

For Cohn's vocals, Wisch used a Neumann U67 tube mic, "which can be tricky," he noted, "but Quad has four of them, so we're covered." Generally speaking, Wisch likes to record dry, "except for some of John's guitar parts—he'll put on some effects that go to tape. On Marc's vocals, I'll record with no EQ, because if there are any punches that come later, you don't have to try to match it."

Though Wisch felt strongly in November that the album was moving

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forward well, he did acknowledge that there were a number of areas to work on: Wardel Quezergue, the noted New Orleans horn arranger whose work was so effective on Robbie Robertson's *Storyville* album, was set to contribute arrangements to two songs, including the prospective (and eventual) title track; Wisch expressed some qualms about a tune called "She's Becoming Gold," cut with the rhythm section of Tony Levin and Manu Katche; "and then there's this great song called 'The Things We've Handed Down' that we've tried, but we'll probably have to recut," Wisch said.

**FEBRUARY**

When, on February 24, I reminded Wisch of his February 17 deadline, he laughed and said, "Yeah, well, we *are* close, we're very close. I feel good. Since the last time we talked, I've gone through a lot in terms of getting this thing together. We have about half the record mixed, and we have a total of nine tracks that are completely recorded, and we still have one, possibly two more songs to record, though they're very small, intimate songs."

During the months between our conversations, "we've been working

pretty steadily, but with breaks for the holidays and all." He and Cohn and Leventhal went to Los Angeles' Record One to cut two more songs with Hutch Hutchinson and Jim Keltner and keyboardist Benmont Tench (of Tom Petty & the Heartbreakers fame). "The last song we recorded in California is a song called 'Walk Through the World,'" Wisch said, "and we're thinking that will probably be the first radio track. It's a good song, and I think we came up with a great arrangement. So doing that song solved one riddle for us. Once we got that song on the record—one that we know radio will like—we realized we could relax a little bit."

There had been changes to a number of songs. "Mama's in the Moon" was embellished with slide guitar and keyboards from Leventhal and some very cool, atmospheric marimbas and vibes courtesy of Mike Manieri. According to Wisch, "The version of 'She's Becoming Gold' with Manu Katche and Tony Levin wasn't working out for us, so we recut that here with two percussionists instead of a rhythm section, and that's the version that's ending up on the record. We've got a lot of percussion and a frame drum driving the track now. And we got David Crosby and Graham Nash to sing backup vocals on it." (They also appear on one other track.) Wardell Quezergue's arrangement for "The Rainy Season" did work out, "and did I mention that Bonnie Raitt played slide and sang on that?" Wisch asked. "Marc opened some shows for her, and they hit it off. She adds a lot to the track. We tried Wardell on another track, but I don't think we're going to use that—we'll probably use different horns on that."

Did "Baby King" get recorded, with a tuba instead of bass?

"It did get recorded," Wisch said, "in California with five singers and no tuba. Jim Keltner played drums, and we may still add some bass." The vocal group on that tune included Was (Not Was) singers Sir Harry Bowens and Sweet Pea Atkinson, longtime Ry Cooder backups Terry Evans and Willie Greene Jr., and Arnold McCuller. They also (sans Greene) sing on the haunting "Paper Walls."

And what of the troublesome "The Things We've Handed Down"? "In addition to 'She's Becoming

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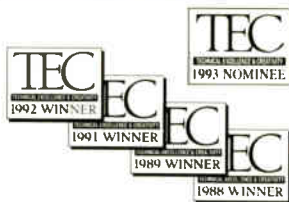
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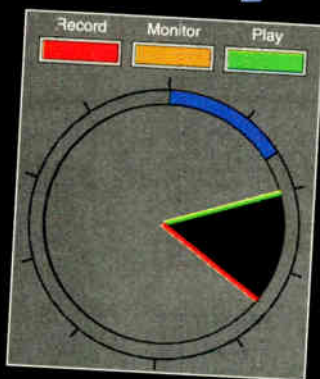
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Gold,' that's a song that's haunted us somewhat. We did recut it, but we've eliminated that version as well, and actually, just last night we attempted to record it one more time, this time with Marc playing electric piano solo, and that seems like it's going in the right direction, rather than having him play with other musicians."

Just as Leventhal was probably the key member of the production team during the lengthy overdubbing process (he plays just about everything, it seems), Wisch, with his engineering chops, was the driving force behind the mix. "We've been rough mixing all along," he stated. "What mixing at this point does, though, is give us a chance to really hear the songs and make sure they're completely finished and the mixing concepts are there. For singer-songwriters, the most important thing is for the artist and the song to come through—hopefully the production is a support unit. Certainly for someone like Marc, it's important to keep the vocal and the lyric out front and make it the most powerful thing on the track, because that's what's going to draw the listener in."

Wisch was putting in long hours at Quad touching up mixes. "I'm here most of the time, and then I'll messenger tapes over to Marc and John. Marc likes to listen at his house, then he'll call up, we'll make some changes, or they'll both come in and have a big pow-wow." What gets changed? "With Marc, it's usually vocal stuff—the amount of reverb on his voice; this line is too loud and this one's too soft. I've been using very little reverb, which is great; when you can pull that off it's cool, because it's that much different than most of what's on the radio." Wisch's reverbs of choice for the record were primarily Lexicon PCM 70, 480 "and some Yamaha stuff. I don't use that much outboard gear. This room [at Quad] has a woody, earthy quality to it that's enabled me to not use a lot of reverb, on the drums especially."

So Ben, you've been working on this for half a year now—are you burned out yet? Again, he laughs. "No, not really. We definitely have those end-of-the-record blues or whatever you want to call them. There are definitely times we look at each other in the studio and say,

—CONTINUED ON PAGE 182



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by Mr. Bonzai

# AL SCHMITT

## THE UNFORGETTABLE TOUCH



Downbeat for the historic 1993 Frank Sinatra Project is scheduled for 7 p.m. in Studio A under the world-famous Capitol Records tower on Vine Street in Hollywood. Engineer Al Schmitt is setting levels for the 55-piece A-player orchestra while producer Phil Ramone is going over charts for the evening's work when...the Chairman of the Board arrives a half-hour early!

The tension in the air is almost tangible as engineers scramble to position microphones and multiple machines are engaged for the historic session. There are no excuses when working with Frank Sinatra, and everyone knows if it ain't right, he might walk out without a word. Collective breath is held as the 77-year-old crooner, dressed in grey slacks and blue sport coat, leisurely walks out into the big room, picks up his mic and starts off with "You Make Me Feel So Young," which he last recorded in the very same spot on January 9, 1956.

Michael Mazetti, who is running the computerized teleprompter, confides to me that Mr. Sinatra is in especially good voice and good spirits tonight. He's enjoying the work and taking the song a number of times to get it right, even ad-libbing a bit. After a playback that everyone likes, he says, "That's fair...now let's make a record."

As the last note hangs in the air, Schmitt glances over at me and sighs a mighty big sigh of relief. Ramone smiles, blesses himself and glances up toward heaven. Sinatra calls for the next number, "I've Got a Crush

on You." After a take, the superb band cranks up for "South of the Border," and Ol' Blue Eyes scats through the lyrics but then decides to move on to "What Now My Love," finishing with "my last goodbye...my last *bye-bye*."

Al Schmitt, awarded six Grammys for his work as an engineer, began his career more than 40 years ago with Tom Dowd in New York City. His first Grammy was for Henry Mancini's soundtrack for *Hatari* in 1961, and his most recent award was for last year's "Unforgettable" Nat and Natalie Cole duet. In between, Schmitt



**Al Schmitt in front of Capitol Studios' mural in Hollywood**

made records with Sam Cooke, Barbra Streisand, George Benson, Jefferson Airplane, Toto, Steely Dan, Jackson Browne, Diana Ross, Michael Franks and Ray Charles, to name but a few.

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**Schmitt:** It's one of the biggest thrills of my career. Somebody asked me a few years ago if I had any regrets, and I said I had one—that I had never worked with Frank Sinatra. He was my idol. As a kid, I used to play hooky from school and take the subway over from Brooklyn to see him at the Paramount Theater in New York. Anyway, I thought I would never have the opportunity to work with him because I didn't think he would be recording anymore.

When Phil Ramone called and asked me if I would work with him, I didn't know who the artist was. Then he says it's Frank Sinatra! When I hung up, I told my wife I would do this one for free. You can put that in the article, because I'll be paid by the time the story comes out. [Laughs]

It's been an incredible thrill, and I was nervous about it—a huge undertaking, a 55-piece band, a *roaring* band with some of the best players around. French horns, harp, basses and cello and saxes, strings...and Frank. We first put him in an iso booth, but he was there for two minutes and said he couldn't sing in there. So he's out there with the band, goboed off, and it's gone pretty well. The first day, he had laryngitis, so he stayed a few minutes and left. The second day, he sang a little and was having a little trouble getting loose, and he left. I guess he didn't want to strain his voice. Then the third night, he came in and sang for three hours and was such a trooper!

**Bonzai:** I was surprised the night I was here that he was taking so much time, doing multiple takes.

**Schmitt:** You know, we didn't think he was coming that night, and he showed up early and wanted to go. We were scrambling. We had the band cooking, we opened the microphone, Frank started to sing, and you knew it was going to be a good night. He was in good voice, singing well. Every time I hear him, I get goose bumps.

**Bonzai:** I noticed he was using a hand-held mic. That's odd for a studio session, isn't it?

**Schmitt:** Well, we tried three different microphones on him, and this was the best-sounding mic. Years ago, we weren't concerned with the leakage as much, because we weren't trying to do things like tune voices up and so forth. Now leakage is a problem, because if we want to tune

him, we tune the leakage also, and we get the band out of tune. This was the best way to work with him: It gave us the best isolation. His live sound man thought it was a good idea, and he felt comfortable. When that mic went into Frank's hand, he just seemed more comfortable. He hasn't made a record in ten years, but he doesn't give you the impression he's the kind of guy who would be nervous.

**Bonzai:** It looked to me like he runs the entire show.

**Schmitt:** Certainly does. [Laughs] He is the Chairman of the Board.

**Bonzai:** Don't you have noise-handling problems with a hand-held mic?

**Schmitt:** Well, it's a live show RF mic: Cerwin-Vega electronics with a Shure 87 element. He was comfortable and felt good. Last week, when he finished, he said to the band, "Okay, bus leaves tomorrow at 10 o'clock. We're going to Philadelphia." That was his way of saying they were good, and he was going to take them on the road.

Later we went out to dinner, about seven of us, and he was talking for two hours, and everyone he mentioned he spoke about with good feelings. It wasn't something I expected, and I learned a lot that night about the way we should speak of others.

**Bonzai:** What comes next with the Sinatra project?

**Schmitt:** Well, it's similar to what we did with Nat Cole and Natalie. Other vocalists will come in and record, and we'll take Frank out in spots. Pavarotti is supposed to do a cut, Elton John, Natalie Cole, Willie Nelson, Gloria Estefan.

**Bonzai:** Has your experience on the *Unforgettable* album come in handy?

**Schmitt:** Yes, but you know that cut on the album was fairly easy to do. People say, "My God, how did you do that?" Nat had recorded "Unforgettable" on a 3-track, with him on the center-track. Although he was in the room with the orchestra and there was quite a bit of leakage, he was pretty much by himself on that track. So we transferred that

track to a multitrack tape. We did some filtering and had a drummer do a live click to the vocal. We then played the click and the vocal back to the orchestra with Johnny Mandell out there and Natalie in the booth. She sang all the way along with him, so it was a total duet. Then in the mix, we would mute her on certain passages and mute him on some. We sampled him in certain sections, so we could fly him in and he could answer her. Johnny Mandell did the arrangement, and he did it much like the original so that the leakage things were filled up by the orchestra. And then we mixed it. It was that simple. We used echo and tuned him up in a few spots. The engineer who worked on it with me was Dave Reitzas, and he won a Grammy also. We worked together, hand-in-hand, on that, and between us it wasn't that difficult.

What they did in the movie *Bird* was tough, with a totally new rhythm section over Charlie Parker's sax. The original recordings were mono, so they had to filter out drums, bass and so forth. This Sinatra album will be easier, but one of the challenges we'll have is that a lot of the artists will be singing via satellite from London, Miami, New York. It's going to be a wonderful record when it's done. Phil is very meticulous, and he's really done his homework on this. We've known each other for at least 30 years, and this is the first time we've worked together. It's been a ball, because he's really got his shit together.

**Bonzai:** You started out in 1950 with Tom Dowd, didn't you?

**Schmitt:** Yes, Tommy was kind of my mentor. He had started his studio nine months before I got there, and I learned a lot from him. I was an apprentice and watched the way he worked. First of all, he was very meticulous, and I would watch him move the microphones. He'd move the mic an inch, and it would change the sound. This taught me about the subtleties of microphone placement.

Way before this, when I was a kid, my uncle had the first indepen-

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dent recording studio in New York City, Harry Smith Recording at 2 West 46th Street. He had worked previously for the major labels. I used to get on the subway and go to his studio on Saturdays and watch him record. It was one microphone in those days, and they moved the musicians around to get the levels and balance. He was recording on wax, and then on aluminum-based acetate, and during the war it was glass-based. I remember my uncle telling me as a child that you had to

look at work with this equipment as if you were a watchmaker, and you were working on a very delicate watch. I was in awe of all this and learned to take good care of the equipment.

Tommy was also like that—meticulous—and it rubbed off on me. The studio was called Apex Recording on 57th Street in Manhattan. One of Tommy's big hits was "If I Knew You Were Coming, I'd Have Baked a Cake," with Eileen Barton. We did all the Atlantic Records stuff before they built their own studios. We did a major amount of stuff with Prestige Records—artists

like Sonny Stitt, The Coasters, The Clovers, The Drifters, Ruth Brown. A lot of the old beboppers.

I was in the business for about three months, and my first real session was on a Saturday. There was no one there, and I had just been doing voice and piano demos. I turned around, and a bunch of musicians were coming in, and I said, "Wait a minute, what's going on?" I was told there was a session for Mercer Records. I explained there was a mistake, because I had only done demos and wasn't qualified to make a record. I got on the phone and tried to reach my boss but couldn't.

So I ended up doing this session: the Duke Ellington Band with Billy Strayhorn on piano. Duke Ellington sat right next to me, and I kept saying, "Look, this is a mistake." He patted me on the leg and said, "Don't worry, son, we'll get through this." He calmed me down, and we did get through it. It sounded okay, and after that, things got easier for me.


**Bonzai:** Who else did you work with during that period?

**Schmitt:** Modern Jazz Quartet, Chris Conner, a lot of jazz with folks like Chet Baker, Gerry Mulligan. I loved bebop and did records like The Streetswingers with Bobby Brookmeyer and Jim Hall for World Pacific. One of my first big hits was with Connie Francis, "My Happiness," which was Number One for quite a while. I did some work with Jessie Belvin, Sam Cooke. Sam was really my favorite artist to work with; I was the engineer on "Cupid," "Another Saturday Night," "Bring It on Home," "Twistin' the Night Away," and all those records. Hugo & Luigi were producing in those days at RCA, and I'd moved out of engineering and into production to become a staff producer. Hugo [Peretti] and Luigi [Creatore] left to start their own label. Sam said he wanted me to produce his records, so I produced all his later work: *Sam Cooke at the Copa*, *Shake* and all those records.

The night Sam was killed in 1964, I was with him earlier in the evening. We had dinner at Martoni's here in Hollywood and were discussing the next project. RCA was at 6363 Sunset, but before that was on the corner of Sunset and Vine, which used to be the NBC building. That's where the original RCA studios were, where I did all the early Mancini things.

Actually, the first Mancini record,

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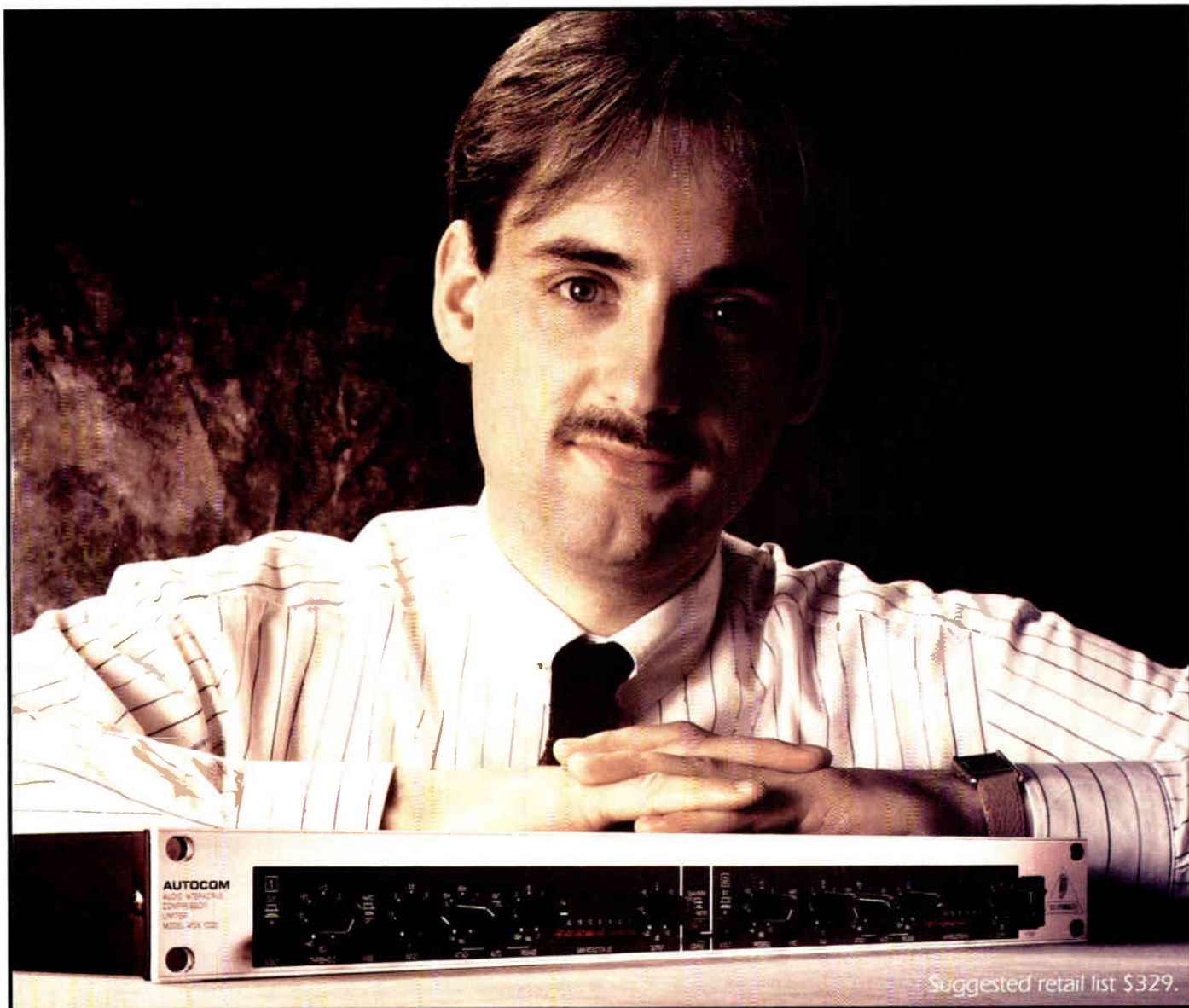


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"Peter Gunn," was started by Bones Howe, and I finished it. I did *Breakfast at Tiffany's*, *Mr. Lucky*, *Mr. Lucky Goes Latin*, *Experiment in Terror* and *Hatari*, which had "Baby Elephant Walk."

**Bonzai:** Why do you think that record got the Grammy?

**Schmitt:** It was an incredibly difficult record to do. Hank went over to Africa while they were shooting the film and came back with all these African instruments like log drums and shakers, original kalimbas and so forth. That record was all live-to-2-track, with no overdubs. We had five percussionists, bass flutes, French horns and trombones, strings, brass. I guess people who voted knew it was a difficult record to make.

The year before, I was up for a Grammy for *Breakfast at Tiffany's*, and I thought I was going to win, but *Judy Garland at Carnegie Hall* won. It was a wonderful album, and she had just made her comeback, but it wasn't all that well-recorded—there was distortion. But it did win, and those things happen. I didn't expect *Hatari* to win, and it did.

**Bonzai:** Your next Grammy was for George Benson. What year was that?

**Schmitt:** I think it was '76, for *Breezin'*. That was done here at Capitol in the old Studio A before the redesign. We did eight tunes, and six ended up on the album. Of the eight tunes, six of them were the first take, including "Masquerade." And it's a live vocal, not an overdub. George was right in the middle of the rhythm section, and I had a microphone up for a guide vocal. It was an Altec, probably a \$60 microphone, but there was some kind of magic going on, and that was the vocal we used. For the next album, George had to have that same mic. He was so superstitious that it took me two albums to talk him out of using it.

**Bonzai:** You got Grammys for two albums with Steely Dan?

**Schmitt:** *Aja* and *FM—No Static at All*, a single that turned into an album.

**Bonzai:** Don't most people think of Roger Nichols as their engineer?

**Schmitt:** And they should. Roger is the thread that goes through all the Steely Dan albums. But Bill Schnee and Elliot Scheiner, two of my favorites, both won Grammys for their work with Steely Dan. On *FM*, it was

—CONTINUED ON PAGE 298

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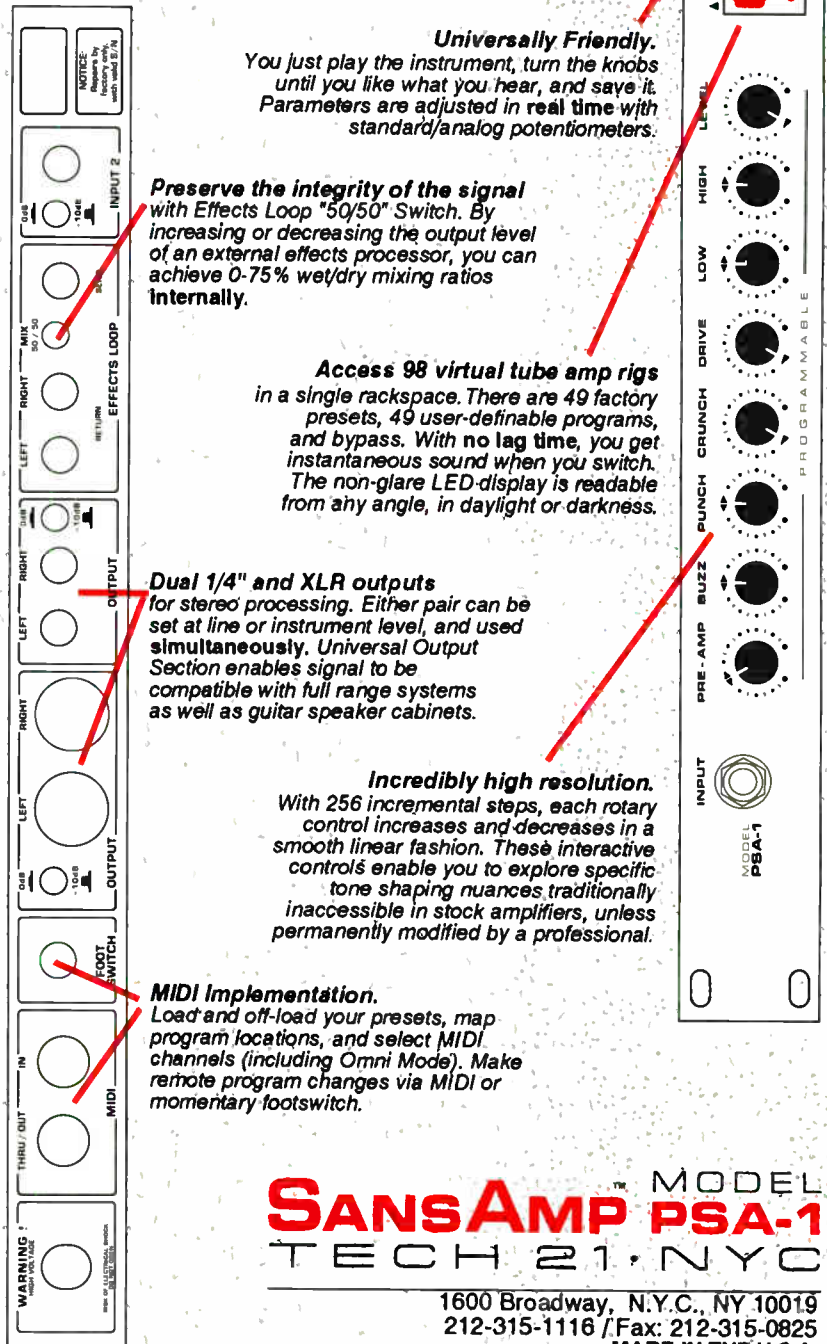
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by Blair Jackson

# TONY VISCONTI

## A BRILLIANT CAREER

**L**ike many people, I always assumed that Tony Visconti, the enormously successful producer/engineer/arranger/songwriter whose career has spanned a quarter-century, was some proper English gentleman. First, of course, there's the name—like viscount, which is just below an earl in English peerage. Then there's the incredible list of (mainly UK) acts he's worked with, including, in the '60s, Procol Harum, The Move, T. Rex and Joe Cocker; in the '70s, David Bowie, Badfinger, Gentle Giant, Thin Lizzy, Rick Wakeman and Paul McCartney; in the '80s, the Boomtown Rats, Hazel O'Conner, The Stranglers, Squeeze's Difford & Tillbrook, The Alarm and U2. And when I actually talk to Visconti, I detect a strong English accent and speech littered with colloquial British expressions. Surprise, surprise: Tony Visconti grew up in Brooklyn, New York.

As a young teenager, he played guitar in various Brooklyn bands and at weddings, and by 16 he was a professional double bassist in the Catskill Mountains resort circuit, all the while developing his arrangement and composition chops. He moved to London in 1967 at the behest of top British producer Denny Cordell and immediately found himself in the heart of the local recording scene, first assisting Cordell on arrangements, orchestrations and some production, and then on his own. He discovered the enormously popular Tyrannosaurus Rex and eventually made 13 albums with them. But he is probably best known in America for the nine records he made with Bowie, including *Space Oddity*, *The Man Who Sold the World* and the moody, adventurous '70s "trilogy," *Low*, *Heroes* and *Lodger*. He has worked with American acts—John Hiatt (*All of a Sudden*), Sparks (*Indiscreet*) and Iggy Pop (*The Idiot*) are the most prominent—and after years of living



in England, and even owning a top studio there (Good Earth, which he built in '72 and ran until '89), he now resides north of Manhattan in Westchester County. Still, it's not like Tony Visconti has "come home" exactly. He still works in Europe more often than not, frequently working in France.

A true jack-of-all-trades, Visconti is a refreshingly down-to-earth fellow with many a tale to tell. In fact, he's currently working on an autobiography with *Q* magazine staff writer John Tobler. *That* should be something.

**What are you working on right now?** Just today, I finished an album with Les Rita Mitsouko. This is the fourth album I've done with them—they're

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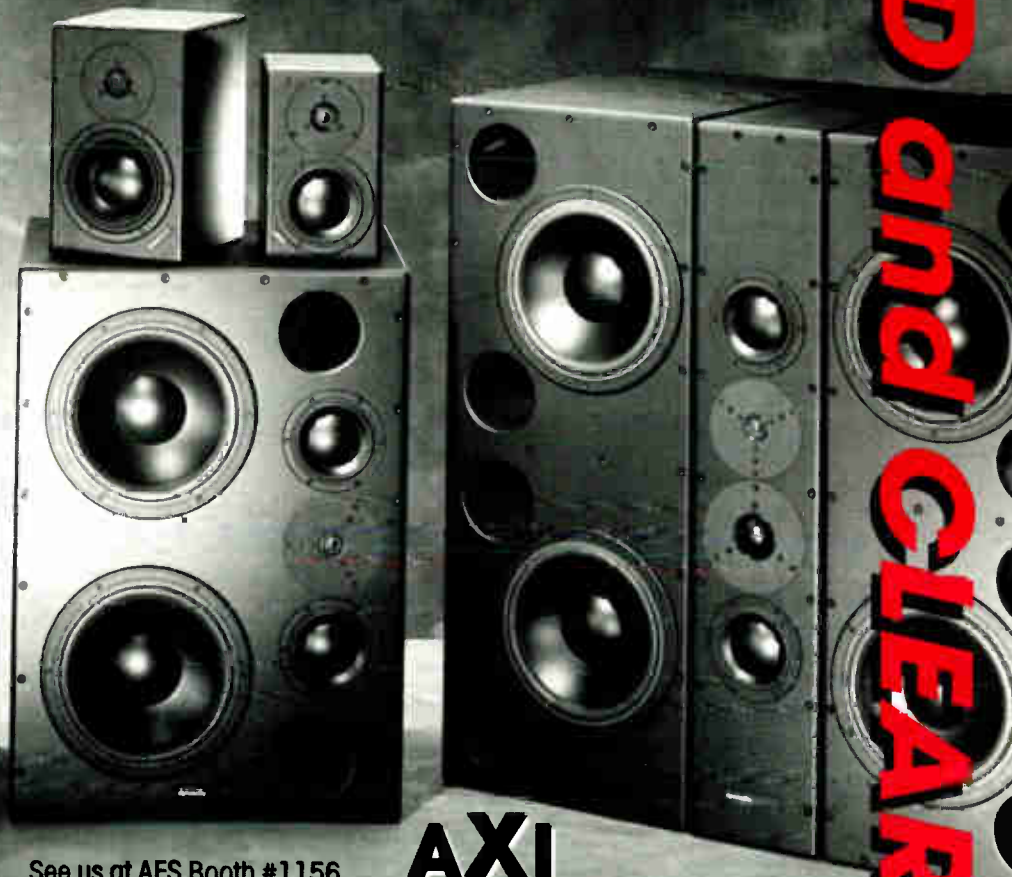
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enormously popular in France. They're big, I think, because they've broken all the rules of being a French group. They're actually innovative and do new things, rather than copy American and British groups. And for that reason, I think they're going to be the first French group to be big outside of France.

*What's been your experience working in French studios? I assume you've worked at Guillaume Tell and Studio Davout and places like that.* I've worked at them all. Generally, they're very well-equipped. They're going out for phenomenal prices. It's really worth it for an American group to get a little Paris holiday and record there. It's about \$1,600 a day for 48-track digital. I think it's going to be discovered in a big way sometime soon. I've been recording there for more than 15 years, because when I lived in London, it was so easy to go over there and make an album, and for tax reasons, it was ideal for some of my bands to record outside of England.

*Ab yes, tax exiles.*  
Tax dodgers is more like it. [Laughs]

*Is there a French approach to recording, or are they just following the lead of British and American engineers?*

Well, those are certainly the most successful models worldwide. Generally, I'd say the French record very timidly. They record like the Germans recorded 25 years ago, which is to say they watch their levels very carefully, and they rarely print effects on tape, so if you want to chorus a guitar, they'll record the guitar on track 12 and put the chorus on tracks 13 and 14, because they're terrified they might want to take it out in the mix. Recently, they've started to experiment more, and there are some really good producer/engineers coming up now.

*How is it that you went to Britain originally?*

I left America in 1967 to go to Britain. In American studios at that time, it was still the old regime where you had to make an album in three days. You'd take six to 12 hours for recording, three hours to mix it. I was being trained as a record producer in

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New York by my publishing company. They'd tell me what budgets were available. And I was doing a little talent scouting. I was a rejected songwriter, so in one fell swoop I was fired as a songwriter and hired as a record producer, because my demos were good.

Anyway, it seemed like all the records I was buying were British records, and then I would read articles about how the Beatles took one week per song to make *Revolver*—like 13 weeks on an album—and I

thought, just give me *two weeks*, and I'll make a great album!

Then, through very lucky circumstances, I met Denny Cordell, who was the producer of Procol Harum and Joe Cocker and The Move and Georgie Fame. He had come to New York to make a record with Georgie Fame called "Because I Love You," and he was hiring all these good players like Clark Terry to play on it, but he didn't have a chart. He thought he was just going to play them the demo, and then they'd write their own charts. So I said, "That's going to cost you a fortune in New York

City." So I wrote a quick arrangement and copied out the trumpet line from the demo, and then the session went very well, and he hired me to be his assistant in London.

When I went there, it was everything I hoped for. We were in the studio all night long, taking weeks and weeks to make an album! [Laughs]

*What was taking so damn long over there?*

[Laughs] We were really taking our time to get great sounds in the studio, not just a live sound. Previously, most records were virtually live records. Well, the Beatles changed all that. They taught people to do it piece by piece—concentrate on the drums, then add a bass, then add a guitar and so on. That takes hours and hours. And working on 4-track, as we were back then, you really had to plan ahead. On one 4-track, you really could only get away with eight or nine track-bounces before the sound really deteriorated. And even having the luxury of two 4-tracks, it was quite limited.

*One of the things that really struck me about T. Rex was how different your string arrangements were than most records of that era. You and Paul Buckmaster seemed to be doing the only cool orchestrations in rock.* What I did with the strings in T. Rex was an old trick, really. If Marc Bolan [the group's leader] played something on the guitar that came out of his head spontaneously, I would turn that line or figure into a string part. And when you have that guitar part doubled up with four cellos and then a violin adding a counterpoint to that, it suddenly sounds incredibly clever—as if it was conceived like that in the first place. So I used the strings to reinforce the rock band, rather than in a traditional supportive way. So in "Bang A Gong," the strings reinforce the guitar changes. Toward the end, the strings started to get more far-out and have their own voice, but we always kept it in the rock genre. I used to approach it saying, "If Marc Bolan could play the cello, what would he sound like?"

*Was Bolan a pretty sharp guy? In the States people either seemed to love him or think T. Rex was a fraud. The whole early glam scene he was a part of was really looked at condescendingly by most people here.*

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He was very bright and very intuitive. He wasn't very disciplined—it was hard to get him to sit down and practice—but he was very talented. America was going through a very cool period back then [late '60s, early '70s]. You had to have long hair and wear jeans and be very laid-back. And Marc Bolan was a real obnoxious cosmic punk. He was trying to ram his British success up everyone's nose, and Americans did not take well to it. Had it been a few years later, when Elton John came over and did the same thing, Marc would probably have gone over better here. His timing was off.

*Were you at all intrigued by what was happening in the States while you were over in Britain—the whole West Coast scene?*

I was aware of it, but concentrating on British music, I wasn't an aficionado or studying it. I was a local British producer producing British acts.

*Looking back on some of the records you did in the late '60s, how do they sound to you sonically?*

Actually, they sound surprisingly good to me. I was speaking to Bono last year, and he was saying that the drum sounds today have gotten so ridiculously big that there's only one way to go: back to the sounds that we got, which were ambient and dry. We definitely miked up the room, but the drum sound had to be done in that spot—we had no digital delays or fancy reverb programs, no gates. It was really an art to recording that's a bit lost now.

Even when I go 20 years further back than my records—to early R&B records—sometimes my jaw drops when I hear those drum sounds. There are some terrific drum sounds, mainly because the drums were being picked up by the vocalist's microphone.

*Since you were concentrating so much on capturing the individual elements and figuring out how to stack tracks, how did you manage to make your recordings sound like performances?*

A lot of them were performances of a band, with a lot of overdubs. All the T. Rex stuff was done live as a band, but then we overdubbed like mad, buried the mistakes. [Laughs] Marc would sometimes have four or

five guitar parts on top of each other to fatten it up. Or he'd have three solos he liked, so we'd play them all at the same time during the mix. [Laughs]

*How did you get jobs back then?*

I worked for Denny Cordell for two years, and through him, I made a lot of contacts. I met both David Bowie and Marc Bolan during those two years. I met Bowie through his publisher, Denny Partner, and Marc Bolan I found on my own—I went talent scouting and found him playing in a club one night. Then, having

hits with those two guys, people came to me.

*It's funny that Cordell ended up going to Tulsa and being the architect of that whole scene, with Leon Russell and Dwight Twilley.*

He was always heading west, and I was always heading east, and we crossed somewhere in London. He wanted to get an American sound—that's why I was hired originally. He thought I was going to help him get the sound of some down-and-dirty, funky American rhythm section. My hidden agenda was I wanted to learn

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how the Beatles made records; simple as that.

*What was Bowie's status in England when you started working with him?* He had one album out, called *The World of David Bowie*, and it was pretty good. On one track he'd sound like a rock singer, and on the next he'd sound like Anthony Newley. He was hard to pigeonhole because of that, and to some people he was even laughable. But I liked him, because he was quirky and unpredictable. That's what I liked about Marc Bolan, too. Anyway, I stuck it out with him for about two years before the "Space Oddity" single came. Actually, I hated "Space Oddity" and didn't produce it. I didn't think it was his statement. He was in his folk-rock period, and the record company was saying, "We don't really like these songs," and so his manager Ken Pitt said, "We have to come up with a hit song." The record company even suggested we re-record that song, "Incense and Peppermints" [the Strawberry Alarm Clock hit].

David considered it for about a day but, fortunately, turned it down. Then he came up with "Space Oddity" as a commercial ploy—it was around the time man was landing on the moon and all. I thought it was a cheap and not very original idea for a song. So I walked out of the sessions. I was very, very idealistic in those days. [Laughs]

We had our ups and downs, but we got together again after he was Ziggy Stardust, and he asked me to help him finish off *Diamond Dogs*, and then we got together again for several years.

*I imagine the Philadelphia soul style of the Young Americans album was quite a departure for both of you.*

That took me completely by surprise. When David told me the people he wanted to use—Willie Weeks on bass (one of my all-time favorites), Andy Newmark on drums, Dave Sanborn on sax, I said, "Yeah, I'm headed for Philadelphia!" I went there expecting to do a straight producing job—make sure the sessions went smoothly and supervise—but when I got to Sigma Sound, I took one look

at this board, and it was a real home-made job; there were no labels on it, the EQ was very, very nondescript. And when I asked who was engineering, they said, "Well, you are, because Bowie doesn't like my sounds. He said, when Visconti comes, just show him how to use the board." Up till then I had done a lot of mixing, but I hadn't done much session engineering, because it's a scary thing to be in charge of 20 microphones and all that. I was jet-lagged, and I literally went from the airport to the studio, and that night we recorded the "Young Americans" track. It was quite a night. I could tell it was special, and I just had to get it right. So with the help of my friendly engineer, we were able to get it that night, and we never re-recorded it.

That was a great album. Also, Bowie did his vocals live in the room. So we tried this thing that someone had once described to me where we got two identical microphones, stuck one about three or four inches higher than the other, and had identical limiting on both, but the bottom mic was out of phase with the top mic, so both microphones were picking

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up the band but canceling it out, because they were out of phase. I instructed David to sing really hard on the top microphone and not go near the bottom mic, and it worked! If I could get that multitrack, you'd be amazed. On the final mix, we ended up using probably 70 percent of those live vocals. Of course, that's really a credit to how good a live singer David is—he's phenomenal.

*Then, when we get to Low, Heroes and Lodger, which I think of as having certain similarities, that was another radical change for both of you, wasn't it?*

Yes. What happened was, David phoned me up and said, "I've booked the Chateau D'Heroville [outside of Paris] for one month. My friend Brian Eno is going to come there. We don't know exactly what we're going to do. We're going to experiment a little with music like Tangerine Dream and the ambient music from Brian's repertoire, and I've written some songs—I don't even know if I'm going to sing vocals yet." He'd hired a few musicians, and I suggested a few others, like this lead guitarist Ricky Gardener. And he asked if there were any strange technical things I might have picked up that could add to the project. I had just bought the second Harmonizer in all of Europe—the H910—and I said, "Yeah, I've got something. It sort of messes with the fabric of time. You can raise the pitch, lower the pitch, distort it, and the speed doesn't change." Well, in 1976 this was mind-blowing. Bowie and Eno went nuts: "We want it!" [Laughs] For months after that record came out, I got all these wild phone calls from engineers wondering how I'd gotten those sounds. I didn't let on until everyone else was getting Harmonizers.

*So, is a lot of what we hear on Low just experimenting in the studio?*

Yes, it was a real luxurious experiment. David said at the outset, "We may just be wasting a month of our lives, and nothing will come of it," but I didn't care. He's a great person to experiment with, as is Eno, of course.

Every day, we'd record in the strangest styles we could imagine. We'd have people swapping instruments, tried all sorts of things just to be different. It was quite unusual. RCA didn't like it at all. In fact, one guy said, "I'm going to buy Bowie a

—CONTINUED ON PAGE 300

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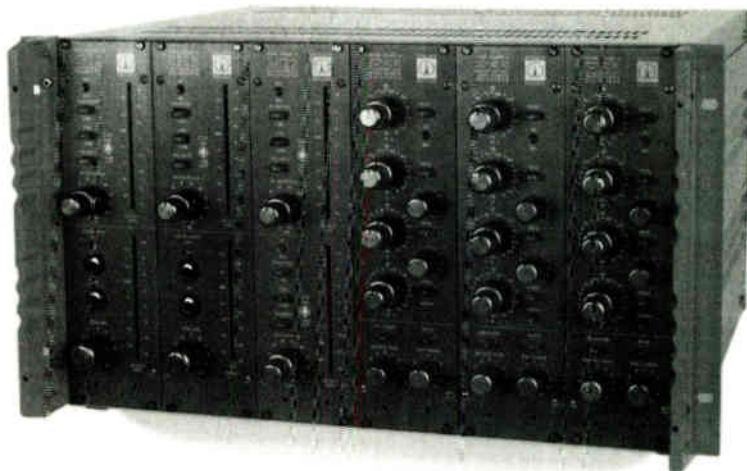
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# Engineer

# Dave Way

At  
the  
Top  
of  
the  
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Heap



by Iain Blair

**D**AVE WAY is one of the most in-demand recording engineers in the business, and at the ripe old age of 29, his resume includes a staggering number of chart-topping R&B records from the last few years. In the past two years alone, his credits include engineering producer Teddy Riley's tracks for Michael Jackson's *Dangerous* and mixing hits for the likes of Whitney Houston, Bobby Brown, Boyz II Men, Shai and T.L.C. Not bad for a middle-class white kid

who grew up on Long Island.

But Way isn't just the automatic engineer of choice for such top producers as Riley, Shep Pettibone, Dallas Austin and L.A. Reid & Babyface because of his great set of ears. He's also a hard worker, which explains why's he's already hunkered down in Larrabee Studios in West Hollywood at an hour when most self-respecting music folks are barely able to smell the coffee, let alone juggle 24 tracks.

**How did you get started in the music business?** I grew up in Long Island in a fairly musical family. My dad's a singer, and I started off playing piano and then got into bands in high school. My mom even let us rehearse in the house, and after the guys left, I'd use two cassette decks and make my own demos, going back and forth, and I loved that even more than the actual playing. I'd experiment with tracking and putting down layers, and as the bands got bigger,

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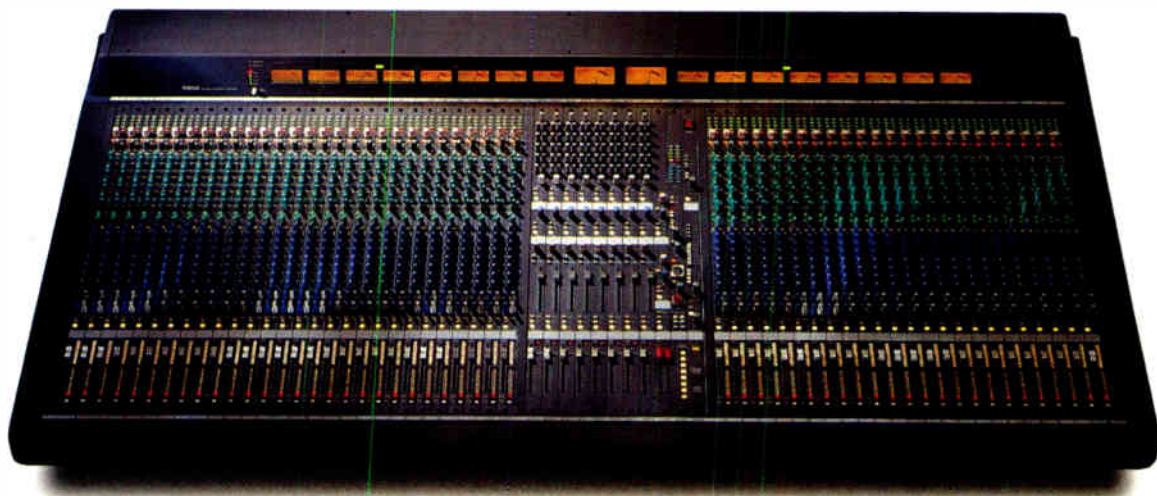
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the tapes got better.

**Who were your musical influences?** For two years, from 14 till 16, all I listened to was the Beatles; to every little sound. That's when I really fell in love with production and making records. But for some weird reason, when I got out of high school, I decided to study civil engineering at Tulane University in New Orleans. After one semester, I knew I'd made a mistake. I quit and told my parents I wanted to be a recording engineer instead, and I enrolled at Berklee in Boston. It was the best thing I could have done. It was four years of nonstop music, and I graduated with a degree in engineering and production.

**What was your first break?** I got a job as a gofer at the Hit Factory in New York for seven months, and then I moved across the street to Sound Works as an assistant. I had a great time there, and one day the engineer didn't show, and Shep Pettibone asked me if I'd fill in and mix a 12-inch of Blondie's "Heart of Glass." That was my first thing; it came out great, so I did some more mixes for Shep. Sound Works had just one room, and Shep and Teddy Riley were two of the main guys there, and the same thing happened with Teddy. His engineer didn't show, and he asked me to remix Soul II Soul's "Keep On Movin'." That spawned a two-year relationship with Teddy where I was his right-hand man and did everything he worked on.

**How would you describe his style?** He's very creative, and being self-taught, he approaches everything in that way. He'll get a new piece of equipment, and he won't read the manual—he'll just start playing with it, and before you know it, he knows more about it than the guys at TMS who sold it to him. I love that, because there are no rules, and coming from Berklee where you go by the book, it was very liberating for me. So those two years were a great learning experience for me.

**When did you make the move to L.A.?** The last project I did with Teddy was *Dangerous*, which brought us out here, and after a few months working on it here, I just decided to stay.

**On how many tracks of *Dangerous* were you involved?** All the ones Teddy produced. I engineered seven tracks, except the title cut, which was re-recorded. We cut most of them at Larrabee in Burbank, and we were there for months. We also spent about

a month over at Record One in Sherman Oaks, which has a great Neve console. We started off at a good fast pace and got the tracks down fairly quickly. But once we started doing the vocals, it really slowed way down, because the vocals were done at Michael's pace and he works very slowly and methodically. The tracks were done at Teddy's pace, and he works very quickly. Obviously, Michael's taken a long time on all his records, and that's how he records. I must say it was a great experience, and I learned a lot.

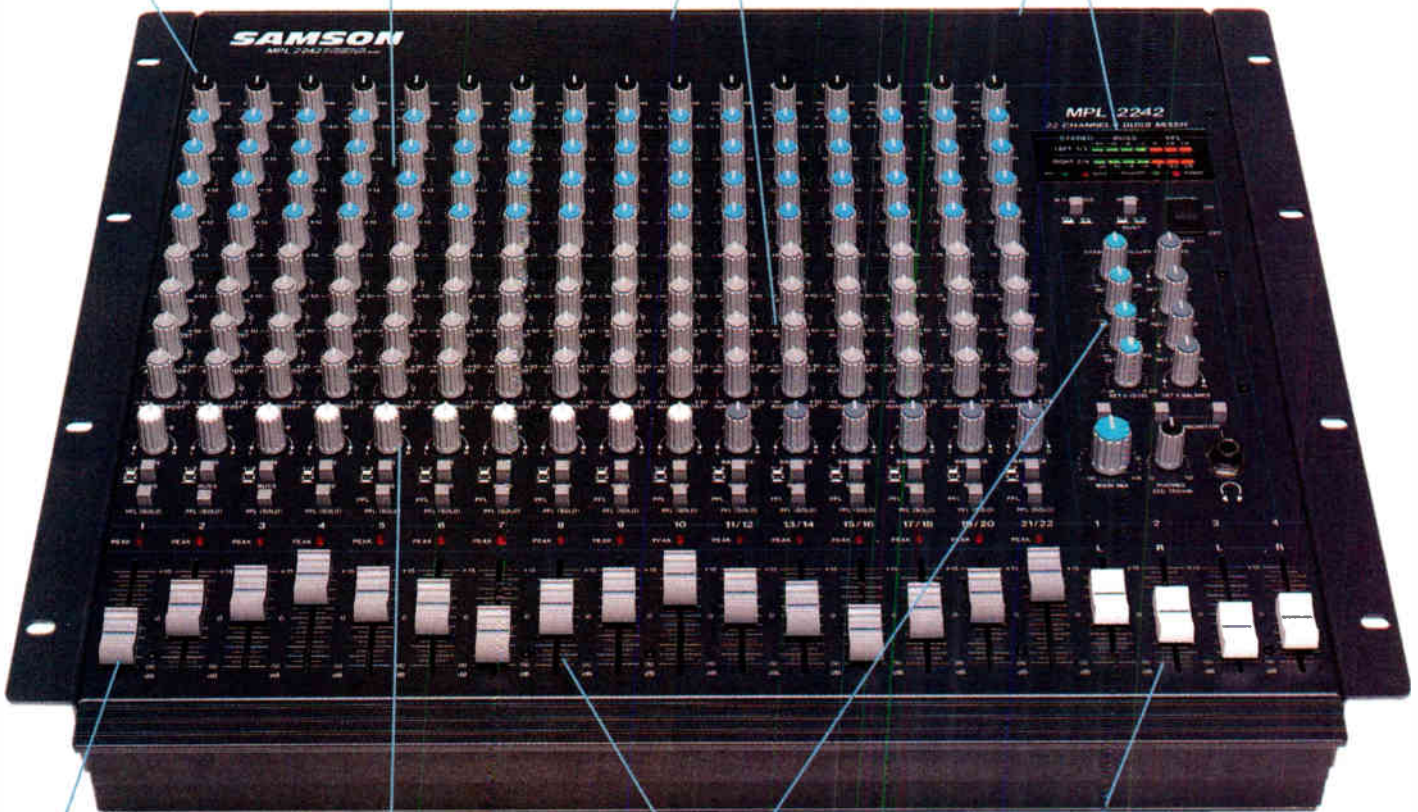
**Did you experiment much?** We experimented quite a bit with the Roland RSS 3-D sound unit. For instance, we created this effect that runs all the way through "Jam," which is pretty cool. A lot of times, Teddy does this talking track, to kind of hype up the track, and we'll often treat it with a telephone effect. But this time, we took it a lot further and filtered it out and distorted it with a mic preamp, and then put it through this H3000 that had pitch shifting and modulation so that it was kind of slow and not very deep. We then put that in the RSS unit, and the great thing about that unit and where it differentiates itself from Q Sound and some of the other systems is that it's MIDI. So you can do all this panning and move the wheels and send it into a sequencer, and it'll play back all these movements that you've programmed, which is fantastic. It certainly gives you one up on Q Sound because a lot of the times you're using it as a real effect, and to be able to move it and hear all the phase changes as it's going from left to right is pretty impressive.

**You also mixed *The Future* album for Teddy Riley.** We did nearly all of that at Sound Tracks in New York. They have two rooms, and we cut most tracks in the bigger room, which has a G Series SSL. The main reason we needed the big room is that Teddy has so much gear. He has racks and racks of everything, including every keyboard you've ever heard of. It was a great project for me because I'd been doing so many remixes, and you don't have control over the tracks you're handed. But on *The Future*, I was there from beginning to end, even down to the sequencing, and that gives you a lot more control.

**How did you get involved with Dallas Austin and L.A. Reid &**

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**Babyface?** They really came to me. I'd met Dallas in Atlanta working with Teddy, and he called me up months later and asked me to mix "Motownphilly" for Boyz II Men. And now some of the groups are producing, and they called me to mix a track for Johnny Gill, so the circles keep turning. And it was Dallas who introduced me to L.A. We went down to Atlanta where they have their studio and did this remix for Pebbles, who's married to L.A., and a track called "Backyard." They really liked it, and so they asked me to work on most of their projects for the past two years.

In fact, I've just done Babyface's second solo album, which they produced. And before that, I did "Humpin' Around" for Bobby Brown, which I knew was a smash the moment I heard the basic track. I felt the same way with T.L.C.'s "Baby Baby Baby." We've also done several tracks for Whitney Houston, including "Queen of the Night" from the *Bodyguard* soundtrack, and we did the title track from *White Men Can't Jump*. Next we're doing a track for T.L.C. for the *Poetic Justice* soundtrack.

**It sounds like you're doing a lot of soundtrack work.** Yes, we just did another cut, "Call Me a Mack," for *Poetic Justice* by this new kid called Usher Raymond, and I think it's going to be a smash.

**How different are the mixes?** When I do a film mix with Dolby Surround, I usually start with the album mix and, after that's printed on 1/2-inch, work it into a Surround Sound format. That format tends to bring in everything monowise, so you have to exaggerate your stereo field.

**You've done remixes for everyone from Freddie Jackson and Color Me Badd to EYC and Nona Gaye. How different a discipline is it from straight mixing?** It's completely different. Mixing can be fairly straightforward, but remixing involves a whole other side, which is essentially producing, as you have to come up with all these different parts that you can reshape and revitalize the track with. And a lot of times this new stuff completely replaces anything that was on the track before.

The other big difference is the time factor. [With a remix] often you only get two or three days to totally

rebuild a track in at least one, and often two or three, different ways. So you have to come up with a track that's going to fit for a hip-hop station, another one that will fit in a club, and perhaps another one for pop radio. A lot of times now, they also want Quiet Storm mixes for night R&B stations.

One of the things I think is important to do is to keep separate the time when I'm trying to be creative and come up with these parts and get the vibe happening for the tracks, and the time when I'm actually mixing and getting technical and thinking about what frequencies I should be tuning in on. So if I'm programming drums and I start to think too much about the timing and whether I should use a flanger or not, it'll completely distract me. Sometimes you can really burn out, because you're switching from left brain to right brain all the time. All the creative work is right-brained, while the technical stuff is left-brained. So ideally I try to concentrate on both, but one at a time, and keep the pace going.

**Is it difficult bouncing between mixing and remixing?** It is, be-

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cause when you're remixing you're producing, and there are a lot of engineers who try to produce and engineer at the same time, and I think most would agree that it's hard to keep your objectivity. Luckily I have a good assistant, Tom Russo, who takes care of a lot of that for me. So while I'm programming something, he'll engineer for me and let me concentrate more on the production side.

**Why do you think you're so successful at uptempo R&B tracks?**

I just seem to have a knack for it, and I like to keep things raw. I don't like to get too into effects, and that's easy to do, particularly on remixes, with all the technology out there today. You can get lost in the technology and lose the essence of the song, and end up making the artist sound more distant.

**You produced a track, "Baby I'm Yours," for Shai. Do you want to get more into production?**

Definitely. I like to think of remixing as opening the door into production, and I've got some other production projects I'm getting involved in.

**Are you a tech-head?** I like to keep on top of all the new technology and equipment, but I don't consider myself a tech-head in any cutting-edge sense. I like to use certain equipment all the time, but a lot of the gear is old, like Space Stations and Prime Time delays, which sound like crap on their own but in a track have so much character. So I tend to mix and match the old and the new, like this new Sony R7 reverb that I really like, which is very digital-sounding with a Space Station, or an old EMT. It's especially effective now with all the retro sounds today, because people have sampled so many old records and then you hear all the old reverbs and chambers. I love it, because people get to hear an old EMT 140 or a spring reverb—gear that's been forgotten until now.

**How important is it to stay on top of all the new technology?** It's important, but the truth is there's so much coming out that often you just don't have time to try out a new system. I recently tried out the new TC M5000 reverb, which has pitch change and delays, and it's very smooth-sounding. I had the TC guy come down and show me, but that's a rarity. When you have a one-day mix, it's just impossible. The other thing I've found is that a lot of the new gear isn't very user-friendly. The

Sony R7 has over 300 parameters you can change, which is pretty overwhelming, so you're almost forced to just check out the presets and not find out everything it can do.

**What are your favorite studios?**

Larrabee Studio B is always my first choice, because I love small, tight rooms. Larrabee's got all the gear I could want, including great old equipment like these Motown EQs that were built by the Motown engineers. They sound incredible, and I always have three or four in the room with me, and I use them on vocals. They're passive, and even if you're using them

in bypass, it sounds better. If I can't get in here, I'll go to Encore in Burbank, which is very similar to L.A. & Babyface's Lacoco Studio in Atlanta. I've mixed everything in the last two years between those three places.

**You seem to have a lock on the R&B market. What's in the future for you?**

I'd love to do a rock project, because I love hard-sounding tracks with a lot of attitude like rap. I'd really like to work with some Seattle grunge rock bands, because there are a lot of the same elements and emotions involved. I definitely want to diversify. ■

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# LETTERMAN

## MOVES TO CBS AND THE ED SULLIVAN THEATER

*"I just think it might have been easier renovating Ed Sullivan than the theater."*  
—David Letterman

BY DAN DALEY

Rumors flew around New York's audio community that the revamp of the Ed Sullivan Theater to accommodate David Letterman's move to CBS was not adhering to schedule. But according to everyone involved—and there were plenty of them—the renovation went surprisingly smoothly, considering the time frame involved: Signed by CBS last December after his original network, NBC, dropped out of the bidding war, the \$14 million Dollar Man's *Late Show with David Letterman* was slated to start August 30. It took three months to scout locations after Dave and his production company decided to stay in New York. Construction began in March and went on seven days a week through one of the hottest

summers New York has seen in recent years.

The theater itself was something out of a Bob Villa nightmare: Built in 1927 as the Oscar Hammerstein Theater, the house was originally designed as a Broadway venue at a time when acoustics, not electronics, were the primary means of amplification. Resonance and reflections were desir-

able characteristics, not problems to overcome. The building received its last overhaul in the late 1960s when CBS, which then as now leased the building, converted its video technology to color. Before that, the stage had been extended into what had been the orchestra pit, with a control room along the right side of the building next to a stage wing that was used for musical acts. That's where the Beatles stood for their landmark performances on the program. Ed himself, a former New York Daily News gossip and celebrity columnist who parlayed his printed page pulpit into a 27-year-long variety run on television, stood stage right while Topo

Gigio ("Kizz me, Eddie!") and innumerable (and often interminable) jugglers and other circus and carnny acts played on center stage. For the last several years, the venue was used as a research and demo facility for an HDTV company, while time and atrophy took their toll.

### ACOUSTICAL DISASTER

"The place was a disaster when we got into it last March," says Chuck Dages, CBS's director of broadcast

**The new and old marquees of the Ed Sullivan Theater**



PHOTO: PATRICK PAGNANO/CBS

PHOTO: ARCHIVE PHOTOS

facilities planning, referring as much to the acoustical problems awaiting the show as the condition of the house. The theater was built with a large overhead dome that would cause severe reflections and focusing effects for contemporary broadcast audio. Jim Merrill, a principal acoustician at Shen, Milson & Wilke, analyzed the room and made several recommendations that addressed the acoustical problems within the constraints caused by the new air-conditioning system, the broadcast lighting needs and the fact that the theater is officially landmarked. Acoustical baffles were hung in the ceiling, suspended below the dome, to absorb and deflect sound. A large "sail" was constructed in the rear of the house, eliminating several rows of seats, to further cut reflections and to add a higher degree of intimacy to the space. "If it were up to us, we would have built a new ceiling," Merrill says. "But the landmark status prevented that. The big challenge was integrating all those aesthetic and technical requirements."

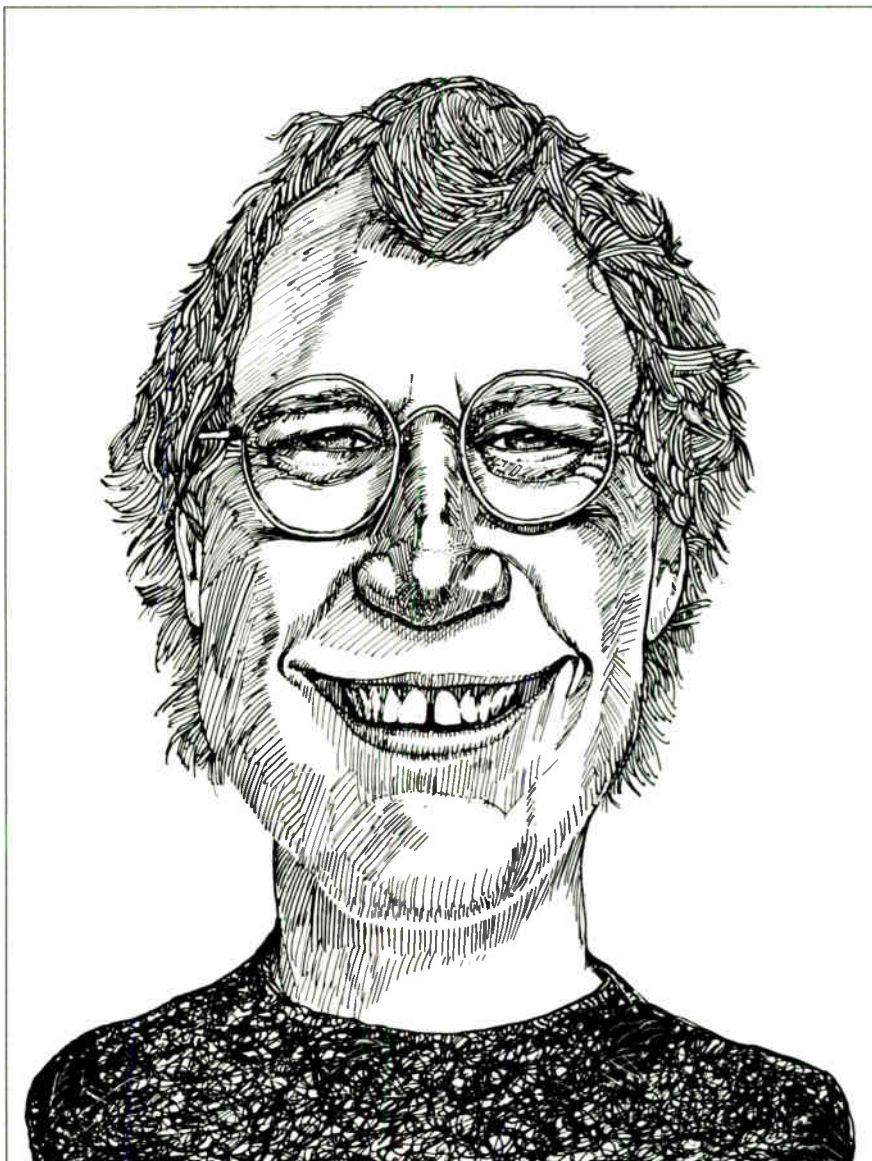
#### PRIMITIVE A/C AND SUBWAYS

The huge new air-conditioning system (Dave likes his studios very cool, staffers say) is a big improvement on how that function was accomplished in the old days, when huge blocks of ice were loaded beneath the theater and electric fans blew cold air through a series of ducts that vented beneath the seats. And though the acousticians had suggested further isolation from subway noise (the Seventh Avenue line runs below the theater), Dages and project director Alan Hodgson, a veteran of the BBC and numerous political convention broadcasts, decided that a reinforced stage with steel mesh and concrete would be sufficient. They didn't have the same good fortune as Ed Sullivan, for whom the New York City Transit Authority suspended subway operations on the line for an hour every Sunday night when his show was on, a testament to the power of the young medium at the time. However, the subway breaks down so often on its own that Letterman will have at least a 50-50 chance of no trains during a given taping.

#### AUDIO CATACOMBS

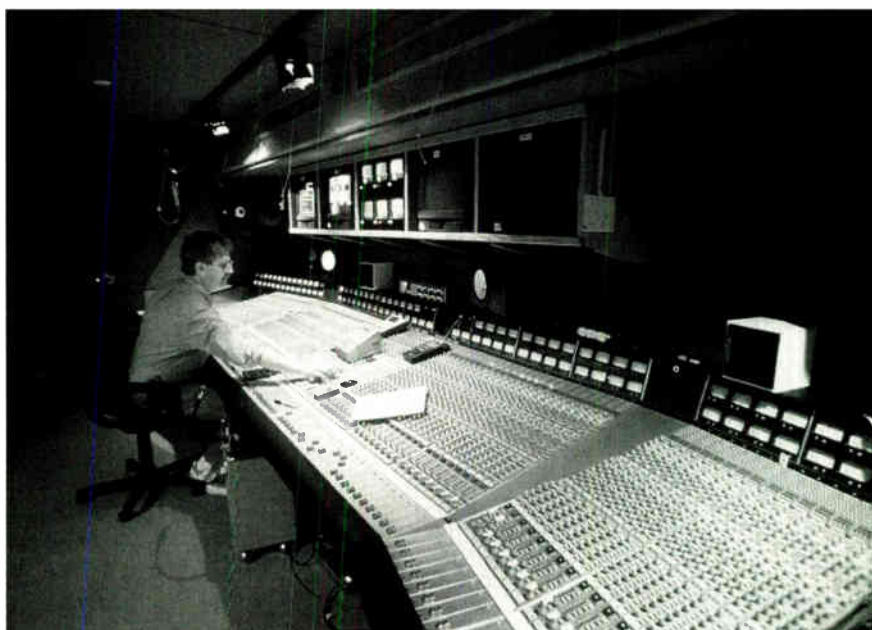
After the acoustical issues were resolved and aesthetic matters settled

ILLUSTRATION: TIM GLEASON



**Below: Michael Delugg at the SSL console in the "Music Room" of the newly refurbished Ed Sullivan Theater—close monitors include Auratones and Yamaha NS-10s; mains are KRKs.**

PHOTO: PATRICK PAGNANO/CBS





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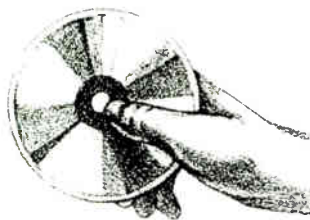
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(a looming black cover over the proscenium arch on the stage was removed to reveal stained glass windows and ornate plaster work, some of which is being restored), technical choices for audio were made and implemented. Most of that implementation took place in the catacomb-like basement, where a series of suites were built to house the on-air control switcher room, a broadcast audio console and a music mixing room, among other things. Both the broadcast console and music consoles are SSL desks; the former is an unautomated, but modified, 56-input 8000 Series BG board (only the second ever built by SSL), and the latter is an 80-input 4000 Series with Ultimotion. The broadcast console, located in a cramped room angled 90 degrees from the switcher room, with good line of sight to it, is based on the 4000 Series module with G Series processing, but items like machine control are replaced with customizations for the broadcast, such as IFB soloing systems and two main stereo outputs. Also included is a Bluestone cue system modification, providing an additional four stereo or eight mono cue sends. And both consoles incorporate G-Plus systems, with oxygen-free cabling and enhanced metering capabilities.

Through a series of labyrinthine tunnels is the music mixing room, where Michael Delugg, who has mixed music for Letterman since 1988, handles Paul Shaffer and the CBS Orchestra, as well as guest musical artists. The larger number of inputs on his winged SSL makes dealing with a house band newly enlarged by two members easier, he says. "And the automation means it's no longer a fire drill to get set up for the guest band during a two-minute commercial break," he adds.

Delugg, who began his career in New York as a staffer at the now defunct but affectionately remembered Media Sound, says that being able to start from scratch is considerably easier than walking into the middle of an ongoing production as he did five years ago at NBC. "The show had been on for seven years at that point, and by then certain habits had been established that I didn't necessarily agree with but couldn't do much to change," he says. One change he did make was to replace Letterman's older Sony wireless mi-

crophone with a Sennheiser MKE-2 system. "We were getting too much air-conditioning noise, and I wasn't happy with the level of intelligibility and clarity from the old system," he explains. (The old RCA 77 mic that sits atop Dave's desk will also remain, continuing to function as a backup/prop microphone.)

Sony is well-represented, though. According to Rick Gross of Sony's Systems Integration Division, Sony designed and prefabricated much of the new renovated theater's D-2 video system and the associated line-level audio, as well as the distribution and control of the signal. Caught jogging down an aisle between the new theater seats (which are covered by plastic to protect them from the dust raised in construction—the Sony ATR's installation was delayed for the same reason), Gross comments that the controlled chaos around him masked the fact that the overall installation was going pretty much according to plan. "Considering the very tight time frame in which things have to get done, it's gone very well," he says.

## HOUSE SOUND

The house sound system is elaborate. Put together by Clair Brothers Audio, it includes some items designed specifically for the "Late Show" that will henceforth be part of Clair's product inventory. Clair has had a full monitoring system in at *Saturday Night Live* for several years and was familiar with many of the faces at NBC who will be lending expertise to Letterman's new show, including audio consultant Stacey Foster and Delugg and Paul Shaffer.

The theater's design called for a unique approach to house sound, says Gene Pelland, general manager for systems installations at Clair Brothers, who also worked closely with Foster in developing the house system. To deal with the prognathous balcony, an under-over system was devised. The under-balcony theater uses the Clair Brothers UB-2003 enclosure, a dual 8-inch speaker system with a wide-dispersion, high-frequency driver. "It was specifically designed without a lot of low end—they didn't want too much in the way of low frequencies under the balcony, in order to keep a high level of intelligibility," Pelland explains. Another system is located be-

—CONTINUED ON PAGE 254

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# Adventures In Audio

## COMPILING SOUNDS FOR TRAVELS WITH JACK

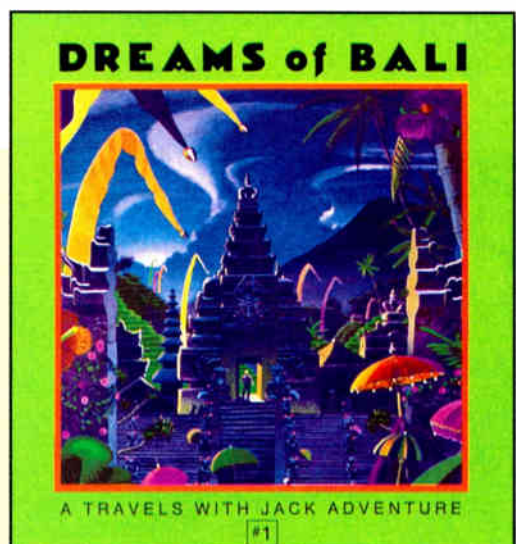
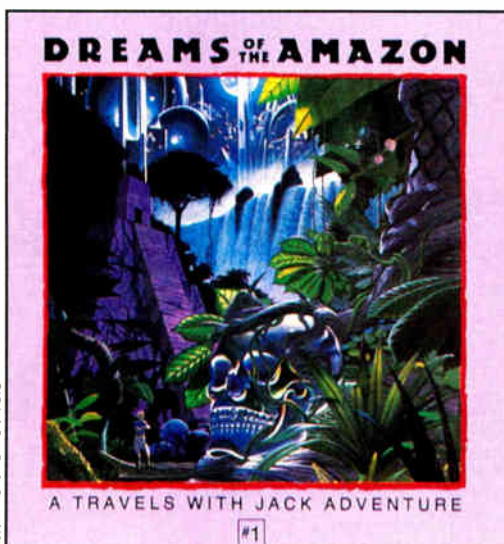
by Georgia George

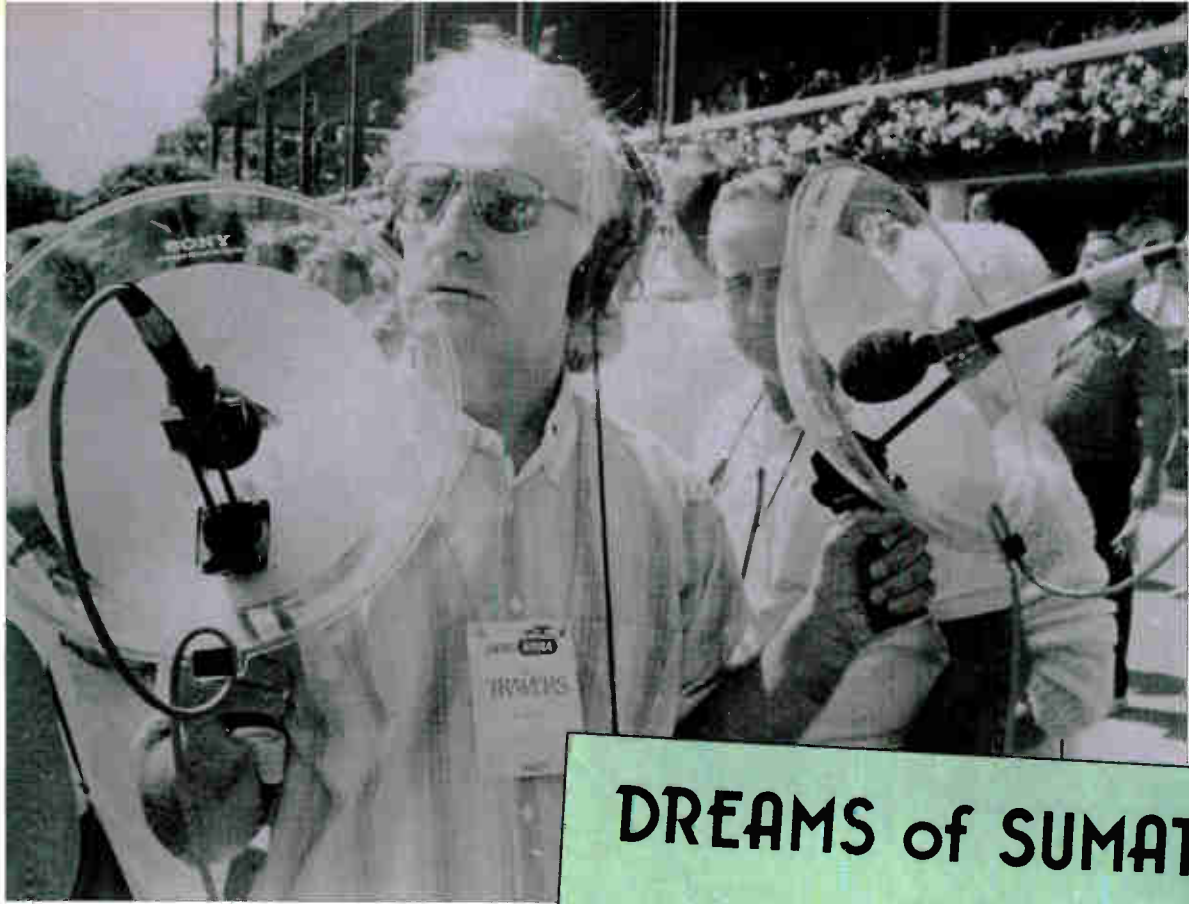
**W**hoa...how did I get here?" I think, as I drive into the parking lot at work. Last thing I remember, I had pushed in the tape to hear more of Jack Flanders' adventures in Bali. He was at a cremation celebration (yes, celebration; the Balinese believe burning the body allows the soul to fly free), and I was there with him, right in the middle of the shouting, clanging, gamelan-playing crowd of revelers. I have heard the sound of skulls popping.

"Dreams of Bali," one of many *Travels With Jack* adventure audio dramas

set in an exotic country, is written, recorded and produced by Tom Lopez. It is the convenience, affordability and sophistication of DAT recording equipment that has enabled his almost single-handed production.

Lopez has been to the Amazon three times, in addition to Sumatra, Java, India and Bali in his quest for unusual sounds. "You'll get the idea from what one imagines the sounds will be," Lopez says. "You can hear rickshaws and things described in Somerset Maugham stories, for example. Or you'll see a picture in a





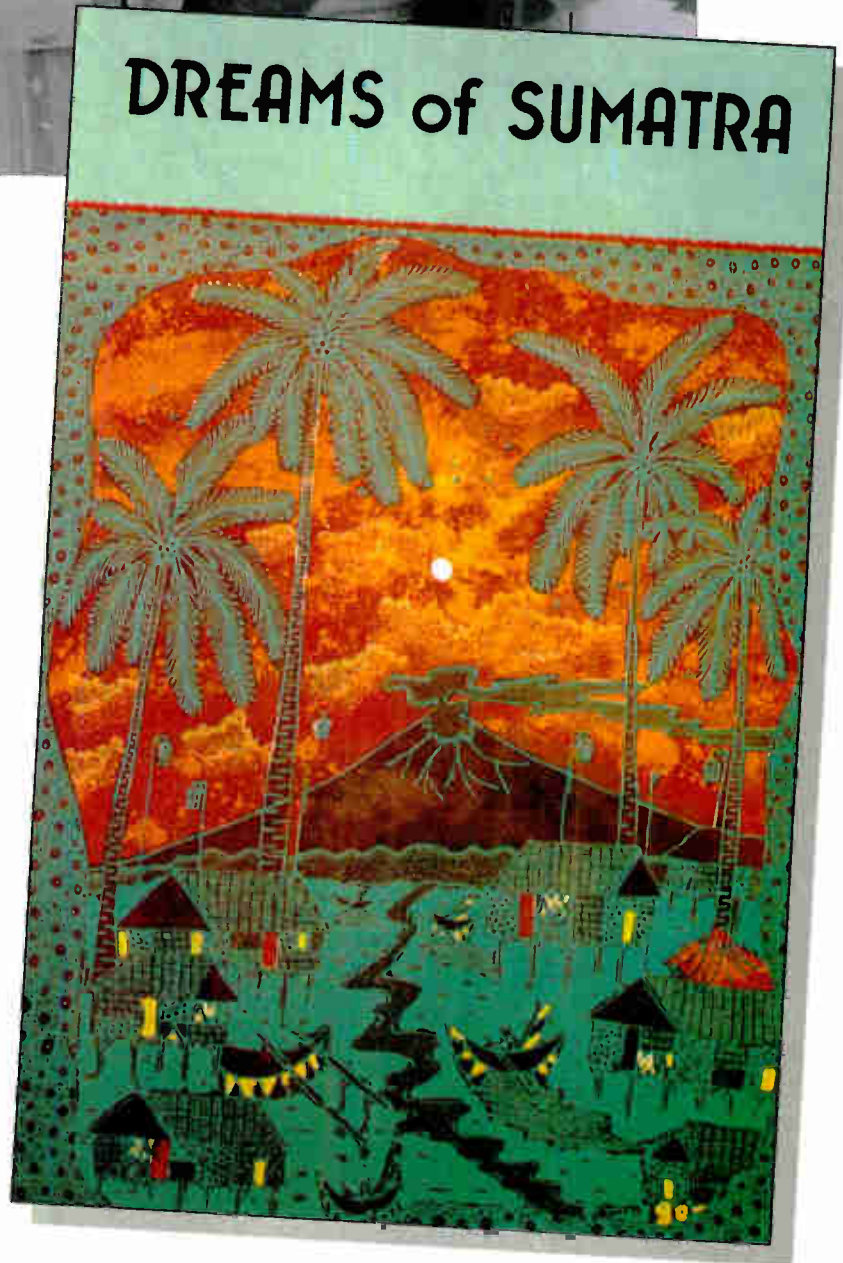
Left:  
Tom  
Lopez  
in  
action

book, and you know there are good sounds in that picture.”

Though most producers start with a script and then search for the sounds to complement it, Lopez is motivated by sounds, which he uses as inspiration to write his stories. “If you have a great sound that has character, it’s as good as having a character who has character,” he says.

His traveling recording equipment is spare: a few Sennheiser mics, two Sony DAT recorders, Sony MDR collapsible headphones (mics, recorders and headphones are packed in silicon crystals to keep them functional in humid climates), a pair of Sony parabolics, a tripod or two, some cables and connectors. Both DAT machines and the microphones fit in a small rucksack under his airplane seat; the other items pack into hard cases stowed in the luggage compartment.

Lopez begins recording in the city where he lands—sometimes he has timed his arrival to coincide with a festival, such as Carnival in Rio, or a good sound event, such as the cremation ceremony in Bali. To capture a whole crowd, he uses a Sony TCD 10 DAT recorder and a Sennheiser MKH20 omnidirectional microphone. If he just wants specific sounds, like voices in a marketplace but not the







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road traffic nearby, he'll use a Sennheiser MKH40 cardioid.

Non-city sounds come next. On a recent Brazil trip, he and composer Tim Clark flew 2,000 miles into the Amazon to gather wildlife and nature sounds. They hired a boatman and translator to guide them for a week on the big river's tributaries. Lopez and Clark hauled the equipment, including about 15 hours worth of Hofronics external battery power, in plastic-garbage-bag-lined backpacks. They used the omnis to obtain the ambient bird and insect sounds, and the cardioids to catch single events, such as toucans in the treetops, screeching in fruit-munching glee. "Toucans in flight look like beaks with wings," Lopez remarks.

The pair doesn't experience many problems with the equipment (other than with Fritz in high humidity, see sidebar), although sometimes they *think* they're having problems. Once in the vast Pantanal (a swamp in Brazil) they were recording the moos, groans

and tail-flaps of Cayman alligators stalking their prey. They were getting a buzz, but after checking all the equipment, couldn't find the problem. Although their mics were only four feet away, it was pitch-black night, and they couldn't see them. Finally, they discovered that giant dragonflies with 8-inch wingspans were hunting mosquitoes about four feet away—a distance apparently maintained by Lopez's and Clark's repellent. The giant insects were using the mics as landing and take-off pads. That "equipment" problem was solved by moving a bit closer to the mics and shooing the dragonflies away.

Lopez checks all of his equipment before leaving the States and, as a further precaution, brings extras of the most important items: two DAT recorders, about seven different kinds of mics, two headphones, extra cables and extra connectors. That was the original reason he bought his Sony DC3 Walkman DAT recorder, but he finds that because of its portability,

he uses it as much, if not more, than the higher-performance TCD 10. He carries it with him now at all times in a photo bag slung 'round his neck, using it as a writer might use a notebook. He sets general levels that seem to work in most cases, clips two little Tram microphones to the outside of the bag, and whenever he comes upon a good sound, he reaches in and presses "record." Not the greatest quality, but he catches spontaneous events, and it is inconspicuous.

When not in the middle of a jungle, Lopez listens to everything he has recorded each day and jots notes to keep track of what he's gathered. Here is where the adventure story begins. "Story ideas come from wandering around and gathering sounds and talking to people, in whatever way you can communicate, and just observing things and also reading up about the place," he says. "Story possibilities will start to emerge. You will meet someone and decide that this would be an interesting character, so

## Fritz, The Binaural Head

Fritz doesn't get to go along on Tom Lopez's recording adventures anymore. In humid countries, he begins to "motorboat" (make little throbbing sounds) about a minute after he's taken out of his dry case. Fritz has other problems: He's extremely heavy, and he attracts a lot of attention. Fritz is essentially a pair of Neumann KU81s: a solid plastic replica of a human head with microphones mounted inside anatomically correct ear canals.

When it comes to recording audio dramas close to home, however, nothing matches Fritz's depth of sound. Once, Lopez took him out into the country in the middle of the night, setting him up on a mic stand in the woods to gather sounds. Sitting there in the darkness, Lopez was unnerved by all that he heard through his headphones: "It was the scariest thing I have ever experienced, because the weird thing about Fritz is that he actually hears better than your ears hear."

Lopez and engineer Bob Biel-

ecki used Fritz on a boom to record the Stephen King novella *The Mist*. The story is about 35 people trapped in a supermarket by a mist that consumes anyone who ventures out. Fritz is great for this type of recording, perfectly capturing the ambience of the actors moving



about in the supermarket. You can hear that all the power is down; it is deadly quiet. Fritz has the capacity to re-create a three-dimensional soundscape of remarkable depth—best heard if you're listening with headphones.

One problem with binaural recording, however, is that if you have to patch in any sound later (such as a giant

spider attacking someone leaving the supermarket), you can't just record the spider and mix it in to the existing track; it would sound distinctly flat against the original. Lopez solved this problem by constructing a five-speaker cluster mounted back-to-back. Then he fed the spider screech (a processed Siamese cat yowl) through the speakers in a location similar to the original. He positioned Fritz to pick this up, and *that* recording is what he patched back into the original mix. The result is bone-chilling.

—Georgia George





it's sometimes [a matter of] lifting people right out of life."

Lopez also collaborates with assistant producer, sometime co-traveler, and wife Marcia Dale Lopez on story ideas. "She is very perceptive and notices a lot of things that I don't; she relates with people very well," Lopez says. When he gets home, as he is writing the story, he listens again and catalogs the sounds. "The story unfolds, and sometimes it meanders because you want to work certain sounds in—like, 'These are great frogs, terrific frogs! I gotta work these in somewhere.' Or sometimes it is just a setting that you really like, so a particular character becomes associated with a certain setting." In one story, whenever the countess has a scene, you hear a fountain, caged birds singing and a really bright, tiled-floor ambience. This is her villa. "It was just a place I recorded in Morocco," Lopez explains. "I loved the sound of the place, and at the time I had no idea where I was going to use it."

He writes the scripts himself, sometimes with a little consulting from the native actors he has managed to find in New York City. After a few rehearsals,

he records the dialog there on DAT.

He brings this back to his recording studio in upstate New York, where he transfers it to 1-inch tape using a 16-track Otari MX-70. He stripes the tape with SMPTE time code and then adds ambient sounds he has collected in the field (the bugs, birds, traffic, ocean), along with sound effects from the library he has collected over the years (footsteps, coffee being poured, doors opening). He cleans up his collected sounds with a Symetrix SX-200 noise gate, Teletronix LA-3A compressor/expander and an Ashly SC-66A equalizer. He uses Pultec EQP-1A3 and MEQ-5 tube equalizers to add warmth and fullness to voices.

After assembling the sounds, Lopez does a rough mix on his Soundcraft 600 24-channel console and sends a DAT to composer Tim Clark in Phoenix. Sometimes there is music in the ambient sounds, and Clark will add to that using similar sampled instruments. When Clark wants the music hot, he'll take out the midrange frequencies so that the music (or ambient sounds) can be pumped up and not "blow out" the speaking voice. Clark mixes his soundtrack down to

a DAT and sends it back to Lopez.

With audio storytelling, intelligibility is of paramount importance. "Much of the time, what my characters are saying isn't that interesting; it's what the sound is that I think is interesting," Lopez says. "But listeners want to hear every darn word that's spoken. I have to honor that, and when I do the mix, I try to bring every word out."

Lopez lays the music track down, mixes and tweaks a little, then transfers the whole tape to 2-track Dolby SR 1/2-inch analog tape. If he's working with shorter pieces, he may go direct to DAT, but for voice he prefers the warmer sound of the SR.

The tapes and CDs are marketed to radio stations and independent consumers. Audio drama has become increasingly popular as more and more people find themselves spending so much time trapped in cars. And Lopez has found his niche market for his unique collection of sounds, wrapped up in adventure stories. ■

*Georgia George is production director at Mix and is lately enjoying her commuting hours.*



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# Raymond Scott's Push- Button Musical Universe

by Irwin Chusid

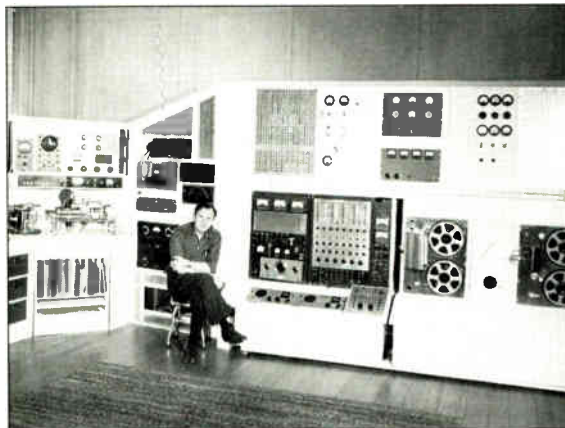
HE'S BEEN CALLED "the man who made cartoons swing." But though his melodies were immortalized by Warner Bros. music director Carl Stalling in more than a hundred Bugs Bunny and Daffy Duck romps, and though his late 1930s Quintette recordings now underscore the mayhem of *Ren & Stimpy*, Raymond Scott never wrote a note for cartoons in his life.



Scott's best-known strains, which choreographed the hijinks of wascally wabbits and stuttering pigs, can be heard on the recent Columbia release, *The Music of Raymond Scott: Reckless Nights and Turkish Twilights* (produced by the author). But his least-known work was conducted in the lab and the home studio. Scott was more than a composer of pop novelties, a conductor and pianist; he was also an engineer, inventor and electronic music pioneer.

Scott's drummer during the late 1930s, Johnny Williams, used to complain about the bandleader's perfectionism. To Scott, "We were machines," Williams grouched, "only we had names." It was just a matter of time before names were superfluous: From the late 1940s on, Scott's most trusted musical sidekicks didn't have flesh and blood—they bore circuits and solenoids. From this hardware, Scott received complete cooperation: Electronic instruments didn't sass back; they obeyed even the most arcane instructions, and no plug-in sideman ever nipped bourbon between takes.

Scott's early titles reflected the mechanical, the anthropomorphic, the comic and the futuristic—e.g., "Powerhouse," "War Dance for Wooden Indians," "Girl at the Typewriter," "Serenade to a Lonesome Railroad Station," "Square Dance for Eight Egyptian Mummies" and "Dedicatory Piece to the Crew and Passengers of the First Experimental Rocket Express to the Moon." No love songs, no broken-hearted elegies. His lamentations were reserved for when he needed a spare part in the wee hours, after the electrical supply shops had closed.



In 1948, Scott invented a \$100,000 gadget he dubbed Karloff, for use in commercial soundtracks: it could imitate the wheeze of a chest cough, kitchen clatter, the sizzle of frying steak and jungle drums. By 1949, according to one source, he had built his first synthesizer, a machine that could simulate conventional instruments by electronic means, though Scott himself credited Canadian scientist/musician Hugh LeCaine with having pioneered some of the earliest synthesizers.

ANOTHER OF SCOTT'S creations was the Clavivox, a portable keyboard that produced an eerie, sci-fi whine. Simulating the difficult-to-play Theremin (which was controlled by manipulating one hand around a vertical electronic wand and the other over a horizontal plate), the Clavivox allowed a player to glide from one note to any other over a three-octave keyboard without a break. It was used to accompany the Raymond Scott Orchestra on a rare 45 rpm Top Rank single ("Twilight Zone" b/w "Naked City"). Equipped with footpedals and a set of left-hand keys, the Clavivox could create staccato attacks, allow on/off vibrato toggling and permit other effects not possible on a Theremin. Its design included an electronic subassembly devised by a young engineer named Robert Moog, a student at Columbia University whose acquaintance Scott made in 1957.

A 1959 article in *Popular Mechanics*, entitled "Musical House for a Musical Family," took readers on a tour through Scott's and then-wife Dorothy Collins' 32-room home in Manhasset, New York. The story referred to Raymond as "a self-taught audio engineer [who] has filled many of the rooms with electronic instruments that have confounded highly trained experts in his field." It noted that Dorothy, a popular singer, "can usually be found in the recording studio trying out a new tune, listening to a playback or trying to get her husband to explain what all the dials are for."

The article described a half-dozen space-age gizmos, including the Videola, for composing film scores by remote control. Installed atop the living-room piano, the mechanism operated a film projector elsewhere in the house. Scott could monitor the film on a television screen perched on the piano as he crafted, and simultaneously recorded, a soundtrack. Another device depicted was his scanning radio. Curious about popular new music but too busy to get up and switch stations, Scott devised a radio that changed frequencies by itself at preset intervals. (Although this feature is standard on modern car radios, Scott has not benefited from this patent—or others—for reasons examined below.)

In 1960, Scott allegedly built the world's first pitch sequencer. The idea, Scott wrote in his notes around 1970, was "triggered by the introduction back in 1959 of the Wurlitzer Drum Machine called the Sideman—a rotating me-



chanical disc-switching device that produced an electronically generated sequence of drum sounds. It immediately occurred to me: Why not build a device that would automatically sequence...musical pitches?" Using thyratron tubes and relays, Scott had a prototype constructed by spring 1960. When unijunction transistors were introduced around 1961-62, he built a second sequencer with UJTs and stepping relays.

An early variant of the sequencer was Scott's Circle Machine, which was used to create audio effects for TV commercials. For an Autolite spot, he replicated the sound of "a storage battery dying because the electrolyte is rapidly evaporating, ending in a short circuit." It sounds like a 23-second breakdown of a Lilliputian merry-go-round, followed by a soft string of firecrackers.

In a 1987 issue of *Music, Computers and Software*, Hofstra University Professor Herbert A. Deutsch, a musician and one of Scott's colleagues, described what he saw when he first visited Raymond Scott's studio in 1965: "Standing six feet high and covering 30 feet of wall space, the sequencer consisted of hundreds of switches controlling stepping relays, timing solenoids and tone circuits. The sounds were generated by 16 individual audio oscillators, a specially modified Hammond Organ, an Ondes-Martenot [a French keyboard synthesizer designed in the '30s] and two keyboard Theremins of Scott's own design. If you walked behind the wall during the operation of the sequencer, the music produced would be all but drowned out by the cacophonous klickety-klack of the relays as they switched positions."



**Photos clockwise from top left: Scott at the piano, 1938, perhaps overjoyed that a bandmember faithfully interpreted his musical cues; Scott's Clavivox (keyboard Theremin); fronting the CBS Radio Orchestra, 1944, Scott explains the musical difference between a peanut vendor and a penguin; Scott, ca. late 1950s, operates a disc-cutting lathe at his home studio on Long Island, New York; and Raymond Scott in his self-designed home recording studio, ca. 1960.**



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SCOTT CREDITS MOOG with coining the term "sequencer." Moog, however, interviewed from his workshop in Leicester, N.C., where he builds and sells MIDI-controlled Theremins, declines to take credit. He recalls that Scott rigged his sequencer with telephone switching equipment (hence, the "klickety-klack"). Although he isn't sure when Scott began exploring sequencers, Moog attests, "You don't go from having nothing one day to having 30 feet of equipment the next. Scott probably was fooling with that sort of stuff for years and

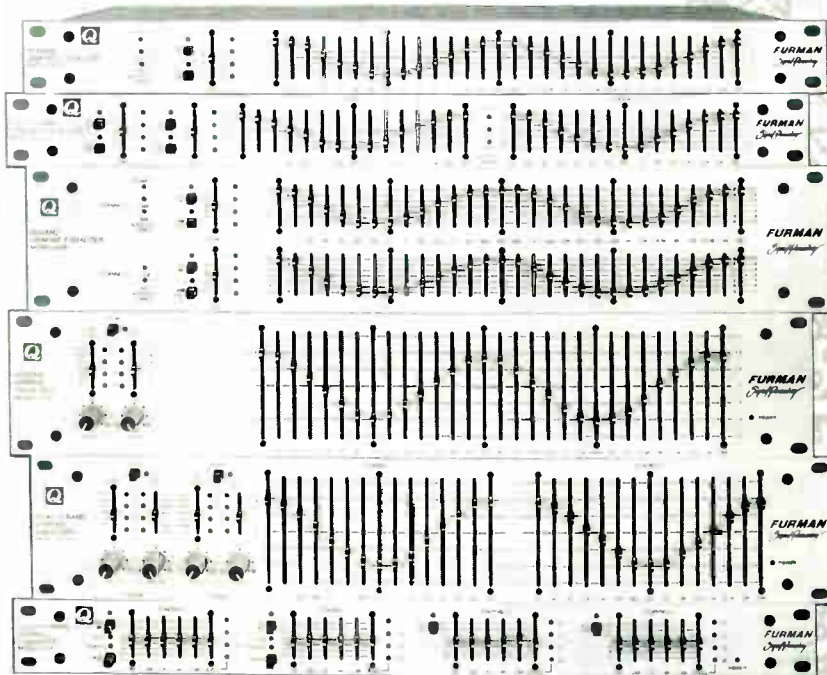


Publicity still of Raymond Scott, 1938

years." Dates may be hazy, but Moog acknowledges, "Scott was definitely in the forefront of developing the technology and in the forefront of using it commercially as a musician."

Nevertheless, Scott's influence on the development of electronic music was somewhat limited, because he operated in a vacuum. He refused to publish his findings and belonged to no academic community; he only demonstrated his inventions to a few trusted colleagues, and he made little effort to market his creations. In his notes, Scott himself conceded, "During those early '60s, I was so secretive about my development activities—perhaps neurotically so—that I was always reminding Bob [Moog] that he mustn't copy or reveal my sequencer work to anyone." And though Moog is the one who received public acclaim and recognition for the invention, Scott had the utmost respect for his colleague. "[Bob] is a most honorable person," he wrote. "He steadfastly refrained

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from embodying my sequencer in his equipment line until the sheer pressure of so many manufacturers using the sequencer forced him to compete."

Moog confirms Scott's isolation: "Because of his paranoia, any influence he had on other musical instrument designers resulted from information that leaked out. Publishing was the last thing he would have done." Scott did consider marketing the Clavivox, and a product photo exists. But for Scott, Moog recalls, "It was like giving away your child. I think there was something irrational there." Another marketing obstacle was Scott's notoriously short attention span: He often got distracted by new ideas, putting aside current work in the process. "I'm not sure how many of those inventions were actually finished products," Deutsch reflected.

Nevertheless, Scott stayed busy in the lab. Seemingly eager to replace union-scale deadbeats with push-button bandmates, he invented the rhythm synthesizer in 1960; the seri-

rhythm guitar simulator, both in 1972. A year later, Kraftwerk released their debut album. And Ralf and Florian never even said thanks!




Mark Mothersbaugh, Raymond Scott's wife, Mitzi, with the Electronium and DX-7 keyboard at the Scott home in Los Angeles

SCOTT'S MOST AMBITIOUS project was the Electronium: an "instantaneous composing machine." With this invention (built using a number of Moog-designed components and completed by 1970), Scott could create original music through the random generation of sequenced tones, rhythms and timbres. In his own words: "The Electronium is not a synthesizer—there is no keyboard [it was manipulated with knobs and switches]—and it cannot be used for the performance of existing music. The instrument is designed solely for the simultaneous and instantaneous composition-performance of musical works." It was

al doorbell, 1966; a synthesized Chinese gong, 1968; the bass line generator, 1971; and the melody maker and

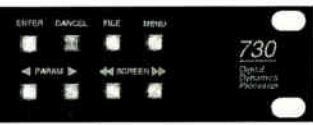
signed solely for the simultaneous and instantaneous composition-performance of musical works." It was



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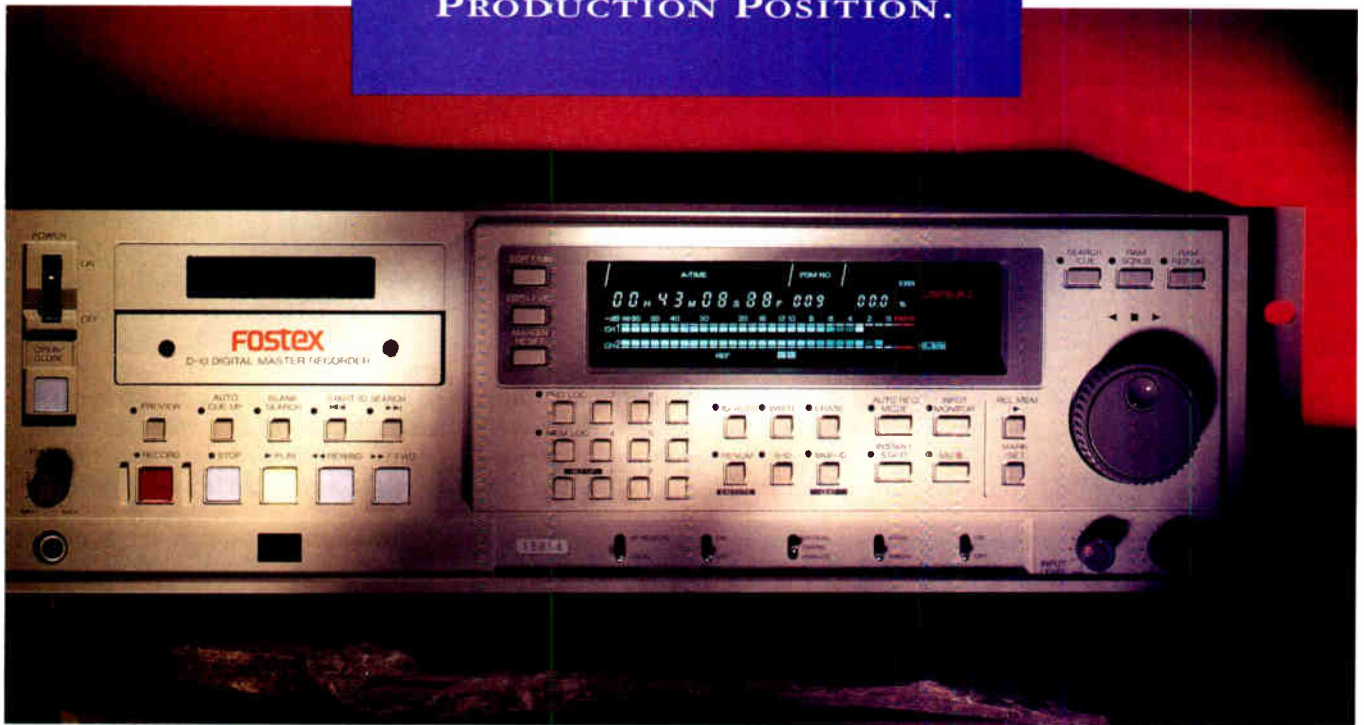
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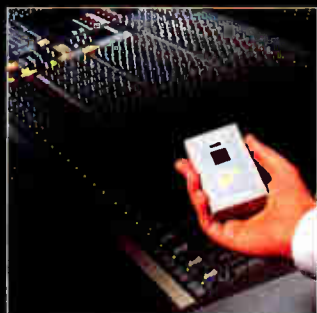
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by Dan Daley

# EMF

## A CAUSE FOR CONCERN, NOT PANIC

I took a shot at a health-oriented piece in these pages about five years ago. I examined, with the assistance of a few experts in the field, the implications of extended exposure to high decibel levels by engineers. As part of the story, the head of audiology at a Manhattan hospital center generously offered to provide hearing tests to any engineer who cared to take the half-hour or so required to participate.

The turnout was almost nonexistent. When I asked a few colleagues why they opted not to take the hearing test, the response was, reduced to a single phrase: "I don't want to know."

It was understandable; ears are a critical part of the anatomy for audio professionals. We know they get abused by ourselves and by clients, but to quantify precisely the depth of that abuse can drive the point home in ways that many are apparently unwilling to face.

High-SPL environments are still with us, and another invisible problem has been brought to the fore lately, the topic for this month's column:

Electromagnetic fields have been a hot topic for several years, unfortunately generating more heat than light for the most part. The hue and cry began in earnest several years ago when studies indicated higher-than-normal rates of illness, including cancer, in people living and working under or very near high-power lines. The most recent investigations center on hand-held cellular telephones and possible, though far from defined, links to brain cancer. The National Cancer Institute has announced that it will begin a comprehensive study later this year.

### A WALK-THROUGH WITH A METER

These allegations are cause for some understandable nervousness on the part of those who work in environments with heavy EMF levels. Are re-

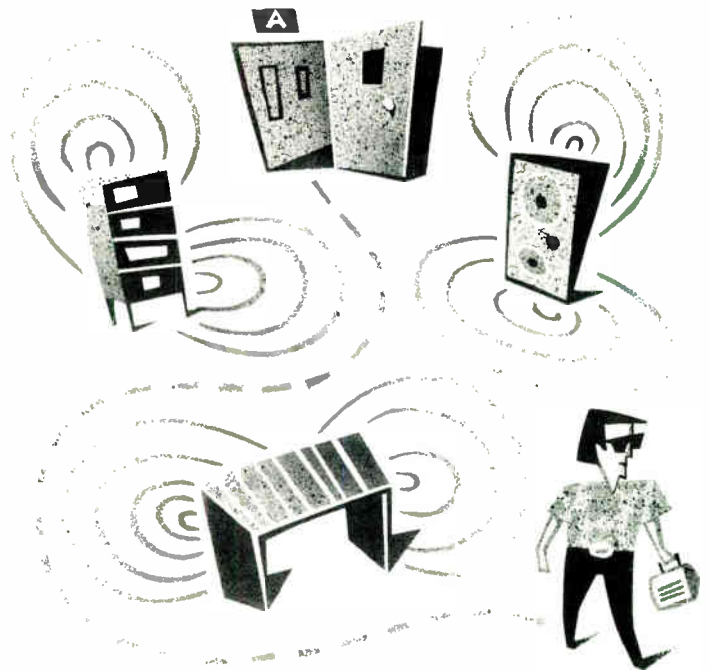


ILLUSTRATION: MARTY BRAUN

ording studios such environments? Based on some experiments I did with the staff at the Recording Industry Management program at Middle Tennessee State University, the answer seems to be a qualified "yes." The good news is that the emissions encountered from some of the equipment we measured fell off dramatically within a half-foot from the source.

Working with program chairman Dr. Richard Bernet and the facility's chief engineer, David Thibodeau, we checked two of the university's three studios with a gauss meter. First, we went outside the building to get a baseline reading away from the electronics. On the meter we used, we saw a 0.05 reading, roughly establishing the residual magnetic field of the earth. The open area we used for this measurement was away from any metal objects and not near any obvious electrical or magnetic sources.

Next we checked Studio A. For the most part, the outboard rack gave a range of between 0.30 and 0.50 gauss



levels as the meter was passed across the front of the rack. The Publison Infernal Machine was the spike in the process, at 0.75. The top of the rack gave the highest reading of all, just above the AC line terminal, where coiled cables were plugged in. Here, there was a reading of 1.30 on the meter. The readings diminished sharply as the meter was pulled back, descending to just above the baseline beyond six inches to a foot, which established the ambient level in the room at right around 0.10.

The SSL G Series gave a very low reading across the top of the console, right around 0.20, including the computer CRT monitor. However, directly over the quad bus/stereo compressor section, the reading jumped off the meter, well over 5.0 gauss. This reading also dropped off sharply as the meter was pulled back, diminishing to ambient levels after six inches. The most intense readings on this part of the console came from the sides, with less intense readings coming from the meter bridge/fader axis.

Steve Clark, a field service engineer with SSL in New York, said the

spike was likely attributable to the density of components in the 651 master section, which is stacked vertically beneath the compressor control section. "It doesn't surprise me," he said of the finding. "It could also be coming from the VDT [yoke], which is next to that section, although it's pretty well shielded with mu metal."

Speakers, as might be expected, gave off very high gauss readings, with a pair of Realistic mini-monitors coming in higher than larger Meyer monitors, indicating less shielding.

In the MTSU B room, an Otari Series 54 console with DiskMix automation gave uniformly low readings, less than 0.20, with no anomalies. In the machine rooms, the levels were also around 0.20 for both the Studer 24-track analog deck and the Sony digital deck. The WaveFrame system was only slightly higher at 0.30.

In the tech room, the ambient level was lower than in the studio, probably due to the tech room's spaciousness. A Denon CD player with its cover off registered low levels of 0.10.

The bottom line seems to be that distance, and not necessarily much of it, is the best prophylactic measure against EMF emissions. Those who need to be most aware of this are perhaps technicians working on a piece of equipment *in situ*, such as in the rack. Keeping your body very close to the gear while it's turned on for long periods should be avoided.

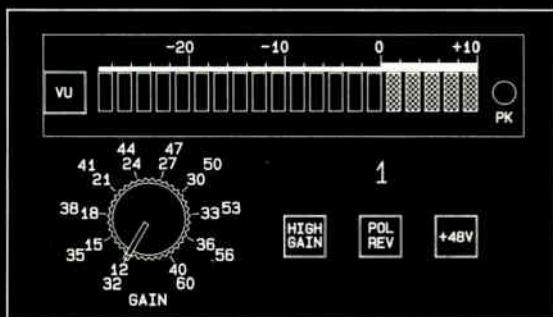
This having been said, it's important to reiterate that no hard data exists indicating adverse effects of EMF at these levels. Nor is the cumulative effect of any dosages over long periods clear. However, an awareness of the potential for a problem is enough reason to make some simple adjustments, such as turning off nearby equipment, if possible, while doing repairs.

#### COMPUTERS

The most recent addition, relatively speaking, to the studio EMF environment is the proliferation of computers in music. The computer is not the problem, since their CPU's operate on low voltage and are thus a negligible source of radiation. The Video Display Terminal is the culprit, and it's not unusual to have four or five of them in a control room, all running simultaneously.

These video monitors emit a wide spectrum of radiation, from microwaves to X-rays to EMF, most in extremely low dosages. The glass screen

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and internal shielding absorb many of these emissions, but some do escape. Though there are no definitive studies regarding the level of radiation from a VDT, enough of them in one room is cause for some consideration. Here again, distance is the key. The tendency is to lean into VDTs, especially when doing tight waveform and sequencing edits. Instead, try to develop the habit of sitting back while working on computers. Some experts recommend at least 18 inches. According to a recent story in *The Washington Times*, some American companies are rearranging their workplaces to provide this minimum distance for their employees. Also, keep in mind that much radiation is also emitted from the back and sides of monitors; the actual EMF source is the "yoke" that projects from the rear of the monitor. So if more than one screen is on, radiation could be coming at you from a number of directions. (You don't want to keep monitors too closely together anyway, because their electromagnetic fields will cause interference with each other.)

Another possible solution is Inter-

national Paper's new Saf'n'Shielded nickel-coated, graphite-fiber wallpaper, which has been used in military and commercial applications to cut down on EMF waves. The company asserts the product can attenuate electromagnetic signals of up to 40 gigahertz by over 100 dB.

Aside from distance, exposure can be cut down simply by taking breaks and not eating lunch at the screen. Another way to minimize this exposure from computers is to turn the monitor off when it's not in use. This is feasible on IBM-compatible systems and some Macintosh computers using stand-alone monitors. Unfortunately, the monitors on one-piece Macs, like Classics and the SE/30, both of which are used heavily in studios, especially project studios, go on and off with the computer itself.

Also, the type and size of monitor has an effect on radiation level. Smaller monochrome screens emit less than larger, color monitors. For color monitors, there are now low-radiation VDTs available, designed to meet the standards set by Swedish health officials, the most stringent in the world. There are some other products on the market

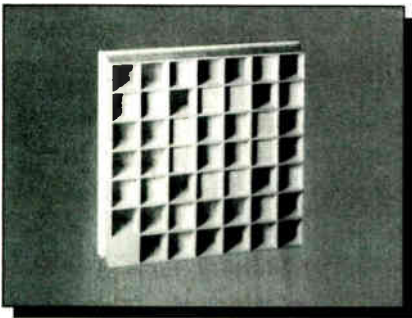
that can help, including a grounded, transparent mesh shield, which can significantly reduce the electric portion of the EMF output. A steel-alloy cylinder that fits around the monitor's yoke is claimed to cut down the magnetic portion of the emissions.

At some point in the not-too-distant future, LCD screen technology of the type that's now being used in laptops will essentially eliminate this problem, since they emit no radiation at all.

The evidence is not all in, and much of what is in is inconclusive. Enough people have made their livings for enough years in enough recording studios so that concern is a more appropriate response than panic. But enough is known about high-intensity EMF to make further research and investigation into the effects of lower-level exposure worth pursuing, and the studio environment today has far more sources of EMF than even five years ago. Meanwhile, that which can be avoided, simply by being a few inches further away than usual, should be. ■

*Dan Daley is Mix's East Coast editor. The dry cleaning bill on his lead suit is rapidly dissipating the trust fund.*

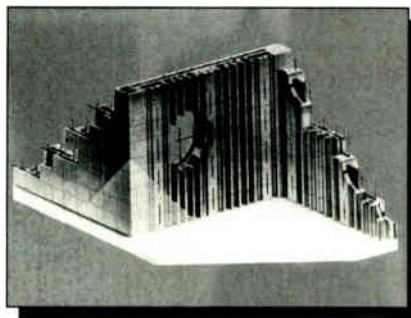
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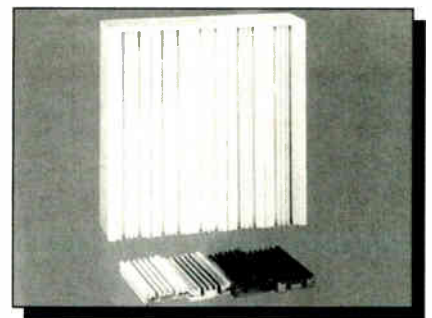
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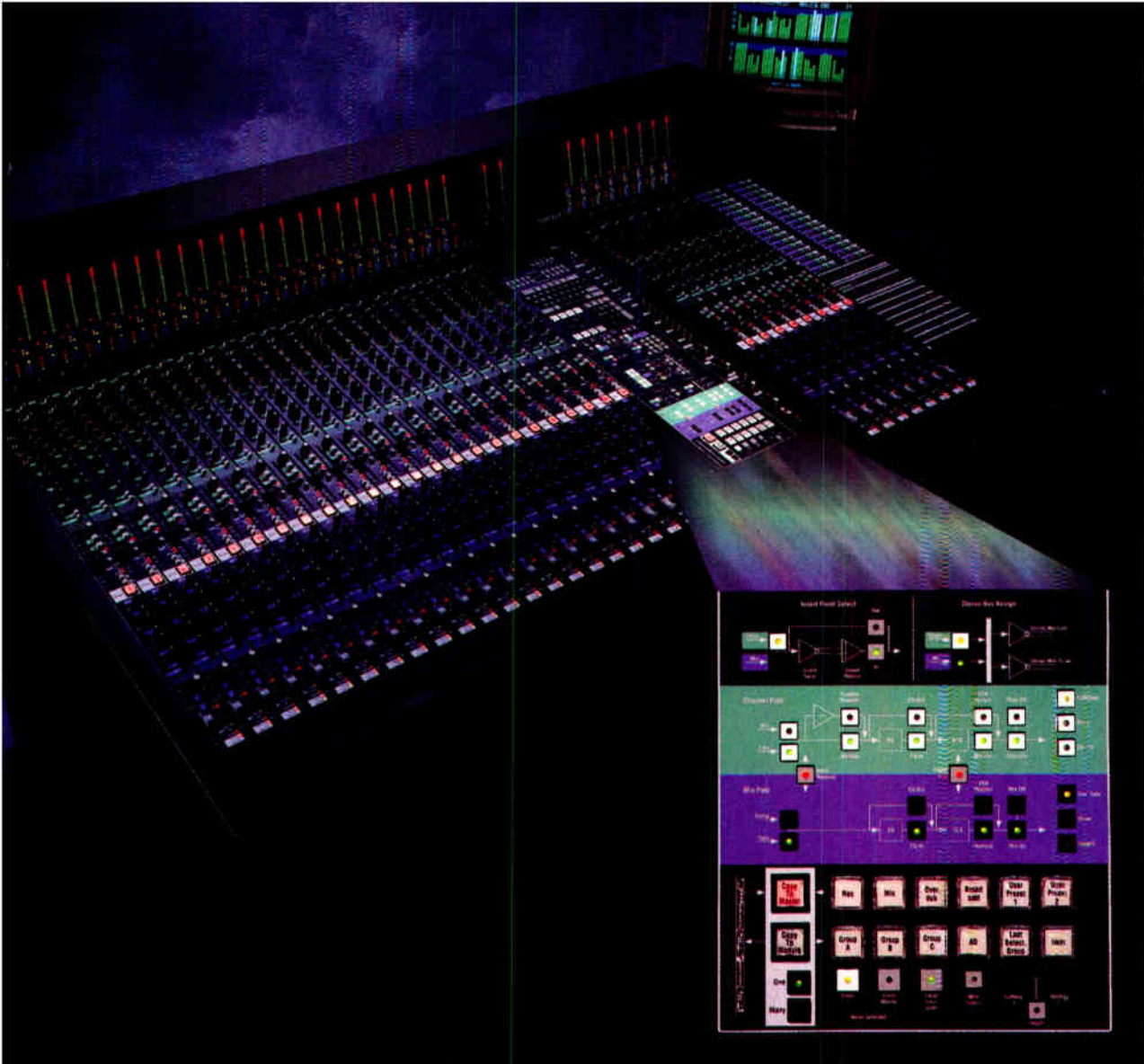


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## Digital Audio Sample Rate

# Incompatibility

**The problem** of digital sample rate compatibility is one that plagues the digital recording studio, as well as the video post-production suite and the emerging digital broadcast studio. We live in a world that does not have the convenience of a single digital audio sample frequency standard. And new digital audio recording formats and applications for digital audio mean that this problem will only worsen as time goes on. As examples, personal computer sound boards generally support sample rates of 44.1 kHz, 22.05 kHz and 11.025 kHz (among others); 44.056 kHz is used when film is resolved to video, and 32 kHz is often used for medium-fidelity broadcast applications.

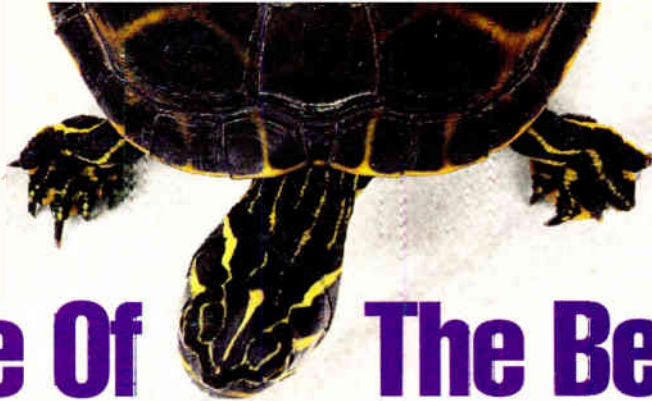
A typical problem encountered in the studio is the requirement for incoming digital audio sources to be

synchronized to a local "house" or word sync sample clock, generally provided by the multitrack digital recorder or by a video sync generator. Generally speaking, this is a manageable issue if all the sources can lock (or slave) to this reference and are operating at the same nominal sample rate. However, there are many situations that call for the integration of sources recorded at different sample rates, such as when a field-recorded DAT source (48kHz sample rate) is used in the production of a CD (44.1kHz sample rate). This sort of dramatic sample rate disparity requires a sample rate converter.

Another common studio situation is the mixing of multiple independent AES/EBU input channels. Even if these inputs are recorded at the same nominal sample frequency,

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**by Maury Wood**



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their sample clocks are asynchronous (differ by a few Hertz) and must somehow be synchronized to the common sample frequency of the mixer. Again, this is not a problem if these AES/EBU sources allow themselves to be slaved to a house sync, but if they are master only, a problem exists. Digital mixing console manufacturers are eager to offer AES/EBU digital inputs that can independently slave themselves to sample clock master sources.

Many video post-production situations require that the digital audio be locked to a color NTSC (525 lines/59.94 Hz) sync generator, which dictates a sample frequency of 44.056 kHz. The common solution to this incompatibility with the 44.1kHz CD sample rate is to "slip" an audio sample every 1,000 samples or so, or approximately once every 23 milliseconds. A higher-quality solution would be to actually convert the incoming sample rate to 44.056 kHz in this "near-synchronous" case.

In the broadcast world, stations are beginning to use digital Studio-to-Transmitter Links. These links are typically dedicated microwave communication lines that link the production site to the transmission site. Because the FM radio bandwidth is limited to approximately 15 kHz, it is common that equipment feeding digital STLs operate at a sample frequency of 32 kHz, but there is no universal sample frequency standard. Clearly, if a production studio using CD-source material feeds a 32kHz STL, there is the obvious need for sample rate conversion. Other broadcast studio equipment must also address a variety of input and output sample rates. Digital NAB cart machines, for instance, can use a lower internal sample rate to extend their storage capacity. A sample rate converter on the output could upsample this internal rate to the various required output sample rates.

Varispeed, a widely used function in the analog studio, can change the key of the musical material to give the singer a more comfortable vocal range during overdubbing, or to correct for slight pitch errors in vocal or instrumental tracks. So analog-style varispeed is a function that digital recorder manufacturers are eager to emulate in their digital equipment. This requires a continuously variable input sample rate over a  $\pm 12.5\%$  range without changing the output sample

rate. This calls for a sample rate converter that can tolerate a dynamically changing input sample frequency, while maintaining an uninterrupted output sample stream.

One of the bugaboos related to the transmission and reception of digital audio information is that recovered sample clock is often jittered enough to cause audible degradations in the final analog output. This jitter can arise from interconnect transmission line effects as well as from data-dependent effects. A sample rate conversion solution, if properly designed, can also address the jittered sample clock problem if the sample rate converter is able to be a clock slave on both the input and the output sides, since a high-quality crystal oscillator can supply a very low jitter signal to serve as the output sample clock.

Numerous manufacturers offer dedicated sample rate converters packaged as outboard devices. These include the Sony DFX-2400, nVision NV4448, Roland SRC-2, Digital Integration SRC-1000 and the Gambit Audio SFC. In general, these products allow a continuous input sample frequency over a 30 to 54kHz range and supply fixed output sample frequencies of 32, 44.056, 44.1 and 48 kHz. The continuous input sample range permits them to handle variable speed inputs. Some units allow the output sample rate to be synched to an external sample or word clock. These products address many of the requirements of sample rate converters, but also have important shortcomings, such as their substantial power consumption, cumbersome size, and relatively high cost. It would not be practical, for example, to construct a digital mixing console with one of these systems at every digital input.

Analog Devices (Wilmington, Mass.) developed the AD1890 and AD1891 SamplePorts, which are Asynchronous Sample Rate Converters in a single-chip, integrated-circuit package. This solution to the vexing problem of sample rate compatibility is small enough, cheap enough and low-power enough for digital audio equipment manufacturers to offer it as a standard feature in their products and therefore eliminate digital interfacing concerns at their source.

Besides the more mainstream applications for low-cost sample conversion touched on above, there are

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some interesting—if less obvious—usages of this technology.

#### DIGITAL AUDIO ON FILM

New techniques allow digital audio to be optically encoded between the sprocket holes on motion picture film. The sample rate of the recovered digital information can be jittered by the imperfect servo motor that drives the film transport mechanism. This jittered data can be applied to the input of the ASRC, and a low-jitter clock source, such as a crystal oscillator, would be used as the output sample frequency. The

dejittered output data from the SamplePort can then be distributed to the theater's playback system.

#### NETWORKED DIGITAL AUDIO AND MULTIMEDIA

Networking companies want to offer the ability to route digital audio messages on existing and emerging technology communication networks. It is obvious that there may be source material that is sample-rate-incompatible with the sample rates of the network, or of the playback equipment, which is connected to the network. The networks could include

T1, T3 or ISDN lines, or Ethernet, FDDI, SONET or ATM LANs or WANs. The SamplePort could be used to convert the source sample rate to a rate that is compatible to the network. (For more information about transmitting digital audio over telephone lines, see Chris Reilly's article on page 156 of this issue—Eds.)

One requirement of the emerging multimedia computer will be to accommodate the utilization of digital audio sources at disparate sample frequencies. The multimedia computer of the future should, for instance, be able to seamlessly integrate (with high fidelity) CD-sourced background music with a voice band recording sampled at 22.05 kHz and not burden the user with concerns about sample rate compatibility.

#### CABLE TV AND DIRECT BROADCAST SATELLITE

Emerging digital cable TV systems transmit digital audio riding on a bi-phase encoded clock, much like that defined for the AES/EBU interface. Due to the long transmission lines found in cable systems, the recovered clock can be substantially jittered. An ASRC can be used as "brick wall" to isolate this jittered recovered clock on the input side from a low jitter clock used by the interpolation filter and the DAC on the output side.

DBS systems often use an audio sample rate (such as 44.056 kHz) which is not compatible with mainstream audio source material. These awkward sample frequencies arise when the satellite uplink/downlink carrier frequency is divided down. A SamplePort could be used to isolate the requirements of the satellite transponder from affecting the sample rate of the material presented to the encoder or recovered from the decoder.

The availability of IC-based sample rate converters marks the beginning of a new era. These sample rate compatibility problem solvers are small, cheap, low-power devices with professional-quality audio performance. Original equipment manufacturers in all sectors of the audio market can now afford to design around all sample rate compatibility and digital interfacing issues, leaving the users of their equipment liberated from these concerns. ■

*Maury Wood is the Sound Processing Team marketing manager at Analog Devices.*

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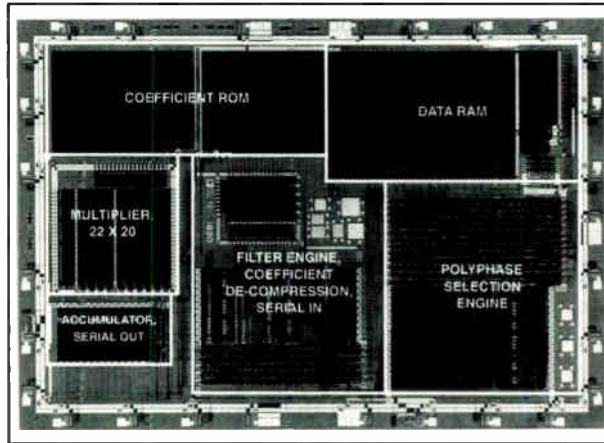
## SAMPLE RATE CONVERSION ON AN IC

**B**uilt into 28-pin, integrated-circuit packages, Analog Devices' AD1890 and AD1891 SamplePorts are Asynchronous Sample Rate Converters with feature sets addressing both pro and consumer markets. The AD1890 accepts up to 20-bit input samples, while the AD1891 accepts up to 16-bit input samples; both devices output 24-bit samples.

The devices are sample clock slaves on both the input and output sides. They automatically sense the applied sample frequencies, require no user programming and can tolerate dynamically changing, asynchronous sample clocks over an input to output sample frequency range of 1:2 to 2:1. They can operate with sample clocks from 8 to 60 kHz. The polyphase filtering engines possess the equivalent of 4 million 22-bit, on-chip, digital-filter coefficients and use

27-bit internal accumulation. Four-wire input and output serial ports interface to AES/EBU receivers and

transmitters and DSP chips. Interpolation is the familiar process of "oversampling," which is used in all modern CD players. It conceptually involves stuffing zeros between samples in the original digital sample sequence, then digitally low-pass-filtering the result, to effectively increase the sample frequency to an arbitrarily high rate. Decimation can be thought of as "downsampling" and conceptually involves deleting output samples from the interpolated digital sample sequence, then digitally low-pass-filtering the result, to effectively decrease the sample frequency to an arbitrarily low rate.



Processing section layout of a SamplePort ASRC chip

transmitters and DSP chips.

In general terms, here's how these devices perform:

Sample rate conversion can be best understood by invoking the DSP concepts of interpolation and deci-

The combination of interpolating up the sample frequency and decimating down the sample frequency can yield an output sample frequency of any desired rate. The distortion introduced by this method (in the general asynchronous case) is

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proportional to the time resolution of the interpolated sequence. If we want very low distortion, we must interpolate up to a very high frequency, up to 3.2768 GHz to get 16-bit (approximately 96 dB) THD+N performance across a 20kHz audio band. Clearly, this is an impractical rate to operate an IC when one of the design goals is low power consumption.

The SamplePort ASRCs use an equivalent—though less commonly known—method of sample rate conversion called polyphase filtering. The digital audio sample sequence is applied to a highly oversampled prototype digital FIR lowpass filter with a passband from 0 Hz to 20 kHz. The filter is oversampled in the sense that it comprises many thousands of times the required number of coefficient samples to satisfy the Nyquist criterion. Depending on the instantaneous temporal relationship between the input and output sample events, a sparsely sampled subset of filter coefficients is chosen to process the input sample.

The on-chip filter coefficients are equivalent to 65,536 of these so-called polyphase filters, each processing a

sample with a fractionally different group delay. (Group delay is the derivative of phase with respect to frequency. The FIR filters used have linear phase responses, and thus the group delay for each filter is constant across the audio passband.) The first polyphase filter processes the sample with the maximum group delay, the second with slightly less group delay, and so forth, with the group delay decreasing linearly to the last polyphase filter. The amplitude of the output sample is computed at the desired output sample frequency, but at the slower processing rate of the polyphase filter, in the manageable low-MHz range.

The SamplePorts automatically modify the cutoff frequency of the polyphase filters to avoid aliasing distortion. As the output sample frequency drops below the input sample frequency, the number of taps in the polyphase FIR filter linearly increases from 64 (when the ratio between the input and output sample frequency is between 1:2 and 1:1) to 128 (when the ratio between the input and output sample frequency is 2:1). At the same time, the passband

of the FIR filter compresses from 0 Hz to 20 kHz, to 0 Hz to 10 kHz.

The selection of the proper polyphase filter to process the input samples is determined by the temporal relationship between the input and output sample clock events. This is computed as a frequency ratio, using a digital servo control system so the ratio is a digitally filtered, rather than an instantaneous measurement. The effect of this lowpass-filtering mechanism is to reduce any jitter that may be present on the input or output sample clocks. Because this servo loop filter is implemented digitally, it is a simple matter to change the filter coefficients, and thus the filter's attenuation characteristics.

To accommodate a dynamically changing input sample rate (such as during varispeed situations) and provide a stable flow of output samples, a sample rate converter needs some sort of an elastic sample buffer. The AD1890 and AD1891 have on-chip First-In, First-Out memories that serve this purpose. Input samples are written into the FIFO at the input sample rate and read from the FIFO at the output sample rate. —Maury Wood

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# A Short Course in

# Maintenance

BY MEL LAMBERT

**C**liches, no matter how hokey, often help to focus our attention on the heart of the matter. For example, ignoring the adage “an ounce of prevention is worth a pound of cure” may be harmful to the health of the equipment that your business depends on. Everything breaks down eventually, so by emphasizing the uptime, we can dramatically minimize the downtime!

Maintenance must be regarded as a two-fold exercise, not simply reacting to dysfunctional gear by reaching for the toolbox or your dealer’s phone number. Beginning a schedule of preventative maintenance starts with determining your knowledge about the way your equipment functions. I don’t mean at the component level, but rather a basic understanding of how electrical signals flow from one piece of equipment to another, such as between the various input, monitor and output modules of a mixing console. *Mix* readers have a widely divergent appreciation of what happens under the hood of modern recording hardware. Anyone making the

first step toward keeping their investment in top shape (and accurately diagnosing any problems that may occur) should know their limitations and not be too adventurous. More on this key point later.

The good news: Modern production hardware is *remarkably* reliable. Manufacturers, in essence, would rather avoid the hassle of dealing with irate customers demanding that their suddenly nonfunctional devices be fixed. This is your first line of defense: Complete and return any warranty cards that might have been included with your equipment and retain a copy for your files.

Most routine alignments/adjustments are relatively simple to perform and should not be beyond the average user. User manuals generally include advice on keeping the hardware in good running order; the better ones contain good troubleshooting sections to help you through obvious problems.

Equipment malfunctions often result from a lack of basic understanding of the way gear is supposed to work,





rather than electronic or mechanical breakdowns. Invest some spare time understanding the way that your gear operates when working as it was designed to. Then, when it breaks, you'll at least have a direction in which to head.

### **An Ounce of Prevention...**

What's the best way to begin a program of preventative maintenance? Start by preparing a reasonably detailed sketch of the various components in your studio and how each one is hooked up to the next. Forget the myriad details of the patch bay, however; simply draw the main signal paths from the units that are normally connected to your effects sends, for example, or to the group output. Now complete the drawing with notes listing any modifications to the interconnect scheme, such as ground lifts to prevent hum loops, and other work-arounds.

If you're a novice to the recording process, it is worthwhile to make additional sketches of where important knobs, buttons and switches are normally set for the various recording, overdubbing and remix stages of a production. For your diagram of the recording area, sketch where the mic boxes are routed, along any foldback/cue systems, and how they connect through to the control room.

Call the manufacturer to obtain maintenance manuals for your larger items of equipment, such as the recording console, analog multitrack or workstation. Don't wait until a problem occurs before you think about ordering schematics or tech documentation! And remember that, after a while, such materials may go out of print or become unavailable, especially if the product is discontinued.

If you routinely use MIDI keyboards or MIDI-based processors, make notes of the MIDI channels they normally operate on, and any programs that are normally expected to be available at power-up. In this way, you can quickly return to a setup that you know, from experience, works for you.

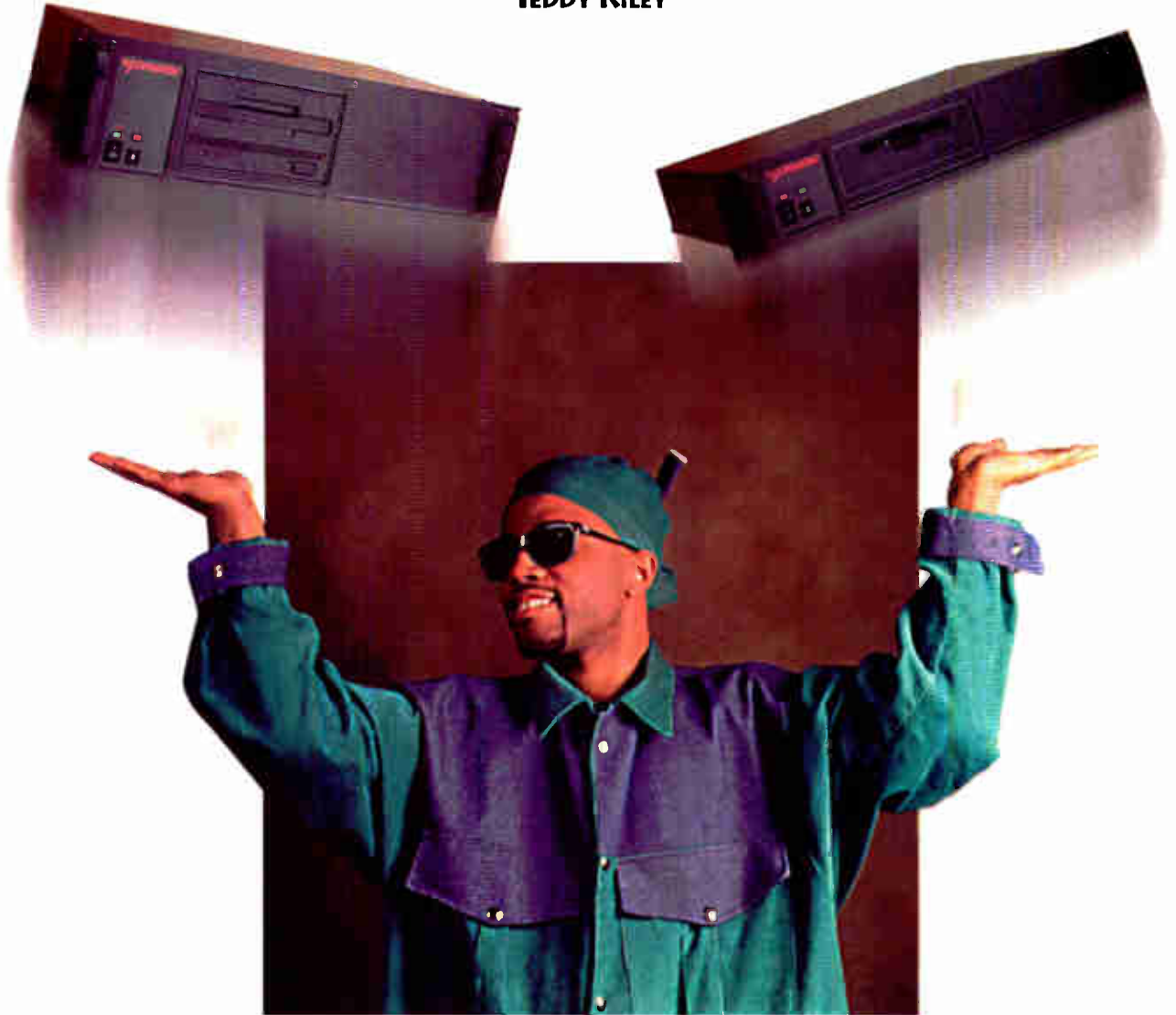
As you move around the control room and recording hardware, become familiar with the types of plugs and sockets that are used to hook together the various systems. In addition to the more familiar XLR, 1/4-inch (balanced, tipping-sleeve plus stereo) and phono connectors, studios also include video decks and monitors, MIDI systems and multiway cords used between the multitrack and remote control, for example. Once you know how they interconnect,

—CONTINUED ON PAGE 152



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# Real-World Examples

Let's consider some examples that you might encounter in the studio.

## Example One:

During a mixdown session, distortion is heard from the right-hand near-field monitor.

**Suspects:** Tape machine, console, power amp and loudspeaker.

**Test #1:** Cross-patch the console's left-hand monitor output with the right-channel control room amp.

**Result:** Distortion moves to the left near-field monitor.

**Conclusion:** Problem is with tape machine or console.

**Test #2:** All channel modules assigned with equal L/R panning are turned off, one at a time.

**Results:** All tracks are okay except some drum and guitar tracks.

**Conclusion:** Problem lies with kick, snare, and tom drum tracks, plus bass and guitar overdub, and finally traced to guitar track.

**Test #3:** Solo the guitar track.

**Result:** No change in distortion.

**Conclusion:** Problem lies in the input module, not the monitor section.

**Test #4:** Guitar track is routed to another channel, and back to the suspect channel via the pre-EQ insert point.

**Result:** No distortion is heard.

**Conclusion:** Faulty preamp section; probably op-amp failure.

**Repair:** Module is exchanged for loaner by local dealer, who replaces part under extended warranty. Two-day turnaround.

## Example Two:

After a keyboard overdub, you hear no output from the analog 16-track during replay. Both the 16-track and the console's meters are moving as expected, meaning that we do indeed have a signal on tape, but it's not reaching the mixer.

**Suspects:** Tape machine and noise-reduction unit and/or interconnections.

**Test #1:** Bypass the corresponding noise-reduction module.

**Result:** An encoded signal is heard through the console.

**Conclusion:** Faulty noise reduction card.

**Repair:** Good noise reduction card is "borrowed" from track 16, which is carrying time code and does not require noise reduction. Replacement card ordered from dealer for eventual exchange. Five-day turnaround.

## Example Three:

Intermittent distortion while mixing various output tracks from digital workstation. Just about everything in the control room, including effects units, is being routed through the console.

**Suspects:** Virtually everything!

**Test #1:** Determine if the problem is in the left, right or center of the soundfield.

**Result:** The noise is smack in middle of the stereo image and heard over both monitors.

**Conclusion:** Problem is affecting both left and right outputs.

**Test #2:** Mute the output from any and all channel modules that are panned hard left or hard right.

**Results:** Problem is isolated to several drum, sampled vocal and solo MIDI keyboard tracks, plus their respective effects sends.

**Conclusion:** By muting combinations of inputs, we determine that the problem can be narrowed to a keyboard track and its digital reverb.

**Test #3:** Remove the send signal to the reverb unit.

**Result:** Distortion ceases.

**Conclusion:** Problem might be with effects unit, patch cords, the master effects send or the channel auxiliary send section.

**Test #4:** The reverb is sourced from another channel.

**Result:** No distortion is heard.

**Conclusion:** Reverb unit and master effects send are okay; fault is probably within console input module.

**Test #5:** Having reconnected the reverb to the suspected channel module, you tap lightly on the corresponding effects send.

**Result:** Intermittent distortion produced by module.

**Conclusion:** Problem lies within module's aux-send section.

**Repair:** Again, the module is replaced under extended warranty. Two-day turnaround.

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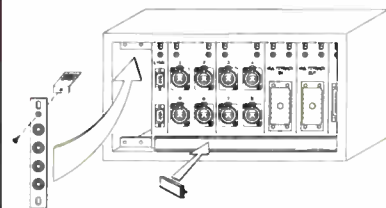
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often an excessive buildup of heat indicates that a component has either failed somewhere or is about to bite the big one. And it may be something as simple as a blocked or clogged cooling fan! Over a period of time, any studio operator can learn to observe, feel, smell and hear changes in equipment and make instinctive guesses about what's wrong.

When analyzing a fault, it's desirable to isolate it to one section of the hardware. This approach, often referred to as the "Divide by Two Theorem," involves dividing a large system into lots of smaller subunits to determine if the problem is confined to a specific area. Once we've isolated the problem to a mixer module, for instance, we can focus our diagnostic and repair skills to that region. And even if you don't plan to fix the problem yourself, the amount that a dealer or repair tech is going to charge will be dramatically reduced, simply because they can go straight to the cause of the problem.

Many investigations involve simple determinations of a signal's presence, either by listening over monitor speakers or observing VU meters. For more precise analysis, we need some simple test equipment. You might consider a good set of tools (cross-head, philips and conventional screwdrivers, plus hex and torque wrenches) and perhaps a simple oscillator and test meter. The oscillator should preferably be battery-powered and offer several sine-wave frequencies from 20 to 20k Hz. The test meter should handle voltages in the range of several millivolts to about ten volts (which, aside from loudspeakers and power supplies, should accommodate most line-level signals), preferably with a built-in continuity tester for checking cables, etc.

Now, by injecting a known signal level into one end of a connection—a studio mic input, for example—we can trace its progress through the wiring and the console until it disappears. Obviously, each console design will be different but, by becoming familiar with our system block diagram (supplemented with those found in the appropriate service manual), we can make realistic determinations about where the problem lies. ■

*Mel Lambert is senior editor of Mix and an audio industry consultant.*

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# Global Audio

## *Telecommuting in the '90s: An Update*

by Chris Reilly

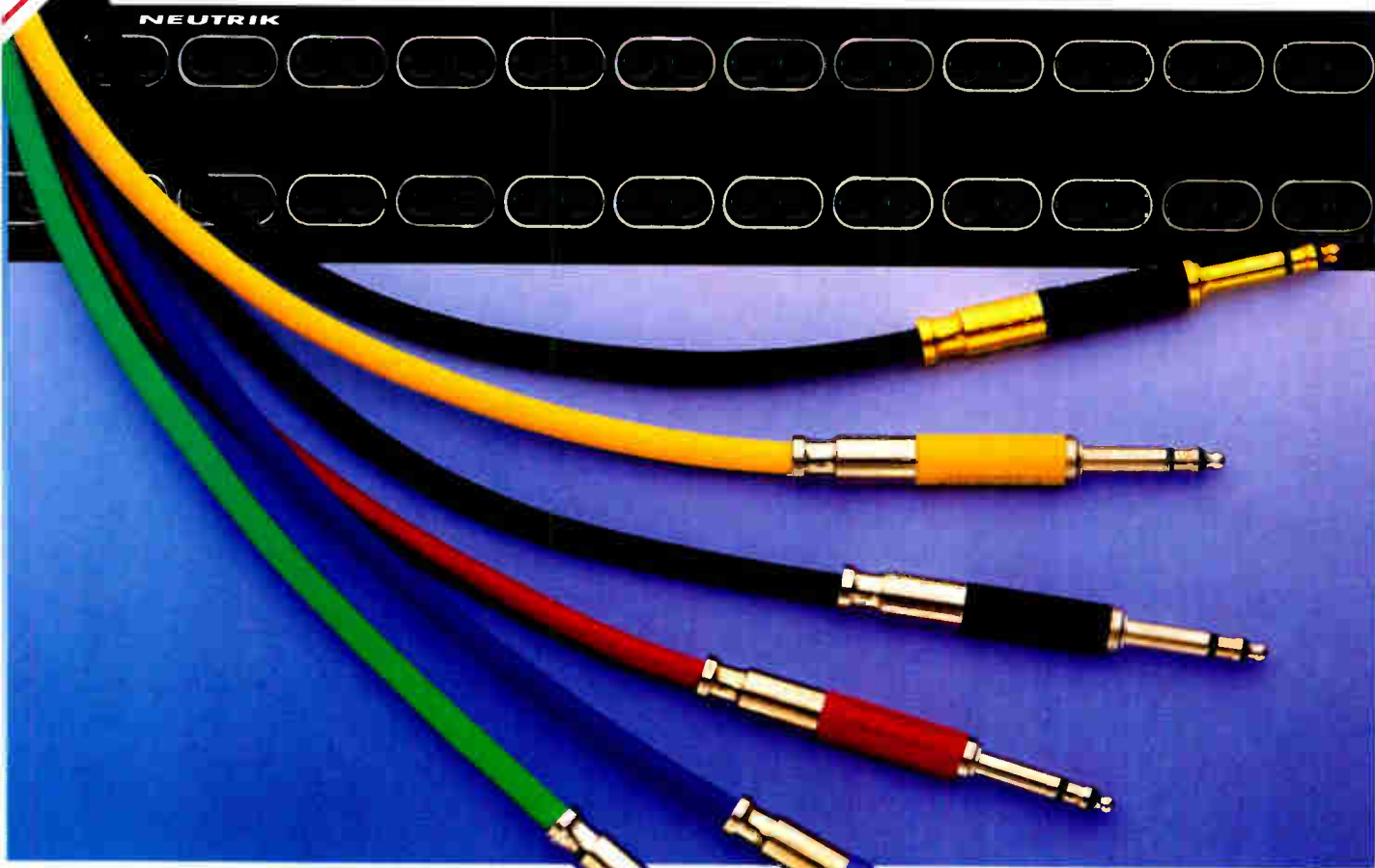
It's been 18 months since my first *Mix* article on telecommunicating appeared (April 1992), and during that time, the concept of transmitting digital audio over telco (phone company) lines has become an accepted practice in the pro audio industry. In addition to providing a dramatic improvement over previous solutions—specifically, analog lines and satellite links—the increased level of confidence in digital audio and the reliability/flexibility of digital phone networks have inspired creative possibilities that never existed before. Best of all, it's happening right now.

As more facilities depend on telco transmissions to attract new business, and more clients come to expect the immediacy of telco, many studios are offering this service as yet another means of staying competitive. The following are some typical telco applications in pro audio.

**Audio Only:** Typically, a voice is talent at one location while the client is at another location where the voice is actually recorded. If synchronization is necessary, time code can be sent just as if it were audio using the additional channel in the codec.

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### Audio with Remote Video/ Film:

In this situation, a sync signal, whether biphasic or time code, can be sent from the recording location to lock up with picture at the other end with talent (an example of this type of session is described below).

**Audio with Video:** Phone companies are aggressively going after this market, which was lost to satellite services. Pacific Bell's Advanced Broadcast Video Service currently offers end-to-end digital video and audio in broadcast-quality NTSC with Dolby AC-2 audio; HDTV and MPEG will be added later. VVX, a subsidiary of Wiltel, also offers a switched digital video service throughout the U.S. Both of these types of services require 45 Mb/sec (DS-3, which is 28 T1s) to support broadcast-quality video. Television networks have used this service almost exclusively to transport network feeds. Recently, however, the film and TV post-production industries have discovered its potential.

### Long Distance ADR: One Case Study

Here's a recent example of an audio with remote video session via Entertainment Digital Network (EDnet) as described by Stewart Sloke, VP of sales, Digital Patch Division. Four months ago, EDnet of San Francisco facilitated a remote ADR (Automatic Dialog Replacement) session with actor Ben Kingsley for the feature film *Searching for Bobby Fischer*. Kingsley, (working from Joe & Co. in London for the session) was connected through both of EDnet's networks—the Dolby AC-2-based T1 Digital Multichannel System (DMS) and the Digital Patch (DPS) Musicam SW56 system—to Skywalker Sound in Los Angeles (refer to Fig. 1 for a block diagram).

Since the two facilities were using different transmission formats (T1 for DMS and ISDN for DPS), it was necessary to use EDnet's EDlink™ to connect the two systems digitally. To synchronize all of the equipment, time code from a video worktape at Skywalker Sound was sent via T1 to the EDlink bridge in San Francisco and then onward to London via ISDN. Once in London, the time code, via a synchronizer, locked up the video at both sites. While Kings-

ley monitored the video worktape in London being controlled from Skywalker Sound, he was given instructions over his headphones via conventional telephone from Henry Golas, assistant to the director, who was at Skywalker Sound.

As Kingsley read his replacement dialog, it was being recorded at Skywalker Sound via ISDN and T1 circuits. A recurring problem with remote ADR is the amount of delay in-

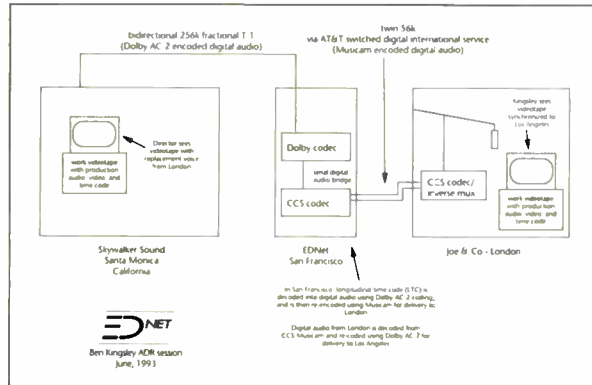


Figure 1: Block diagram of long-distance ADR session

roduced by the audio codecs and the transmission paths (some international switched digital circuits may be sent via satellite, creating even longer delays). In order to synchronize the delayed voice with picture, John Wheeler, EDnet's manager of technical services, and John Rotundi, Skywalker Sound engineer, calculated a delay of 23 frames and introduced that offset to synchronize the audio and video at Skywalker Sound.

Overall, the session lasted four hours, and the results were very positive on both sides of the globe. Henry Golas said, "We are pleased with the results of our experimental, remote international ADR session. We do wish that beeps or streamers would have been provided to the actors for cueing and to have playback ability so [the actors] could get a reading on what they had done and then adjust to refine their readings."

Paul Cartledge, chief engineer of Joe & Co. in London, responded, "As far as beeps or streamers, they could have been laid on the video soundtrack that we were sent; I think this was the case with the video used at Skywalker. Alternatively, we could provide these ourselves with notice. We could also synchronize a 24-track tape recorder in the same way as the video, allowing for reference playback. I hope we have an opportunity to try these ideas out in the future."

It's worth pointing out that the telecommunications industry is experiencing growing pains as older technology is upgraded to allow for services such as video on demand, improved healthcare and multimegabit switched services. As this upgrade continues, "situations" will happen, and any bugs that are discovered will be remedied. Consider, for example, EDnet's San Francisco facility, which leases Pacific Bell ISDN circuits for connection to its own DPS. While ISDN is a 128Kb/sec service, Pac Bell is experiencing hardware/software problems that limit transfer speeds to 112 Kb/sec (8% less than the line's 128Kb/sec potential). Pac Bell is working with EDnet on this problem; when resolved, the service will offer the full 128Kb/sec ISDN and still remain compatible with SW56.

If this can happen with just one phone company, imagine what could occur when you try to connect different services—like T1 and SW56—together for a session be-

### INFORMATION, PLEASE

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APT (apt-X): (213) 463-2963  
CCS (Musicam): (908) 946-3800

#### Telecommunication Equipment

Ascend: (510) 769-6001  
Hayes: (415) 974-5544  
SCii/ISCOM: (301) 779-1368

#### Audio Codec Equipment

APT (apt-X): (213) 463-2963  
CCS (Musicam): (908) 946-3800  
Dolby (Dolby AC-2): (415) 558-0200

#### Video Services

Pac Bell ABVS:  
(800) 400-6990 (in Calif.)  
(818) 576-6990 (outside Calif.)  
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tween different continents, Here's what the Ben Kingsley session required:

Time code from L.A.'s Skywalker Sound via T1 to GTE to Pac Bell to Wiltel to Pac Bell to EDnet EDlink in San Francisco, then via ISDN to Pac Bell to AT&T Domestic to AT&T International to British Telecom. Audio from Joe & Co. in London via ISDN to British Telecom to AT&T International to AT&T Domestic to Pac Bell to EDnet EDlink in San Francisco, then via T1 to Pac Bell to Wiltel to Pac Bell to GTE to Skywalker Sound in L.A.

It appears that you should not try this yourself; this is a job for professionals like EDnet.

## New Applications and Networks

According to EDnet spokesman Tom Scott, the music industry has discovered the idea of the "virtual studio," where simultaneous recording sessions happen throughout and across the country. Record labels such as Capitol, producers such as Phil Ramone and studios such as Crescent Moon in Miami are taking advantage of EDnet's DMS to complete projects never before possible.

A European ISDN-based Dolby AC-2 network was recently formed that will link studios throughout Europe, much like EDnet does here in the States. Initially the network, called the Audio Exchange, will connect the two Magmasters facilities located in London and Burbank; the Burbank facility is the former B&B Sound Studios.

To use ISDN-BRI circuits, which operate at 128 Kb/sec, a device called an inverse multiplexer is used to split the 256Kb/sec Dolby AC-2 bitstream into two separate 128Kb/sec bitstreams for transmission onto BRI circuits. Called the Multiband, the inverse multiplexer is manufactured by Ascend and distributed in Europe by GPT.

By the time the New York AES show opens, the Audio Exchange will be operational, and the company is currently negotiating with facilities in Germany, France, Holland, Sweden, Italy, Spain and the Czech Republic. "This is the answer to our international post-production dreams," comments Magmasters' Steve Cook. "Many of our U.S. clients will love the speed, cost savings and quality of the service." Tentative plans include connecting Audio Exchange in Europe to EDnet here in the U.S., and

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live demos of both networks will be conducted on the AES show floor.

Situations may arise where two facilities do not require real-time communications. In such "store-and-forward" applications, PC-compatible cards integrating apt-X, Dolby or Musicam data compression allow digital audio to be stored on hard disk and transmitted at a later time. These cards are available directly from APT, Antex (which licenses Dolby AC-2) or CCS, which licenses Musicam. In addition, PC versions of SW56/ISDN modems (CSU/DSU for SW56, and terminal adapters for ISDN) are available from SCii Telecom and Hayes Inc.

Time is the trade-off in this type of transmission because the audio is transmitted four to six times slower than real time, depending on the compression ratio/data rate of the algorithm and the data rate of the transmission.

#### Different Applications, Different Algorithms

With the many varied applications for delivery of digital audio via telco comes the decision of which algo-

rithm to use. The three major algorithms commercially available for professional audio—apt-X, Musicam and its derivatives and Dolby AC-2—have all settled into those applications for which they're best suited.

Both Musicam and apt-X have been very successful transmitting voice and low data rate stereo formats using both SW56 and ISDN. These algorithms provide surprisingly good audio at these data rates up to a certain point. The trade-offs on lower data rate formats are audible artifacts on complex material.

EDnet, ABVS and The Audio Exchange have chosen the Dolby AC-2 at 128 Kb/sec/ch. for applications such as voice-over, ADR for film work, overdubs for record mixes, mastering mixes and broadcast audio-for-video. These applications rely on this algorithm because of its signal integrity and transparency.

While standards committees may recommend algorithms for universal applications, as in the case of MPEG, it is the end-user who ultimately chooses what best suits the application. With that in mind, these algorithms will be used in specific ap-

plications for which they are best suited.

Digital audio via telco may not solve every problem or find its way into every facility, but against the bottom line of time and money, it has proven itself to be a capable medium. In addition, when projects require quick turnaround, courier services can no longer compete with the immediacy of telco. While digital audio via telco started out as a better solution, it is now a creative tool opening up possibilities that never before existed. Costs of this service depend on the type of project and the users' expectations. From the simple, point-to-point, store-and-forward applications to full-blown, multilocation/multichannel mix sessions, the choices and opportunities are there.

[Note: The first part of this article, "Telecommuting in the '90s," is available through the Pacific Bell Data-FAX information service at (800) 995-0346.] ■

*Chris Reilly is an application specialist with Dolby Laboratories, San Francisco, Calif.*

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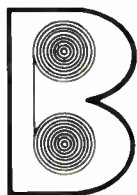
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# Riding the Bus

## TO TOMORROW'S ALL-DIGITAL STUDIO

BY MARK WILCOX

If we closed our eyes and—like a modern-day Mix Van Winkle—woke up in 20 years, we'd almost certainly be greeted by the sight and sound of the all-digital recording studio. It would probably have some sort of centralized user interface with a video display providing visual feedback on tracks and their levels, panning, EQ and automation. A tactile control surface would allow for adjusting mix parameters and controlling recording, mixing and playback. Patching, routing and connections would all be digital. Recording and producing would be precise, efficient, and have at least 20-bit fidelity. And

tying everything together, we'd probably find the future equivalent of today's digital audio workstation.

Judging from the current direction and pace of digital technology, this day is actually not far off. In fact, the gap is quickly closing, thanks to technologies such as the digital audio bus, which will help bring us there faster, with surprisingly few growing pains.

### **THE MODERN HYBRID STUDIO**

Today's recording studio is in a state of transition from analog to digital—a hybrid of analog and digital elements. In more and more studios, digital tape and digital audio work-

stations are taking over as the main recording devices. But we still have to connect to the rest of our studio, which is made up of various devices— analog and digital—with different connectors, electrical qualities and formats. The current method of patching and routing these together—the analog patch bay—is rapidly becoming outdated. Time-consuming, inefficient and prone to mechanical failure, patching systems benefit immensely from centralized, automated digital control.

Yet only a percentage of the rest of the devices in the audio production chain are digital. In a typical studio, as signals are routed through the audio chain, they are subjected to a series of redundant conversions from analog to digital and back again, as they travel from their source, through a mixing console, onto hard disk (or digital tape), back out to the console, through effects processors, and back to disk again. Such repeated conversions ultimately degrade the quality of the audio. And analog signals are also prone to picking up RFI and EMI.

So how can we create an efficient, high-fidelity, centralized, all-digital environment, while still maintaining full connectivity with the rest of the studio's predominantly analog production chain? The answer lies in the advent of the digital audio bus, and a digital routing technology called Time Division Multiplexing.

#### **ALL ABOARD THE DIGITAL BUS**

The idea of a digital audio bus isn't a new one. In fact, it was developed many years ago by the telephone industry to solve a number of problems that are strikingly similar to those facing to-

day's studios. Large companies with many telephones needed a way to route incoming calls to lots of individual telephones. In the early days, companies had switchboard operators using patch cords to route the flow of calls coming in and out. The work was error-prone and extremely tedious—sort of like our modern-day studio patch bay, a relic of the same archaic technology.

To remedy this, equipment manu-

any destination in the matrix. After these signals were digitally routed, they could then be converted back to analog to work with existing telephones, which are predominantly analog. (*See sidebar for more information on the theory behind TDM—Eds.*)

Significantly, TDM was designed to work with existing analog telephone technology in homes and companies, thus making the transition invisible to the user. People didn't have to

## **Judging from the current direction and pace of digital technology, the all-digital studio is not far off.**

facturers developed PABX systems (Private Automatic Branch Interchange), a more efficient way for businesses to route phone calls. At the heart of PABX was Time Division Multiplexing, a digital technique for creating a large routing matrix of digital signals with many sources and many destinations. TDM allowed instantaneous routing of any source to

buy new telephones to benefit from the faster, more accurate telephone routing made possible by the new technology. Well, audio is audio, and it just so happens that this technology applies very well to digital recording, too.

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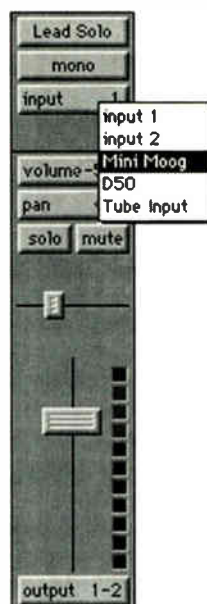
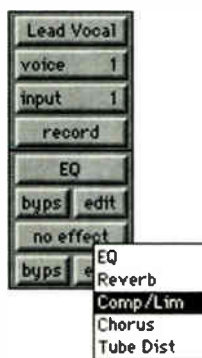
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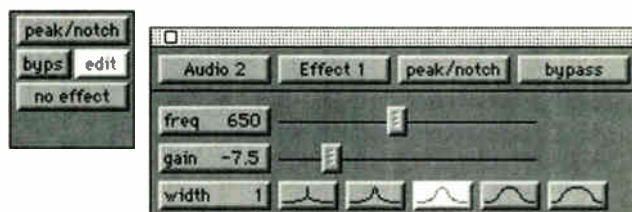
## Routing and Patching in the TDM Studio

*Because TDM offers radically new ways of managing routing and patching, it might help to see three examples of typical studio routing actions and how they can be accomplished in a TDM-compatible system, such as Digidesign's Pro Tools.*

*To add an effect to any track, click on the "no effect" button and select one of the DSP software "plug-ins." TDM automatically handles any necessary patching.*



*To integrate your trusty old Minimoog (or any external audio source) into the digital mix, just select it as a source. Now you can add effects, patch, mix and route the Minimoog with the same flexibility as a digital track. You can even automate and graphically edit its volume and panning.*



*To adjust the parameters of any plug-in, such as this equalizer, click on its "edit" button. All of the parameters are automatically stored and recalled the next time you open the session.*

be able to route many channels of audio digitally from any source to any destination while avoiding unnecessary analog and digital conversions. We'd love to have unlimited routing flexibility and an automated, centralized control center. But like the phone system, we must connect to our studio's existing analog devices, which still sound good and which we'll be using for some years to come.

In essence, an ideal digital bus would allow us to:

- ◆ Use our digital audio workstation as the central recording, production, and patching device in our studio.

- ◆ Patch all studio equipment into a software-controlled, digital routing matrix with instant reconfigurability and complete recall, all via a hardware interface with both digital and analog I/Os.

- ◆ Keep audio production largely in the digital domain and undergo

fewer analog digital and digital/analog conversions for a higher-fidelity audio product.

All of this is possible by implementing a TDM-based digital audio bus in a workstation. In the development of a TDM-style system for professional audio applications, several factors must be considered in order for a solution to be successful:

- ◆ A TDM-based digital audio bus must have sufficient power to accommodate large, multichannel recording systems and future digital audio developments such as 20-bit audio.

- ◆ It must be priced so studios could easily adopt it.

- ◆ It must be easy to set up and use, so studios can avoid significant downtime or long learning curves.

- ◆ It must be open to support from other studio gear manufacturers and flexible to incorporate new connec-

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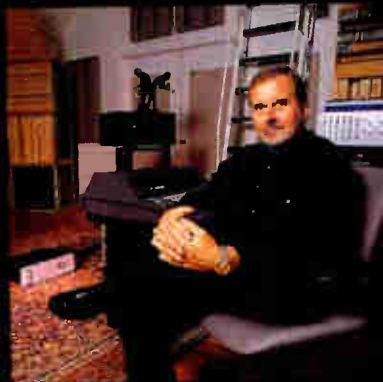
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tion standards (such as the yet-undetermined multichannel digital interface standards) as they are established by the audio industry.

One solution would be to design a custom ASIC chip that allows the system to route 256 channels of 24-bit digital data at variable sample rates (between 32 kHz and 48 kHz) through a software-controlled, fully configurable matrix.

In the situation where the digital audio workstation consists of plug-in expansion cards for a Macintosh or PC-based computer, the TDM digital audio bus might be fitted into the system by attaching a TDM "piggyback" card (where the chip resides), to each card in the system. A TDM ribbon cable on each of the piggyback cards could complete the connections, and the cards could support high-speed (256-times the sample rate) communications with each other.

In a computer with many available expansion card slots, the TDM ribbon cable could be extended further to connect third-party products, such as reverb and effects processing cards, I/O cards for adding external digital or analog studio gear to the

TDM-routing matrix, I/O cards for future multichannel digital interfaces and other products.

After the initial plug-in setup, the


The complete "digital transformation" of the recording studio is still in its relative infancy, but it is progressing rapidly.

actual TDM technology would ideally be transparent to the user, integrating virtually all studio functions under workstation control. For example, reconfiguring the entire routing of the patch bay or mixing setup during a session would require no more than a mouse click or two. And the user could save the status of practically every knob, dial and patch point in the studio and recall them at will.

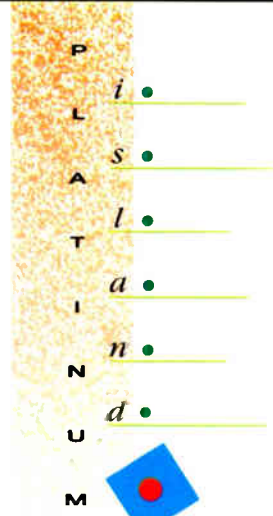
With regard to resolution, TDM's internal DSP processing should be optimized to operate with a word width of 24 bits—enough to accommodate all 256 channels playing in-phase at the loudest possible level. With one additional bit for error, and three or four more for mixing headroom, the system could still ensure that all audio channels will maintain full fidelity.


As for ease of installation, anyone who has crawled under a console with a soldering gun or wired a patch bay will appreciate the advantages of popping a card into a computer and attaching a ribbon cable.

Recognizing the importance of an open, flexible system, several companies have already announced products that will support an audio version of TDM: among them are Digidesign, Lexicon and Apogee Electronics. In addition, the system software that manages this implementation of TDM allows for software "plug-ins" from third-party developers that could range from special application EQs, to pitch-to-MIDI converters, de-clicking software or virtually anything. And when the



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# TDM Basics

One of the major benefits of TDM is its ability to transmit many channels of digital audio over a few wires, creating a very compact system that saves a great deal in cable and wiring costs. How does TDM accomplish this?

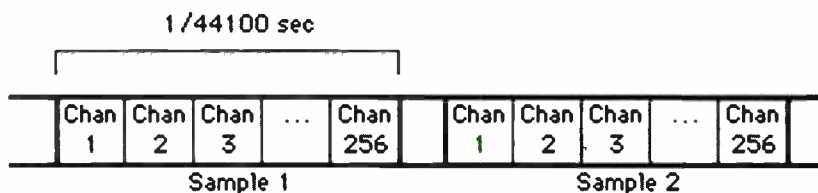
As TDM is a digital system, audio signals are transmitted as digital data. To speed up the process, all the bits of each sample (TDM supports up to 24-bit data) have their own wire on the bus and are thus sent at the same time. This is 24 times faster than sending all of the bits along a single wire, one after the other. At a sampling rate of 44.1 kHz (the same as used in a CD), TDM must send a new sample for each channel every one 44,100th of a second. If it took exactly one 44,100th of a second to accomplish the actual transmission, TDM would only be able to transmit one channel of audio. However, TDM actually accomplishes the transmission of each sample more than 256 times faster than that. In this way, TDM can use the extra time gained by the fast transmission to send 256 channels of audio, where one sample for all of the 256 channels is sent down the bus, one after another, in the space of 1/44,100th of a second. The effective bit rate is tremendous, being more than a quarter-billion

bits per second!

With regard to the TDM hardware, the TDM-equipped device that receives this stream of interleaved or "multiplexed" digital audio channels can be programmed to "listen" to only certain channels, because it knows exactly what time these channels are being transmitted. It can "extract" only the desired channels from the total TDM data stream.

The situation is similar to what happens when you turn on your cable TV. There are many different programs available on different channels, all at the same time. You can choose to watch whichever one you want at any time. You can even watch two or more at once with additional tuners. And all of the channels come through the same single coaxial TV cable.

In actual practice, the technical details of TDM are somewhat more complex, but all of this complexity is completely hidden from the user. All you need to do is tell the system the routing you want (e.g., "route this guitar track to a flanger, then to a reverb processor, then back into the mix"). You don't really need to know any more about TDM to route and patch digital audio than to use the telephone. TDM makes complex routing transparent to the user in both cases.



Each "sample" in TDM actually contains 256 different audio samples.

audio industry finally settles on a multichannel digital standard, all that would be necessary for TDM to work with it is a TDM-ready interface card.

## AND IN THE END...

The complete "digital transformation" of the recording studio is still in its relative infancy, but it is progressing rapidly. Perhaps best of all, the transition will be largely painless. The enabling technology of TDM will allow us to meet the future on our own

terms, at whatever pace we're comfortable with. With TDM we can still tie in our 24-track analog deck if we want, our console of choice, a classic tube limiter, or anything else we'd like to bring with us into our all-digital future. Exciting times await us. ■

*Mark Wilcox is manager of technical documentation at Digidesign. He is currently investigating rumors of a top-secret cellular DAW being developed by the CIA.*

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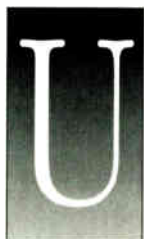
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OCTOBER 1993, MIX 171



by Paul Potyen

# AVID TECHNOLOGY AUDIO VISION



Until recently, readers of this magazine might have thought of Avid Technology in the context of nonlinear, digital, video-editing systems. Soon after the company opened in 1987, its products were embraced by pioneer video editors and production houses, and today Avid's Media Composer systems are generally accepted as the de facto standard in the nonlinear video industry.

It was only a matter of time before Avid developed a high-performance digital audio workstation designed specifically for editing audio to random-access digital video. That system, Avid AudioVision, has been in production since about January. The current Version 2.0 software has already undergone one major revision in that period, reflecting Avid's philosophy of adapt-

ing quickly to user feedback.

Audio professionals need not think of Avid as a bunch of video guys with no background in audio production. To the contrary, Mack Leathurby, Avid AudioVision's product manager, worked at SSL and Lexicon before coming to Avid, and he has assembled an impressive team of engineers and technical people with extensive audio—as well as video—backgrounds.

Avid AudioVision comes in 4- and 8-output models; the system I used was the larger model. It is a turnkey system consisting of the following standard components: a Macintosh Quadra 950 computer, JPEG compression/video board, SCSI accelerator board, two Digidesign Sound Accelerator boards with Audio Interfaces, Pro Tools Video Slave Driver,

**Although the incorporation of video is a key element of AudioVision, it's really only a small part of what the unit can do. It's a full-featured digital audio workstation designed for professional audio-for-video applications. The system allows up to 24 virtual audio tracks, any eight of which can be easily routed to the outputs. The larger Model 8 supports eight analog or four digital (AES/EBU or S/PDIF, 44.1 or 48kHz sample rate) ins and outs.**

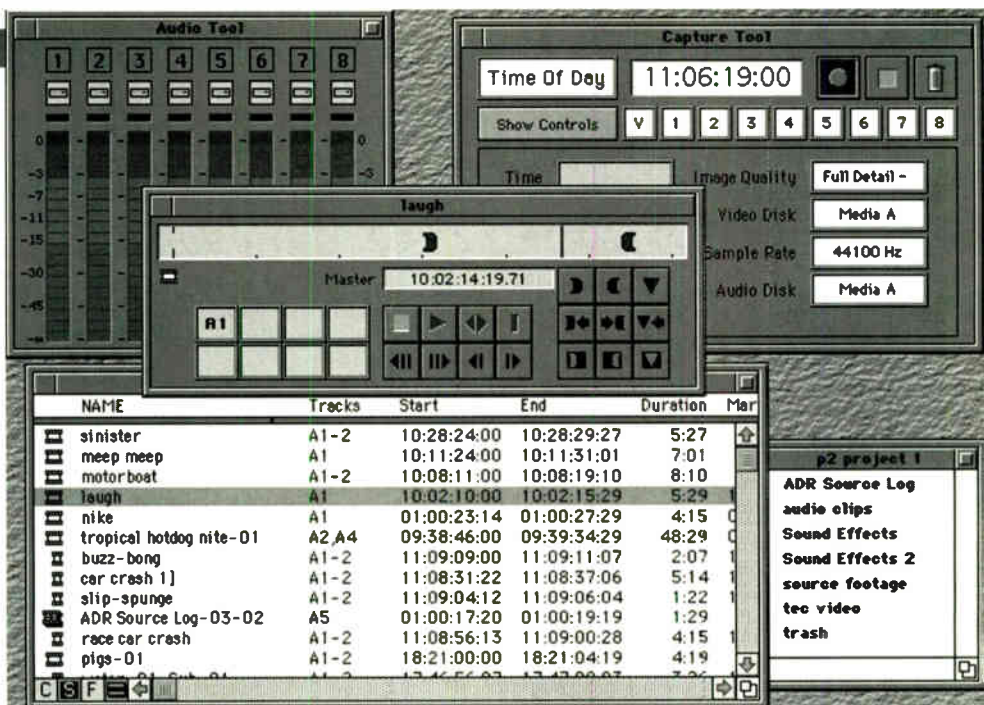
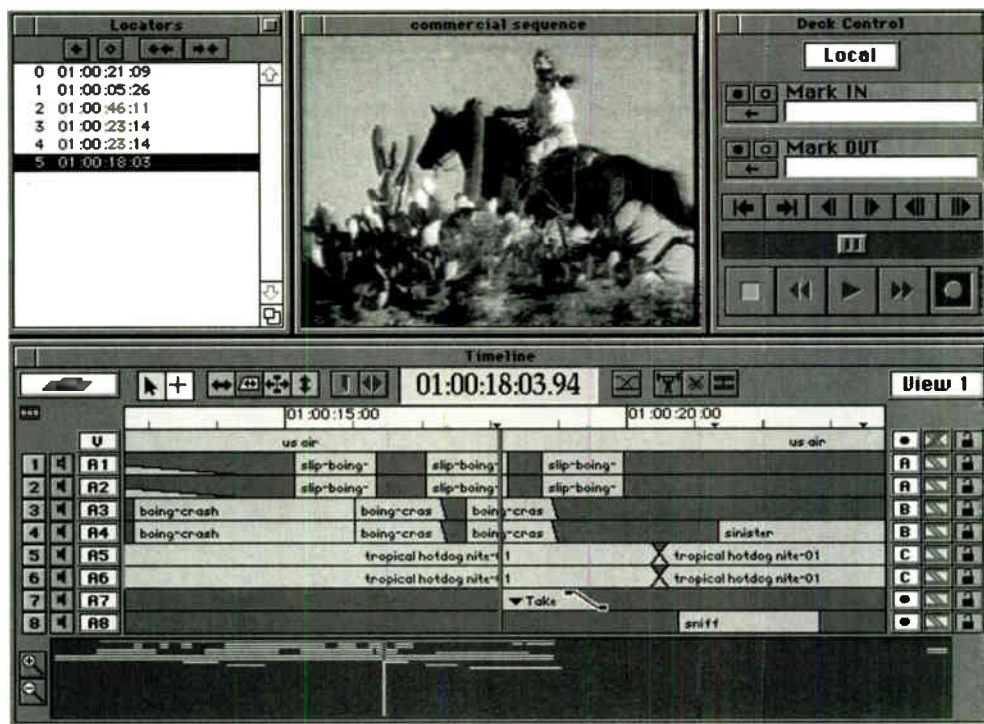


Figure 1

Figure 2



**Above: Figure 1 and Figure 2 show a typical arrangement of windows on the two-monitor display system. You can easily switch to full-screen video display on the lower screen.**

2GB fixed magnetic hard drive, two 19-inch NEC multisync color monitors, Sigma Electronics Series 2100 black-burst generator, Practical Modem 9600SA modem and the Avid AudioVision 2.0 software. When Avid says "turnkey," they mean it, as the system also includes Norton Utilities and DOS Mounter software and all necessary cables, each with labels on both ends for a quick, plug-and-go installation. Our evaluation unit came with an op-

tional AB International Professional Series 200 headphone monitor amp and a pair of Boston Acoustics HD5v speakers. Whew!

One of the distinct advantages AudioVision offers over other work-

stations is compatibility with Media Composer. You can load audio and video material created and edited in Avid's companion systems simply by saving a sequence to an optical cartridge and importing it into AudioVision. The system also allows direct digitization of material from any video deck or camera. And basic digital video edits can be made in AudioVision (ideal for quickly reworking audio elements after the producer has cut three seconds from



the program).

Although the incorporation of video is a key element of AudioVision, it's really only a small part of what the unit can do. It's a full-featured digital audio workstation designed for professional audio-for-video applications. The system allows up to 24 virtual audio tracks, any eight of which can be easily routed to the outputs. The larger Model 8 supports eight analog or four digital (AES/EBU or S/PDIF, 44.1 or 48kHz sample rate) ins and outs. Other features include auto-conform from an EDL, batch digitizing of audio and video material from the original sources, frame-locked scrubbing of audio and video, "loop & nudge" for quick alignment of a selected region to a video frame, digital looping and ADR/Foley, an extremely well-designed graphic user interface, and flexible database management of media.

Eager to get started, I unpacked the system before the technical support person showed up (it's stand-

ard operating procedure for new users to get at least a day of instruction from an Avid trainer). Avid includes a set of comprehensive, well-written manuals and tutorials for setting up and using the system, which I, of course, placed on a shelf for future use. With the able assistance of fellow editor George Petersen, I had completed all but a few cable connections over the next hour, at which time the Avid trainer arrived. We passed on the supplied Boston Acoustics speakers in favor of a pair of Meyer HD-1s that reside in our test lab.

Once the system was properly configured and checked, it was time to try out the software. Weighing in at 2.6 MB, it's as complex an application as you might run into today, but it takes full advantage of the Macintosh user interface and conventions—a distinct advantage over many other workstations, to my mind. I found the learning curve on this system to be formidable, yet not as steep as other DAWs I've looked at of similar or less complexity.

However, certain additional con-

cepts must be understood before using AudioVision, not the least of which is file hierarchy. For every media file created when audio or video is digitized, a corresponding "clip" is generated. Clips and subsequent subclips are used to create a "sequence," which is a string of clips. As long as you are working with clips, the original media files are unmodified and are stored separately from the workreel that you create to store and edit your clips and sequences. At the highest level of file hierarchy is the project. Only one project can be open at a time, but the project can contain as many workreels as you need.

Without some sort of method of organizing your work, one could quickly become hopelessly awash in a vast ocean of files. Fortunately, AudioVision includes a user-customizable database of files, with multiple ways of sorting and locating that perfect prairie dog bark that you digitized last week.

It seems that, no matter what you want to do, there is more than one way to do it. I found that for creat-



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ing original files, it was best to go to Capture mode and record audio and video from that window (see Fig. 1). After a clip is recorded, the file name appears in the destination window, where you simply double-click to play it, or option-double-click to play and trim it in the clip editor window (center window, Fig. 1). You can load clips, subclips or sequences into either the Video Display window or the Timeline window (Fig. 2). If you drag and drop the clip (or the subclip that you may have created by trimming the original clip) into the Video Display window, you'll be asked to name a new sequence, whose name will subsequently appear in the workreel you specified. If you drag a clip into the Timeline for an active sequence, a graphic representation of that clip appears in the specified track. The icons for clips, subclips and sequences all differ slightly when shown in the workreel.

The Timeline is where you assemble your sequence, and once you've built a sequence, you may find it more convenient to record directly into the Timeline by enabling the appropriate tracks. Typically, your two video monitors will be arranged to look something like Figs. 1 and 2, and you'll drag source clips from one or more workreels (lower left window, Fig. 1) that you've opened from your current project (lower right window, Fig. 1) onto the Timeline shown in Fig. 2.

Looking more closely at the Timeline window, one video track and eight of 24 possible audio tracks (A1-A24) are represented graphically in the main display area. If you click on A8, for example, a pop-up menu lets you select any other track not currently displayed. An overview of all 24 audio tracks is shown below the main display. You can also choose a second or third set of tracks by clicking on the View menu (upper right of Timeline window). The vertical bar at the center of the Timeline indicates the current position in the sequence.

There are many ways to navigate to another part of the Timeline. You can click in the desired location in the overview display, click on a location in the time code display above the video track, or type a period followed by a time code num-

ber and hit enter on the Mac numeric keypad. You can also zoom in or out on the main Timeline by clicking on the icons at the bottom left of Fig. 1. Additionally, you can quickly get to the next or previous edit by clicking on the left or right arrow buttons in the Deck Control window. You can also use the mouse or other input device to shuttle or scrub across your sequence by first choosing the corresponding tool to the left of the current time code display in the Timeline window.

In Shuttle or Scrub mode (as well as normal Play mode), video is locked to audio, so you can pinpoint any audio edit to a specific time frame. Scrubbing is also accomplished by moving the slider in the Deck Control window. The buttons above the slider move to the left or right in single-frame increments; to the right of these are ten-frame increment buttons. Yet another way of moving around the Timeline is via the Locators window (top right, Fig. 2). You can store an unlimited number of time code locations here and instantly get to them by double-clicking on the corresponding number or clicking on previous/next locator buttons. All of these buttons—and many more—have keyboard equivalents, and a template is provided for you to stick your favorites onto the appropriate keys.

Clicking on the speaker icons at the left of the Timeline lets you solo tracks; shift-clicking mutes them. You may also select as many tracks as you want to display their waveform, but turning the waveform display on for all tracks in a dense sequence can cause delays in re-drawing, though the audio and video playback is unaffected. The set of padlock buttons at the far right of the Timeline are Sync Safety buttons; to the left of them are Edit Enable buttons; and next to them are Gang buttons, which let you lock groups of audio tracks together.

I've mentioned two ways to record audio and/or video into AudioVision. A third way is via the ADR/Loop Record window, which lets you select a clip or region in a sequence, loop the playback of that section and automatically record multiple alternate takes. As with the other features of the software, the ADR/Loop Record is flexible, well-thought-out and easy to use once you get the hang of it. You can cre-

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ate an ADR source log as you record takes or ahead of time. The latter is ideal for making maximum use of voice talent. You identify each region you want to replace, name it, describe it and then call the list up in the ADR/Loop Record window. When you have a successful take of your cue, the next cue points are automatically loaded into the window. You can even use EDLs you have imported from other systems to create your source log. Or you can use MediaLog, a program that allows you to log your footage offline and create a workreel that you can open in AudioVision and use as an ADR source log.

Once you have completed the ADR session, the clips appear in the correct place in the Timeline window. Wherever multiple takes were kept, you can choose the best one directly in the Timeline window by clicking on the upside-down triangle on the left of the clip in the Timeline. This brings up a pop-up menu with a choice of available takes. All in all, the ADR/Loop Record feature was one of the most impressive in the entire program.

Avid AudioVision contains many powerful audio-editing features, as well as simple cuts-only video-editing features. The clip editor is the best way to trim your clips, create subclips and place them in the Timeline. Clips can also be moved and copied in the Timeline using the usual Mac protocols. There are constraining modes that only allow you to slip a clip or move a clip to a different track without changing the timing. To cut a clip, click on it, position it under the current time and click on the Add Edit button (farthest button to the right of the current time code display, Fig.2). You now have two separate clips butted together. To remove one clip without closing up the track, highlight it and click on the Lift button (weightlifter icon). To remove the clip and close up the track, click on the Cut button (scissors icon). All of the above operations can also be performed across multiple tracks on multiple clips.

Crossfades are accomplished in the following way: highlight one end of a clip (or clips) by clicking on it. A handle appears. Click on the crossfade tool (directly to the right of the current time code display). A pop-up menu appears, offering you

a choice of "before, after or centered." Then type in the desired length of your fade (in your choice of frames, milliseconds or samples) and press Enter. While this was not overly complex, I felt that it would be nice to have the option of directly dragging the handle of the highlighted clip out to essentially "draw" my own fade.

Clips can be trimmed, even with fades intact, simply by moving the handle with the mouse or entering a "+" or "-" followed by a number on the numeric keypad and pressing Enter. Scrub Align lets you hear a selected audio region against the current video frame as you slide the track under the Current Position Bar. You can use the Loop & Nudge feature to align a selected region to a particular frame of video quickly by choosing Rehearse mode from the pop-up menu that appears when you hold the Play button in the Deck Control window, entering a "+" or "-" followed by a number from the numeric keypad, and pressing Enter. The region will nudge by the specified amount and play it back.

For some applications, eight tracks of audio might not be enough. Never fear! Avid AudioVision has a Track Bounce tool that lets you select and mix as many as eight tracks down to either mono or a stereo pair. You can adjust pan and volume for each track as well as master gain. You can also choose to mix down only a section of the selected tracks by setting a Mark In and Mark Out. If you are mixing many tracks of audio without trimming back the master, you may receive a message, "Clipping was detected during track bounce..." Though it's nice to know this, I'd love to see a feature where you are instructed *beforehand* where you need to set your master level, or alternatively have a "normalize" feature automatically kick in and adjust the mix accordingly.

One conspicuous omission in the current version of the program is the lack of dynamic control over tracks. If you want to duck your music under a voice-over, there is no convenient way to do it using this software. You can adjust the *overall* level of any track output in the Audio tool, as well as in the Bounce tool, but if you need to ride your levels, your best bet is to run the

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tracks through your console. Most facilities might prefer to use their current automated console to accomplish this anyway. Nevertheless, Avid is aware of this issue and is working on incorporating digital consoles from Yamaha and others into AudioVision. A system so equipped would allow dynamic automation and equalization, all in the digital domain.

Version 2.0 also lacks the ability to view waveforms in the Clip Editor window. Again, Avid is working on incorporating this in a future version. And those who use MIDI with Avid AudioVision today are doing so via TimeLine's MicroLynx synchronizer.

In the time I had to familiarize myself with Avid AudioVision, I was unable to explore its synchronization and output features. According to the manual (which, by the way, is no longer on that shelf) there are three modes for output of audio: Local mode, which allows the Avid system to act as a simple playback device, controlling no external decks; Master mode; and Slave mode. The External Decks window lets you set up as many as four external decks.

EDLs can be imported into AudioVision; supported formats include Ampex, CMX 340, 3400 and 3600, GVG 4.1, Paltex, and Sony 5000 and 9000. The options for automatically assembling your material are possibly among the system's most important features.

It's not easy to evaluate a product of this complexity and power in a couple of weeks, and then to write comprehensively about it. I have yet to see a digital audio workstation that offers so much without being overwhelmingly intimidating. The software was stable; the only serious problem I incurred was when I plugged a SCSI cable into the Avid hard drive without powering it down, and I subsequently had to reformat the drive, losing all my data. (The manual—yeah, the one up on the shelf—warns you not to do this, by the way.)

There were occasional error messages on entering the program, which prompted me to restart and were only a minor annoyance. Once I was up and running, operation was smooth and error-free—that is, aside from user error, which usually caused

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a helpful dialog box to appear. A call to The Mix Place in NYC, which uses the system for audio post, confirmed that Version 2.0 of Avid AudioVision has never caused that facility to lose any audio data.

The software offers 32 levels of "undo," allowing you to get back to where you were before you began wandering down that audio "blind alley" 15 minutes ago, messing up your sequence in the process. Another powerful feature—one that is not implemented in the current version—allows you to stretch/compress an audio clip without changing the pitch, as well as change pitch without affecting duration. A beta version of this feature was demonstrated to me, and I was impressed by the quality of the resulting files as well as the speed with which the file was processed. It was expected to be available by the time you read this.

Support from Avid, in terms of training, manuals and telephone support, was first-rate. In addition, I used the 9600-baud modem and excellent custom telecommunication software that comes with the system to log into the Avid BBS, where I was able to ask questions, report problems and receive additional software and other feedback. I suspect that no one ever sleeps at this company.

In fact, with sample-accurate synchronization to random-access digital video, Avid AudioVision has few, if any, real competitors at this price point. If you need a fast, powerful, reliable, easy-to-use DAW for audio post-production, take a serious look at Avid AudioVision. It's the first in a new generation of DAWs and sets a new standard for the audio industry. The prices of turnkey systems start around \$35,000, with optional equipment—such as additional hard drives, TimeLine synchronizers, a Mackie I604 mixer, speakers and other such goodies—bringing you into the neighborhood of \$65,000 for a fully loaded system.

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*Paul Potyen is a Mix associate editor and a DAW (Driven, Assiduous Wordsmith).*



**24 TRACKS**

|                                               |       |
|-----------------------------------------------|-------|
| 3M M79-24, totally rebuilt.....               | 13950 |
| 3M M79 parts.....                             | call  |
| 3M M79-24 track, great sound.....             | 10500 |
| Ampex ATR124 audio record card.....           | 595   |
| Ampex MM1200 audio or switch cards.....       | 95    |
| Ampex MM1200 8 ch. card rack, full.....       | 2450  |
| Ampex MM1200 switching card extender.....     | 195   |
| Audio Kinetics Q-LOC 310-3.....               | 1195  |
| Fostex 4030 syncs (2), Fostex 4035            |       |
| (1) controller, and interfaces for E16, Otari |       |
| MX55, and JVC video 3/4" decks.....           | 1995  |
| Lyrec 24 track, 60% head life, excl.....      | 12000 |
| MCI 24 trk AL III, mint, low hrs.....         | 19500 |
| MCI JH16-24 non-Quor, ALLI.....               | 13500 |
| MCI JH24, Locator III.....                    | 17950 |
| Otari MX80 24 trk.....                        | 18750 |
| Stephens A-821 24trk, best sound.....         | 12500 |
| Studer 827-24 trk, 1 yr. old, low hrs.....    | call  |
| Studer A80 Mk IV-24.....                      | 22500 |
| Taberaser for 2" tape.....                    | 499   |
| Tascam ATR80 2" 24 trk, 500 hrs!.....         | 22950 |

**16 TRACKS**

|                                        |      |
|----------------------------------------|------|
| 3M, Ampex, Scully, MCI 16 trks.....    | call |
| Akai MG1214.....                       | 3950 |
| Autocolor built for any deck, NEW..... | 495  |
| Fostex 4030/4035 syncs 85-16, JVC..... | 1595 |
| Fostex 4050 autoscanner.....           | 695  |

|                                             |         |
|---------------------------------------------|---------|
| Fostex E22 1/2" 2 trk center track TC.....  | 1595    |
| Nagra III non sync, 3 speed full track..... | 495     |
| Nakamichi DRP-100 Digital (like F-1).....   | call    |
| Otari MX5050-BII, NEW demo was 750.....     | 625     |
| Otari MX5050-BII 15-30ips.....              | 1495    |
| Remote controls: MCI, Ampex, Otari.....     | 195     |
| Revov B77 2 trk 7.5 & 15 ips.....           | 795-995 |
| Sony APP-5003V center trk TC, new.....      | 7900    |
| Sony TGD, or Marantz portable cas.....      | 249     |
| Studer A80 Mk II and Mk IV 2 trk, 1/4"..... | call    |
| Tascam 52, excellent.....                   | 1295    |
| Tascam ATR 60-2T time code 2 trk.....       | 3990    |
| Tascam RC71 Remote control.....             | 125     |
| Technics 1500 1/4 trk w/2tk pb.....         | 6995    |
| Technics 1520 2 trk recorder, iso loop..... | 995     |
| Telefunken M-124A 2 trk.....                | 1450    |

**TAPE HEADS**

|                                            |      |
|--------------------------------------------|------|
| Ampex ATR700 full or 1/4 track stereo      |      |
| NEW head assemblies, cheap!.....           | 150  |
| Ampex ATR800-4 track head assembly.....    | 475  |
| 3M 56 or 79 head mounting plates.....      | 650  |
| 3M 16 trk used heads, good cond.....       | 695  |
| 3M M79-16 8 tk head assemblies.....        | call |
| MCI JH110A 1/4" assembly, excellent.....   | 395  |
| MCI JH16-8 track assembly.....             | 595  |
| MCI JH24 heads, erase, rec, play.....      | call |
| MCI JH24-16 trk E-R-P headset, NEW.....    | call |
| Otari MTR-10 1/4" assembly, excellent..... | 395  |

|                                             |      |
|---------------------------------------------|------|
| Telefunken M921 tube mic, rare.....         | 3950 |
| Tube Mic preamps, per channel.....          | 295  |
| Western Electric 633A split-shaker mic..... | 125  |

**CONSOLES/MIXERS**

|                                           |       |
|-------------------------------------------|-------|
| AHB 168 16x8 mixer.....                   | 1200  |
| Akai MB76 Midi programmable mixer.....    | 299   |
| Akai MPX-820 rack mt. mixer, auto.....    | 495   |
| Artek M2000 28x24, harness, pb.....       | 12500 |
| Ampex and Altec tube mixers.....          | call  |
| API 1604 consoles and parts.....          | call  |
| ART 2408 24 ch. mixer, 6 sends, new.....  | 1199  |
| Audronics 501 46 input, 50 frame.....     | 12500 |
| British Dynamix Model D3000, 32x8.....    | 6950  |
| Carvin MX1688 16x8, 24-ch, in mixdn.....  | 1595  |
| Carvin MX2488 24x8, 32-ch, in mixdn.....  | 3450  |
| D&R Dayner 31, 32, 24 inline mod.....     | 14900 |
| D&R Dayner 59 fr, 32 in, C-mix auto.....  | 22900 |
| D&R Triton, 32 inline modules.....        | 33500 |
| Harrison Model 3232, 32x24 w/pb.....      | 18950 |
| Hill Multimax.....                        | 1195  |
| Mackie 1604 mixer, new demo.....          | 795   |
| MCI 428's 24x16x24 (2 avail).....         | 695   |
| MCI JH-36, 32 in, automated.....          | 18500 |
| McMartin LX50C's-12x2, rack mt. mixr..... | 2950  |
| Neotek 1-20 input, 24 frame.....          | 7995  |
| Neotek IIIC 28 in 24 monitors.....        | 16000 |
| Neve 1060 eq, mic, pre's, pair.....       | 2575  |
| Neve 8014, 16x4, no eq's, line amps.....  | 3250  |

|                                           |                  |
|-------------------------------------------|------------------|
| Pultec EQP1's, EQH2's, HLF3C's.....       | call             |
| Quad Eight EQ's, 3 band.....              | 3495, 5 for 1995 |
| SKL 302 tube type hi low filter, Tube amp |                  |
| similar to Pultec-warm up! (3) ea.....    | 395              |
| Soundcraftsmen EQ-44 22 band stereo.....  | 1390             |
| Speck EQ16-24 24 ch. NEW.....             | 1750             |
| TC 2240 stereo parametric, NEW.....       | 995              |
| UREI 535 Dual graphic.....                | 295              |
| Urei 500 passive eq.....                  | offer            |
| White 1/3 octave EQ's.....                | 50               |
| Yamaha DEQ EQ.....                        | 825              |

**OUTBOARD/COMPRESSORS**

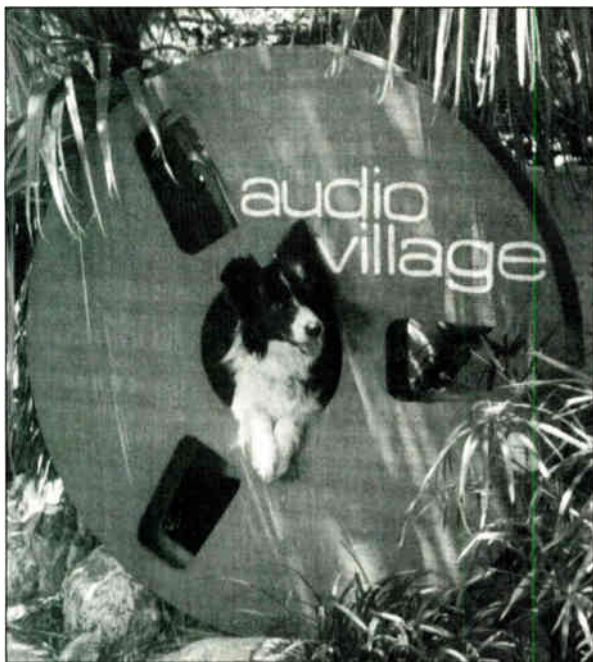
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|-------------------------------------------|------|
| Aesis 3630 dual comp/lm.....              | 325  |
| Allison Gainbrains or Kepexes.....        | call |
| Altec 1591A compressors.....              | call |
| BBE B22 Sonic Maximizer.....              | call |
| Collins stereo tube limiter.....          | 795  |
| DBX 1BX expander.....                     | 195  |
| DBX162 (stereo 160).....                  | 649  |
| Drawmer 1960 was 2700 new.....            | 1950 |
| Dynaco PAT4 Stereo preamps.....           | 69   |
| Tascam PB2 1/4" to RCA patchbay.....      | 79   |
| Tascam PB64 RCA to RCA patchbay.....      | 69   |
| Fostex 4030/4035 sync system.....         | 1200 |
| Orban 536A de-esser, top of the line..... | 349  |
| Summit LA100.....                         | call |
| Urei 1176LN, black face.....              | 649  |
| Urei 1178 stereo limiter, demo, NEW.....  | 895  |

**AMPLIFIERS**

|                                          |      |
|------------------------------------------|------|
| Crest LA901 800w power amp, NEW.....     | 5999 |
| Dynaco Stereo 120 rack mount amp or      |      |
| Stereo 70 tube amp, your choice.....     | 229  |
| Elin Lab Tube pwr amp, 200w/ch., pr..... | 795  |
| Fairchild 688 mono amps (3) ea.....      | 125  |
| JBL SE408 40w stereo, 100w mono.....     | 69   |
| Marantz 510 M amp.....                   | 425  |
| Marantz Model 250 amp.....               | 350  |
| Phase Linear 400 Series II.....          | 550  |
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| Spectro Acoustic 202C amp, 200W/ch.....  | 95   |

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|                                           |       |
|-------------------------------------------|-------|
| Fostex E16, 4030/4035 & all cabling.....  | 3950  |
| Fostex E16, 4030/4035 & all cabling.....  | 4950  |
| Otan MX70-16, very good cond.....         | 8450  |
| Otan MX70-16, excellent.....              | call  |
| P.I. heavy-duty 1" tape demag.....        | 395   |
| Tascam AO 65 locator for 85-16.....       | 495   |
| Tascam ATR60, dBX, Fostex 4030.....       | 11950 |
| Tascam MS-16, dbx, AQ-65 loc, 30ips, 5950 |       |
| Tascam MS16, AQ65 locator, 15 ips.....    | 4495  |
| Tascam MSR16.....                         | 3950  |

**8 TRACKS**

|                                             |      |
|---------------------------------------------|------|
| 3M 1" 8 track, orig. Frank Sinatra's.....   | 2450 |
| Ampex 440C 1" servo motor system.....       | 795  |
| Fostex R-8 1/4" 8 trk, w/MTC-1 locator..... | 1450 |
| MCI 110B-8, 1" 8 trk, with 4 pos. loc.....  | 2950 |
| Otari MX5050BIII 8tk w/remote, stand.....   | call |
| Otari MX7300 15-30ips 1" 8 trk.....         | 2450 |
| Otari's swivel stand for 5050, or buy our   |      |
| strong welded stand for only \$149!.....    | 275  |
| Scully 284B-8, mint.....                    | call |
| Tascam 38 with dbx.....                     | 1995 |
| Tascam 38B 1/4" reel deck/mixer.....        | 1595 |
| Tascam 80-8 channel extender card.....      | 25   |
| Tascam 80-8, never used and perfect.....    | 1695 |
| Tascam DX-8 noise red, for 80-8.....        | 595  |

**4 TRACKS**

|                                            |      |
|--------------------------------------------|------|
| Ampex MR-70 4 track tube deck, rare.....   | 6450 |
| Tascam 34B 4 track.....                    | 849  |
| Tascam 40-4 in flight case w/free dbx..... | 895  |
| Tascam 70-4, 1/2" 4 trk.....               | 495  |
| Teac 3340 4 trk.....                       | 375  |

**2 TRACKS**

|                                        |      |
|----------------------------------------|------|
| Akai GX912 cassette deck.....          | 495  |
| Ampex 375 tube/SO motor drive amp..... | 295  |
| Ampex ATR102.....                      | 3850 |
| Ampex pedestals for ATR102's, NEW..... | 650  |
| Fostex 8031 Remote control, NEW.....   | 89   |
| Fostex D-20 Timecode DAT.....          | 4450 |

**NOISE REDUCTION**

|                                         |       |
|-----------------------------------------|-------|
| dBX 150X, or 150.....                   | 225   |
| Dolby A 24 ch. nr racks.....            | 19500 |
| Dolby SR XP24 rack, Proco hamess.....   | 19500 |
| Symetra 511 A dynamic noise filter..... | 395   |

**DUPLICATION**

|                                           |       |
|-------------------------------------------|-------|
| Otari 4050 C2 / Z 15 copies stereo.....   | 4950  |
| Otari 4050 CCF stereo reel to 6 cas.....  | 1495  |
| Recordex 330 Series II copier.....        | 995   |
| Recordex CW600 6-slot cas. rewinder.....  | 295   |
| Tapematic 2002 dual cass winder.....      | 14000 |
| Telex 6120 reel or cas, to 11 slaves..... | 6950  |

**MICROPHONES**

|                                           |      |
|-------------------------------------------|------|
| 50' snake 12 XLR box + 4 1/4".....        | 295  |
| AKG 422, large dia. stereo mic.....       | 1950 |
| AKG 451 pair.....                         | 475  |
| AKG 460, CK1.....                         | 295  |
| AKG C24, mint stereo tube mic.....        | call |
| AKG C414 B-ULS mics.....                  | call |
| AKG CE5-1 Vocal capsule.....              | 49   |
| AKG D12, ong, as used by the Beatles..... | 249  |
| Altec 1589B, 2 ch. mic preamp.....        | 95   |
| Carvin SNK-12 split snake.....            | 100  |
| 12x3x8 100.....                           | 395  |
| Chinese "U67" tube mic system, NEW.....   | 695  |

|                                            |      |
|--------------------------------------------|------|
| Groove Tube mics, tubes, NEW.....          | call |
| Neumann KM86 3pat, mic, pair.....          | 1795 |
| Neumann KM89 stereo/quad mic.....          | 1950 |
| Neumann TLM-170, mint.....                 | 1695 |
| Neumann U-87, w/swivel mt. (2).....        | call |
| Neumann U47, U47let's, U67's.....          | call |
| Neumann UM57, East German, looks like      |      |
| C12, sounds like 47, excellent.....        | call |
| Neve 1066 eq/mic pre's pair.....           | call |
| RCA 44BX and 770X mics, mint.....          | call |
| Sony ECM54P cond. cardioid, w/s.....       | 175  |
| Stewart ADB-1 direct box.....              | 69   |
| Stewart ADB-4 4 ch. active direct box..... | 199  |

|                                             |       |
|---------------------------------------------|-------|
| Neve V-2, 60 in, flying ladders, 1 yr.....  | call  |
| Quantum 12A mixer.....                      | call  |
| Rolland M-160 line mixer.....               | 595   |
| Shurer M67 4tk mixer.....                   | 195   |
| Soundcraft 600, 24 inputs.....              | 750   |
| Soundcraft 500 24x8x16, 40 mixdn.....       | 4950  |
| Soundcraft 600 24x8x16, 40 mixdn.....       | 5950  |
| Soundcraft TS24 52 in, 56 frame.....        | 39500 |
| Soundworkshop Series 34, 24x24.....         | 16500 |
| Studiomaster 42 in, midi ready.....         | 3750  |
| Studiomaster old vers. 24x8, fl. case.....  | 1200  |
| Sunn 2216, 16 ch, 3 buss, 4 band.....       | 995   |
| TAC Scorpion 32 in matrix mixer, 8 sub..... | call  |
| Tangent 3216, 20x16 board w/pb.....         | 3995  |
| Tascam 308 mixer.....                       | 995   |
| Tascam M15 any in or out module.....        | 135   |
| Tascam M16 16x8 console.....                | 1950  |
| Tascam M208 8x4x2 mixer.....                | 550   |
| Tascam M600 32 in studio console.....       | 8900  |
| Tascam Model 15 any module or p.s.....      | 149   |
| Trident 16x8x16.....                        | 5950  |
| Trident 65, 24x16, as new cond.....         | 11500 |
| Trident A-Range, 40 inputs, 32 mon.....     | call  |
| Ward-Beck 24in, 4 band parametrics.....     | 7250  |
| Western Elec. 25A, classic 1938 tube.....   | 2950  |
| Yamaha DMP-11, auto, digital mixer.....     | 995   |

**EQUALIZERS**

|                                             |      |
|---------------------------------------------|------|
| Angus Graphic eq (4), ea.....               | 495  |
| API 550, 550A, 550B, 554, 312's.....        | call |
| ART HD31 31 band, NEW.....                  | 299  |
| Ashly SC68A stereo parametric.....          | 79   |
| AudioSource EQ Eight 8 band stereo.....     | 99   |
| Crown VF22 dual electronic xo.....          | 195  |
| dBX 1531P 15 band stereo/31 mono.....       | 229  |
| Ferrich 664A passive EQ perch.....          | 89   |
| Gemin 7 input DJ mixer, NEW.....            | 249  |
| Lang PEO-2.....                             | 1095 |
| Metrotec FW-1 stereo graphic.....           | call |
| Neve 1073 pair in 3 rack sp. pkg w/p.s..... | call |
| Orban 622B parametric.....                  | 495  |

**REVERBS**

|                                                |      |
|------------------------------------------------|------|
| Valley 610 compressors (2).....                | call |
| Valley Gain Brain II's (4) in PR10 rack.....   | 1250 |
| Valley single card racks for Kexep II, ea..... | 119  |

|                                         |      |
|-----------------------------------------|------|
| AKG BX10 analog reverb, classic.....    | 349  |
| Echoplex II smooth reverb! Midwest..... | 595  |
| EMT 240 gold foil.....                  | 1950 |
| Clark Teknik DN780 digital reverb.....  | 450  |
| Lexicon 224 Reverb.....                 | 3200 |
| Lexicon 224X Digital Reverb w/LARC..... | 4950 |
| Lexicon LXP-1 digital reverb, NEW.....  | 349  |
| Lexicon Model 200.....                  | call |
| Quanteq Room Simulator w/remote.....    | 5950 |
| Yamaha SPX90 II.....                    | call |

**DELAY EFFECTS**

|                                          |       |
|------------------------------------------|-------|
| Cooper Time Cube Acoustical Delay.....   | 95    |
| Delta Lab Efectron 1024.....             | 1595  |
| Eventide H-3000 Harmonizer.....          | 1995  |
| Eventide H3000 Harmonizer.....           | 2350  |
| Ibexen SDR1000 digital reverb/EFX.....   | offer |
| Lexicon PCM 41 Digital delay, 800ms..... | 425   |
| Lexicon Prime Time.....                  | 525   |
| Lexicon Super Prime Time.....            | 1250  |
| MXR Pitch Transposer w/ display.....     | 325   |
| Rockman Sustainer, Chorus/Delay.....     | 195   |
| Roland SD1000.....                       | 225   |
| Vesta Kaza Programmable delay, midi..... | 495   |

**MONITORS**

|                                            |      |
|--------------------------------------------|------|
| Altec 288-16, 291-16 2" comp. drivers..... | 129  |
| Altec 604-8G studio monitors.....          | 795  |
| Altec Manta Ray 902 hf horns.....          | 125  |
| Neve pr.....                               | 125  |
| JBL 4301B 8" monitors.....                 | 325  |
| Tannoy Gold 15" pair in cabinets.....      | 1795 |
| Tannoy Gold Line, 12".....                 | 2750 |
| Tannoy LGM 12" Little Golds, mint.....     | 1395 |
| Urei 813B Time Align spkrs.....            | 1950 |
| Westlake BBSM12 pair.....                  | 2750 |

**INDUSTRY FACT:** When Elvis Presley died in 1977 there were 37 Elvis impersonators in the world. Today there are 48,000. If the current trend continues, by the year 2010, one out of every three people in the world will be an Elvis impersonator.

**619/320-0728  
or fax 320-2454**





—FROM PAGE 90, MARC COHN

"We're still in the same room. We've been here for six months."

Any deadlines looming? "We have a mastering date [at Sterling Sound in N.Y.] March 31." He pauses for dramatic effect. "Uh-huh. *Right*." And then he laughs again.

#### MAY

The album is done, and the record company is happy. Indeed, "Walk to the World," the first track released to radio, is immediately a top add on both album rock and adult contemporary stations. Wisch is on to the next project, relieved that *The Rainy*

*Season* has been completed and content in the knowledge that he and Cohn and Leventhal have given it their best shot. "I feel really good about it," the ever-affable Wisch tells me. "I think it's a great record."

As usual, there had been a number of eleventh-hour changes, including, at one point, the notion of adding two songs at the mastering stage! A new tune that Wisch had raved about in February, "Girl of Mysterious Sorrow," fell by the wayside. "Baby King" never got its tuba or a bass line—just a Wurlitzer overdub by Leventhal. And "The Things We've Handed Down" did end up

featuring mainly Cohn and electric piano, augmented by Leventhal on B-3 and nylon-string guitar. It is, after all the trials and tribulations, the perfect ending track for the album—a poignant paean to fatherhood that is as effective as anything Cohn has ever written.

I asked Wisch about the album's commercial prospects: "I don't really know. I think there are a lot of great songs on it, but you can never tell what people will like, or whether radio will play something I like. As an overall album, it's a little more mysterious than the last one. A lot of the songs on the first album tended to be very personal statements about people in Marc's life or about himself. This one, although it still contains some of that, has a little more mystery in it, which is reflected not only in the songs, but in the production."

#### AUGUST

So far the album has not quite performed up to Atlantic Records' admittedly lofty expectations. "Walk Through the World" got solid radio play for several weeks but never really caught on as a single. My own theory is that the song's slight similarity in style to various Bruce Hornsby songs—at a time Hornsby himself was releasing his excellent *Harbor Lights* album—might have mitigated some of the song's potential radio impact. The follow-up radio track was "Paper Walls," a cool, catchy folk shuffle. And I suppose "The Rainy Season," with Bonnie Raitt, is a likely candidate for serious airplay down the road a bit.

But talk about singles and sales shouldn't obscure the fact that *The Rainy Season* is a superb album by an artist who clearly has a lot to say and interesting ways to say it. The production by Cohn, Wisch and Leventhal is always appropriate, and often downright adventurous. Though a couple of songs (most notably "From the Station") harken back to Cohn influences like Jackson Browne, on this sophomore effort, he continues to establish a distinctive songwriting voice. And whether or not the album ultimately produces a hit on the order of "Walking in Memphis," *The Rainy Season* stands as one of the most intriguing and tuneful discs of the year. And it was definitely worth spending half a year on. ■

*Blair Jackson is managing editor of Mix.*

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by David (Rudy) Trubitt

# SOUND CHECK



**Above: Third Ear Sound recently did the Monterey Blues Festival. Below: The Neville Brothers mix position and Europa console. See story on page 193.**

## LONE WOLF RECEIVES FUNDING

Since its inception in late 1988, Lone Wolf has never been short on vision. Reflecting its founder's backgrounds in music and audio, as well as telecommunications and networking, Lone Wolf released the unique MIDITap in 1990. This product attempted to address the needs of the MIDI community for simplified cabling of large systems and network management. The MIDITap was a 4x4 MIDI router and processor that could be connected to other MIDITaps through a fiber-optic cable. In addition to studio use, these systems began touring as the MIDI backbone for INXS and others.

The communications software underlying the fiber connection is Lone Wolf's MediaLink, which, as

its name implies, was designed to carry a variety of media over a network. Although MIDI was the first application, provisions were made for carrying other information, including digital audio and video. So, when the professional audio community began looking at the networked control of sound systems, Lone Wolf put forward MediaLink as an option.

At the time, some manufacturers were uneasy about Lone Wolf's start-up company status and were reluctant to commit to the system. However, 1993 was the year Lone Wolf finally overcame that chicken egg dilemma (see the July 1993 *Mix* for a recap of the computer control marketplace). Once a few manufacturers signed up (QSC, Rane and Carver among the first), others quickly joined in, bringing industry validation and financial sustenance. The latter was probably insufficient to fully fund the company's technological vision.

—CONTINUED ON PAGE 190



PHOTOS: CHA LEVIAS

## Jimmy Buffett and the Coral Reefer Band

### VENUE

Shoreline  
Amphitheater,  
Mountain View, Calif.

### SOUND COMPANY

Sound Image, San  
Marcos, Calif.

### FOH

Dave "Snake"  
Reynolds

### MONITORS

Ross Ritto

### HOUSE TECH

Rich Davis

### MONITOR TECH

Luis Sanudo

### SUPPORT ACT TECH

Jon Schimke



**A**lthough the success of Jimmy Buffett the best-selling novelist has cut into the available time of Jimmy Buffett the musician, the singer is continuing his tradition of sell-out summer and fall touring. And once again, it is independent engineer Dave Reynolds and a team from Sound Image providing sound for Buffett's current "Chameleon Caravan Tour."

"This is going on my sixth year with Jimmy," says Dave

Reynolds, known as "Snake" to his colleagues. Reynolds worked for North West Sound and moved to Maryland briefly after MSI acquired NWS. Before working with Buffett, Reynolds toured extensively with Dan Fogelberg. This time around, the Buffett tour was out for most of June, off most of July, and started its

second leg in August. During the first leg, *Performance* magazine cited Buffett as the top-grossing act during the week he brought in \$3.5 million from nine shows played to 150,000 fans.

There's a lot that's new on this tour, starting with a slightly larger band. "It's one bigger than last year," says Reynolds. "Now we have 14 musicians plus Jimmy. They all play a lot all the time. It's 58 inputs, not counting the video and other returns, and that's narrowing it down. Last year, I had couple of things in stereo. This year, I've got to mono a lot of it out just to get it in here."

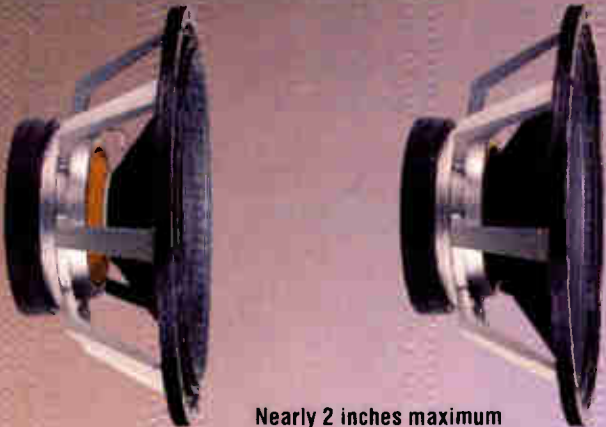
As you might guess, this is a

—CONTINUED ON PAGE 199



**Left: Buffett/Sound Image crew: (left to right) Sanudo, Davis, Ritto and Reynolds**





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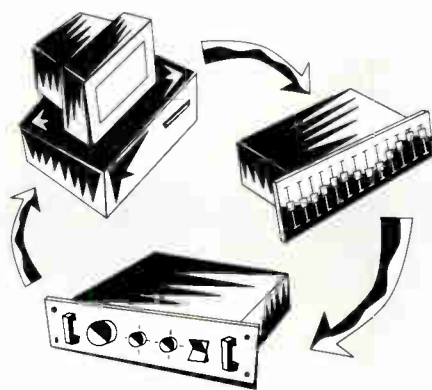
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World Radio History

# COMPUTER CONTROL CONCEPTS

by Bob Moses and  
Craig Rosenberg with  
David (Rudy) Trubitt



## FUTURE HUMAN INTERFACES

In past articles, we've discussed how machines communicate with each other. However, we've only touched on the human interfaces that will allow people to use these systems effectively. When we speak of the human interface, we're including a broad range of issues, including types of physical controls used to adjust the system, the depth and breadth of system status displayed to the user, as well as the devices used in this communication between human and machine.

## ADAPTING TO USER SKILL LEVELS

A computer-controlled sound system can be adapted to the skill level of the person(s) operating it. A successful human interface will offer only the types of controls a user's skills merit, both for their comfort and the protection of the sound system. Consider three standard interface modes: novice, expert and privileged.

In novice mode, most of the sound system's functions are hidden from the operator. A very simple interface is provided, with controls resembling a standard home entertainment system.

In expert mode, all sound system functions are available to the operator, though some functions have restricted operating ranges. For example, the power amplifiers cannot be adjusted beyond safe levels, limiters cannot be uncalibrated, anti-feedback equalization cannot be

adjusted and so on.

In privileged mode, all sound system functions are fully accessible. The operator may adjust any parameter in the system through its full range. Privileged mode typically is reserved for the chief engineer of the system and is restricted from operators (even experts) to protect the calibrated settings of the system.

Furthermore, use of a system by a skilled operator can actually improve its performance for personnel less familiar with the system. With the addition of artificial intelligence, or so-called "expert systems," many routine and non-creative tasks can be automated safely. For example, the system can "learn" that whenever the clip lights on an amplifier illuminate for an extended time, the operator turns down the level in that channel. After learning that detail, the system can perform that task automatically.

As the system learns more tricks, the novice operator will be able to operate the system with even better results. The expert operator benefits as well, since more time is available to be creative and less time is required for the logistics of controlling the system.

## TRADITIONAL METHODS OF CONTROL

For decades, interaction with audio equipment has taken place through analog-based controls such as potentiometers, switches, etc., connected directly to the audio signal path. This

is straightforward but not very flexible. Devices with a large number of controllable functions, such as a mixer, become large and heavy. The moving parts involved with analog controls are often inaccurate, unreliable and expensive to automate. To compensate for these shortcomings, manufacturers began introducing digitally controlled analog devices that omit the use of moving parts and place functions under the control of a microprocessor.

Digitally controlled analog (and fully digital) devices typically interact with the human operator via a touch keypad. Keypads usually provide an improvement in reliability, accuracy and size over analog controls, but are frequently more expensive. Further, while keypads can provide a simpler, improved human interface, users are often left wondering which keys to hit to evoke a desired action. More importantly, many sound engineers are accustomed to interacting with certain devices via traditional analog controls—for example, a graphic equalizer. Clearly, a keypad and an LED or LCD doesn't necessarily provide better control than old-fashioned knobs and sliders.

The next level of sophistication brings us to computers with their general-purpose keyboards and flexible, high-resolution displays. This is likely to be a common interface between us and the first generation of networked audio systems. In the coming months, we'll look at many specific examples of software configured for real-world sound system control.

However, let's not forget that computers impose their own demands. We use them by staring at a motionless two-dimensional display while typing cryptic messages into a keyboard that was originally designed to slow us down. Let's face it, we interface with computers on their terms. Computers control us, and the more functions we build into them, the more perplexing their operations become.

ILLUSTRATION: ANDREW FAULKNER



In particular, computer-controlled sound systems should allow human operators to focus on the creative side of their art, not on the equipment. We must bring the computer closer to our world.

#### **NEW HUMAN INTERFACE TECHNOLOGY**

We generally interact with our natural world by looking at things with our eyes, manipulating them with our hands, and communicating in spoken language and gestures. With this in mind, how best can a person operate a large, distributed sound system in real time with hundreds of channels of audio and nearly a thousand audio signal processing functions?

So-called "human factors" researchers are studying questions like these and devising new human-machine interface techniques and technologies. These new devices mimic the way we interact with our natural

world. Some of these technologies have become components of virtual reality systems.

Although VR has been hyped to death, computer-controlled sound systems have the opportunity to use new VR technologies to provide a more natural and intuitive environment to their human operators. Here are some of the possibilities on the horizon:

Eye-tracking devices are now available, giving computers precise measurements of where a person is looking. Imagine how this might affect live sound systems: Engineers could select a performer just by looking at him, and adjust his parameters on a simple universal controller. Look at another person, and the controller reassigns itself to her. Whomever the engineer looks at, their parameters are instantly mapped to a physical controller, analogous to a single console input strip. No sea of knobs—just the minimum assortment necessary to control anything

you can look at. This could make touring mixing systems much smaller, lighter and easier to operate.

The development of transparent head-mounted displays (THMD) has the potential to solve another problem in live sound mixing: How can you adjust mix levels, watch meters and tweak signal processors while watching performers for visual cues? A THMD allows the operator to see the real world through the display (after all, it is transparent), with overlaid live or computer-generated images. These generated images could include available system commands, representations of components of the system, or live video of action in another part or the venue. This allows the sound system operator to interact with equipment and watch the performers simultaneously.

Spoken word is the most common and rapid form of communication between human beings. To take advantage of

## THE STORY SO FAR...

If you're like most of us, you may be trying to come to grips with this topic and why you might want to learn about it. Over the past six months, we've covered nearly all the basic aspects of computer control and audio networking technology:

**MARCH:** Introduction; **APRIL:** Who's Who In Computer Control History; **MAY:** Three Real-World Applications; **JULY:** State of the Marketplace; **AUGUST:** Why Object-Oriented Networking Is So Important; **SEPTEMBER:** How DSP Objects Could Revolutionize Sound System Architecture.

Although there's more on the subject than appears in these articles, they represent a good place to start. Back issues are available through Mix Bookshelf at (800) 233-9604. In the meantime, if you're just joining us, here are a few key benefits of this new technology:

#### **REMOTE CONTROL**

Computer-controlled systems allow an operator to control devices from a remote location, through a network. As a result, equipment can be distributed or centralized—whichever is most convenient. System operation is simplified because a single operator has access to all devices in the system.

Non-human operators (i.e., computers) can take over many of the routine tasks such as watching clip indicators and VU meters and adjusting the levels appropriately. This frees the human operator to concentrate on more of the creative and fun tasks. Few would argue that remote control is not highly desired—just look at the average American coffee table!

#### **INTEROPERABILITY**

Computer-controlled systems provide an architecture of interconnected devices. These devices have the opportunity to

interact, share resources and work together as a team rather than a collection of autonomous entities. This capability has not yet been fully exploited by any of the computer-control systems in the industry. In the future, DSP modules will share their CPU's to allow flexible (and powerful) distributed parallel processing.

Controls on one device might be mapped to other functions in other devices (e.g., an amplifier volume control might control an equalizer to dial in a "loudness" curve as level is turned down). Interoperability will have a profound impact on the performance and the flexibility of systems, much more so than we are aware of today.

These underlying capabilities of computer-controlled, networked audio systems enhance the potential for the sophisticated human interfaces described in this month's column. ■

this, voice recognition systems have been developed to recognize speech. Engineers already dictate mixer settings into a microcassette recorder to speed setup on the next console. Amek/TAC has developed the Langley console, which automatically stores and later recites all control settings. Soon, our sound systems may be listening to us for a change.

When it's too loud to talk, hand signals are often the next-best thing. Why not use these gestures for input to the computer as well? There are a variety of glove-like devices that do just that. Gloves work by measuring the bend angle of several joints of each finger. By recognizing certain combinations of bend angles, the computer is able to recognize a gesture (i.e., the "peace" sign, the "thumbs-up" sign or the "okay" sign). Many gloves also incorporate dimensional spatial trackers, which allow the computer to know where in space your hand is and which direction it's pointing, as well as the position of your fingers.

How could these tools be used? A house engineer could wear a dimensional spatial tracker on his hand. Data from the spatial tracker could then be used by a computer to operate many of the parameters and functions in the sound system. For instance, equalization could be adjusted by moving the hand horizontally (to select frequency) and vertically (to select level at the current frequency). The mix could be adjusted by pointing at a sound source and raising the arm. Virtual knobs (shown on a THMD) could be turned by twisting the wrist. Almost any physical control could be represented by a virtual one and adjusted by tracking hand movements.

#### SUMMARY

The age of computer-controlled sound systems is upon us. However, until new, improved human interfaces are evolved and incorporated into sound systems, the potential power of computer

control will not be fully realized.

Today, the challenge is to define new paradigms for implementing systems and operating them. Local area networking is at the core of this work, and the AES SC-10 subcommittee is working to establish standards for tying all these new devices into future sound systems. But let's not lose sight of the ultimate goal. We want to be free from computer tyranny. We want to be creative, feeling human beings, not technical bureaucrats.

Computer control is, ironically, the answer. ■

*Bob Moses is with Rane, and Craig Rosenberg is from the Human Factors Lab, University of Washington. They acknowledge many fruitful collaborations on human interface and sound system control with Colin Brickman, William Bricken, Garrett Cobarr, Geoff Coco, Brian Karr, Mark Lucas, Philip Reay, Rick Spirtes, Steve Turnidge, Ronald Justin and David Warman.*



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—FROM PAGE 181, SOUND CHECK

Financial stability is now assured with the announcement that Paul Allen, co-founder of software giant Microsoft, has made a substantial investment in Lone Wolf; the amount is reportedly about \$5 million. The deal also includes a cooperative R&D effort with another of Allen's affiliated companies, Interval (Palo Alto, Calif.), a multimedia research firm.

Although some outside pro audio have found uses for Lone

Wolf's technology (including NASA's remote control of a submarine beneath the Antarctic ice cap). "This investment doesn't change our commitment to pro audio," says Lone Wolf's Rick Rutkowski. "Pro audio has a fundamental strategic importance to our business plan." Toward that end, Lone Wolf has added a half-dozen new staff members in software development, licensing and other areas. Among the projects benefiting from the investment will be the transmission of digital audio over MediaLink,

which is expected to be demoed in prototype form at this month's AES convention.

Lone Wolf co-founder Mark Lacas adds, "Since Lone Wolf started, we've had the same basic technology, but we were limited in personnel and financial resources. For me, [this investment] means not trying to work with both hands tied behind my back. It's nice to not have money be the limiting factor."

In related news, it was announced that Mark IV has

## S.I.R. OPENS NEW THEATER FACILITY IN HOLLYWOOD

Founded in L.A. by Dolph Rempp and Ken Berry, two UCLA frat rats who made their first break into the music industry by helping Ken's brother Jan (of Jan & Dean fame), Studio Instrument Rentals (SIR) now encompasses an empire with facilities in the Los Angeles area, San Francisco, New York and Nashville. Back when it all began in 1967, SIR supplied gear and rehearsal space to the likes of Jimi Hendrix and Eric Clapton. "When Hendrix first returned to this country, he was a pretty strange-looking guy to most," Rempp recalls. "If he walked into a regular music store, there weren't a whole lot of people who would take him seriously. We were more than happy to accommodate him, however, so he became one of our earliest customers. Besides making equipment available to him, we provided rehearsal space. Because of the volume levels his band commonly produced, he was turned away by the union, and he needed a place to go."

Musicians and other industry types needing a place to rehearse today have a new choice among the facilities offered from SIR. Located at 7950 Sunset Boulevard, next to the Virgin Records mega-store at Crescent Heights, SIR's latest venture occupies

what was formerly the Director's Guild of America building. Equipped with a large theater and complete sound and lighting rigs, the building is now referred to as the SIR Theater and Studios. "Our new structure is extremely flexible," Rempp says. "You can do a variety of things here, and over the years we've found that there's a real need for dedicated theater space in our industry, especially for events like MTV's *Unplugged* series and special showcases. Now we can accommodate these types of events and offer an environment that looks like the Academy Awards Theater rather than a warehouse."

The facility's main stage is 55 feet wide, 30 feet high and 25 feet deep, although it can be expanded if needed. At each side of the main stage are four of Community's electronically controlled RS880 three-way loudspeakers and four of its ferrofluid-cooled VBS415 subwoofers. Power for the bi-amped system comes from two Crown 3600VZ amplifiers per side, while a hefty arsenal of effects is kept at hand for visiting artists. Chief engineer Lou Carnevale keeps tabs on the system's performance, while Bryan Haggerty mans the Gamble 32-channel house console.

"Since the former inhabitants

of this building were the country's top film directors, a no-holds-barred philosophy was implemented when it came to its construction," Rempp says. "This attitude crossed over into the acoustical realm as well. The sound in this room has been upgraded through the years to meet the highest standards possible. We feel that based upon the SPLs we're used to—and we are not afraid to turn those Community loudspeakers up to 10—that this is a very high-performance space."

Rempp confides that many components were tested before they settled upon the current assortment, which is also used in similar configurations in some of the New York and San Francisco locations. "We went through the complete A/B comparison process, and when it was over, we felt we had created a system that provided a lot of power for the money. Any visiting artist who comes here won't hear any excuses about the sound."

In addition to the theater itself, a reception area is offered along with a green room, outdoor patio, food and drink service, and the old Director's Guild boardroom studio, which can be opened up to combine with the theater to create one huge space. Parking for 200 cars is available at the rear of the building.

—Gregory A. DeTogne

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entered into a license agreement to use the MediaLink protocol. Mark IV has given Lone Wolf a contract for the development of interfaces and applications layer software.

#### MONTEREY BLUES FESTIVAL

The eighth annual Monterey Blues Festival took place this summer at the arena made famous by Jimi Hendrix and company when they performed at the pop festival of the same name 25 years ago. This year's blues festival featured B.B. King, the Neville Brothers, Etta James and Clarence Carter, along with eight other supporting acts on the main stage and various musicians on two sidestages—the garden stage and the nightclub stage. So there was plenty of music for those enjoying the sunshine and great food that were prevalent throughout the weekend of the event.

Third Ear Sound of Richmond, Calif., has provided sound for the Monterey Blues Festival for all eight years of its existence. This year was especially good-sounding, thanks in part to Third Ear's familiarity with the venue and the addition of JBL Array Series speaker systems. Third Ear general manager Raul Saurez explains, "As the years have gone along, the caliber of artist and the technical requirements of the artists have grown rather noticeably.

"We got our first Arrays at the end of last year," Suarez adds. "We were intrigued with them because not only did they sound excellent but they were also very small and lightweight. We originally bought the Array system for corporate sound gigs because its small size makes it easy to rig in that type of environment. Monterey was the first outdoor venue we've used it on."

The Third Ear P.A. system included 16 JBL 4894 speakers stacked in two tiers of four on each side of the stage, two JBL 4892s for center fill and four of Third Ear's proprietary Power Port subwoofer systems for

added bottom end.

The lightweight of the Array Series speakers was put to good use by the delay system that Third Ear employed: A cluster of three JBL 4892 speakers were suspended above the audience to provide fill to the back of the arena. "In order to get intelligibility throughout the facility, we flew three JBL 4892s with a ½-inch wire-rope attached to some structural support on the roof of the grandstand [which flanks both sides of the horse-shoe-shaped arena]," Saurez says. "It's been traditional that we hear complaints about dead spots in the rear sections of the venue underneath the eaves of the grandstand. This year no one complained."

Other featured equipment supplied by Third Ear included a Soundcraft Europa 40-channel console at the front of the house and a Soundcraft Series IV console at the side of the stage for monitor feeds at the main stage. Third Ear also supplied sound systems for the two ancillary stages. —*Jeff Forlenza*

#### DALLAS' GEMINI EYES TOURING MARKET

Dallas-based sound company Gemini Sound and Lighting opened its doors more than a decade ago. Founded by brothers Tim, Terry and Dell Cain, the company primarily does corporate, festival and one-off gigs along with the occasional install. Recent Gemini clients include musical acts Crystal Gayle, Lee Greenwood and The Smithereens and corporate clients such as Southwest Airlines and American Airlines, Northern Telecom, Apple Computer and IBM. When local competitor Sound South West went under, that company's owner, Richard Martinez, moved to Gemini, along with much of his old client base. At the time, Gemini considered acquiring SSW's gear but decided against it.

However, now the company is looking to expand. "It's hard to buy new gear when times are slow," says Tim Cain, "but times are getting better. We'd like to

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get a system so that we could do a 4,000-seat country or alternative tour." Extended touring would be a new line of work for the company. "We've never gone after that market, because it's hard to compete with the Clairs and Showcos. It's also hard to justify those jobs for the amount you make, when corporate shows take one-third the gear for three times the dollars."

Gemini currently has an all-Crest-powered, 70-box Renkus-

Heinz system, including SR-1, SR-2 and WR-1 cabinets. "We use more Renkus than anything else," says Cain. "We've had it for about six years, and we've been happy with it." Also in inventory is a 24-box, pre-PRISM Showco system purchased when Gemini was founded.

"We recently purchased a Midas XL3," says Cain, "and we're looking at the CoEnterant System from Renkus." Three models comprise this line: the full-range CE-3, the two-way

CE-3 M/H and its companion, the CE-3 LOW. All three trapezoidal cabinets share the same compact dimensions. At the heart of the CoEnterant design is a single-compound throat, which combines the output from both mid and high-drivers. Shadowing of the mids is eliminated by placing the HF drivers behind, rather than in front of the mids, as is common on many co-ax designs. The arrangement of drivers also results in compact, high-power cabinets. For example, the CE-3 M/H contains six high and six mid-drivers for an overall sensitivity of 113 dB at 1W/1M and 142dB peak program output.

Cain's only reservation is the lack of name recognition factor for tour riders. "People are set in their ways, and it's hard to break a new system in," he says. "I'm more than confident in the cabinet; it's just going to take some time. If you get the marketing right and a few people start using it, the rest will take care of itself. We'll get four stacks of CoEnterant in a few weeks and take it out—that's the true test."

#### TOUR NEWS

Eastern Stage Productions has fielded a large EAW 850 Series system with The H.O.R.D.E. Festival. Including (at different times) Blues Traveler, Widespread Panic, Col. Bruce Hampton & the Aquarium Rescue Unit, Samples, Big Head Todd & the Monsters, Phish and the Allman Brothers Band, the tour is playing 10,000- to 20,000-seat sheds nationwide. The 850 rig is powered by Crown Macrotech amps. House mixer Bill Danilczyk uses a pair of Crest-Gamble EX 56 consoles. Dan "Freedom" Friedman runs monitors from a Crest/Gamble IIC 40 and Soundcraft 500-40 board. Crest 8001s drive Schubert 2x12-inch stage wedges. Processing includes Klark-Teknik, dbx and Aphex gear, with effects by Lexicon and Yamaha.

Delicate Productions (Camarillo, Calif.) has a number of systems out, including sound and lights for Yanni's symphony tour of outdoor amphitheaters. A 48-

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Photo: Harrison Funk

**Chick Corea & the  
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## LIVE SOUND

box Martin F2 system with a Yamaha PM4000 has been supplied for house engineer Tom Sterling. Monitor engineer Curtis Kelly is mixing on a Ramsa WRS-840 driving Martin LE600 LE700 wedges. Mike Horn and Scott Scherban were the techs on the tour, which ran through July.

Natalie Cole will again use Delicate for her upcoming tour. Equipment highlights include a 24-box Martin F2 system with F1 near-fills and a custom JBL Array Series monitor rig with a digital ES52000 controller. House engineer Paul Sarault has spec'd either a Yamaha PM3000 or 4000 with extender. Monitor duties will be covered by Bill Sage, with techs Harry Netti and Brian Langowski.

Also out with Delicate are The The and a 32-box F2 rig with eight subs. Steve Venezia is mixing house on an XL3 with extender, band engineer Keith Lamont is on a WRS-840 and Kurt Wolf and Mark Newman are techs.

Finally, Porno For Pyros headed out on a U.S. tour in August on a similar Martin-Midas-Ramsa rig. Rob Seifert will be assisted by Delicate's Kurt Wolf, while Vince Buller will mix monitors with Scott Scherban assisting.

## UPCOMING RIGGING SEMINARS

Harry Donovan and Jay O. Glerum have announced two three-day rigging workshops, which will be held in McLean, Va., on October 25-27, and Secaucus, N.J., on November 1-3. The seminars are intended to serve the needs of riggers, venue personnel, IATSE locals, sound, lighting and stage companies, loudspeaker manufacturers, consultants, contractors and installers. Material covered includes engineering principles of rigging, arena and concert rigging techniques, and permanent rigging for theaters, concert halls and arenas. For information, contact Rigging Seminars at (812) 995-8212 or fax (812) 995-2110.

## TANNOY

### THEATER INSTALL

In-house staff of the Barbican Theater (London) recently upgraded the theater's main auditorium system with eight of Tannoy's new CPA10S SuperDual loudspeakers. These extremely compact (15x21x8.5 inches), constant-directivity, co-axial loudspeakers are designed to cover the range from 150 Hz to 22 kHz. CPA12.3B subwoofers and a larger front-of-house unit, the CPA 10SXB, are slated for installation soon.

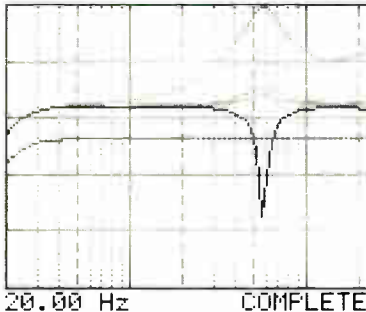
The theater's long association with Tannoy made it the ideal candidate for the first theatrical test of the system. The SuperDuals' first run is on a new production of *The Beggar's Opera*, which made use of the speakers positioned onstage. After that run is complete, the enclosures will be mounted around the proscenium arch, in keeping with the venue's usual sound design style for its repertory catalog. ■

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# Why you should buy an FBX to do nothing to your sound.

By Doran Oster, President, Sabine Musical Mfg. Co.

Until the invention of the Sabine FBX Feedback Exterminator, engineers had no practical alternative for controlling feedback other than the 1/3-octave graphic EQ — a 35-year-old technology.

**"What's wrong with EQs?"** Nothing — if you need to "shape your sound". On the other hand, if you're using an EQ to eliminate feedback, you may as well think of it as a "sound sponge". In fact, EQs "soak up" a lot more sound than you might realize. Practical experience proves that EQ filters are much too wide for chasing feedback and end up muting the program.

**Here's why: 1/3-octave EQ filters are actually one full octave wide!** Think about this: If the filters were only 1/3 octave wide, there would be no filtering

**Wouldn't it be great** if your EQ filters could be ten times narrower? Then they could eliminate feedback without a perceptible change in the sound. What if you could get more gain before feedback? Well, the Sabine FBX does all that — and the FBX's fully digital adaptive filters do it automatically!

**N**ow, you may say, **"If the room is set up properly with an EQ, I don't have a problem."** But maybe you do, and don't realize it. Try this test, and prove it to yourself. After you finish your next installation, patch in a CD player and play your favorite CD. Now punch the EQ in and out of line. **We think you'll agree it sounds like there's a blanket on the speakers when the EQ is in.** That's your EQ soaking up the sound.

ulates the frequency of the feedback and, in less than a second, places a very narrow digital filter



The Sabine FBX-900

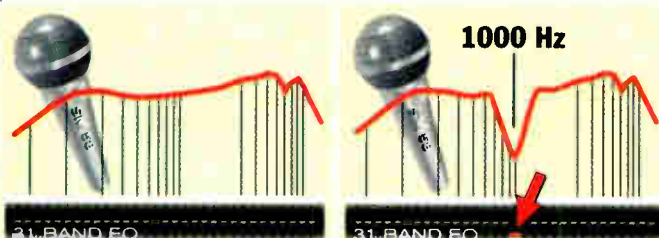
(ten times narrower than a 1/3 octave EQ and up to 20 dB deep) directly on the resonating frequency. **The FBX automatically eliminates feedback without muting the sound. And you get more gain before feedback.** Think of the FBX as an EQ with 20,000 sliders run by 1,000 top-notch engineers. It's just that simple.

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**Are all sound professionals crazy** to use EQs to control feedback? No — up until Sabine invented the FBX, there was no practical alternative. Parametric EQs have narrow filters but are too slow and cumbersome for live sound.

**Moving even a single EQ slider ruins your frequency response!**

between the fixed sliders. I'm not just talking about cheap EQs — even the best EQs share this problem. **In fact, if you pull your 1000 Hz slider down 12 dB, it actually removes 46% of the power going to your speakers between 500 and 2,000 Hz!** Pull two or three sliders, and you wipe out the overtones of your voice, causing you to sound nasal and your monitors to sound muddy.

They cause phase shifting, and drift with temperature. Pitch and phase shifters ruin the sound and can't be seriously considered.

**W**hich brings us back to the new Sabine FBX Feedback Exterminator, the only option that really works. Put it just before the power amp in the audio chain, and it automatically senses feedback. Then it automatically cal-



**"Think of the FBX as an EQ with 20,000 sliders run by 1000 top-notch engineers. It's just that simple."**

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—FROM PAGE 185, JIMMY BUFFETT

very full stage. "I'm always at the bottom of the food chain, when it comes to staging," Reynolds explains. "Whether it's a video camera in the way, props or whatever, I've learned to live with it. The steel drums are really my only pain, because you have to play with a lot of dynamics—it's just the nature of the beast. They have so many overtones that if you open up the microphone to where you can really hear all the overtones of the steel drum, then you hear everything within ten feet." On various tours (including this one) Reynolds has had the option of using Plexiglas baffles for isolation. A new harder-playing percussionist also reduces the relative level of leakage.

Stage clutter is reduced by the use of clip-on microphones. "Rather than have 421s or other mics that might have a more rounded sound, [and require less work] to get the proper sound, I've always used the smaller microphones—the Ramsas the past couple years, [and now numerous Shure SM98s]." Reynolds notes. "You might have to work on them a couple more minutes per microphone to get *that* sound. But like I say, nobody in the audience knows whether I boosted a frequency or whether it's the natural sound of the mic, as long as it sounds good. I'll get phone calls if you put it in the magazine, but I believe in twisting the knob until it sounds right." [Letters are always welcome—eds.]

On the subject of vocal mics. "We started using Beta 58s last fall," Reynolds adds. "We switched to them on some one-off shows we did with other sound companies. And even with some less-than-desirable P.A. systems, all of sudden the vocals were easier to control." Shure Beta 57s are used on the horn section.

All these mics find their way to a pair of Soundcraft Europa consoles at the front-of-house. Although Europas have been used in a number of high-profile

installs and done their share of regional touring, one thing that may have slowed their acceptance is the length of the console, which was a tad too long to fit across the back of a truck. Fortunately, by replacing the board's end caps with trimmer ones and fabricating new road cases, the boards now fit.

"The Europa's EQ is really smooth," Reynolds says. "Besides being a four-band total parametric, we still got a high- and low-pass filter. So you can gang it all

up for just about any desired effect. [The consoles are inter-linked.] The VCAs and mutes carry over, and all the audio comes back on a separate snake. All the subs can be plugged in to each other via their multipin, so all the effects can be the same."

The Europa's liberal use of ¼-inch TRS connections kept Reynolds busy at the beginning of the tour soldering up a variety of adapters and fan-outs. "This is a padless [mic preamp] console," he explains. "You've got an XLR

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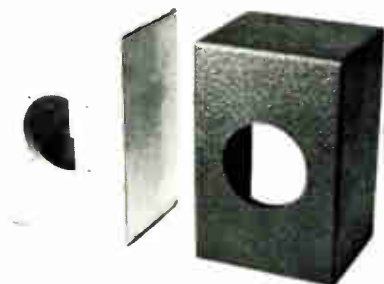


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### LIVE SOUND

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**The Buffett tour served as an experiment to test the feasibility of multitrack digital live recording without using a remote truck or even a separate recording console.**

With most consoles, it's XLRs."

This tour also served as an experiment to test the feasibility of multitrack digital live recording without using a remote truck or even a separate recording console. Through a combination of direct outs, aux sends and the odd resistive combining network, the tour's 58 inputs and two Europa consoles feed 24 tracks of Alesis ADATs while simultaneously serving as FOH boards. One particular console feature was an important element of the test: The Europa's Aux 12 send for each channel can be individually disengaged from the aux bus and transformed into a direct out, pre- or post-fader, with its own level control. This allowed for a simple input-to-track direct patch.

Reynolds prefers to solo off a pair of JBL Control 1 near-field monitors, rather than fumble with phones. These speakers are fed by a delay to align their output with the sound coming from the P.A. "I have an independent control for the headphones and one for the speakers, and you can select different sources—cue, bus, group or a tape," Reynolds says.

On the outboard front,

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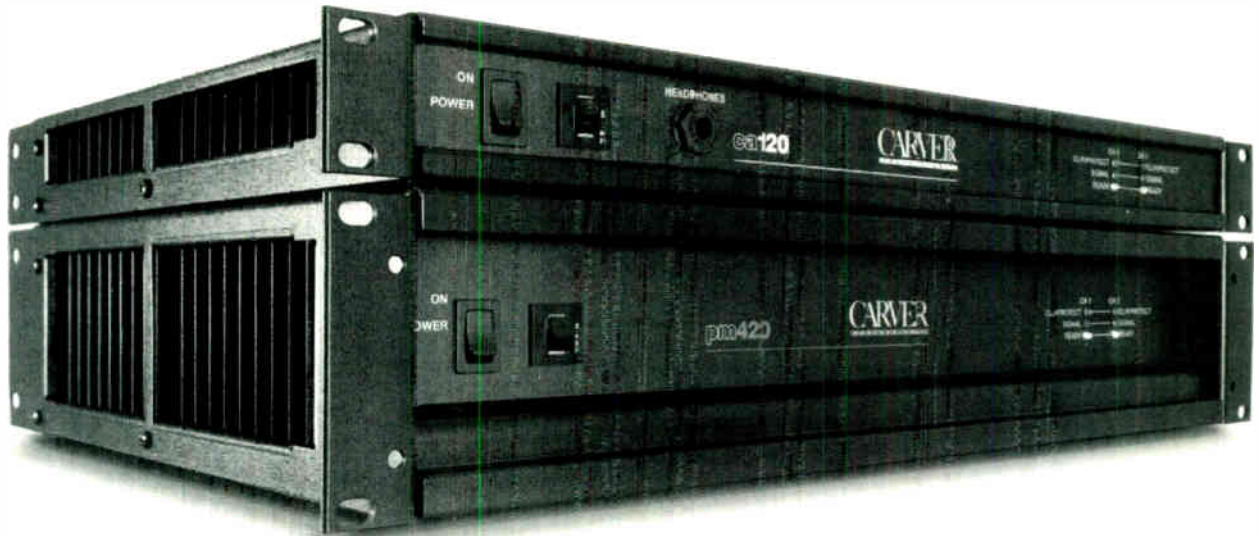
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effects usage is limited. "The band doesn't really lend itself to a whole lot of effects," he adds. Despite that disclaimer, Reynolds' rack is not entirely a spartan one, holding a Lexicon 300, Eventide 3000 SE, Yamaha REV5, two SPX900s and an SPX90II, an Aphex Type III and Compellor, Roland SDE 3000 and Klark Teknik compressors.

In addition, the tour has had excellent results from the Symetrix 542 multimode crossovers. "They have been a big winner for us," says Sound Image president Dave Shadoan. "They're trouble-free and sound great. They're also truly balanced in and out, and you don't need a scope to set it up—everything's on the front panel." Reynolds also found a place for Symetrix's voice processor, using it to duck potentially harsh midrange frequencies on soprano sax and harmonica amps when either plays in its loudest range.

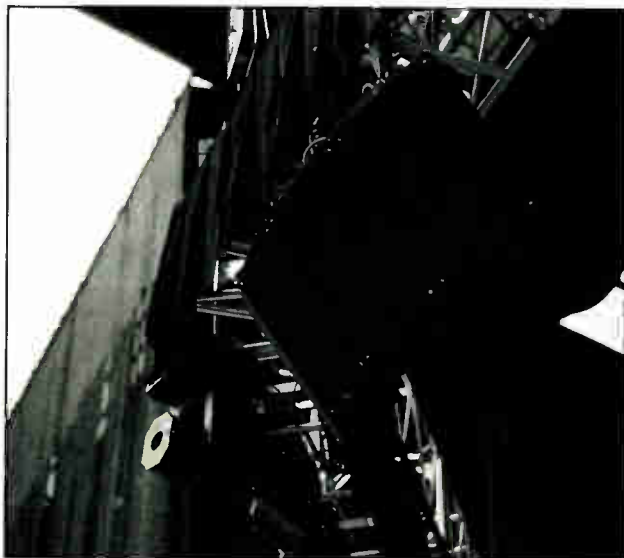
Another new addition on the tour is Bag End's ELF (Extended-Low-Frequency) integrator, which provides the subwoofer feed. Unlike a conventional crossover, ELF operates loudspeakers below the resonant frequency of the enclosures, with design goals including reduced box size, improved linearity and extended low frequency. The ELF concept was developed by Ed Long and Ron Wickersham and manufactured under license by Bag End.

ELF requires a sealed enclosure, which meant closing the ports on Sound Image's existing sub-cabinets. (Bag End also offers its own speaker enclosures, but other cabinets can be used.) "The low end has tightened up a lot," reports Reynolds. "I'm actually running less power to the subwoofers, yet I'm getting a lot more thump out of it."

Another first on this tour is a lightweight center-fill/stage monitor cabinet, called a G2, designed and built by Sound

Image. These cabinets house a 12-inch cone and a modified 2-inch driver mounted to a proprietary waveguide. These cabinets are symmetrical on all axes, allowing them to be hung side-by-side to form arced arrays, or laid on their sides as floor wedges.

The other aspect of the new cabinet is the use of a proprietary waveguide, rather than a traditional throat and horn. Sound Image has worked in con-



Sound Image's proprietary G2 cabinets flown as center fill.

junction with designer Mark Engelbretson in this development. Several advantages are cited for the waveguide. First, there is no throat to add coloration to the device. Although the waveguide does provide pattern control (approximately 90 or 60 degrees) and acoustic-impedance matching to the free air resonance, Sound Image's Dave Shadoan describes the HF's performance as akin to a direct-radiating device. The opening of the waveguide is the same size as the 12-inch cone driver (right down to the screw-mounting template), and the magnetic structures of both devices are in the same plane, providing time-offset alignment.

Sound Image has been a long-time user of QSC amps for both house and monitors, a relationship reaffirmed by the recent purchase of a slew of new EX Series amps. The tour is carrying

nine amp-racks packing 141,600 watts for the 32-box rig. "I've got 16 boxes each side," says house tech Rich Davis. "12 high boxes and four low boxes, for a three-to-one high/low ratio." QSC EX1600s are used on the high end with EX 4000 on the 12s, 15s and 18s in Sound Image's proprietary Phase Loc five-way system.

"We've also got a new AC distro with a 200 amp main breaker," Davis continues. "Each amp rack is driven off one single three-phase plug." Each phase is available through Edison outlets in the back of each rack, allowing for approximate load-balancing within each rack. The Buffett tour uses one distro on each side of the stage, although they are designed to function singly as well.

Another new aspect of the Chameleon Caravan tour is the use of computer control over the amps used in the main house system. At press time, a Lone Wolf MediaLink system had been installed during the three Pine Knob dates at the end of the first leg. Lone Wolf's VNOS (Visual Network Operating System) software allows end-users to create their own "virtual venue," giving the operator point and click visual access to the entire system. This virtual venue configuration was underway at press time with the intention of using the system full-time on the second leg. Control over amplifiers is made possible by installing a plug-in card into each EX amplifier, which allows remote control and status monitoring from one or more computers connected via a fiber-optic link. (For more on the subject, see "Computer Control Concepts," p. 187.)

"I see all sorts of possibilities for it," Reynolds says of the system. "It's always been walkie-talkies around the room going, 'I need more horn over here.' We can do it with a computer—it beats running back to the

PHOTO: STEVE JENNINGS

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amplifier. And that's probably the most crude use for it. We've got three acoustic songs in the middle of the set, and the EQ changes drastically." Reynolds sees the possibility of automating changes to the input attenuation of different amplifier bands for this sort of broad tonal-shaping (network-controlled equalizers are also available). He also looks forward to defining basic system-wide presets for indoor and outdoor venues as a push-button starting point for system tuning.

Computer control is a technology with the potential to fundamentally change the architecture of touring sound systems, and Sound Image® plans to be at the center of developments with the MediaLink system and QSC. The company's use of the system represents the first large-scale tour using amplifier control via MediaLink, although Lone Wolf's gear has already toured extensively as the heart of sophisti-

cated MIDI stage systems.

A band this large would often inspire an equally complex monitor system. Although there are 15 mixes (one for each play-

**"I've tried to work with simplicity. I like to use a limited amount of EQ and play around with monitor placement, rather than fighting it with electronics."**

**—Ross Ritto**

er). "It's pretty straightforward," Ritto says. "I don't have a lot of reverbs and compressors and gates, because if there's one person who wants a reverb, then I'm going to need 15 reverbs.

"Because I'm an old guy, and this is the only band I do moni-

tors for at this point," he adds. "I've tried to work with simplicity. I like to use a limited amount of EQ and play around with monitor placement, rather than fighting it with electronics. The volume level on the stage usually doesn't get out of hand until the end of the tour. And it's pretty much Jimmy's word: If he says, 'turn down,' they do, which is nice. I'm also fortunate that I've been with Jimmy longer than all the bandmembers."

At the other end of the seniority spectrum is sound man Jon Schimke, whose first gig with Sound Image was this tour's kick-off date at the Shoreline Amphitheater. Schimke serves as tech for opening act The Iguanas. A self-contained trailer with band gear and P.A. is set up in the parking lot to provide entertainment for Buffett's faithful, who typically start the festivities with a preshow tailgate party. "We've got six mixes on stage and a mono house mix," says Schimke.

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"It's 16 inputs—it's really straightforward. We've got a Soundcraft 800B, an SPX and a REV7," says Schimke, who spent the last five years as an equal member mixing the San Diego-based Cardiff Reefers. "This is a great tour to be on, but it was a hard decision because I put a lot of time and money into my old band. But this was a good career opportunity for me—now I'm at the bottom on this level, but if you keep your head on straight and work hard, you'll be fine."

Even though I saw the first date of the tour, Reynolds seemed to be on top of everyone's entrances with just a couple days of rehearsal under his belt. "Perhaps it comes partly from being a pilot, where you learn to scan your instruments all the time," Reynolds explains. "A lot of engineers get too deep into their effects rack, but I'm looking at the band as much as I'm listening."

Reynolds' live mix strikes an excellent balance between intelligibility and keeping each musician audible within the band's dense musical arrangements. "It gives me fits to try to get all that in there," he laughs, but he does it by holding back drum and bass levels below the typical rock 'n' roll thump that forms the starting points for many mixes. This makes it possible for most players to sit at a similar nominal level without having to compete with the rhythm section. Buffett's vocal is placed well in the front of the mix. Although Buffett is a bright singer, the lead vocal was kept from being harsh, while intelligibility was excellent. Although not intimately familiar with the material, I was able to understand all the lyrics without any effort. ■

*David (Rudy) Trubitt edited the recently released Concert Sound, a collection of sound reinforcement articles from the pages of Mix.*

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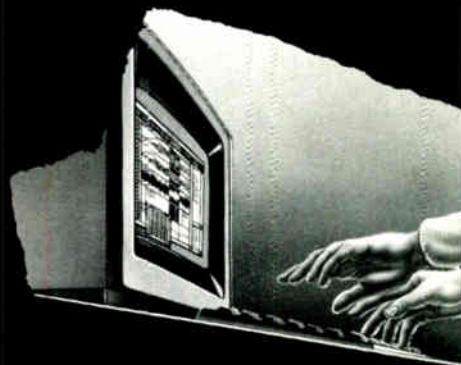
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by Rick Clark

# CROSSROADS '93 MEMPHIS

## LOGISTICS OF A MULTICLUB SHOWCASE



Todd Snider rockin' out at Jerry Lee Lewis' Spot

Getting heard and seen by a record label A&R guy, or major music manager, lawyer or publisher has always been a daunting task for any band or artist living outside of the primary music industry centers of New York or Los Angeles. While industry reps do travel to see a band display its wares, the process of cajoling them into coming to a gig has

always been an exasperating task. For years, serious acts would leave their hometown for "the coast," in hopes of getting seen in some lousy club that usually charged the band an arm and a leg to play.

During the '80s, a few folks got the bright idea of creating an incentive for major music industry reps to check out indigenous talent. By getting local clubs to cooperate, organizers began to present their best regional talent through concentrated multishowcase expositions. (South By Southwest, in Austin, Texas, has generally been regard-

ed as the grandparent of these undertakings.)

One of the first events to emerge on the scene was the Producer's Showcase, held in Memphis, Tenn. From the outset, the Memphis Producer's Showcase, conceived by Larry McKeehan, was hailed as a standard for seamless multishowcase presentation. Over the years, it also enjoyed one of the highest success rates of artist signings in the country.

Two years ago, the project was expanded and reorganized as Crossroads, a fitting name in a city whose deep musical heritage is the result of the cross-pollination of black and white cultures. *Mix* spoke with executive director Jon Hornyak, production director Joe Hillenbrand and technical director

Ken Whitehead to see how they orchestrated the many production aspects of Crossroads. After all, the logistics behind moving almost 250 acts on and off ten different club stages, during a three-day period, required special preparation.

Each year,

Crossroads (and previously the Producer's Showcase) chose the historic Beale Street district for the event site. The clubs that participated ranged from small rooms that held fewer than 100 people (the

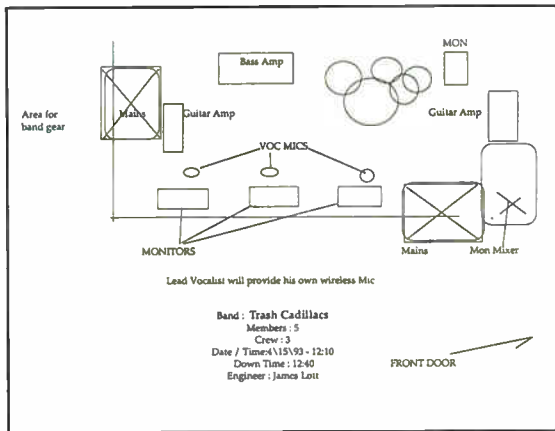


Burnin' Blue at the New Daisy



Neighborhood Texture Jam at Six-1-Six Club

PHOTOS BY RICK CLARK



**Stage plot diagram for Trash Cadillacs**

accepted, showcased with similar acts. Those that were accepted were given the date and venue in which they were to appear in time to notify industry contacts. To help make sure each slot ran as efficiently as possible, Hillenbrand sent out venue stage diagrams to all the bands, so they could

plot their equipment and personnel setup and mail it back. "This process kept our sound, lighting and stage crew from flying blind. They were always ready for the next band and knew what was supposed to go where," Hillenbrand explains. "I'd say 85 percent of the bands sent in their stage plots. The majority of the ones that didn't were acoustic or taped acts, and we knew in advance what they were going to be like. "When we sent out the stage

Band Box), to large, elaborate setups, like B.B. King's club or the New Daisy theater. Among the other clubs that participated was Jerry Lee Lewis' Spot, which featured a weird catty-cornered stage setup but managed to be a very good-sounding room; it also has a history of being the venue with the most industry signings to its credit.

"The convenience of Beale Street, with all of the venues being in a two-block area, made this a much more manageable feat than if it was spread out all over town, like some similar events," remarks Hornyak, who began work on the April event the previous August.

"Our headquarters were located in the middle of all of the clubs, so it was easy for the participants and ourselves to know exactly what was going on," he continues. "Except for the Six-1-Six Club, everything was in walking distance, and we had regular shuttle service operating between that venue and Beale."

Joe Hillenbrand was brought on to plan the club logistics and work with the band submissions, which were averaging between 40 and 50 a day, beginning in February. Besides the usual rock, pop and alternative music represented in these events, Crossroads added showcases for rap, country, blues, R&B, gospel and contemporary Christian styles.

Each band paid a ten-dollar entry fee, and their submissions were grouped by genre so that they could be evaluated, and if

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### LIVE SOUND

plots, I asked if the band had an engineer, and what was his name and number." Hillenbrand continues, "We would coordinate things with him, and during sound check, the band's engineer would get a feel for the board by going over it with the house engineer."

In many cases, band engineers were unfamiliar with the systems or lacked the knowledge to get the best sound out of the venue. Hillenbrand and Ken Whitehead provided each club with production crews who were well-versed in each room's sonic characteristics and load-in/load-out logistics.

"We had a lot of really experienced people at the sound man position, who were great at working with the bands and helping them achieve what they wanted. That was one of the keys to this event's success," Whitehead states. "While many of the bands indicated they had a sound guy, we found it was usually somebody who knew how to punch a fader up but didn't truly know how a sound system worked. They would end up relying on our house sound man. That could have been weird, but it really worked out well because of the personalities involved."

Naturally, many of Crossroads work force came from the participating club's own engineers. "We really tried to use the in-house people," Whitehead says. "It made a lot of sense to let those people run those clubs, because they knew their management, what it took to fill those clubs and what level the bands needed to maintain during their performances. It also ensured that we had a lot of cooperation when troubleshooting was required."

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## Crossroads Equipment Highlights

### IN-HOUSE SYSTEM FOR B.B. KING'S CLUB

*Dawn Hopkins and Alan Mullins—engineers*

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### SIX-1-SIX CLUB, SYSTEM BY TENNESSEE CONCERT SOUND, MEMPHIS

*Analy Roark—general manager/  
Crossroads soundman*

- Soundcraft 400B 24x4x2 house console • Four proprietary full-range boxes with one McCauley 18-inch, one EV 10-inch, one Gauss 2-inch • Four reverse-thrust cabinets with one JBL 18-inch in each cabinet—two per side • One Klark-Teknik DN 360 31-band stereo EQ • Soundcraft 400B 32x8x2 monitor board—six stage mixes • Six EAW SM 155 monitors • Three KT-DN360 EQs • One Lexicon PCM 42 delay • Two Yamaha SPX 90 • One REV7 • One Roland SRV 2000 digital reverb • Six Valley People Gain Brain II • One Symetrix 544 Quad gate • Custom-designed, ported sidefill cabinets, two 15-inch EV, one 1-inch JBL horn

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### LIVE SOUND

Hornyak was able to cover many of the event's needed P.A. components, as well as supply amplifiers and drum gear to every club. Tennessee Concert Sound and Rally Productions supplied the larger venue systems.

"Some of the clubs, like B.B. King's, already had a good house system," Hillenbrand says, "but a number of them needed some augmentation. Some of the local music stores contributed systems as part of their sponsorship. They also helped us with amplifier lines as well. With so many acts, and a tight schedule, this enabled acts to basically plug in and go. That approach saved us a lot of hassle and time."

Both Hillenbrand and Whitehead arranged backup equipment in case of emergencies. Whitehead brought a truck loaded with extra gear, and Hillenbrand kept a complete spare amp setup at the headquarters.

"An event like this means a lot to the bands who just want a decent shot to prove themselves in front of the industry," Hornyak sums up. "Previously, if I wanted to get someone to see an act in Memphis, it would take me several months to get even a half a dozen labels to show up. This way, you can get your acts in front of people that you never could have before. The amount of record and publishing deals that have been landed because of these events speaks well for the concept. Crossroads not only has achieved industry respect, but the Memphis region looks forward to seeing it because of the high caliber of talent and production. We're grateful for the good fortune we've had, and we're already beginning to work on making Crossroads '94 even better." ■

*Rick Clark is a freelance writer based in Memphis.*

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# RECORDING · NOTES



PHOTO: LISA JOHNSON

## SMASHING PUMPKINS

### A Beautiful, Disturbing Dream

Just so you know where I'm coming from, I was not a fan of Smashing Pumpkins' first album, *Gish*, which became quite a *cause celebre* in the alternative scene, eventually selling about 300,000 copies. I think I listened to it all the way through once when it came out, and I probably wasn't listening that intently—you know how it is when you're inundated with new "product"; things fall through the cracks.

But I got a tip from someone I trusted that the Pumpkins' second opus (and first on a major label, Virgin) *Siamese Dream*, was special. And when an advance tape arrived a couple of months before its July release, quite frankly it knocked my socks off. It was only after

*The Smashing Pumpkins from left to right are: Billy Corgan, guitarist & vocalist; guitarist James Iha; bassist D'Arcy Wretsky and drummer Jimmy Chamberlin.*

*Below: Co-producer Butch Vig at Triclops Studio in Atlanta*

I'd heard the tape a half-dozen times that I found out the skinny about this Chicago-based band—found out about the dark, driven, visionary leader of

the band, Billy Corgan, who writes and arranges the bulk of the material, sings it and plays buzzsaw guitars as well as anyone.

—CONTINUED ON PAGE 215



PHOTO: GUY AROCH

## AIMEE MANN'S LIFE AFTER TUESDAY

by Daniel Levitin

Cornered at a recent night out on the town, ace mixer Bob Clearmountain was knocking back a few with Aimee Mann and her producer, multi-instrumentalist Jon Brion. The trio had just finished mixing some of the songs off what may well be the best-crafted pop album of 1993, Mann's *Whatever*.

At one point, Clearmountain is recognized by an aspiring engineer, who showers him with compliments and questions about the kind of equipment he uses. Clearmountain



PHOTO: LAURA LEVINE/VSAGES

graciously answers the fan's questions, while hinting politely that he would rather relax with his suds and socialize with Mann and Brion. Undaunt-

ed, the relentless questioner pelts him with inquiries about compressors, brands of tape, etc., and then asks the question that sends Clearmountain soaring

over the edge of patience. "Bob," he asks innocently. "What do you listen for in *wire*?" Clearmountain snaps. "I don't listen to

—CONTINUED ON PAGE 228

### BOOK REVIEW

## LES PAUL: AN AMERICAN ORIGINAL

by David Schwartz

Recording industry history buffs will find much to discuss in Mary Alice Shaughnessy's recent biography from William Morrow & Co. The *People* magazine staff writer pieces together long interviews with Les, as well as with many of his friends and other observers, to chart his fascinating life as the first artist/engineer to achieve stardom on both sides of the control room window.

Although Les might bristle at some of the sordid details Shaughnessy comes up with, her mural of The Legend's life is both colorful and extensive. At its best, the book provides rich new insight into the

man who, especially throughout the '40s, shaped much of what the recording industry would become.

She recounts the story of Les' obsessive pursuit of his career vision: "Les was determined to increase the range of musical colors on his discs, to paint pictures in sound. He placed microphones within inches of—or in some cases, inside of—the instruments he was recording and cut tunes over and over with different microphone arrangements. Feeding his amplified guitar directly into the mixing system, he simulated the sounds of various instruments by altering the recording speed, sometimes synthesizing entirely new ones. He created odd percussive effects by drumming on top of the

guitar with his hands. And he enhanced the sound of other performers by miking them separately, which gave him greater control in the mixing process."

Although no technical details are included in the book, this is the first extensive view of Les Paul's remarkable and important career, and it deserves a read. ■



PHOTO: RICK GOULD

The inimitable Les Paul



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World Radio History

—FROM PAGE 212. SMASHING PUMPKINS

Dipping into clippings in the alternative music press, I learned about the troubled relationship between Corgan and his very talented bandmates—guitarist James Iha, bassist D'Arcy Wretsky and drummer extraordinaire Jimmy Chamberlin—and about the infantile sniping and hipper-than-thou posturing that's gone on between the Pumpkins and other groups in the Chicago scene. (Yawn. What we need is an "alternative" to bratty, arrogant bands and fans who refuse to respect the taste and ideas of people outside their narrow cliques.)

What hooked me on *Siamese Dream* was Smashing Pumpkins' incredibly hip sense of musical dynamics—the way songs ebb and flow, the way one song might build to a noisy peak that sounds like an entire universe of guitars exploding, and then drop down to a near-whisper where what we mostly hear is the tapping of a cymbal-top or a clear, simple bass line. The richly textured tapestry that the band creates encompasses the ferocity of the toughest riff-heavy hard rock *and* spacey, ethereal passages that have a strange, hypnotic quality. Corgan's lyric themes—when you can decipher them, since he's purposely kept his vocals low in the mix much of the time—are sometimes despairing or foreboding, yet his music often strikes me as both exultant and triumphant, as if it transcends the personal pain and frustration his words often express.

Like the band's first album, this one was co-produced by Corgan and Butch Vig, who's become a mini-celebrity himself by virtue of his excellent production work with Nirvana, Sonic Youth and a few other bands. *Gish* was recorded mainly at Vig's own Smart Studios in Madison, Wis., but for *Siamese Dream*, "the band and I both wanted a different environment," Vig says. "They didn't want to do it in Chicago because they're from there, and I didn't want to do it in New York or L.A. because I'd done records in those cities recently. So we looked around for a place that was more isolated but still urban, and Atlanta was one of the cities at the top of the list. I'd heard some good things about Triclops there, and we checked it out and liked it a lot. I love working on Neves, and that's a

particularly good one they have, and the staff is great."

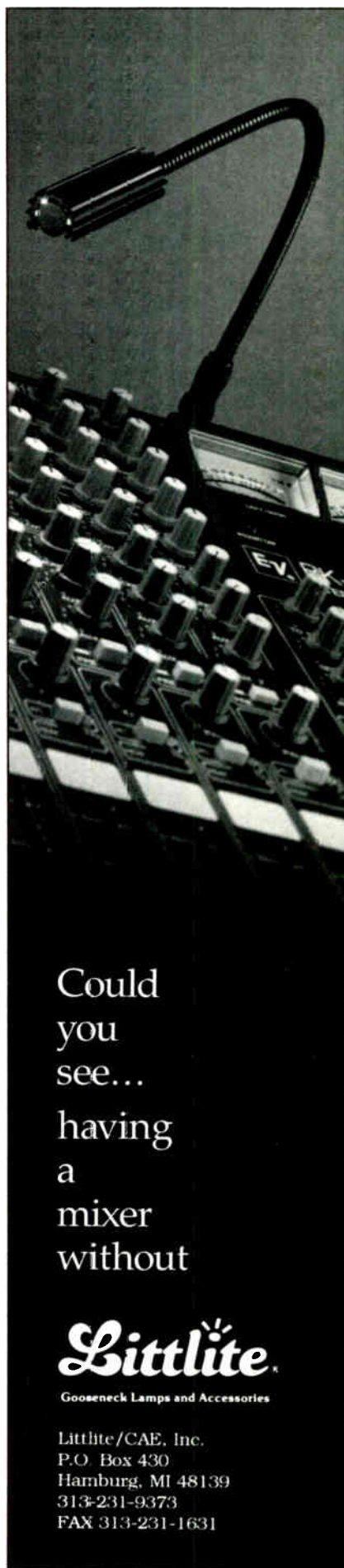
Indeed, Triclops has probably been the busiest rock 'n' roll studio in Atlanta over the past year, hosting the likes of Yngwie Malmsteen, Allmans guitarist Warren Haynes and the Pumpkins. Triclops staff engineers Mark Richardson and Jeff Tomei worked with Vig on the Pumpkins sessions, and both readily sing the praises of the band and producer. Comments Tomei, "Butch and the band had a real good working relationship. He's the consummate producer-engineer—really informed—he knows what he wants and how to get it. It was four months of real intense recording, and the last month pretty much turned into a seven-days-a-week marathon."

"When we made the first record," Vig reflects, "they had all the songs pretty much done and had played them quite a bit, so the arrangements were pretty much fleshed out. On that record, we were just trying to capture the sound of the band for the most part. When we went into this record, Billy and I decided that we wanted to have the room to leave some things open to work on in the studio. Not that we were going to just screw around, but we wanted to leave the door open to more spontaneity.

"For this record, they just had a couple of band rehearsal tapes and a couple of things where Billy played acoustic guitar," Vig continues. "We didn't want to do these elaborate demos and then go back and try to re-create them, because by the time you do the demo, the spark is gone for the real record."

"I think Billy had most of the ideas for what he wanted in his head," Tomei adds. "He was very explicit about what he wanted. He's an excellent guitarist—he knows it backward and forward—and a lot of the time was spent getting guitar sounds, which Mark [Richardson] is also really good at, and doing these layers and layers of guitar tracks and sounds made by guitars."

"We'd go through all these different combinations of guitars and amps and pedals until something made sense to us," Vig says. "Billy and I have this strange chemistry where we both kind of agree on things. We can listen to 20 sounds in a row, and all of a sudden we look



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up at the same time and say, 'That's it!' Sometimes we might be looking for something that's like the attack of the killer bees, or maybe we want something sludgy.

"Soma" has 26 guitars on it—three or four on the intro, three or four on the verse, and so on. Mark Richardson was really helpful: He had a lot of old amps and pedals and preamps and things," Vig explains. "Like he had this old Magnacorder tape machine that we used like a guitar preamp. We'd plug it in, and it'd have this weird, *thwanky*, distorted sound. He also had this old pedal steel that had this super-crunchy high-end noise, this distortion, that we used on this wall of buzzing guitars (on 'Cherub Rock'). And Billy and James had all these old analog pedals that we'd chain up three or four in a row to try to stretch the sound into some overly fuzzed-out thing for some of the heavier parts."

Corgan's guitar parts (mainly using a Strat) were captured with a single Shure SM57 on his amp (usually a Marshall), "and of course some of the stuff ran through effects," Tomei says. "We used the [Eventide] H3000 and got some odd effects that way. On one song we got a real nice feedback effect by accident, by having an adjacent track in 'record.'" For the bass tracks, the engineering team generally used a Sennheiser 421 or Neumann FET 47 on D'Arcy's SVT cabinet, occasionally combined with some DI for extra punch.

"Butch and Billy wanted to keep the music real intense and in-your-face," Tomei says. "They didn't want to go crazy effectswise. They kept things pretty much the way we tracked it, although there were cool things they did in the mix, doubling vocals and stuff like that."

Vig comments that Corgan "isn't that technically inclined, but he's very articulate, and he's not afraid to take chances. If I'm experimenting with a sound, he's not afraid to jump in and start tweaking knobs. He goes on his gut instinct, which is cool, because a lot of times he might lean over and crank up something, and I'd think, 'Oh no, you can't do that, it's too weird,' and it might end up sounding good."

Two songs stand out as examples where Corgan's open, even serendipitous, approach in the studio paid tremendous dividends. "We cut 'Spaceboy' live with bass, drums and acoustic guitar," Vig says, "and then at the end of the night we were going out to din-



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ner and Billy saw this Mellotron in the corner of the studio, and he got the idea to try that. So he did a couple of tracks of Mellotron completely spontaneously. He's not even a keyboard player, and he made some odd choices of notes, things that didn't sound quite 'right,' but it ended up being great for the song. In fact, James originally played slide on that, but we took it off to make room for the Mellotron."

The song "Disarm" started out as a full band track, "but everyone agreed that for some reason it just wasn't happening," Tomei says. Then Corgan played a simple acoustic version in the control room one day, and the approach changed; Corgan decided he liked the idea of using a string quartet and some percussion on the song. "We got one violin player and one cellist, and then we just stacked a lot of tracks to make it sound full," Tomei says.

Adds Vig, "We sort of went wild and kept adding to it. It probably wasn't the easiest way to do it—we could have scored it out and then hired an orchestra and done it in half a day. As it turned out, it took two long days of recording—getting all the pieces together—and then I spent another whole day editing it. We ended up with something like 40 tracks of strings, which I mixed down to a stereo violin track and a stereo cello track, and then the timpani and bells, which Jimmy played. We used a [Neumann] 47 on the bells and an 87 on the timpani."

Corgan's vocal mic was a Shure SM7 on every song except one, where he used an [AKG] C-12. Not that you can really make out what he's singing half the time. "Yeah, I'm sure that's what the record company is saying, too," Vig laughs when I mention it. "There are songs where I wish we'd pushed it up a little bit, but Billy had this idea that in a lot of places on the record he wanted the vocals to be more part of the band, rather than a voice on top, like on most pop records. You can hear him pretty well on the quiet parts." Besides, we agreed, there's always the early R.E.M. precedent, or the Stones' *Exile on Main Street* for that matter.

Once the four months of tracking at Triclops was completed, Vig took the tapes to Los Angeles' Rumbo Recorders (where the Neve has Flying Faders automation) and brought

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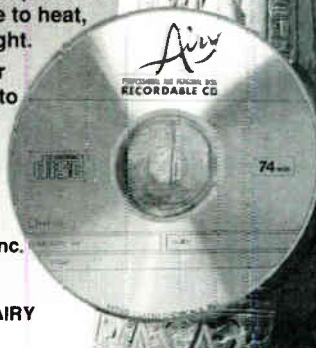
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in mixer Alan Moulder (My Bloody Valentine, the Jesus & Mary Chain) to offer a new perspective on the music. "Billy and I were too close to it and a little burned out on it by the end," Vig says, "so it was great to have someone with some new ideas in there."

Now that he has some distance from the project, Vig says he's very happy with how the disc turned out, though making it was "one of the hardest things I've ever done," he explains. "This band is barely hangin' on. I think they're on the verge of spinning out of control, but in some ways that's what makes them a great band—they're so volatile. They're very intense people, and I just hope they don't explode on the road." ■

## Arlen Roth Shares His Own Hot Licks

Despite four solo albums and a long, successful career as a guitarist supporting everyone from Simon & Garfunkel and Bob Dylan to John Prine and Phoebe Snow, Arlen Roth is probably best known as a guitar *teacher*: He's written seven books on the subject, and he is the founder of Hot Licks Instruction Tapes, the popular video library that contains "lessons" from some of the best



PHOTO: MOREN HAUG

players in the business, including rockers like Eric Johnson (Hot Licks' best seller these days), Danny Gatton, Nils Lofgren and Mick Taylor; jazz greats like Barney Kessel, Joe Pass and Larry Coryell; and country pickers like Chet Atkins and James Burton.

Roth himself is featured on eight of the more than 80 available tapes, covering such topics as "Rockabilly," "Slide Guitar" and "Chicago Blues." And now he's put out a fifth solo album, *Toolin' Around* (on the

**Above:** Øystein Sevåg, Windham Hill Recording Artist

## Artist's Studio: Øystein Sevåg's Norwegian Retreat

You can probably count the number of Norwegian artists who have made the *Billboard* charts on one hand. Yet for the second time in three years, keyboardist Øystein Sevåg scored high on the magazine's New Age chart with an album of his own instrumental music, *Link* (on Windham Hill Records). Much of Sevåg's music does have the sonorous, easily digestible qualities we generally associate with new age (or NAC radio format) music, but there's more to it than that.

"The first album [1991's *Close Your Eyes and See*] was very much my own computer-based ideas after nearly five years with no input from anywhere," he says. "So that was a document of that period of my life. It was me in my studio. ["Norwegian Mood" from that record was a popular NAC choice.] *Link* has a lot more interplay with different musicians. The sax and trumpet are more improvised, like in jazz, and that can be a problem for some American formats. NAC is a very small frame—

**Below:** Arlen Roth and Brian Setzer

—CONTINUED ON PAGE 220



—CONTINUED ON PAGE 223

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—FROM PAGE 218, ARLEN ROTH

Nashville-based Blue Plate label), that is certain to bring him some overdue acclaim. Roth has put together a bright, eclectic set that showcases his own versatility at the same time it offers scorching licks from many of his talented guitar-playing friends, including Albert Lee, Danny Gatton, Duane Eddy, Duke Robillard, Brian Setzer, Jerry Douglas and others.

"The solo artist thing has always been my top priority," Roth says, "but it's also the toughest one to crack. With this [new] record, I had a few ideas I wanted to try out, with

no thought of a deal or a record company in mind. About midway into it, I was doing a lot of videos with other artists, like Duke Robillard and Brian Setzer, and I got this duet idea for my own album. Well, it sparked new life into it—it made my playing stronger and made the album as a whole stronger, and the project attracted more record company attention, as well."

The bulk of the album was recorded at NRS Recording in Hurley, NY, (near Woodstock) with Scott Petito co-producing and manning the board. "It's a great, funky little place out on a farm in the mid-

dle of nowhere," Roth says, "but it's also pretty state-of-the-art. People like Dave Brubeck and The Band have recorded there, and Scott is a really good engineer, as well as a good bass player. I'm real comfortable with him. We did most of it there, and then, after the deal was signed [with Blue Plate] we went down to Jack Clements' studio in Nashville, which is a real downhome place. Jack was the original engineer on the old Sun records, and he's got a helluva engineer named Dave Ferguson. We did three tracks down there: One with Albert Lee, one with Duane Eddy—this cool, moody blues I wrote just for him called 'Quarter to 12'—and one with Jerry Douglas and Sam Bush. Then we mixed with Scott back at NRS."

According to Petito, the recording was relatively straightforward: "We didn't use that many tracks. Mostly it was two guitars, bass and drums, so usually I had tracks to spare. This is a pretty classic record in a lot of ways. We used very little processing—usually just a little delay on the guitar, and some nice room sounds." For the guitars, Petito generally used either Shure SM57s or Sennheiser 421s. "On a couple of songs, I also used a room mic or two—U67s—that I'd blend in a little, and then beef up that ambience with some Lexicon 300," the engineer says. "There was nothing tricky involved."

I ask Roth if his deep involvement in teaching and instructional videos had made it more difficult for him to assert his own style. "Not at all," he replies. "My style was formulated so long ago that I'm not that affected by things I hear now. Sure, I might get a little trick here or there—like when I did a video with Tuck Andress, I spent a couple of months after that trying to sound like that, which is impossible, of course. Same thing when I worked with Eric Johnson and Steve Morse. But I try to be very stern about holding my own style. People say, 'Gee Arlen, you play so many styles,' but I don't think of it that way. I think I play one style—me."

"You can tell that this record was made in this period of my life," he adds. "You can tell there's a lot of blues influence and a lot of country influences, but there was no attempt to be either obviously blues or country or any of those things. And even though there are all those other

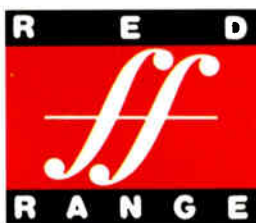
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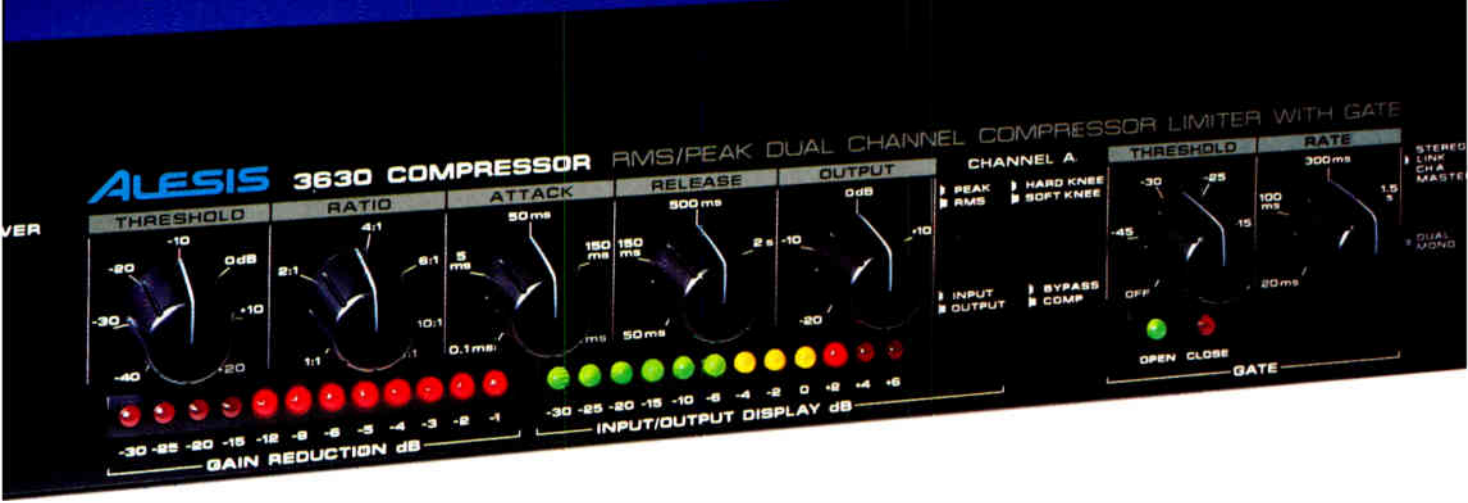
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artists on the record, it still comes back to me. They're playing with me, and I'm always bringing the songs home to where I hear them."

Even if *Toolin' Around* takes off commercially, Roth says he remains committed to Hot Licks, and he's always looking for new artists to capture on video for the series. He'd love to get such so-far elusive pickers as Eric Clapton and Ry Cooder (with whom he worked on the film *Crossroads*) into his catalog of titles, "and of course I think about all the players who are gone who I'd love to have gotten," he adds. "Not just obvious people like Hendrix, but some of the people who influenced me, like Merle Travis and Clarence White. [The video series] is a heavy responsibility because you're not just making something educational, you're documenting a style. And I think that's important." ■

—FROM PAGE 218, OYSTEIN SEVÅG

*everything* seems to be a stretch for them. In talking to radio people, I've heard things like, 'We could play that song except for those two bars where the sax freaks out. It's too edgy.' That's too bad, but I can't let the format dictate where I'm going with my music. And it's not good to calculate too much. Fortunately my record company is behind me."

Sevåg produced and engineered both of his albums at his own studio, Bogen Lystudio, located in an isolated 250-year-old house perched on a fjordside cliff in Stokke, in southern Norway, a couple of hours southwest of Oslo. "I can look out the window and see the water and draw some inspiration from it," he comments. "I feel at home there." As a keyboardist primarily (he also plays the flute on *Link*), "I've been working with MIDI for years, and my studio is built around that. I've used Sequence Plus software from Voyetra Technologies for ten years. It's not necessarily the hippest thing out there, but I know I can trust it. I use a Roland S750 sampler with 80 megabytes RAM, an Akai sampler, Roland JD-800 synthesizer, various older synths, like the Roland MKS70, and some others. I buy and sell [synths] all the time—I find I can't use most of them for more than a couple of years before they sound dead to my ears."

The studio has a 20x14-foot control room "with LEIDE-like architecture," Sevåg explains. "I get very good definition in there." His console is a 24-channel Soundcraft S600, but his principal recorder is an Otari MX-5050 8-track: "So far, it's been enough to have just eight tracks, but I think it's time to get something new. I'm going to look at these new [modular] digital multitracks; the Tascam [DA-88] interests me a lot. Sevåg monitors on Seis speakers (a Norwegian brand) and uses a fair amount of conventional outboard gear, most notably the Lexicon 224XL digital reverb.

As a musician with a serious background in classical, rock, jazz and other music forms, he frankly worries about being pigeon-holed as "some flakey new age guy," he says. "When I look and see what's happening, I see an explosion of rhythm and melody and ethnic music—much more of the human element in music, and not so much machines." *Link*, which features 12 other Scandinavian players (including the noted sax player Bendik Hofseth) is a step in that new direction for Sevåg, and he promises an even more interesting rhythmic approach next time out. ■

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## Guitarist Stevan Pasero: Hooked on the Classics (and Pro Tools)

Stevan Pasero, a brash and (fortunately) very talented classical guitarist/producer/record company owner, makes the rather astonishing claim that he has sold more than a million copies of his albums on his own Sugo Records label. If you haven't heard his name mentioned in the same breath as Segovia, Parkening and Williams, it might be because most of Pasero's sales have come in the often overlooked "gift market": independent retailers who are not primarily record sellers but who do well with seasonal and specialty discs and tapes.

You'll probably find Pasero's works at Tower Records, but just as likely, you'll also see them in a point-of-purchase display at your local gift "shoppe," or at craft fairs all over the country. There's more than one way to skin the retail cat, and Pasero has evidently tapped into the perfect market for his music, which consists largely of guitar transcriptions of popular classical themes (*The Nutcracker Suite, Bolero, Peter and the Wolf*, even Beethoven's Fifth), seasonal collections and his original compositions, which lean toward melodic, borderline-new-age meanderings.

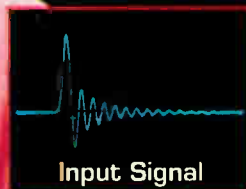
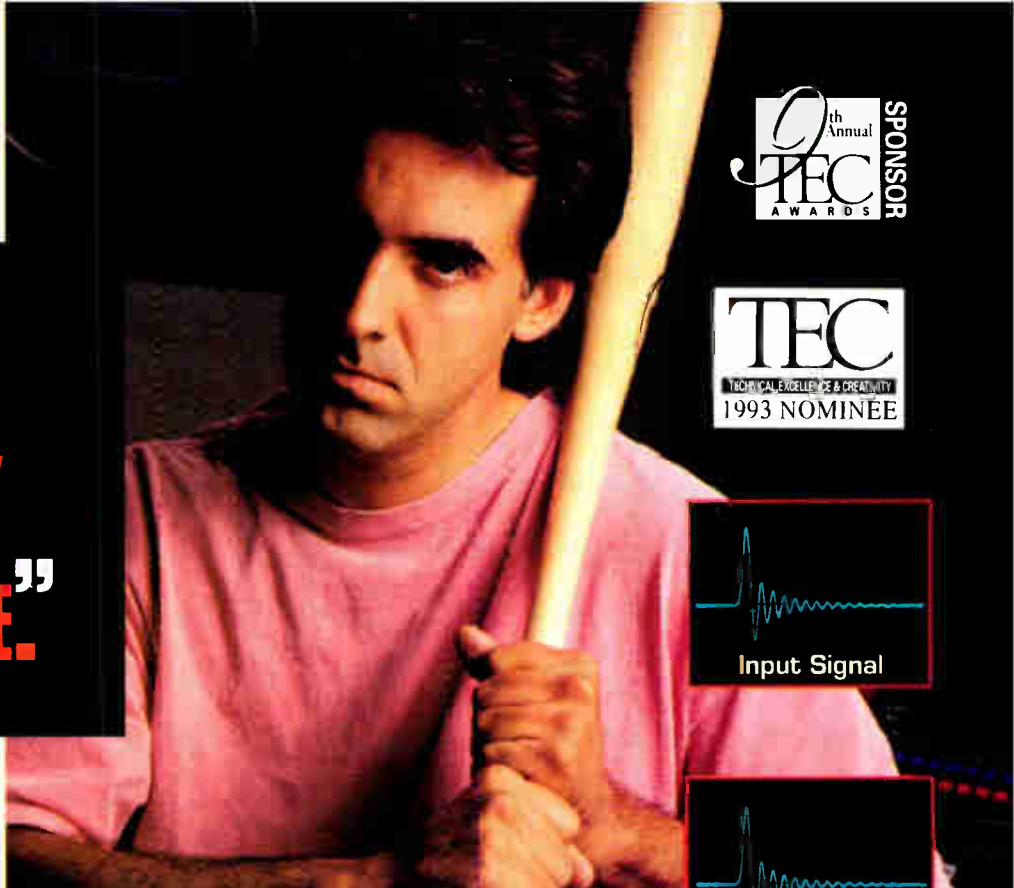
He's as good a marketer as he is a guitarist and arranger, and I don't mean that as any sort of put-down. On the contrary, he's to be admired for making very high-quality recordings that are accessible to many people. The music on Sugo ranges from melodic solo piano to ethnic harp music to guitar-and-flute versions of Christmas carols to symphonic collections of well-known classical pieces. Pasero's own most recent release, *Seasons*, is a pleasing collection of highly melodic guitar compositions backed by percussion and various keyboard patches—perfect for the "adult alternative" market that has embraced Ottmar Leibert and Strunz & Farah.

Besides being Sugo's primary recording artist, graphic designer and business manager, Pasero also produces several albums a year for the label. He is a longtime user of Digidesign's Pro Tools hard disk recording system. In fact, by virtue

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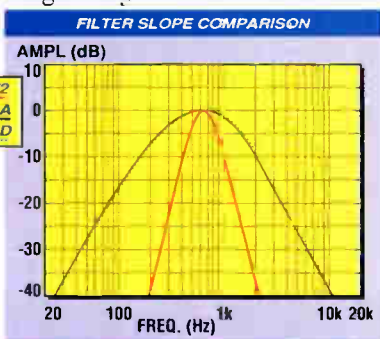
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**Stevan Pasero**

the program. You can EQ, automate and it's expandable. It's the hottest thing out."

*Seasons* was recorded in three different places using Bond's 6-foot-high portable rack, which includes Pro Tool 2.0, a Quadra and a number of Bond's favorite effects. The day we

spoke, Pasero was about to produce his first session using Pro Tools 2.0 with 20-bit resolution: a disc he's making with Russian pianist Nina Tostolovskaya called *Romantic Piano*. Other recent Pasero productions include *Enchanted Christmas* by harpist Anna Maria Mendieta, and a jazz piano record by Jim Vajor. "I can't tell you what a difference it's made to have the 2.0," Pasero says. "We can cut and paste in ways we couldn't before, and we have more flexibility all the way around." And you can bet Pasero will be a willing guinea pig for the next Pro Tools upgrade, too. ■

of his long association with Christopher Bock of Digidesign, who co-produced and played on *Seasons*, Pasero has been among the first to try out updates of Pro Tools before they've been marketed. "We were the record that debugged Pro Tools 2.0," he says with a chuckle.

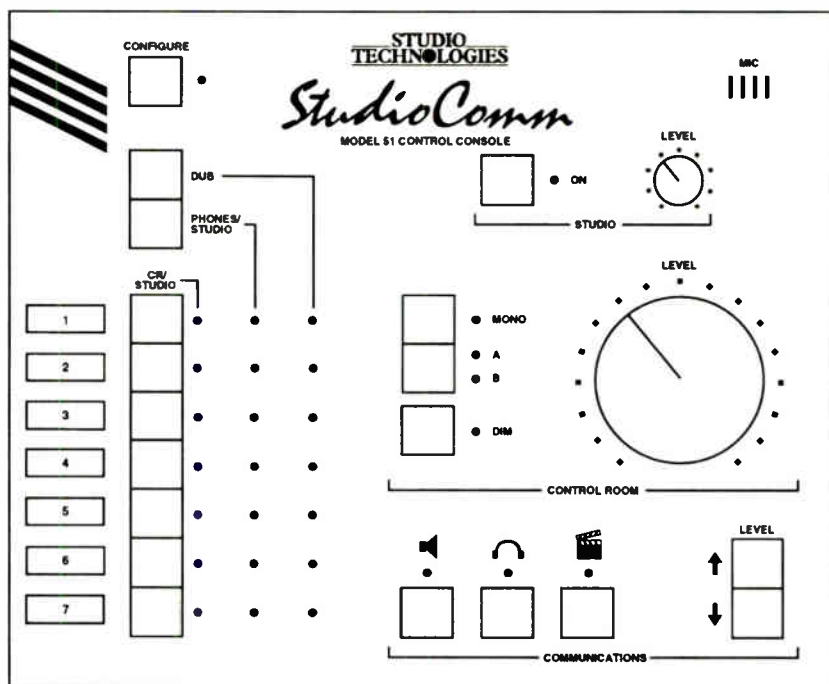
When Pasero and Sugo Records were starting out nearly a decade ago, Pasero did most of his recording at the Music Annex in Menlo Park, Calif. (just south of San Francisco), the studio that helped put Windham Hill Records on the map. There, he formed an alliance with engineer Russell Bond, and together they worked on the best ways to record Pasero's guitar music. "What we came up with," Pasero says, "was we'd put one AKG 460 two to three inches behind the bridge and two to three inches off the board, and another placed around the 12th fret, the same way, sort of perpendicular. These are circumference microphones that pick up classical guitar real well." Pasero plays a Lester Devoe cutaway classical/flamenco guitar.

In his days recording at The Annex, Pasero worked with Bond on the studio's Neve 8036 board and Studer A80 recorder, but for his last few projects they've bypassed the console completely and recorded directly to Pro Tools. "We still use the AKG 460s," Pasero says, "but now we do it through a Summit preamp straight to a I-gig hard drive. We used to use a Macintosh IIci; now we're using Quadras. With the earlier Pro Tools, if it was simple one-pass recording, we used Sound Designer. But if it required more, like if we wanted to EQ something, we'd have to go back and forth between Pro Deck and Sound Designer. Now, with Pro Tools 2.0 we can do all sorts of things without ever leaving

Tool 2.0, a Quadra and a number of Bond's favorite effects. The day we

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by Chris Stone

# THE AES AND YOU

## WHO, WHAT, WHERE, WHEN, WHY?

Sometimes you have to be hit over the head to realize the importance of an event to you and your studio business. Something has to finally register through the fog of day-to-day decision making before you can realize that an important event is about to pass you by. The AES show is such an event: It allows you to find out quickly and simply what is really happening in the recording world.

"I can't afford to go to the show" would be a big mistake. It is almost impossible to estimate the amount of information gathering you can accomplish in just a few days, and the positive effect it can have on your business. The AES show is the place to see, hear, hopefully touch, and be able to discuss the merits of all the new business trends and products being offered with your peers and the manufacturers in our industry.

Maybe you, like me, have always wondered how and where the AES got its start, what it's all about and whether it is an organization in which you should more actively participate. We spoke to Don Plunkett, the Executive Director of AES and one of its first members. He had all the answers.

**The Operator:** How did the AES get started, and who were the founders?

**Plunkett:** The AES was founded in 1948 on the inspiration of Norman Pickering, C.J. Lebel and Ted Lindenberg. Ted was the chief engineer of Pickering, and Norman Pickering was the man who changed the art of record reproduction with the development of a truly high-quality phonograph pickup, which was magnetic. From that point onward, the fulfillment of music lovers' dreams moved ahead, and with it the creation of the "high-fidelity" movement.

After our first year of operation, we had over 500 members. In October 1949, we conducted our first convention with technical papers and an exhibition with 48 manufacturers participating. That was quite an accomplishment for a year-old organization, but not surprising, because

### OPERATOR TIP OF THE MONTH

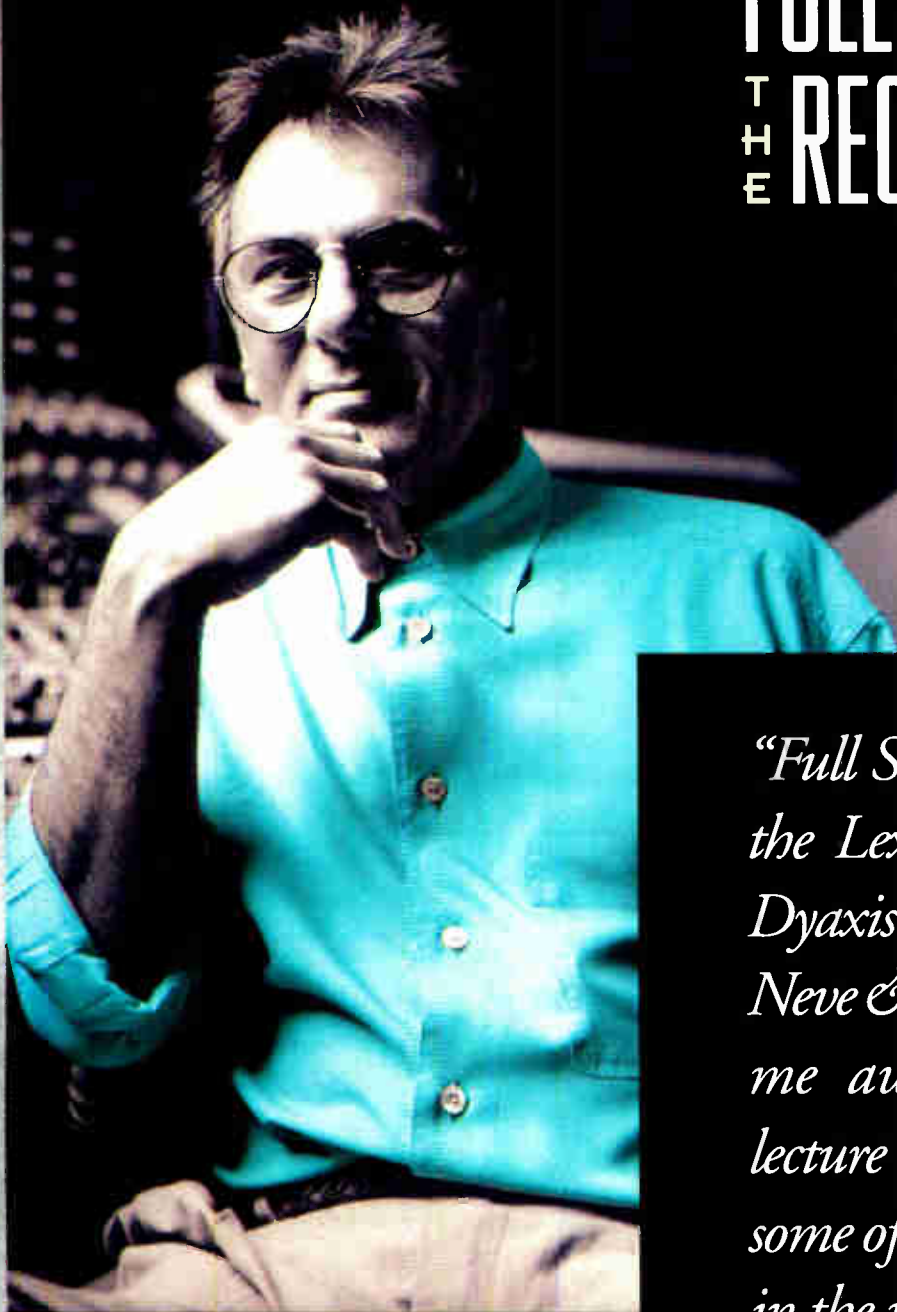
At AES, get your information and ask your questions early in the day when the vendors are fresh. When you are ready to negotiate a deal, do it at the end of the day when they are tired. It could save you money.

the AES was the catalyst for bringing product and manufacturers together for better understanding.

**The Operator:** As it's grown, has the AES changed over the years?

**Plunkett:** Has it changed—Yes! We now have 62 chapters worldwide. The AES convention is now the only place where audio engineers can see, touch and learn of the future. Our conventions are worldwide in scope. This year, for example, we have conventions in Berlin, Copenhagen, Tokyo, Melbourne and our largest convention in New York City in October. We are truly international. Believe it or not, we had members in Russia in the '50s! They are still there, and we have an active

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chapter in Moscow.

**The Operator:** What is the makeup of the membership; who belongs, and what are the age groups you attract?

**Plunkett:** Membership covers all individuals engaged in the recording industry as we know it. In addition to engineers, producers and technicians, we have many musicians with technical expertise and people with computer expertise. The average age of members in North America is 33 and 35 in Europe.

**The Operator:** What are the reasons for joining? How much does it cost? What benefits do you get for your money?

**Plunkett:** AES has always been the fortune teller of our industry, and continues to be. *The AES Journal*, which members of all grades everywhere receive, is a searchlight that shows the path of future technical developments. Over the years, the journal has foretold the developments that have changed our industry and lives: tape, tape cassettes, digital recording, the CD, even the stereo record.

Present dues are \$65 per year in

the U.S. with students being charged only \$35 per year.

**The Operator:** One last question, Don. Why should *Mix* readers care about the AES and the AES show in New York, October 7-10?

**Plunkett:** *Mix* magazine and its readers are good companions for the AES, its *Journal*, our conventions, conferences, and other membership activities such as local section meetings, because they have the same demographics. *Mix* has a wide circulation that anxiously wants technical information, perhaps a little more in summary form than our very technical approach. *Mix* takes the technology of the future as reported in our journal, and our conventions and conferences, and brings it forward to a wide readership in explicit technical terms that are part of the every day audio fraternity.

♦ ♦ ♦

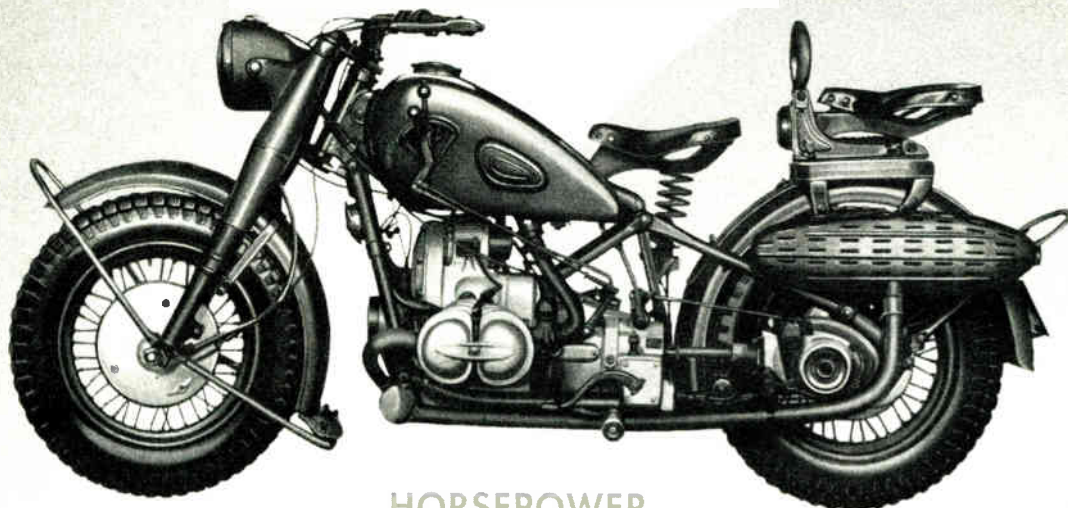
Going to the AES show is serious business. This is truly your best once-a-year chance to see everyone you know or want to know in one venue at one time and be able to solve problems and find new prod-

uct solutions for your studio business. Shop the show. Go there to find out whether that piece of gear you think you want is really necessary or whether there is something better for you at a lower price that you didn't know about. Look at the competitive products, compare the prices, and study the literature. Then make up your mind.

We are a "let's hang out and get to know each other" industry, and that truly applies to AES shows. The drinking and eating areas, lobbies of the show hotels and the manufacturers or trade publication parties and hospitality suites, as well as the exhibit areas of the show, are always full of friendly industry people ready to share their latest find or opinion with you. These are great places to check out your facts and find out new information. We all love this business and need to talk about what we think we know about it. AES is the place. ■

*Chris Stone, a former studio owner, is a pro audio consultant and head of the World Studio Group, an international recording studio agency.*

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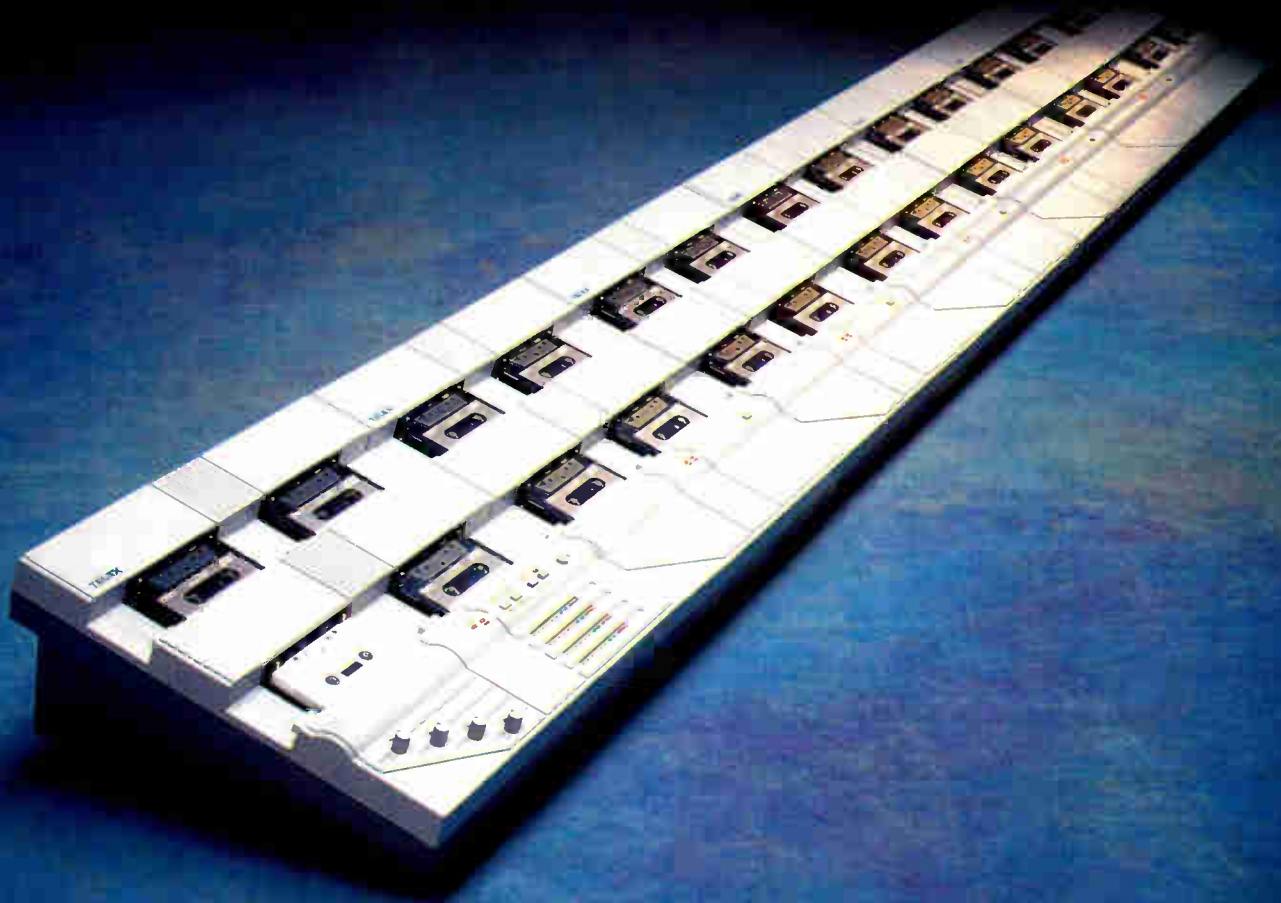
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**TELEX**

by Philip De Lancie

# NEW PRODUCTS

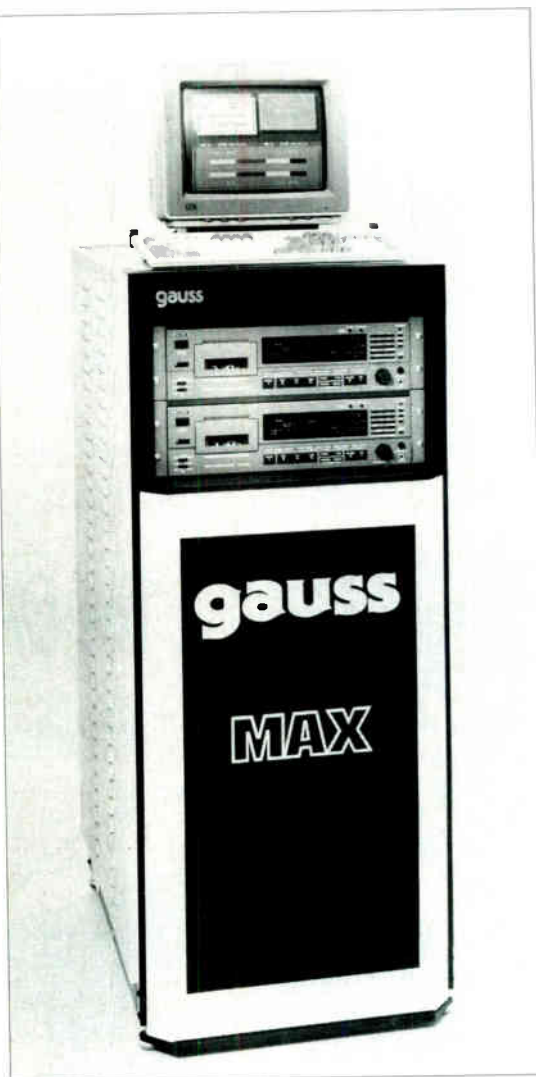
## REPLITECH DEBUTS FORESHADOW AES OFFERINGS

**A**s noted last month, Replitech's combination of seminar and exhibition has established the event as a "must" show for vendors serving the duplication and replication industries. For some manufacturers, the show was so positive that they have decided to scale back or entirely abandon their exhibition space at the AES convention. So it's not clear which of the new products shown at Replitech, some of which will be covered here, will also be available for viewing at this month's AES show.

On the audio duplication side, digital bins were one of the areas of greatest interest at Replitech. Duplitronics was showing its DHS-1 system as well as a DCC bin that the company is building for sale under the Philips name. And with the recent resolution—for the time being, at least—of the Duplitronics/Concept Design battle over patent infringement, the cloud of uncertainty hanging over digital bin technology in general has been lifted. That makes it easier for potential competitors like Gauss, which had been standing on the sidelines, to enter the market.

### MAX FACTS

Gauss had been talking for some time about a bin called MAX (Maximum Audio Xpression). But instead of proceeding independently in competition with existing systems, the company decided to work cooperatively with Concept Design to bring MAX to market. MAX (see photo) will become part of both the Gauss and Concept Design lines in North and South America and will be marketed exclusively by Gauss, along with the rest of the Concept Design line, everywhere else. Concept Design will continue to offer the DAAD-R<sup>2</sup>, which features a user-allocatable "dual memory" allowing the bin to



load and run more than one program at a time.

The core of MAX is similar to the DAAD-R bin that it will replace in the Concept Design line. The machine uses a single-cabinet design, with RAM expandable up to a maximum C-126 capacity. Concept Design plans to sell a C-63 version for about \$100,000. The unit may be set up to run at any two user-selectable duplication ratios from 32:1 to 128:1.





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MAX supports background loading while duplicating. The standard loading configuration, shown at Replitech, includes two Sony PCM 2700A DAT machines for loading both A and B sides at once. Concept Design will also continue to offer high-speed loading (11-times real time) from 1/2-inch VLDS tapes as an option—one that company president Bob Farrow said makes sense for high-volume operations. But Farrow was particularly excited about a new option he plans to introduce soon—loading from CD-R.

Using the CD system, a plant would prepare a master CD on a CD-R recorder in the mastering room. The CD would then be taken to the shop floor, where a bin equipped with a high-speed (four-times real time) CD player incorporating a six-CD changer would load the audio data. Expecting prices for CD-R blanks to drop soon into the \$10 range, Farrow foresees the CD-R option providing a convenient, cost-effective and durable master medium.

### GAUSS' CONNECTIONS

Gauss' main contribution to the MAX system is in the area of interfacing. On the output side, MAX directly drives up to 20 slaves, allowing audio and control hookup to Gauss, Electro Sound, Otari, Lyrec and Tapematic analog machines. It will also support the new Gauss 2440 DCC slave. A standard DCC data bus will be available to feed audio to DCC slaves from other manufacturers. Gauss has also developed an interface to input DCC signals from a Philips DCC downloader.

Like MAX, the Gauss DCC slave has been under development for some time. Its formal introduction at Replitech, and the inclusion of DCC interfacing capabilities for MAX, reflect a shift in Philips' position—announced at the show—from being the sole authorized supplier of DCC gear to encouraging diversity and competition in that market. But the question remains as to whether there is really going to be a DCC market in which to compete.

To Jim Williams, head of Gauss, the assumption shared by many that DCC is a flop seems premature. Williams said at Replitech that he expects the U.S. market for the new format to develop this fall, as cheap-

er and more portable players are available to consumers. However, with existing plants reportedly nearly idle, prospects for a surge in U.S. demand for DCC duplication gear remain limited. But Williams said that as Philips continues the rollout worldwide, duplicators overseas may buy in order to be the first with DCC capability in their markets. So MAX was designed to be usable for analog now, but upgradable to DCC later with the addition of a set of plug-in cards.

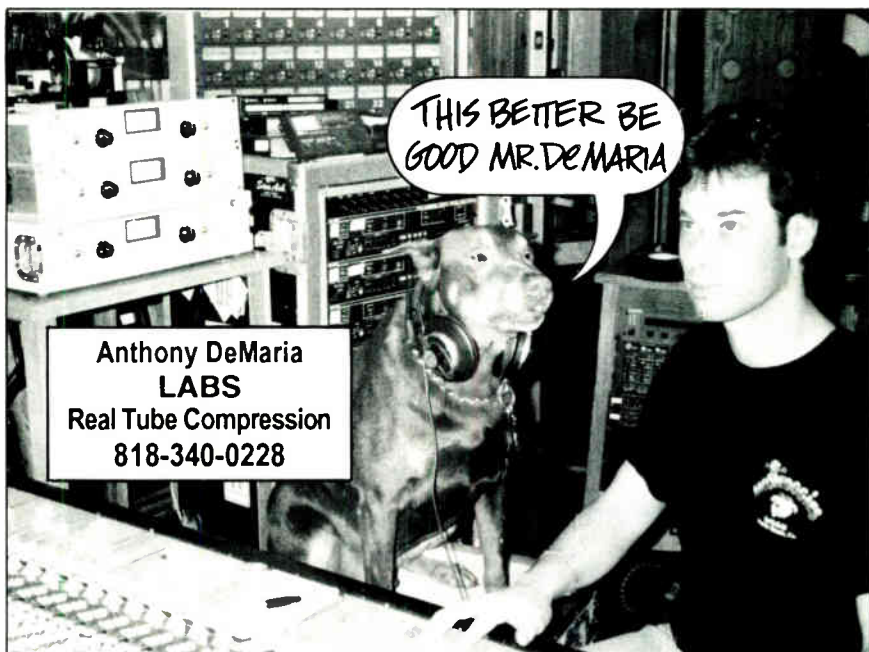
#### DIVERSIFIED OFFERINGS

Digital bins aside, development of new audio duplication gear appears to have slowed—not surprisingly—along with sales of prerecorded music cassettes. Spoken word may be taking up some capacity slack, but it does not seem to be stimulating gear makers to devise new and better ways of making cassettes. It may be that future improvements in the quality of the average cassette will come from more consistent implementation of known techniques and technologies rather than from new innovations.

Perhaps with the above in mind, some audio duplication gear makers have been working on developing or expanding their offerings in other applications; some optical disc-related, others in video duplication. Apex, for instance, the leading manufacturer of on-cassette printing gear, is making a strong bid for the CD-printing market. The company has two new CD-printing systems available. The HSCD-1 is a Letterflex printer incorporating up to four independent print stations to allow full-color process with standard UV-curable inks at up to 100 Parts Per Minute. The CID-63, meanwhile, is a dry offset printer capable of up to three colors at 20 PPM.

As for video duplication offerings, Concept Design was showing a VHS version of its CD-9002 audio cassette loader, dubbed the CD-9002-V. The dual-pancake machine uses a multi-stage nest to ready one shell while winding another. It also uses a deionized air flow to minimize dust.

Tapematic also showed a new video loader, this one targeted for 8mm. Each of the compact model 308 machines uses one of the same pop-in modules found in the company's highly automated Tapecentre 4000, which includes four simultaneous loading stations in one integrated unit. The design will allow a plant that later wants to upgrade to the



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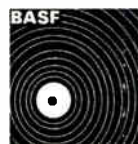


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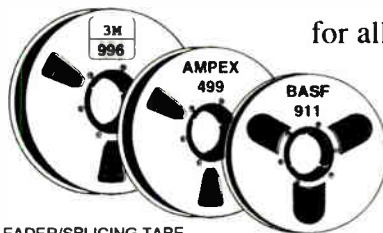
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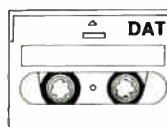
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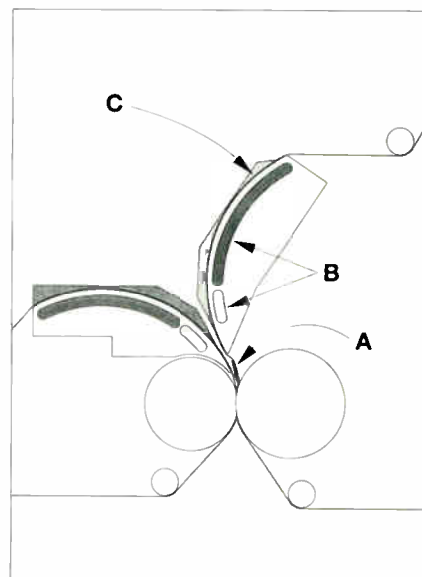
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## TAPE & DISC



**Figure 1: Tape paths in Hightree Media's VT225 VHS Duplicator. The heating element (A) contacts the oxide layer of copy tape, which then contacts the mirror-master tape between the capstan and pinch roller, where the transfer takes place. Tensioning and guidance systems (B and C) allow the copy tape to be recorded in its shell.**

Tapecentre 4000 to put its existing model 308 stations into the Tapecentre chassis. VHS and 1/2-inch versions of the model 308 are also planned.

### HIGHTREE VIDEO DUPLER

Perhaps the most innovative new product on the video side was on display at the booth of video duplication newcomer Hightree Media. The company surprised many in the industry earlier this year by announcing a tabletop office copier-sized machine that will duplicate VHS tape—in shell—at 7.5 meters per second, or 225-times real time. That translates into a cycle time of about 75 seconds for a T-120.

The Hightree approach is based on the same contact-printing principle used in Otari's TMD high-speed duplicators. Chrome tape (chosen for its low Curie point) is heated to the point where its magnetic particles are thermally excited and thus easily oriented by a magnetic field. As the copy tape cools, it contacts a mirror master tape, and the chrome particles assume the orientation of particles on the master (see Fig. 1).

One major difference between the Hightree system and TMD is that Otari uses expensive and energy-in-

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tensive laser technology to heat the copy tape, while Hightree uses a simpler contact-heating element. Another difference is that the Hightree transport is designed to allow duplication in-shell on conveyor-fed cassettes. That makes for a more compact unit that will allow some duplicators to dispense with loading capability altogether.

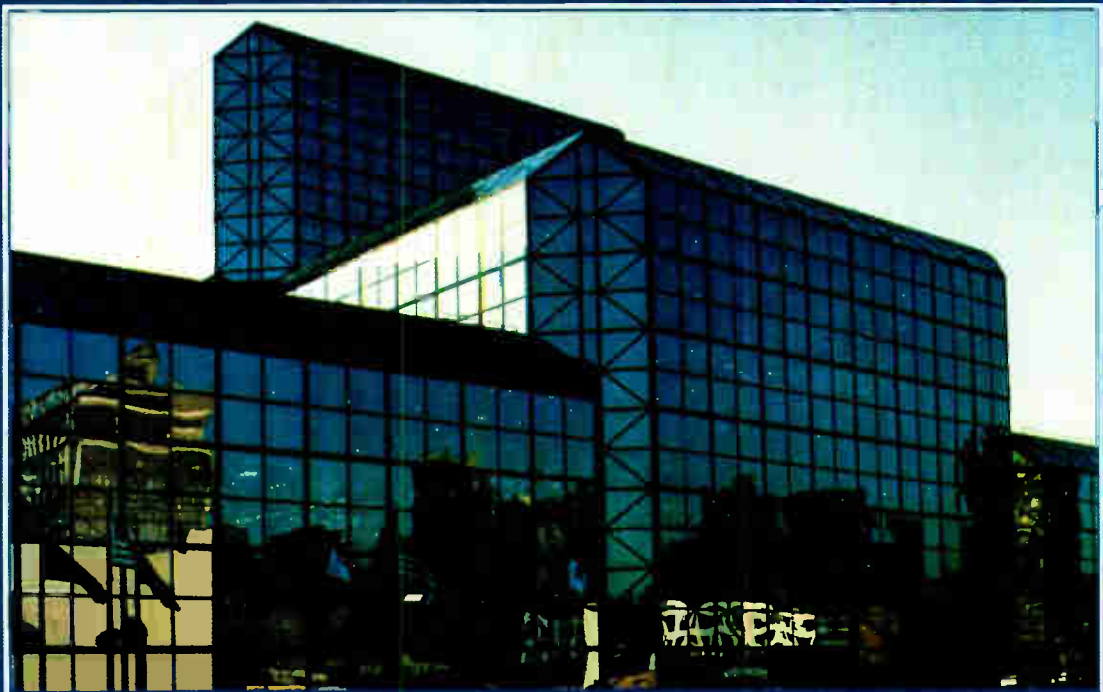
According to Hightree's Tom Burrows, the same decks that are sold to

The Hightree transport is designed to allow duplication in-shell on conveyor-fed cassettes.

record mirror-metal master tapes for TMD have been qualified for use with the Hightree system. But differences in the internal geometries of the record paths mean that the mastering machines will need to be outfitted with different head wheel assemblies. The same will be true of the master recorders for the Sony Sprinter system, which Burrows said are in the process of being qualified. The alternate head wheel assemblies will be supplied by Hightree.

The prototype model VT225 duplicator shown at Hightree's booth was amazingly small: less than one-and-a-half-feet tall with a footprint of about three square feet. The machine was not actually producing tapes, but Burrows claimed the company would be ready to deliver units by the fourth quarter of this year. As for price, Burrows said, "Acquisition cost, whether by purchase or lease, will be far less than for any other system, high-speed or real-time, of equivalent capacity." ■

*Philip De Lancie is a mastering engineer at Fantasy Studios, Berkeley, Calif.*



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# Tape & Disc News

## VIDEO CD FORMAT GAINS MOMENTUM

Philips, Sony, Matsushita and JVC have reportedly reached agreement on a format for distribution of linear (non-interactive) video programming on CD. The Video CD standard will allow up to 74 minutes of video, along with "CD-quality" audio, to be stored on a standard 12cm CD. According to *Billboard*, the format is based on the White Book standard for karaoke CD, which uses the MPEG-1 video-compression scheme.

By coming together on a standard, the four hardware manufacturers add impetus to a growing movement sparked by Nimbus Technologies, which announced a plan several months ago for video on CD. *Billboard* says the new format would be compatible with the Nimbus effort, as well as with the new Full Motion Video (FMV) plug-in cartridge for Philips' CD-I players.

Action on FMV capability for CDs comes as many in the distribution chain for prerecorded video products, from duplicators to retailers, grow increasingly alarmed at the efforts of cable TV and telephone companies to extend megachannel interactive networks into consumer homes. Because CDs can be produced less expensively than tapes or laser discs, they are seen as a potentially vital weapon in the forthcoming battle to defend the lucrative prerecorded video market against cable network intruders.

Until recently, however, it looked as if the use of CDs for distribution of feature films and other videos would have to wait until the competition between various incompatible interactive multimedia formats had played itself out. But the thinking now is that the prerecorded software industry cannot afford to wait, and that what is needed is one universal standard allowing an inexpensive player for video on CD.

Once a single linear video standard is in place, interactive formats could simply be piggybacked on the base platform, either built in or via

plug-in modules. That way, competition between the formats could continue without holding up the overall FMV market. At the same time, movies-on-CD could be the Trojan horse that would finally convince consumers to bring one or another of the interactive formats into their homes. The agreement announced by the four hardware makers testifies to the broad appeal of this scenario.

Some additional notes: A 74-minute maximum playing time is not considered to be a fatal limitation by proponents of Video CD, who don't expect consumers to be overly upset by a brief intermission to change discs. Multidisc changers are obviously anticipated, as well. Nimbus has proposed a system for storing more than two hours on a single disc, but the required increase in data density would mean the discs would be outside of the CD specification, and it is unclear whether Sony and Philips would be supportive of such a move.

Regarding the Video CD-compression scheme, MPEG-1 is already in the process of being superseded by an improved version, MPEG-2. But the prevailing sentiment appears to be in favor of moving ahead now rather than waiting while development and implementation of MPEG-2 is completed.

## PILZ PLANT IN PENNSYLVANIA

German Replicator Pilz has opened an American CD plant and distribution center at Concordville, Pa., a southwest suburb of Philadelphia. The \$12 million facility encompasses 45,000 square feet and employs approximately 60 workers.

According to general manager Martin Mair, current capacity is eight million CDs per year, but long-range plans call for expansion to an output of 40 million. The plant will manufacture both CD-Audio and CD-ROM. Mair says the location was chosen for its proximity to major air and sea cargo facilities, as well as the number of independent record labels in the area.

## SONY BRINGS MD TO MASTERING HOUSES...

A new program to promote MiniDisc to the artistic community has emerged from Sony Software. Recognizing that MD's ATRAC-encoding system affects the way music sounds on playback, Sony is moving away from its original idea that MD masters would be made at replication plants directly from

masters equalized for CD. Instead, the company has initiated the MiniDisc Mastering Station Program to allow artists and producers to work with mastering engineers to optimize sound for MD playback.

The program involves the installation in mastering rooms of a Sony K-1216 MD format converter, which allows the effects of ATRAC compression to be previewed and compensated for in real time. The equalized MD premaster would then be sent to an MD replicator for final glass mastering and disc manufacturing. Mastering facilities will also have the option of using a DOS-based text editor designed by Digital Audio Disc Corporation for preparation of title listings and other text information that may be encoded on the discs for display on MD players. With the editor, the text may be readied without tying up the K-1216 itself.

Four independent mastering houses are participating in the program so far. These include Sterling Sound (New York), Bernie Grundman Mastering (Hollywood), Georgetown Masters (Nashville) and Gateway Mastering (Portland, Maine). Sony Music Studios, the label's recently opened New York complex for in-house use, will be similarly equipped. The company says that "a limited supply" of additional K-1216s will be made available to other mastering houses upon request to Sony Professional Products.

## ...AND TO PERSONAL COMPUTERS

Before Sony introduced MD as a consumer audio format, versions of the underlying magneto-optical technology had been in use for years in data storage for computers. But it was Sony's magnetic-modulation/direct-overwrite technique that made MO feasible for audio recording in the home. Now that same technique is set to return to the world of computing from which MO sprang. Sony has announced the development of standards for MD-DATA, which will bring MD to the desktop as a giant (though tiny) floppy drive for personal computers.

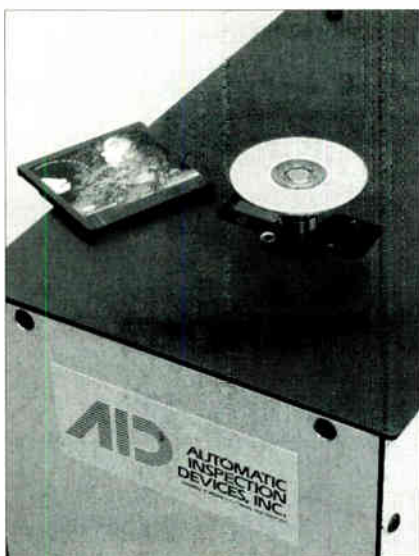
MD-DATA standards are based on those for MD-Audio. As envisioned by Sony, MD-DATA discs will store up to 140 megabytes of information, 100 times the capacity of the standard 1.4MB, 3.5-inch, high-density floppys in current use. Adaptive Cross Interleave Reed-Solomon Code (ACIRC) will be implemented to ensure data

integrity. A platform-independent file system has been developed so that data stored on the discs will be accessible on any computer to which the drives are connected, regardless of the computer's operating system.

Data transfer rate for MD drives will be 150 KB/second. While the rate is far faster than that of floppy drives, it's much slower than the rate for hard drives. Fast SCSI drives reach rates of three to four megabytes per second or more, so MD-DATA will not be viewed as a viable substitute for hard disks.

Even CD-ROM drives, which have been designed to operate at the 150KB/second transfer rate, are now increasingly sold with "double-speed" (300 KB/second) capability. Still, the MD-DATA rate will be sufficient for compressed full-motion video. And the devices will be a wonderful improvement by any measure over current floppy drive systems.

Sony outlines three types of discs that MD-DATA standard drives will be designed to support. Rewritable MD-DATA would have the same function as floppies or any other blank rewritable storage medium. Economies



**Automatic Inspection Devices' MiniDisc System 6-93**

of scale achievable as this segment takes off will help Sony to bring down blank MD prices on the audio side.

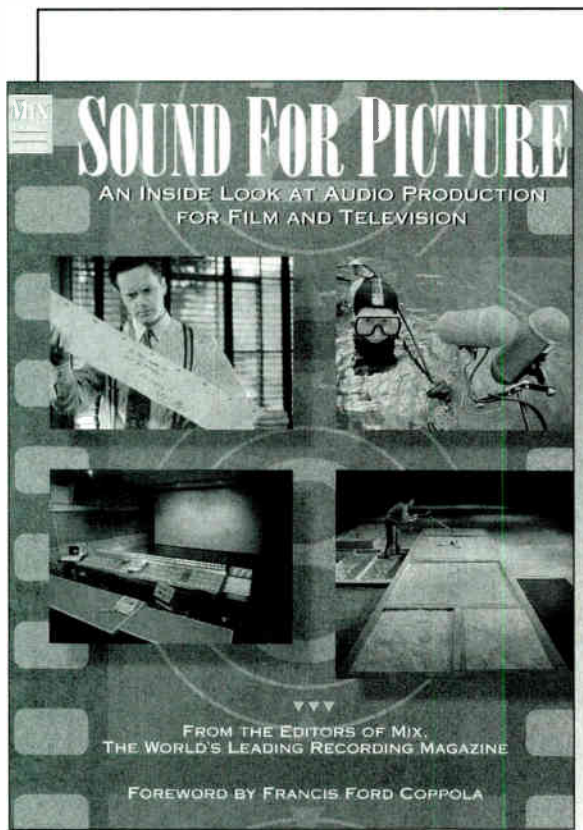
MD-ROM would be replicated at a plant like prerecorded MD-Audio, and could be used to distribute large software programs, electronic books and multimedia. Hybrid MD-DATA would come partially replicated with prere-

corded data, but would have blank recordable areas as well. These could be used for storing user-customized settings, scores for games, or other responses in interactive applications.

Sony's announcement says the company will "offer the new MD-DATA standard to computer and other manufacturers to generate industry support." Given the advantages and possibilities of the format, it seems likely that MD-DATA drives will begin to appear in the market soon, both in desktop computers and in laptops, notebooks, handhelds and other forms of portable computing and gaming devices. Can the MD Walkman PC be far off?

## SPLICES

BASF (Bedford, MA) developed a new duplicating tape for the spoken word market: Dubbed "FERRO," the tape is said to be "a close match" with the existing 619i/919i ferric stock, and an improvement over LNS. BASF's former voice-grade tape... A long-life, ferrite record head for KABA real-time duplicators was introduced by Saki Magnetics (Calabasas, CA). The heads, made of hot-pressed, glass-



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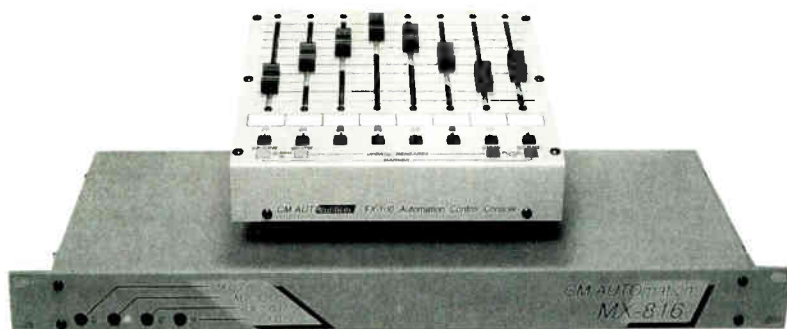
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## TAPE & DISC

bonded ferrite, are said to last up to six times longer than conventional metal heads...Filam National Plastics (Paramount, CA) is adding the C Series box to its line of Norelco boxes for cassettes. Available in clear, black and white, the C Series is targeted as a "cost-effective" product...New pancake tape products from Australia's Greencorp Magnetics are now available through Fujii International in Northridge, CA: XD386 is a super-gamma ferric replacing XD383, while CR230 (replacing CR22) is a premium, chromium dioxide formulation...Versadyne (Campbell, CA) sold a 1500 Series high-speed cassette duplication system to AEI Music Network. The system is AEI's second from Versadyne. In Covina, CA, meanwhile, V-Corporation purchased two new slaves for its Versadyne 1000 Series system...Eastco Pro Audio/Video, whose services include duplication, quadrupled its production, warehouse and office space with a move to new facilities in Buffalo, NY...Automatic Inspection Devices (Toledo, OH) released a new QuickTest feature for the model CD-A optical disc analyzer. The feature allows spot checking of CDs at user-defined intervals and durations. The company also has a new high-speed in-line inspection system for CD printing, as well as three new versions of an in-line inspection system for MD...The QTA Multi-Title System is now available from CD Associates (Irvine, CA). The device tests up to six CDs at once, allowing real-time inspection in one-sixth the time, or simultaneous testing of two or more titles...Optical Disc Corporation (Santa Fe Springs, CA) opened an office in Hong Kong to handle sales of its optical disc-mastering systems...Masterdisk engineer Tony Dawsey worked on Guru's *Jazzmatazz*, while Scott Hull mastered *Soul on Board* for Curt Smith at the NYC mastering house...The soundtrack for *Rising Sun* was mastered for Arista at Rocket Lab in San Francisco...Airshow in Springfield, VA, handled mastering for *Flip City* on Sugar Hill Records and *Off the Record* by Bill Monroe for Folkways...Digital House (NYC) mastered *Flash of the Mirror* from Kevin Locke as well as the *Local Music Showcase* sampler CD from radio station KRFD in Sacramento, CA, released to benefit the Sacramento AIDS Foundation. ■

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—FROM PAGE 82, LAXOIS LIVE

from the last album. [*For the Beauty of Wynaona*] was a little more experimental, and I was kind of responsible for a lot of the sounds.

**How about effects and processing?**

I use the Lexicon Prime Time only for his vocals. I usually use a 100 [millisecond delay time] depending on what kind of slap [echo we're using] or how the song is. Mostly it's the same delays in every room, which depends mostly on how much SPL you push into the room. I have a Korg A3, a guitar effects unit, but I use it on the vocals and drums and get some weird sounds from it. I have certain settings on that piece of gear that I seem to always use. Sometimes I'll look for new sounds.

**Tell me about the Axyx loudspeakers you're carrying.**

It's a self-powered, all-in-one box. I first learned of them at Peter Gabriel's [Real World Studios] during "Record Week," when they bring in all these different ethnic bands. I was producing a reggae act from South Africa called Lucky Dube. I used two of these little boxes—two Axyx wedges—for the whole 15-piece band. I had kick drum in them, and it was amazing the sound coming out of these small boxes. All you have to do is send a line to it. It's very hi-fi sounding. For a club this size [about 800 seats], I use something called the Axyx Source System, which is an 18-inch in each box and then a high-mid cabinet. They're very warm-sounding. Vocally they're just amazing; I get a really clear vocal sound without a lot of EQing. They're out of Holland. They sent me a system to test out, and we bought a couple of small speakers from them. In Europe they supplied us with a whole P.A.

**What about stage monitoring?**

We've been using small Axyx wedges. I have them in the rear for a kind of quadrasonic sound. Usually I use the Source System for the rear, but this club was in mono—they have a single JBL array hanging in the center—and I depend on a lot of delays and stereo images mixing, so I use a Source System in the front and in the rear. So tonight you'll hear effects and vocals coming from the rear of the room. I also have a quad [360°] panner where I can pan the guitar around the room.

**Is that homemade?**

Our tech in New Orleans made the box, and I had it modified in England. And everywhere I go, people think it's cool. I use two sends off the console.

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# White Crow

and I can send whatever I want into it and spin it around the room: echoes, effects, guitars, drums, whatever.

*What's your philosophy for live mixing?*

To get the vocals clear, I use a lot of processing on Dan's guitar. I use some flanging on Daryl's vocal, like on the song "Africa." I even do weird effects on drums, different echoes, just trying to get different sounds. I'm using an Alesis D4 drum trigger, and I trigger the kick drum. And Dan has a trigger on his guitar, which he hits as kind of a talking drum thing. I try to make it as interesting as possible—try to make it different with sounds that nobody has heard.

It's helpful mixing on the bus after the show. It gives me time to experiment with sounds. That's how I came up with a sound, it's called a "Water Flange," on Daryl's vocals on "Africa." I'd been using the sound on Dan's guitar, and just by carrying the console onto the bus, that send happened to be turned up. When I put that track on, I had everything up, and his vocal was already going through it and it was interesting. It's kind of the same in the studio—if you finish a mix, take another song and put it up and leave all the faders and effects from the last song, you'd be amazed that you come up with some interesting things. I don't like normal-sounding things.

*Tell me about your live recording setup.*

We're recording 24-track every night and also DAT. Underneath the console, I've got a Fostex 24-track with Dolby S using Ampex 456 1-inch tape. I'm using API and Neve preamps to go to tape. It's my method of recording preamp-right-to-tape. We have a Peavey console, and we take it on the bus with us, and I mix the shows on the bus right after the shows.

*Can you explain your front-of-house setup?*

I just go direct to tape with all the drums, and I use one of these API 560s on the kick, and I have API preamps I use on the guitar. I don't use the API 550As—I'll use them on the bus just to run the vocals back through. And I have old Class A Neve preamps. The technician for Peter Gabriel stretched them—they were 3-band, and he took a lowpass filter and put a whole new frequency range on the bottom. They sound amazing—I use them on all of Dan's vocals and sometimes guitar. I use all the API preamps for drums and bass. Same with the guitar. I'm



JEFF FORLENZA

**Mark Howard aboard the Lanois tour bus/mobile studio**

using line amps to put it to +4 because it's a -10 machine. And I've got my autolocator on the console.

*Do you guys not like digital?*

We prefer to use analog with Dolby A. We like to use the Dolby for vocal effects: It makes it more breathy and alive.

*What format do you mix with on the bus after each show?*

I record straight from preamps to the one-inch 24-track Fostex. And I also record off the board with all effects onto DAT. Then I mix onto DAT in the bus. But I've already got a mix from that night on DAT, and sometimes that DAT mix already sounds great.

*Are you going to use these live recordings for an album?*

Yeah, we're putting together a live record. Mostly during soundchecks they do a lot of jamming, and it creates different songs. That's how we created a lot of songs for this last record—jams from the tour and soundtrack stuff. We're doing a soundtrack now for a movie out of Canada called *Camilla*.

*Do you have an assistant?*

No, Daniel and I are pretty much a team—in the studio and on the road. The next thing we have coming up is we're going to take a 24-track system and go to Mexico. Daniel's going to do some writing there. We have a portable system: It's a TAC Matchless 36-channel console that we used to record the [Nevilles'] *Yellow Moon* album, Bob Dylan's *Oh Mercy* and Daniel's last record. It lives in a road case. We've got a Studer A80 that fits in a road case. Everything fits in road cases, and we go anywhere we want. ■

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# C O A S T

## L.A. GRAPEVINE

by Fred Jones

Capitol Records had a great party a few weeks ago to celebrate the release of the Beach Boys' five-CD boxed set. They spared no expense. The parking lot was filled with 650 tons of sand, and *voilà*...the Beach Boys played at the beach in Hollywood, just outside the studios where they recorded some of their early hits. Capitol also brought in hamburger and hot dog stands, vintage Woodys and Corvettes, and the nice folks at Paul Mitchell set up a booth to do your hair in "vintage '60s styles."

I mistakenly reported in August that the International Interactive Communication Society was a new group. It is not. The IICS Los Angeles Chapter was founded in 1985. I learned this embarrassing fact from Bob Steel, the IICS past president, who also said that they have just issued a new resource guide to businesses that specialize in multimedia. If you would like a copy, or if you wish to join the IICS, you can reach them at PO Box 6211, Malibu, CA 90264.

Speaking of multimedia, a truly new company (yes, I checked) is Artists for Multimedia (or AFM, but don't confuse it with the union of the same initials). AFM was founded by Ken Rose, formerly with Prosonus (and

—CONTINUED ON PAGE 250

## SESSIONS & STUDIO NEWS

by Jeff Forlenza

### NORTHEAST

Cove City Sound Studios (Glen Cove, NY) has been busy: Color Me Badd stopped in with producer Hamza Lee and engineer Kendell Stubbs to overdub vocals for their upcoming Giant Records release, and popular vocalist Celine Dion was tracking with her producer Ric Wake and engineer Bob Cadway...The Magic Shop Recording Studio (NYC) had Rage



PHOTO: SPARROW



Against the Machine in to cut some new tracks for Epic Records. The self-produced alternative project was engineered by Steve Rosenthal with assistant Joe Warda...Souls at Zero tracked their debut for Energy Records at Baltimore-based Oz Recording Studio with engineer Drew Mazurik and bandmembers/producers Brad Divens and Jay Abbene. The project then traveled to New York City, to mix at Electric Lady Studios with Ron St. Germain...

### NORTH CENTRAL

The avant-garde jazz ensemble of Lester Bowie, Arthur Blythe, Chico Freeman, Kirk Lightsey, Cecil McBee and Don Moye—collectively known as The Leaders—recorded several cuts for their new CD at Chicago's Sparrow Sound Design. The session was engineered by Joanie Pallatto

**Top: At Chicago's Sparrow Sound Design tenor saxophonist Von Freeman (left) tracked his upcoming SteepleChase release with pianist Jodie Christian. SteepleChase owner Nils Winther produced, while Joanie Pallatto engineered the direct-to-DAT sessions.**

**Below: Soundstage 1 Recording Services (Galesburg, MI) recently unveiled its new Studio B. Custom designed by Chuck Burge, SS1's new studio features a Sonic Solutions digital audio workstation for digital audio/video manipulation.**

and Sparrow...At Chicago Trax Recording, Ministry's Al Jourgensen and Paul Barker produced the new Revolting Cocks album, *Linger Fick'en Good*, for Sire/Warner Bros. Grace Production's Critter Newell engineered the first side, and Steve

—CONTINUED ON PAGE 250

# C O A S T

## NASHVILLE SKYLINE

by Dan Daley

Masterfonics installed the very first GML/AT&T DISQ digital mixer core in its mix room, enabling the studio's SSL to control a digital signal. The 64 channels of digital audio were installed in July, and the first session was expected to take place in August, according to Frank Wells, Masterfonics' chief of technical services. In the meantime, the system was being demoed for local engineers, including Tony Shepard, Graham Lewis and John Guess. Masterfonics also added the TC Electronic M5000 digital multi-effects processor and a Lexicon 300, to keep all the effects directly in digital. "We went with this system because it allows the clients to continue working on a familiar control surface," Wells explains.

Soundcheck, a new 57,600-square-foot rehearsal facility in the warehouse district, opened in early August. By far the largest such facility in town, its 80x100x26-foot (8,000 square feet) Studio A was christened with a set by the ever-bizarre Joe Walsh, filling in for Glenn Frey, for whom Soundcheck owner Bob "Norton" Thompson was the guitar tech since the Eagles' heyday. The facility has four studios, offers locker space for storage in between tours, and will have several music instrument sales stores and related independent retail outlets inside its cavernous space.

Thompson had previously been part-owner of Los Angeles' Third Encore (3-E) rehearsal space, which regularly hosted Guns N' Roses, Paula Abdul and Whitney Houston before



**Guitarist Joe Walsh performed a set at the opening of Nashville's Soundcheck, a massive rehearsal facility in the warehouse district. Walsh is seen here with Soundcheck owner Bob Thompson.**

tours and records. Soundcheck will be set up to handle live recordings. The studios are equipped with Yamaha 3000 and Peavey Mark VIII consoles, and JBL, Yamaha and Peavey monitors. John McBride's MD Systems will equip one room as a show-

—CONTINUED ON PAGE 250

## NY METRO REPORT

by Dan Daley

Sound One, a major Manhattan film sound post facility, announced a \$4 million digital audio and video expansion. The company bought three large Neve VR consoles, equipped with custom matrices, to outfit its new identical

—CONTINUED ON PAGE 251

**The control room of Manhattan's Beat On Beat Recording, which opened this summer. Located above Tower Records in Greenwich Village, Beat On Beat features an Amek Angela console, Studer A80 24-track recorder, MIDI tracking capabilities and vintage outboard gear. The new room has already hosted sessions by P.M. Dawn and Blingo Boys.**





—FROM PAGE 248. L.A. GRAPEVINE

earlier, *Mix*), to "bring the best technical and artistic talents to the business of designing, producing, manufacturing and licensing CD-ROM-based multimedia products." Some of the people involved with this company are Jon Anderson, Jeff Baxter and John Arrias.

AFM is currently hard at work on "Show and Tell," a CD-ROM-based game designed to teach children about safety. The National Center for Missing Children will receive a portion of the profits from the sales of this disc. For more information, contact Elizabeth Rose at (818) 999-9356.

Over in Burbank, Forty Four One mastering (where the syndicated radio show *Rockzone* is assembled) just fin-

ished moving into new facilities based around an 8-channel Pro Tools system. For more information, contact Joe Privitelli at (818) 567-4441. The new address is 110 West Alameda Ave., Suite 101, Burbank, CA 91502.

Also in Burbank, Red Zone Studios (located on the former site of Kendun Recorders) added some slick tricks to its repertoire. With the addition of four Timeline Lynx modules, the facility is prepared for any type of session involving synchronization. They are also the proud owners of the Timeline Console Control Unit and System Supervisor.

This new setup will allow Red Zone to lock up dual 24-tracks, a 3/4-inch video machine and a 4-track. The system also talks to the Flying

Faders system they have, which makes for "a joyous mixing experience," according to manager Candace Corn.

Composer (and Tangerine Dream alumnus) Paul Haslinger opened a new facility to the public. It's called the Assembly Room, and it gives Haslinger a place where he can offer his services for album production, film scoring, music for new media and sound design. The Assembly Room is a unique space with an open loft feel, yet it puts you within an arm's reach (or MIDI reach) of just about every vintage of synthesizer known to man. The Assembly Room is located in a commercial building at 606 N. Almont Dr. in West Hollywood. ■

—FROM PAGE 248. SESSIONS & STUDIO NEWS

**Spapperi** and **Paul Manno** engineered the second side of the record. **Critter** also produced and engineered the latest album from New York-based industrial band **Chemlab**, *Burn Out at the Hydrogen Bar* on Metalblade/Warner Bros., at Chicago Trax...

#### SOUTHERN CALIFORNIA

Soul diva **Diana Ross** was at Burbank's **The Enterprise** with guest singer **Luther Vandross**. Producer **Nick Martinelli** and engineer **Humberto Gatica** were at the board... **Sting** checked into **Paramount's Studio B** in Hollywood, to record and mix a remake of the **Police** song "Demolition Man" for the soundtrack of the **Sylvester Stallone** movie of the same name. The track was produced by **Stoker**...

#### SOUTHEAST

Nashville's **Sound Emporium** had **Willie Nelson** in with producer **Grant Boatright** and engineers **Tom Hitchcock** and **Ken Hutton** as they worked on tracks and overdubs for an upcoming album...The **Seldom Scene** were at **Bias Recording** (Springfield, VA) mixing their latest **Sugar Hill Records** release. This is the first recording project for the acid-grass band since **John Starling** returned to the band. **Billy Wolf** engineered and co-produced with the band on the project...At **Criteria Recording** in Miami, **Allman Bros.** Band guitarist **Warren Haynes** worked on a single to benefit the

homeless. **Haynes** was joined in the studio by keyboardist **Chuck Leavell** and vocalists **John Popper** (Blues Traveller) and **Chris Barron** (Spin Doctors), as engineer **Patrick Levinsohn** worked the SSL 6000...

#### NORTHWEST

Flamenco guitar virtuoso **Juan Serrano** recorded his latest **Concord/Picante** release at **Maximus Recording Studio** in Fresno, CA. Engineer **Jeff Hall** used live and multitrack techniques to capture the flamenco magic for **Serrano's** CD, *Blazing Guitar*...In **Redmond, WA**, **Triad Studios** had **Da Broz**, a new Seattle-area band, in recording and mixing a four-song EP with producer/engineer **Tom Hall**. **Hall** also mixed demos for the next **Queensryche** release...

#### SOUTHWEST

**2K (Two Kolors)** were at **Adobe Recording Studios** (El Paso, TX) laying down instrumental tracks, and then they went to **E.B. Recording** (Las Cruces, NM) to overdub vocal tracks for an album called *Kickin' Ass*. **Edmundo D. Arvizu** produced the sessions for the **Didier Music** label with **Tres Stahmann** co-producing and engineering...

#### STUDIO NEWS

Nashville's **House of David** upgraded its room and added an **API 32-input** console and **DynAudio Acoustics** monitors, according to chief engineer **Tom Hitchcock**...Also in Nashville, **Emerald Recording** has a

new studio manager: **Nick Sparks**, formerly assistant manager, was moved up after the departure of **Anthony Little**. ■

—FROM PAGE 249. NASHVILLE SKYLINE

case for its tour systems.

As reported here earlier, **Alan Sides**, owner of L.A.'s **Ocean Way** and **Record One Studios**, is proceeding with plans to build a new recording facility in Nashville. The original site, the old **Tony Alamo** church on 17th Avenue, is now owned by **Sides**, but construction will take place first at a nearby site—the former **St. Bernards**, a 63,000-square-foot church and school complex on 3.5 acres. It will house two studios, the larger being 85x50 feet with a 27-foot ceiling and five iso booths. The console will be a heavily modified, all-discrete board based on an older **Neve Class A** design. Studio design is being done by **Ocean Way** itself. Construction was slated to begin in August, and **Sides** predicted completion in about six months.

Speaking of Los Angeles, **Chas Sanford**, the lightning rod for the **HARP** controversy in L.A. three years ago, has set up shop on the Row. He's taken over a house at 52 Music Square East, once used as a studio by **Crystal Gayle**, and made a few physical changes to the room. **Sanford** is aiming for a high-end mixing facility with his **SSL G Series** and two **Otari DTR-900-II** decks, for the first

64-track digital package in Nashville.

The peripatetic Sanford moved here from L.A. earlier this year after first trying Hawaii, where Mother Nature refused to cooperate and a hurricane destroyed his Secret Sound Hawaii. The present Secret Sound Nashville on the Row will give way to a larger complex Sanford is anticipating sometime next year. Neil Grant has been hired to draw up preliminary designs.

Sanford says the HARP issue literally drove him from Los Angeles, after the L.A. zoning board threatened to prosecute him for operating a recording studio from his home. Tens of thousands of dollars in appeals and legal bills later, Sanford settled the matter with a \$400 fine and his agreement to suspend the home studio's operation. This time out, Sanford is going the full commercial route and keeping a smaller studio for personal use at his home in Franklin. "I took the fight as far as I could," he explains. "But the bottom line is that you can't stop technology. I've been on both sides of the issue." ■

—FROM PAGE 249, NY METRO REPORT

mixing theaters, which can each handle mag or digital audio. In addition, Sound One bought ten Sonic Solutions workstations and is linking them with the SonicNet LAN, and all three mixing rooms and edit suites will have Sonic Solutions' No Noise systems. The upgrades are expected to be completed by the end of the year. Currently, Sound One has 70 editing suites and nine theaters in its two-acre-equivalent facility in the Brill Building on Broadway.

Chung King Studios is doing a major upgrade. Original designer, Frank Comentale, restructured the two main rooms, and owner John King moved a new 64-input SSL G-Plus console with Ultimition in, replacing the Neve V3. The other room keeps its Neve VR60. And the MIDI room is being converted to a tracking/mixing room, which will eventually hold a built-from-scratch Avalon Class A console. Martech electronics were also added to the studio's EMT plates.

While King is happy with his Chinatown location and his mainly rap and R&B clientele, he's actively looking for another large space in Manhattan to build a rock-oriented room.



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"A real old-fashioned rock studio with a multiformat console," he says. "Still in the downtown area."

I.N.S. Recording isn't going out of business, as the rumors would have it. Owners Ian and Debbie North are splitting up—their marriage and their business partnership—and are looking to sell the Murray Street studio as an ongoing concern rather than piecemeal, according to studio manager Trude Kay. I.N.S. was one of the first and most significant rooms in New York's rap, house and other subtypes of urban/contemporary music. The two-room facility has a custom MCI console with Optifile automation and a Soundtracs board. Lease is negotiable, and the ask is in the low to mid-six figures.

Presence Studios opened in September in Westport, Conn. The two-room facility was designed by Russ Berger and sports two SSLs: a 4056 G Series and a 4048. Both are tracking rooms, according to owner Jon Russell. Aside from being able to fish off the parking lot, Russell says the main attraction for him in Southern Connecticut is that most of the upper strata of New York's production talent base lives there. The neighborhood includes producers such as Mike Chapman and artist Michael Bolton.

Also in the nutmeg State, Sonalysts Studios has opened two soundstages—7,000- and 5,000-square-foot, respectively—at its Waterford location, designed by Universal Studios and with a noise rating of NC-15, even with 75 tons of air conditioning going full-blast. Sonalysts is a defense contractor, analyzing sonar acoustics for the U.S. Navy, which has a major submarine installation at nearby New London. Appropriately, the studio participated in sound effects editing for *The Hunt for Red October*. Sonalysts already operates a Soundcraft- and Sony-equipped analog and digital recording studio there—originally started to furnish Navy training tapes. Company VP Ralph Guardiano says Sonalysts plans to aggressively market itself to feature filmmakers, and talks are ongoing with Disney, among other studios. Its location, far from Hollywood or Orlando, is offset by the substantially lower rates Sonalysts can offer, according to Guardiano. "The studio is already paid off," he notes. There's your peace dividend. ■

## STUDIO SPOTLIGHT

### Philadelphia's Studio 4

by Jeff Forlenza

If you were alive last year, and you listened to the radio every so often, chances are you heard songs recorded at Philadelphia's Studio 4 Recording: "End of the Road" by Boyz II Men and "Jump" by Kris Kross are the specific songs I'm alluding to—one set records for longevity at Number One on the *Billboard* charts, while the other was constantly on the air when the other wasn't. Another sales phenom by the name of Cypress Hill came along in their blunt-smokin', hard-rappin' way and blazed up the charts with their Platinum debut and their straight-to-Number-One followup album, *Black Sunday*, which were both tracked at Studio 4. In fact, last year, the Philly facility was responsible for recording albums with combined sales of some 22 million units.

More than 15 years ago, Studio 4 started as an 8-track demo studio. The Nicolo twins, Joe and Phil, started recording at the heady age of 13, when they would record demos of local bands. While in college, the boys built their first studio, Attic Studio, an 8-track facility in their parents' attic in Wayne, Penn. Dave Johnson was the manager of a band that recorded a tape at the Nicolos' small studio, and during that project, a bond was developed, and the trio dreamed of pooling their resources and upgrading the studio. Two years later in 1980, they moved to Philly and opened Studio 4.

When they decided to move to Philly, Studio 4 enlisted industry veteran Tony Bongiovi to help design their new studio, and it is the only other studio Bongiovi designed besides his Power Station in Manhattan. Bongiovi gave the parameters for the studio design, and then they set about building a studio. Dave doing construction and Phil doing wiring.

One of Studio 4's first claims to national fame was a Philly band called The Hooters. "They recorded their first album here, and that really got the whole ball rolling," says Dave Johnson. Those early Hooter records not only gave the band a national reputation but also attracted musicians to the studio from afar.

Today, Studio 4 is a fully automa-

**All at Studio 4 Recording in Philadelphia, PA, producers Joe Nicolo and DJ Muggs of Cypress Hill, at right; below: engineer Phil Nicolo and producer Dave Johnson mix a song for Dandelion, Ruffhouse's first rock act.**



PHOTOS: MARK SCHULZ



ed digital (and analog) 24- and 48-track facility with digital editing, mastering and MIDI production capabilities. Studio 4 has two recording rooms: The A room has a classic Neve 8048 (36x16x32) board, and the B room has an SSL E/G Series (56x32x56) console. But Studio 4 is much more than the sum of its equipment list.

"It's never been the equipment, although we have the equipment necessary to make great records, as evidenced by the people coming here because of the equipment," Johnson explains. "But the number one reason for our success is the people who work here. There definitely is something that goes on here that's intangible. It's not that we've got a Neve console and Studer machines—a lot of people have that—it's definitely a magic that exists here and an atmosphere that allows people to make great records."

Another reason for Studio 4's success is the pursuit of talent through Joe Nicolo's record label, Ruffhouse Records. Joe Nicolo decided to start a label with his friend Chris Schwartz when he saw the success of other startup labels in Philly, like Pop Art,

which scored nationally with DJ Jazzy Jeff and the Fresh Prince. When it came time to find a distribution deal, Studio 4's allegiance with The Hooters was again an advantage, as the Hooters' producer Rick Chertoff helped them secure a distribution agreement with Sony. Then it was only a matter of time before the stable of talent the Nicolo brothers and Johnson had worked with would hit it big—when you're tracking the likes of Cypress Hill, Kris Kross and The Goats, you're gonna sell records.

When we spoke during the last week of August, Studio 4 had the Number One and Number Two spots on the R&B charts: *Black Sunday* by Cypress Hill and *Da Bomb* by Kris Kross. Not bad for three guys who grew up together and wanted to start a studio. "It's amazing," Johnson admits. "We can't believe it ourselves. We started as an 8-track studio, just like anybody else. We had dreams just like everybody else does, but the stick-to-itiveness that allows dreams to come true is what allowed this one to come true. We're living proof that with hard work, perseverance and love for the music, it can be done." ■

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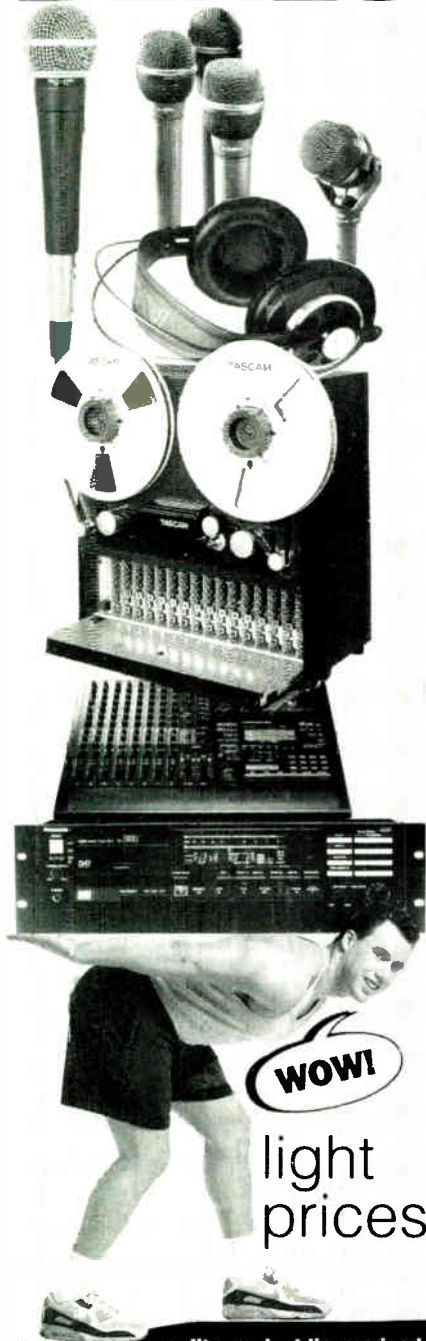
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—FROM PAGE 118, LETTERMAN

neath the apron of the stage using similar components. The speakers addressing the balcony are three pairs of Clair R2-DP enclosures, a passive two-way speaker with a 2-inch compressor driver, a rotating horn and 12-inch cone transducer originally designed for the parade route in Disney World's Magic Kingdom. The house voice sound is controlled from a box built onto the balcony's right side with a pair of Ramsa WRS-840 consoles.

These three systems are designed to convey the voice portions of the audio to the house. Music is addressed with two piston arrays of three-high horizontally mounted enclosures dead hung with a Clair Brothers infrastructure rigging, this combination also being a first for Clair. The monitor system onstage is a standard Clair-issued touring rig with a baker's dozen of 12-AM units (Dave uses one himself) and Clair R-2 units supplemented with an ML-18 subwoofer system. The band's sound is controlled by a pair of Yamaha PM-4000 consoles mounted on the balcony directly in front of the band position and operated by house music mixer Larry Zinn.

Other interesting audio points include several A/B splitter boxes located around the theater, providing raw audio feeds to the consoles for when the peripatetic host goes off to annoy citizens in the streets around the theater. If he gets too far afield, a complete ENG-type video and audio rig is waiting. And a Telos Delta 100 telephone coupler is behind broadcast production mixer Irv Elias' station to convert Letterman's crank calls to broadcast. "The mouthpiece has been removed from the phone at his desk, and the Telos system gives you 40 dB of isolation between the phone output and input to eliminate feedback," Elias explains.

*The Late Show with David Letterman* will debut on August 30. In an ironic coda, around the same time that the Ed Sullivan Theater was being renovated for Letterman, NBC was installing a pair of new SSL consoles for Dave's replacement and former writer, Conan O'Brien. But for all that's going on in anticipation of the new show, Michael Delugg perhaps summed up the feelings of everyone involved when he said simply, "I'm psyched. I can't wait for this to hit the air." ■

—FROM PAGE 64, RUDY VAN GELDER

nice jazz session with Bill Evans and a symphony orchestra, with Klaus Ogerman conducting, for A&M.

*What does the future hold for your studio? New equipment or any expansions?*

New equipment, yes. Always. That's part of the evolution of the profession. And I'm always very much interested in that. As far as expansion, no. I have no desire whatsoever to expand the size of my operation. I don't believe the client base supports that, and I don't believe that the market for the type of music I'm doing here warrants it.

*Are you as excited about your current jazz sessions as you were in the early days of your career?*

I feel excited about the jazz musicians that the producers bring to me. Every session I do is important. I put as much excitement and effort into the projects I do today as I did then.

*Do any musicians stand out in your memory as great people to work with?*

Of course, everyone asks me about John Coltrane, and yes, he was great to work with. And Miles was great to me. That personality you got to know in later years after he left and went to CBS—he was not that way in Hackensack at all. He was very, very straight-ahead. He was a great musician, and he had a great band that he would bring in to play with him. Of course, Art Blakey. And Horace Silver; I spent hours and hours with Horace. Horace is a very-much-together person. Bud Powell is another pianist that I really liked to record—the few things I did with Bud I remember.

*Over the years of recording with such great musicians, what has been the most gratifying thing for you?*

This happened the other day: I was doing a date here, and the trumpet player was here playing, and I had recorded him a couple years ago, and he came in and he said, "Rudy, that record that you did with me is the best thing I've ever done." That's the most gratifying thing, and I hear that all the time. It's just so great. Freddie Hubbard said that; Horace Silver said that. When a musician of that stature says that I recorded them better than anyone else, that makes everything worthwhile, no matter what else happens. There's nothing better. ■

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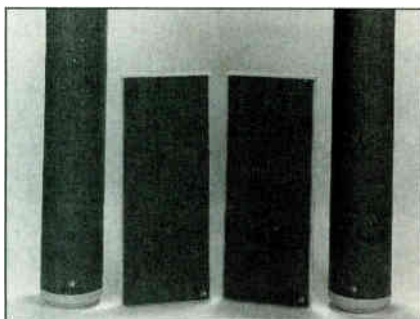
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Project Studio Acoustic System

**ACOUSTIC SCIENCES CORPORATION**

PO Box 1189; Eugene, OR 97402; (503) 343-9727; (800) 282-8823. Product Name: Project Studio Acoustic System. Contact: Michael Edwards. Date Product Introduced: 4/93. Product Description & Applications: The Project Studio Acoustic System is a low-priced acoustical control system for home studios, project studios and smaller commercial facilities. The System consists of studio towers and studio panels. The Towers are free-standing Tube Traps designed to deal with low-frequency build-up in the corners and along the front and back wall of the control room. The panels help eliminate mid- and high-frequency wall bounce. They use a combination of absorption and diffusion to achieve an accurate acoustic space. Basic Specifications & Suggested List Price: Studio Towers are 6' tall, 10" diameter Tube Traps that control low frequencies down to 90 Hz. One side is diffusive above 400 Hz. Absorption vs. diffusion is controlled by rotating the trap. List price: \$899/set of 6. Studio Panels are 14" wide and 36" long. List price: \$299/set of 8.

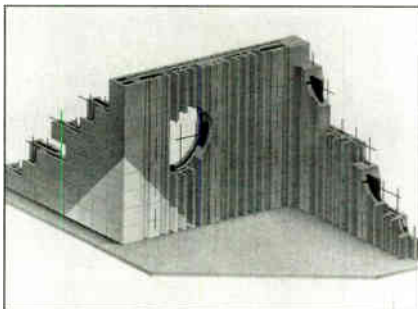
**RADMAR INC.**

1263-B Rand Rd.; Des Plaines, IL 60016; (708) 298-7980. Product Name: Model 6001 Flexible Portable Audio Booth. Contact: Richard M. Davidson, pres. Date Product Introduced: 6/93. Product Description & Applications: Model 6001 Flexible Portable Audio Booth sets up on a desktop for sound isolated recording in an environment with background noise. This lightweight structure can be easily disassembled after use. All components store in an optional accessory duffel bag, which can also be used for carrying to field recording locations. The Model 6001 may also be used to surround and reduce noise from a printer or other piece of noisy equipment. Basic Specifications & Suggested List Price: Weight: 10 lbs net of packaging or case. Dimensions: 27" deep x 30" wide x 28" high. Price \$200.

**RPG DIFFUSOR SYSTEMS INC.**

651-C Commerce Dr.; Upper Marlboro, MD 20772; (301) 249-0044; FAX: (301) 249-3912. Product Name: D'Antonio Performance Signa-

ture Series. Contact: Julie Wolf, adm. assist. Date Product Introduced: 4/93. Product Description & Applications: The D'Antonio Performance Signa-  
ture Series of variable acoustics modular performance shells (VAMPS) has been extended to offer a portable rollable, and fully rigged formats for all performance applications. The new VAMPS shells are manufactured and distributed jointly by RPG Diffusor Systems Inc. and Hoffend & Sons, Rochester, NY. The shell framework has openings which can accept a wide variety of replaceable reflective, QRD diffusive and absorptive inserts for ultimate flexibility and use with bands, orchestras, choruses, smaller ensembles and soloists. Basic Specifications & Suggested List Price: The Demountable portable is lightweight and measures 4' (W) x 4' (D) x 8', 10' or 12' high. The rollable easily nests, has a hinged cantilever for egress through doors and measures 4' (W) x 10' (H) x 2' 10" (D). The fully rigged shell consists of rollable towers 8' (W) x 4' 10" (D) x 20" (H). Special corner sections and rigged ceiling canopies measuring 8' (W) x 10' (L) containing FRG Omnifusors.



**RPG DIFFUSOR SYSTEMS INC.**  
DiffusorBlox

**RPG DIFFUSOR SYSTEMS INC.**

651-C Commerce Dr.; Upper Marlboro, MD 20772; (301) 249-0044; FAX: (301) 249-3912. Product Name: DiffusorBlox. Contact: Julie Wolf, adm. assist. Date Product Introduced: 4/93. Product Description & Applications: DiffusorBlox™ are a patented, new, load-bearing, structural, acoustic concrete masonry unit offering 100% absorption at 100Hz, broad bandwidth sound diffusion using RPG's QRD Diffusor technology and an STC of 55 for excellent sound isolation. The new format offers a simplified two-block system and faster installation. DiffusorBlox™ offer a very economical alternative to building music facilities since the acoustic can now be incorporated into structural walls. DiffusorBlox™ are produced using RPG automatic block machine molds under license by qualified block producers close to the job site to minimize shipping costs. Basic Specifications & Suggested List Price: The DiffusorBlox system consists of three blocks. The A block measures 7 5/8" (H) x 15 7/8" (W) x 11 5/8" (D) and weighs 50 lbs. The B Block measures 7 5/8" (H) x 15 5/8" (W) x 11 5/8" (D) and weighs 39 lbs. The C Block measures 7 5/8" (H) x 15 5/8" (W) x 3 5/8" (D) and weighs 14 lbs. DiffusorBlox offer two low-frequency absorbing chambers with a 3/8"x10" slot for broad band absorption.

**RPG DIFFUSOR SYSTEMS INC.**

651-C Commerce Dr.; Upper Marlboro, MD 20772; (301) 249-0044; FAX: (301) 249-3912. Product Name: Golden Pyramid. Contact: Julie Wolf, adm. assist. Date Product Introduced: 10/93. Product Description & Applications: RPG announces its lowest-cost, partially diffusing surface based on the golden mean which has been used in architecture since antiquity. The Golden Pyramid is made from RPG's new, class A, flame-retardant fiber-reinforced plastic formulation. This new surface is an symmetrical pyramid utilizing the golden ratio of 2 Cos(π/5). It is intended for use where cost is the overriding issue. Hence it will find application in large-area ceiling applications, project studios, schools and auditoriums. Basic Specifications & Suggested List Price: The Golden Pyramid measures 2'x2'x8" and weighs 3.5 lbs. It can be installed in a standard T-bar ceiling or wall mounted with supplied Velcro strips. The standard color is white, but it can be supplied in any color, including wood grain, in quantity.



**RPG DIFFUSOR SYSTEMS INC.**  
Primitive Skyline

—SEE LISTING TOP OF NEXT COLUMN

—SEE PHOTO/LOGO BOTTOM OF PREVIOUS COLUMN

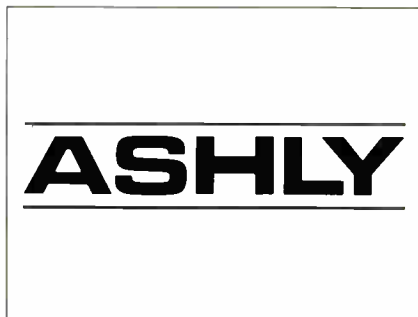
**RPG DIFFUSOR SYSTEMS INC.**

651-C Commerce Dr.; Upper Marlboro, MD 20772; (301) 249-0044; FAX: (301) 249-3912. Product Name: Primitive Skyline. Contact: Julie Wolf, adm. assist. Date Product Introduced: 10/93. Product Description & Applications: RPG is proud to announce a new line of low-cost, flame-retardant, fiber-reinforced plastic acoustical products that offer the high performance of their hardwood products at a very affordable price. The Primitive Skyline is the world's first 2-D diffuser based on primitive root number theory sequence. This new diffuser uniformly scatters sound arriving from any direction into half space and is called the Skyline because its surface topology resembles a city skyline. The Skyline's low-cost and aesthetic unique surface make it ideal for all acoustical applications. Basic Specifications & Suggested List Price: The Skyline consists of a 2-dimensional array of 156 2" blocks and measures 2'x2'x8". It can be mounted in a standard T-bar ceiling or on a wall with supplied Velcro strips. The Skyline weighs 8.5 pounds. The standard color is white, but almost any color can be supplied in quantity.

**AMPLIFIERS**

**AB INTERNATIONAL**

1830-6 Vernon St.; Roseville, CA 95678; (916) 783-7800. Product Name: Model 1150. Contact: Robert Bird. Date Product Introduced: 9/93. Product Description & Applications: High-performance, commercial, audio, power amplifier, designed for live sound reinforcement and touring applications. Basic Specifications & Suggested List Price: 750W per channel into 8 ohms (2-channels), 1,200W per channel into 4 ohms (2-channels), 1,500W per channel into 2 ohms (2-channels). \$2,195.



**ASHLY AUDIO INC.**  
MFA-8000

**ASHLY AUDIO INC.**

100 Fernwood Ave.; Rochester, NY 14621; (716) 544-5191. Product Name: MFA-8000. Contact: Bob French, Sr. Exec. VP. Date Product Introduced: 10/93. Product Description & Applications: The MFA-8000 is Ashly's answer to the growing trend toward bigger and bigger amplifiers. Conservatively rated at better than 750 watts per channel, the MFA-8000 utilizes new technology to achieve more than enough power for even the largest of sound systems. Also in the "Mega Force" amplification service will be the MFA-6000 with 500 watts/channel @ 8 ohms. Basic Specifications & Suggested List Price: Not yet available.

**AUSTRALIAN MONITOR U.S.A.**

PO Box 226; Malvern, PA 19355; (215) 380-1394. Product Name: Australian Monitor Profile. Contact: Paul Sherwood, sales mgr. Date Product Introduced: 1992. Product Description & Applications: AM 1600-2CH, 810 W into 4Ω, AM1200 -4 channel-320 W into 4Ω, K7 350 W into 4Ω, K Series 1K2 550W into 4Ω, Profile 400W into 4Ω, high power Mosfet amplifiers for studio or sound reinforcement applications.

**BROADCAST DEVICES INC.**

5 Crestview Ave.; Peekskill, NY 10566; (914) 737-5032; FAX: (914) 736-6916. Product Name: HPX-100 Transformerless microphone preamplifier. Contact: Bob Tarsio. Date Product Introduced: 5/93. Product Description & Applications: The HPX-100 is a transformerless microphone preamplifier capable of driving a 600 ohm balanced load directly. It features mic/line input selection and runs from a single ended POM supply configuration. Originally intended as a direct replacement for the Gatis/Harris Executive broadcast console, it can be utilized in location recording or other studio applications requiring extra mic preamps. Basic Specifications & Suggested List Price: Frequency response: ±dB 20Hz-20kHz. Total harmonic distortion: <.055. Input sensitivity -55dB, output level 0dB/adjustable input impedance 150 Ω balanced. Suggested list price \$179. F.O.B. Peekskill, NY.

**CARVER**

20121 48th Ave. W.; Lynnwood, WA 98046; (206) 775-1202. Product Name: ca400. Contact: Tami Landburg, pro sales administrator. Date Product Introduced: 10/93. Product Description & Applications: The ca400 is the result of a new design concept imple-

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**CARVER**  
ca400

mented at Carver over the past 2 years. The new ca series amplifiers are built for commercial sound applications. They include barrier strip screw terminals allowing the installer to permanently connect the amplifier and forget it. All new Carver ca series amplifiers are warranted for 5 years. **Basic Specifications & Suggested List Price:** 130 watts/channel into 8 $\Omega$ , 200 watts/channel into 4 $\Omega$ , 400 watts bridged mono into 8 $\Omega$  and 250 watts parallel mono in to 4 $\Omega$ , continuous average output power, both channels driven. S/N greater than 100dB, A-wtd. referenced to rated power.



**CARVER**  
pm420

**CARVER**  
20121 48th Ave. W., Lynnwood, WA 98046; (206) 775-1202. **Product Name:** pm420. **Contact:** Tami Landburg, pro sales administrator. **Date Product Introduced:** 10/93. **Product Description & Applications:** The new Carver pm420 is the result of a new design concept implemented at Carver over the past two years. The pm series amplifiers are built for professional sound applications. They feature two 1/4-inch TRS input jacks per channel. Their rugged construction will withstand years of road use and their ample power and accurate sound reproductions make them ideal for studio use. All new pm series amplifiers are warranted for 5 years. **Basic Specifications & Suggested List Price:** 130 watts/channel into 8 $\Omega$ , 210 watts/channel into 4 $\Omega$ , 420 watts bridged mono into 8 $\Omega$  and 130 watts parallel mono into 4 $\Omega$ , continuous average output, both channels driven. S/N greater than 100dB, A-wtd. referenced to rated power.

Pro audio dictionaries and technical reference guides are available through the Mix Bookshelf catalog. Call toll-free (800) 233-9604 for your free copy.



**CREST AUDIO INC.**  
Crest 7301 Professional Amplifier

**CREST AUDIO INC.**  
100 Eisenhower Dr.; Paramus, NJ 07652; (201) 909-8700. **Product Name:** Crest 7301 Professional Amplifier. **Contact:** Neil Conley, dir. of sales. **Date Product Introduced:** 6/93. **Product Description & Applications:** The Crest 7301 Professional Series amplifier is a compact power amplifier specifically designed for use in bi-amplified systems, including stage monitor, studio monitor and front-of-house applications. The low-frequency channel (Ch. A) utilizes class H operation, providing increased efficiency and higher output power on the low end. The high-frequency channel (Ch. B) utilizes class AB operation which is optimized for precise reproduction of mid- and high-frequency signals. When used in combination with a crossover (including those available in the Crest Dctal Socket Accessory line), the 7301 becomes a complete bi-amplification system in a space-efficient package. **Basic Specifications & Suggested List Price:** Power specifications (20Hz to 20kHz): both channels at 4 ohms; 940W for lows and 240W for highs. Lows at 2 ohms 990W, highs at 4 ohms 220W. Lows at 4 ohms 940W and highs at 8 ohms 125W. THD low channel <0.02% @ 800W, 4 ohms, 1k. THD high channel <0.02% @ 200W, 4 ohms, 1k. Cooling: rear to front tunnel, 2 variable speed DC fans. LED indicators, per channel; clip/limit, signal, temp and active LEDs. Protection: high temperature, DC, turn-on, subsonic, ultrasonic, short-circuit, IGM, output stage protection. Dimensions: 3.5"x19"x16". Warranty: 5 years, parts and labor. Suggested list price: \$2,190.

**DIGITAL PROCESS USA**  
PO Box 230566; Encinitas, CA 92023; (800) 835-1533. **Product Name:** DS-1. **Contact:** D. Harding. **Date Product Introduced:** 1/94. **Product Description & Applications:** Digital studio one - advanced high powered single monitor headphone amp with incredible performance/specs. **Basic Specifications & Suggested List Price:** S/N >95dB, 5-20k freq. response, 15dB separation. RCA input XLR-4 and 1/4" stereo output. List \$300. UL listed power supply.

**EDCOR ELECTRONICS**  
7130 National Parks Hwy.; Carlsbad, NM 88220; (800) 854-0259. **Product Name:** HA200C Headphone Amplifier. **Contact:** Phyllis Weston, sales mgr. **Date Product Introduced:** 5/93. **Product Description & Applications:** 20-20 vision for your ears. A 2-channel stereo headphone amplifier. A separate monolithic stereo amplifier provides each listener with full independent sound. The input buffers and sensitivity adjust allow virtually any stereo or mono line level input to operate to perfection. Enjoy the excitement of concert hall sound and the realism of a true stereo presence. Very low noise and distortion levels. A small, affordable amplifier that delivers high-quality music in a rich black anodized appearance. **Basic Specifications & Suggested List Price:** \$174. Two stereo headphone outputs with .5 watts RMS per each earphone, music power is much greater. Individual channel gain controls with a master stereo balance control. Frequency response 20-20,000Hz  $\pm$ 0.25dB. Noise at 100dB below rated output and distortion at rated output .05dB.

**ESE**  
142 Sierra St.; El Segundo, CA 90245; (310) 322-2136. **Product Name:** ES-201. **Contact:** Bill "R", factory sales eng. **Date Product Introduced:** 4/93. **Product Description & Applications:** 1x4 video distribution amplifier with independently adjustable outputs. This very unique D.A. can save thousands of dollars in cable costs by being able to adjust the gain and equalization for each output individually rather than the standard industry method of equalizing for the longest length and then adding cable to the other locations to match the equalized distance. A true money-saving product. **Basic Specifications & Suggested List Price:** 1 input and 4 outputs each output can compensate for up to 1,000 feet of RG-59. Gain range: -2dB to +3dB adjustable. Response: 10Hz-10MHz  $\pm$ 1dB. Slew rate: 750 V/uS. S/N ratio: 62 dB. Propagation delay: 3 nS. List price \$295.

**FENDER-SUNN PRO AUDIO**  
7975 N. Hayden Rd.; Scottsdale, AZ 85258; (602) 596-7121. **Product Name:** Fender-Sunn SPL-6000 Dual Channel Power Amplifier. **Contact:** Michael Schwartz, mgr., Pro Audio Products. **Date Product Introduced:** 1/93. **Product Description & Applications:** A professional dual-channel power amplifier. 300 watts per channel into 4 $\Omega$  @ .08% THD, 600 watts into 8 $\Omega$  bridged mono mode. Dual (male & female) XLR and 1/4" balanced inputs on each channel. Five-way binding post and 1/4" speaker outputs on each channel.

DeltaComp™ clip protection circuitry with bypass switches. Automatic 2 speed forced air fan cooling. Selectable stereo, dual mono or bridged mono mode. Removable rear rack ears. **Basic Specifications & Suggested List Price:** \$699.99



**FENDER-SUNN PRO AUDIO**  
JPL-M300 Stage Monitor Amplifier

**FENDER-SUNN PRO AUDIO**  
7975 N. Hayden Rd.; Scottsdale, AZ 85258; (602) 596-7121. **Product Name:** JPL-M300 Stage Monitor Amplifier. **Contact:** Michael Schwartz, mgr., Pro Audio Products. **Date Product Introduced:** 7/93. **Product Description & Applications:** A purpose-built, 2-rackspace 300 watt into 2 $\Omega$  power amplifier, with extensive feedback control and other features. These include a 3-band sweepable notch filter, sweepable -12dB/octave H.P. and L.P. filter, switchable DeltaComp™ compressor, an access patch point for bi-amped monitor systems, and two speed forced air fan cooling. XLR and 1/4" input connectors, 1/4" and 5-way binding post outputs. Optional rear rack support ears and security cover for fixed installations. **Basic Specifications & Suggested List Price:** \$499.99



**FENDER-SUNN PRO AUDIO**  
SPL-9000 Professional Power Amplifier

**FENDER-SUNN PRO AUDIO**  
7975 N. Hayden Rd.; Scottsdale, AZ 85258; (602) 596-7121. **Product Name:** SPL-9000 Professional Power Amplifier. **Contact:** Michael Schwartz, mgr., Pro Audio Products. **Date Product Introduced:** 5/93. **Product Description & Applications:** A professional dual-channel power amplifier. 450 watts @ 4 $\Omega$ , 0.3% THD (both channels driven), 900 watts into 8 $\Omega$  mono bridge. Features include dual XLR (m/f) and 1/4" TRS balanced inputs, 2 speed forced air fan cooling and gradient heat exchanger, delayed turn on, an analog computer protection circuits, a rugged case with detachable rear rack ears (included), optional Media Link™ computer remote control (available 1994), dual 41 detent precision attenuation, and much more. **Basic Specifications & Suggested List Price:** \$929.99

**FOCUSRITE AUDIO ENGINEERING LTD.**  
Unit 2 Bourne End Business Centre; Bourne End Bucks, SL8 5AS United Kingdom; (44) 628 819456. **Product Name:** Red 4. **Contact:** R Salter, tech. dir. **Date Product Introduced:** 10/93. **Product Description & Applications:** Precision stereo preamplifier, transformer coupled all inputs & outputs, illuminated VU meters, seven inputs & output switchable sensitivity +4dB or -10dB, Penny & Giles controls, alpha numeric readout, Red Range styling & case. **Basic Specifications & Suggested List Price:** List price \$3,450, freq. resp.: -3dB @ 5 Hz & 150kHz, noise better than -100dB.

**HAFLER DIV. OF ROCKFORD CORP.**  
546 S. Rockford Dr.; Tempe, AZ 85281; (602) 967-3565. **Product Name:** Trans-Nova 9505 Power Amplifier. **Contact:** Rick Gentry, sales mgr. **Date Product Introduced:** 10/93. **Product Description & Applications:** Balanced input power amplifiers with XLR, 1/4" and RCA connectors for studio monitoring, recording and other critical-listening applications. Wide bandwidth, high slew rate, no phase shift. Pure abundant transparent power amplification, 250 wpc into 8 $\Omega$ , 750 watts bridged into 8 $\Omega$ . Now in the professional version. **Basic Specifications & Suggested List Price:** Price: \$2,100 in black finish, \$2,200 in silver. THD below 0.03%, full-power band-

width 0.15 Hz to 300 kHz, slew rate 150 v/ $\mu$ s, damping factor 1000-1kHz, 100-20 kHz, 20-100 kHz into 8 $\Omega$ , 7 year warranty.



**HOT HOUSE PROFESSIONAL AUDIO**  
M500 HV Mono High Current/  
High Voltage Control Room Amplifier

**HOT HOUSE PROFESSIONAL AUDIO**

275 Martin Ave., Highland, NY 12528; (914) 691-6077; FAX: (914) 691-6822. Product Name: M500 HV Mono High Current/High Voltage Control Room Amplifier. Contact: Richard Rose. Date Product Introduced: 1/93. Product Description & Applications: Advancements in the design of the new M500HV 600W mono-block amplifier have been incorporated into both the smaller M500 and the stereo S400 for '93. Refinements in front-end design, coupled with a proprietary application of only minimal local feedback, have further improved the line's audiophile sound, particularly in the areas of detail resolution and transient capability. Slew rate is up to 85 volts/microsecond, while rise time is an industry pace-setting 900 nanoseconds. Basic Specifications & Suggested List Price: RMS power output (not including 3dB dynamic headroom): 600W @4 $\Omega$ , 375W @ 8 $\Omega$ ; maximum peak current capability exceeds 100 amps, slew rate 85V/ $\mu$ s, rise time 900 nanoseconds, frequency response: 5Hz-292kHz, S/N 105dB. Professional user net price \$1,699.

**HOT HOUSE PROFESSIONAL AUDIO**

275 Martin Ave., Highland, NY 12528; (914) 691-6077; FAX: (914) 691-6822. Product Name: M500 Standard Mono Current Control Room Amplifier. Contact: Richard Rose. Date Product Introduced: 1992. Product Description & Applications: Advancements in the design of the new M500HV 600W mono-block amplifier have been incorporated into both the smaller M500 and the stereo S400 for '93. Refinements in front-end design, coupled with a proprietary application of only minimal local feedback, have further improved the line's audiophile sound, particularly in the areas of detail resolution and transient capability. Slew rate is up to 85 volts/microsecond, while rise time is an industry pace-setting 900 nanoseconds. Basic Specifications & Suggested List Price: RMS power output (not including 3dB dynamic headroom): 450W @2 $\Omega$ , 255W @ 4 $\Omega$ ; 150W @ 8 $\Omega$ , maximum peak current capability exceeds 80 amps, slew rate 85V/microseconds, rise time 900 nanoseconds, frequency response: 5Hz-292kHz, S/N 105dB. Professional user net price \$1,399.

**INTEGRATED MUSIC SYSTEMS INC.**

1791 W. Kirkham Way, Salt Lake City, UT 84119; (801) 966-7148. Product Name: Q2020 Reference Amplifier. Contact: Dan James, CEO. Date Product Introduced: 6/93. Product Description & Applications: Small quarterack stereo amplifier (4.2"x1.5"x4") to power near-field studio reference monitors. 40 watts per side. Designed direct path as possible to provide quiet, low distortion, flat response, with extended dynamic headroom. (Rackmount adaptor available to rack with other quarterack devices), \$168.

**POLYFUSION ELECTRONICS**

30 Ward Rd., Lancaster, NY 14086; (716) 681-3040. Product Name: Polyfusion Audio power amplifiers. Contact: Alan Pearce. Date Product Introduced: Late 1993. Product Description & Applications: Three models 860, 960, 980. 860 200 watt stereo; 960 400 watt stereo; 980 200 watt mono (high current). Capable of driving very low-impedance loads (1 $\Omega$  typ.) at double or quadruple their rated power. Basic Specifications & Suggested List Price: All very low distortion class-A operation with power MOSFET output stages. DC coupled with 3 Hz servo and DC protection circuitry. Short circuit-proof. Hot, heavy and rugged. Pricing from \$2,500 to \$3,500.

**RAMKO RESEARCH**

3501-4 Sunrise Blvd., Rancho Cordova, CA 95742; (916) 635-3600. Product Name: ProMod. Contact: Mike Pardee, natl. sales coord. Date Product Introduced: 7/93. Product Description & Applications: Ultra miniature audio processing, amplifying and switching modules. Measuring just 3 5/8"x2 3/4"x5/8", with removable, all metal, interference-free housing. Models will include; amplifiers for mic, line, audio/video distribution, interfacing, power to 12 watts, various relays, silent sensors, mic/line mixers, splitters, remote controlled VCA's, compressor/limiter, and more are scheduled for release summer/fall '93. Basic Specifications & Suggested List Price: Dist' 0.005% typ. Response: flat to 50kHz. Balanced inputs, transparent to source. Balanced electronic transformer outputs. Small UL approved 12 VAC wall mount power source. Price starts at \$46.

**RAMKO RESEARCH**

3501-4 Sunrise Blvd., Rancho Cordova, CA 95742; (916) 635-3600. Product Name: SYSTEM 2000 Integrated Audio System. Contact: Mike Pardee, natl. sales coord. Date Product Introduced: 10/92. Product Description & Applications: Four different mainframe sizes, (AS-1, 2, 3 & 10) with programmable, interchangeable, plug-in audio modules. Modules work independently or in conjunction with any other modules, using on board DIP switches and the dual layer backplane bussing system. Model # xLAS-10, features optional dual redundant power supply, AC, DC, or 220V and will accommodate up to ten modules. Basic Specifications & Suggested List Price: Mainframes use 1 to three rackspaces. Modules specifications vary due to the variations possible. All exhibit studio-quality performance. Contact factory for details. (916) 678-1357.

**SAMSON AUDIO**

PO Box 9068; Hicksville, NY 11802-9068; (516) 932-3810. Product Name: Servo 240 and Servo 150 Power Amplifiers. Contact: Dave Olivier, nat'l sales mgr. Date Product Introduced: 5/93 Product Description & Applications: Both bi-polar amps, Servo 240 produces 120 watts/channel; 150 produces 75W/c. Both at 4 ohms w/less than 1% distortion. Frequency response for both is flat from 10Hz to 30kHz, damping factor is more than 100. Servo feature is part of feedback/loop and used to control DC offset in speaker terminals automatically. Built-in protection device guards against over-current connecting, shorted wires and overheating! LED for problem detection, 2 other LEDs for clipping and idle. Basic Specifications & Suggested List Price: 2 volume knobs; 411 detented positions; 19" 2 space rackmount body; all steel chassis. Servo 240 suggested retail price \$329. Servo 150 suggested retail price \$249.



**SHURE BROTHERS**  
FP22 Stereo Headphone Amplifier

**SHURE BROTHERS**

222 Hartrey Ave., Evanston, IL 60202-3696; (708) 866-2200. Product Name: FP22 Stereo Headphone Amplifier. Contact: customer service. Date Product Introduced: 4/93. Product Description & Applications: The FP22 stereo headphone amplifier features stereo +1 capability, which provides you with professional-quality stereo headphone monitoring without interrupting the signals being monitored. Perfect in any situation from field production to studio recording. The FP22 can monitor a wide range of signal sources in many different configurations, giving you the ability to hear mixed audio in stereo and control the audio to the required volume level. Basic Specifications & Suggested List Price: Frequency response (@ 1kHz): 20Hz to 20kHz +1, -3dB. Equivalent input noise: -127dBV (maximum gain: source resistance 150 $\Omega$ ; 20Hz to 20kHz). Headphone output impedance (@ 1kHz): 10 $\Omega$ ±10%. Power (internal): 9V Alkaline battery. Battery life: approx. 15 hours, under normal operating conditions. External: 12 to 24VDC. End-user price \$375.



**STEWART ELECTRONICS**  
PA-1400 Dual-Mono Power Amplifier

**STEWART ELECTRONICS**

11460 Sunrise Gold Cir., Rancho Cordova, CA 95742; (916) 635-3011. Product Name: PA-1400 Dual-Mono Power Amplifier. Contact: Christopher M. Dragon, sales & mktg. mgr. Date Product Introduced: 4/93. Product Description & Applications: The PA-1400 is a fully dual-mono power amplifier which utilizes Stewart's high-frequency switch mode power supply. It occupies just two standard

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**PARSONS AUDIO**

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**IN THE SHOWROOM**

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rackspaces while delivering an impressive 300 watts per channel into 8 ohms. The PA-1400 weighs just 16 lbs but is no lightweight, it has incredible low end and is extremely musical. **Basic Specifications & Suggested List Price:** 300Wx2 into 8 ohms, 550Wx2 into 4 ohms, 700Wx2 into 2 ohms and 1,400Wx1 into 4 ohms bridged. Inputs include barrier strip, XLR and 1/4" TRS. Output is achieved by standard 5-way binding post. The PA-1400 carries a full 5-year parts and labor warranty. Suggested retail price is \$1,399.

### STEWART ELECTRONICS

11460 Sunrise Gold Cir., Rancho Cordova, CA 95742; (916) 635-3011. **Product Name:** PA-200. **Contact:** Christopher M. Dragon, sales & mktg. mgr. **Date Product Introduced:** 6/93. **Product Description & Applications:** This incredible power amplifier is ideal for guitar rigs, keyboard rigs, bass rigs, monitors or small sound reinforcement. The PA-200 produces a real 50W x2 into 8 ohms while occupying just 1/2 rackspace and weighing 5.5 lbs. Inputs are 1/4" TRS. Outputs are standard 1/4" phone. The PA-200 includes Stewart's IEQ (equalization circuit) and unique auto bridging feature. **Basic Specifications & Suggested List Price:** 50Wx2 into 8 ohms; 90Wx2 into 4 ohms; 100Wx2 into 2 ohms; 200W bridged into 4 ohms. Suggested retail is \$429.

### STEWART ELECTRONICS

11460 Sunrise Gold Cir., Rancho Cordova, CA 95742; (916) 635-3011. **Product Name:** Stewart Electronics PA-1000. **Contact:** Christopher M. Dragon, sales & mktg. mgr. **Date Product Introduced:** 7/93. **Product Description & Applications:** The incredible PA-1000 power amplifier packs 200 real watts per channel (8 ohms) into a single rackspace. The PA-1000 is stable and happy down to a 2 ohms load and produces 1000 watts bridged. As with all Stewart power amplifiers the PA-1000 incorporates the Stewart high-frequency switch mode power supply. The PA-1000 weighs just 11 lbs. yet it will rival any heavyweight. **Basic Specifications & Suggested List Price:** 200Wx2 into 8 ohms; 350Wx2 into 4 ohms, 500Wx2 into 2  $\Omega$ , 1000Wx1 into 4 $\Omega$  bridged. Inputs include both XLR and 1/4", outputs include 5-way binding post. As with all Stewart power amplifiers the PA-1000 carries a full 5-year parts and labor warranty. \$1,099.

### YAMAHA

6600 Orangethorpe Ave., Buena Park, CA 90622; (714) 522-9011. **Product Name:** HPX Series Power Amplifiers. **Contact:** Pro Audio Dept. **Date Product Introduced:** AES (10/93). **Product Description & Applications:** High-power, low-profile professional power amplifiers. 2 EIA rack space, balanced XLR and 1/4" inputs, 5-way binding post output. An intelligent internal limiter. Maybe switches into the circuit for protection. Provisions for remote control and monitoring are also provided. **Basic Specifications & Suggested List Price:** HPX550: 550 watts/channel into 8 $\Omega$  both channels driven. HPX 750: 750 watts/channel into 8 $\Omega$  both channels driven. Frequency response  $\pm$  5dB 10Hz-50kHz. THD  $\leq$  0.1%. Price TBA.



YORKVILLE SOUND  
AudioPro 3400

### YORKVILLE SOUND

550 Granite Ct., Pickering, ON, L1W 3Y8 Canada; (416) 837-8481. **Product Name:** AudioPro 3400. **Contact:** Bud Mayer (716) 297-2920. **Date Product Introduced:** 7/93. **Product Description & Applications:** 2400 watt stereo power amplifier (1200x2@ 4 ohms), 4 ohms minimum load. High-efficiency design provides more power from 120V 15 amps AC. Features: Toroidal power supply, energy

management system, low freq. boost; 2-year transferable, unlimited warranty. Ideal for professional sound reinforcement applications where high-power speaker systems are utilized. **Basic Specifications & Suggested List Price:** Cont. avg. power: 1200W x2 @ 4  $\Omega$ , 750Wx2 @ 8 $\Omega$ . Power bandwidth 20-20kHz. S/N (20-20kHz); 115dB, THD: 0.05%; slew rate: 25V/use. Damping factor: >600. Input connectors: XLR/1/4" phone. Output connector: binding post. 2 rackspaces; wgt: 40 lbs. List: \$1,679.

### AUTOMATION, SYNC AND CONTROL SYSTEMS

### AUDIOMATION INC.

30 Main St., Ashland, MA 01721; (508) 881-7808. **Product Name:** Uptown. **Contact:** John Williams, pres. **Date Product Introduced:** 6/93. **Product Description & Applications:** Midas Performance Automation Package—a moving fader automation package especially designed for live performance on a Klark Teknik 'Midas' console. **Basic Specifications & Suggested List Price:** Built into 'Midas' side car easily installed in Midas desk. Price depends on number of channels

### BRAINSTORM ELECTRONICS INC.

1515 Manning Ave., #4; Los Angeles, CA 90024; (310) 475-7570. **Product Name:** SR-15+ Time Code Ostrizipalyzer. **Contact:** Bernard Frings, president. **Date Product Introduced:** 10/93. **Product Description & Applications:** The SR-15+ Time Code Distrizipalyzer combines 3 functions in one unit: a 1x5 time code distributor (with reshaping on all 5 outputs), a tone Stripper (synchronous with code, video or AC mains) and a time code analyzer. The analyzer checks format, frame rate, video phase, field alignment and time code errors (drop outs, repeated frames, etc...). A comprehensive report can be sent to an external printer via the RS-232 or centronix ports. The SR-15+ is a redesigned version of the original SR-15. **Basic Specifications & Suggested List Price:** Housed in single-space 19" metal chassis, the SR-15+ has reshaped and buffered time code outputs with individually adjustable levels. It can be used with balanced and unbalanced equipment. Connectors are XLRs for code & tone, BMC's for video, 1/4" for relay in/out, DB-9 for RS-232 and DB-25 for centronix. Front panel indicators include an 8-digit reader and a 4-digit frame rate counter. Suggested list price: \$1,400.

### BRAINSTORM ELECTRONICS INC.

1515 Manning Ave., #4; Los Angeles, CA 90024; (310) 475-7570. **Product Name:** SR-2 Frame Rate Counter for Time Code. **Contact:** Bernard Frings, president. **Date Product Introduced:** 5/93. **Product Description & Applications:** The SR-2 is identical to Braintorm's SR-1 Time Code Refresher and has a new 4-digit display for reading the incoming code's frame rate. This very accurate counter (4 updates per second) is ideal to identify the code's format (29.97 vs. 30 fr/sec) and can also detect potential problems such as jitter. SR-1 owners can upgrade their units to SR-2. **Basic Specifications & Suggested List Price:** The SR-2 is housed in a small plastic enclosure. It is available with XLR connectors or 1/4" jacks Input threshold is better than -30 dB. Output level is front panel adjustable. Unit can be used with balanced or unbalanced signals. Suggested retail: SR-2 is \$333 and the SR-1 to SR-2 upgrade is \$133.

### DWIGHT CAVENDISH CD.

6444 Ridgeway, Lincolnwood, IL 60465; (708) 673-0937. **Product Name:** Copymaster PD-40. **Contact:** Carter Ruehrdanz, VP. **Date Product Introduced:** 4/93. **Product Description & Applications:** Video pancake duplicator. Records for 40 hours unattended without the need for changing cassettes. Duplicated pancakes are put on loader to be loaded into shells as the last stop. **Basic Specifications & Suggested List Price:** The PD-40 sells for \$3,995, available in NTSC or PAL.

### CLARK & ASSOCIATES

318 E. Calhoun, Macomb, IL 61455; (309) 837-2244. **Product Name:** TCR-100. **Contact:** Bill Clark, pres. **Date Product Introduced:** 6/93. **Product Description & Applications:** A 1/3-slot AT-size PC card for SMPTE time syncing IBM and compatible personal computers. Also locks to U.S. government IRIG-B format time code. **Basic Specifications & Suggested List Price:** No specs. Selling cost is approximately \$300.

### COMMERCIAL ELECTRONICS LTD.

1335 Burrard Ave., Vancouver, BC, V6Z 1Z7 Canada; (604) 669-5525. **Product Name:** Omni Q LDM-1 Interactive Exhibit Controller. **Contact:** Johathan Meadows, sales & mktg. **Date Product Introduced:** 5/93. **Product Description & Applications:** Used to control self-contained interactive exhibits. Accepts ten contact-closure inputs, and has an RS-232 output. When triggered, it will seek an LDP to a location and play to another location. An attract sequence can run when idle. Each trigger causes any combination of eight relays to activate. Units link to expand inputs/outputs. Factory programming or user-programming (optional programming available). Options include touch screen and time-code input and MIO output. **Basic Specifications & Suggested List Price:** LDM-1, \$750 US/Programmer \$350 US. Laser disk control, by RS-232, BAUD rate is adjustable auxiliary relays—eight built in, can switch 24VDC or 120VAC up to 2A each input executes sequence of commands; Attraction screen—any frame or sequence can be programmed, 120/240 VAC 50/60 Hz@ 4W, 89H 114W, 38D (mm) 400g.

### COMMERCIAL ELECTRONICS LTD.

1335 Burrard Ave.; Vancouver, BC, V6Z 1Z7 Canada; (604) 669-5525. **Product Name:** Omni Q Mixed-Media Show Control Automation System. **Contact:** Johathan Meadows, sales & mktg. **Date Product Introduced:** 10/92. **Product Description & Applications:** The Omni Q show control automation system consists of both software and hardware. Controls hundreds of presentation and multimedia devices of all types. Can run in synch with time-code, internal clock, time-of-day, or can be manually stepped. Can gather votes from audience and branch the show. Powerful OmniSoft cue editing software is provided. Used for theme parks, planetariums, museums, and medium to large mixed-media presentations. **Basic Specifications & Suggested List Price:** System is modular and can range in price from \$15-200,000. Specifications depend on device needing control.

### CBSI/CUSTOM BUSINESS SYSTEMS INC.

PO Box 67; Reedsport, OR 97467; (503) 271-3681; (800) 547-3930. **Product Name:** Digital Universe. **Contact:** Joe McMurphy, sales engineer. **Date Product Introduced:** 4/93. **Product Description & Applications:** Digital Universe™ is an advanced generation digital audio management system that goes far beyond cart replacement, satellite automation, and CD or tape automation. Designed for centralized radio operations. Provides an upgradeable and comprehensive studio solution. It's fast, powerful, and performs multiple tasks simultaneously. Operates multiple studios from one control point. Built around a low-cost computer platform using Microsoft Windows. **Basic Specifications & Suggested List Price:** Hardware: 16-port digital audio, SCSI-2 controller I/O & DSP boards, 486DX2-66 EISA CPU, 300MB HD, 256k caches, 16MB RAM, 3.5" 1.44 MB floppy, 3GB digital audio HD, SVGA card, 14.4 modem. Software: Windows and Digital Universe's Library, production, scheduling, on-air, cart replacement. Call for price.

### DENON AMERICA INC.

222 New Rd., Parsippany, NJ 07054; (201) 575-7810. **Product Name:** DN-1200FP. **Contact:** Michael Stelts, product mgr. **Date Product Introduced:** 8/93. **Product Description & Applications:** This system includes a 200 CD changer with a dedicated controller. Additional changers, model DN-1200F, can be added allowing up to 3000 CDs in one system. The controller, model DN-1200C, was designed with flexibility in mind. Users can optimize control for broadcast, sound effects, background music or home installations. **Basic Specifications & Suggested List Price:** Suggested list \$4,000.

### DAN DUGAN SOUND DESIGN

290 Napoleon St., San Francisco, CA 94124; (415) 821-9776. **Product Name:** Model D Automatic Mixing Controller. **Contact:** Dan Dugan, prop. **Date Product Introduced:** 5/93. **Product Description & Applications:** The Model D automatic mixing controller inaugurates a completely new product category. The 8-channel controller patches into your audio console to assist the sound mixer in handling multiple live mics. Invaluable for broadcasting, sound reinforcement, recording, teleconferencing or wherever multiple live mikes are used. Transparent voice-controlled crossfaders follow unpredictable dialogue flawlessly. **Basic Specifications & Suggested List Price:** 5/14" rack unit, 18 lbs, 8 audio channels, 30H +0/-1dB. Output noise less than -75dBu, distortion less than .03% THD at +21dBu. Units/144 for up to 96 inputs. Power 120.240 VAC, 50/60Hz. Price \$5,450.

### JL COOPER ELECTRONICS

12500 Beatrice St., Los Angeles, CA 90066; (310) 306-4131. **Product Name:** Autograph. **Contact:** Chuck Thompson, VP sales & mktg. **Date Product Introduced:** 4/93. **Product Description & Applications:** Autograph is JL Cooper's flagship automation system. Internal retrofit and external versions provide integrated SMPTE-locked fader and mute automation for any console. Clear, uncluttered graphics, a large time code display, and an intuitive user interface combine to put Autograph years ahead of the competition. **Basic Specifications & Suggested List Price:** Works with any mixing console, makes precision mixing faster and easier, high-quality audio, intelligent cue list editing, adds 15 softgroups to any console, Mac System 7 compatible, hit mode for spotting film or video cues, auto punch (auto nulling) for seamless editing.

### LONE WOLF INC.

1509 Aviation Blvd., Redondo Beach, CA 90278; (310) 379-2036. **Product Name:** Medialink. **Contact:** Richard F. Rutkowski, exec. VP. **Product Description & Applications:** Lone Wolf's Medialink™ Multimedia Network allows real-time control and monitoring of audio systems as well as distribution of audio, video, SCSI RS-232/422 etc. VNOS™ the company's Visual Network Operating System provides a multivendor computer independent graphic user interface for building Virtual Venues™ and Virtual Control Surfaces™. **Basic Specifications & Suggested List Price:** Bandwidth: 125kb, 1MB, 2MB, 5MB, 10MB, 100MB. Physical media: fiberoptic, twisted pair, coaxial, RF. Fault tolerant, real-time communications. Distance: fiberoptic (12kb-100MB-~2.5 Km). List price: TBA.

### MIDIMAN

236 W. Mountain St. Ste. 108; Pasadena, CA 91103; (818) 449-8838; (800) 969-6434. **Product Name:** Syncman Pro MTV. **Contact:** Michael Paul Inman, national sales mgr. **Date Product Introduced:** 1/93. **Product Description & Applications:** Professional rack-mount MIDI sync box with SMPTE screen bordering and character display capability. **Basic Specifications & Suggested List Price:** Locks all SMPTE formats and protocols. Automate punch-in and punch-outs,



geo-lock, tap tempo entry MIDI-to-Foley hit recorder, regeneration and much, much more. Retail \$ 699.95

**MUSEUM TECHNOLOGY SOURCE INC.**

20 Bacon St.; Winchester, MD 01890; (800) 729-6873. **Product Name:** CS Q-1. **Contact:** Adrienne Callahan, VP, sales. **Date Product Introduced:** 11/92. **Product Description & Applications:** Single-button CD controller provides public access to a series of material stored on CD. The order of the material is determined and arranged during set-up and can be changed at anytime. Ideal for demonstrating samples from different tracks. Each push of the button calls up a held sample. **Basic Specifications & Suggested List Price:** Works with Tascam, Pioneer, and Philips CD players. Selects up to 70 segments. Lists for \$695. 1.5"x7.25"x10" rack-mount kit available.

**PENNY & GILES INC.**

2716 Ocean Park Blvd., Ste. 1005; Santa Monica, CA 90405; (310) 393-0014; FAX: (310) 450-9860. **Product Name:** MM16 MIDI Management System. **Contact:** Neal Handler. **Date Product Introduced:** 7/93. **Product Description & Applications:** Designed to aid the programming and management of complex MIDI set-ups, the MM16 MIDI Management System is the first in a new range of Penny & Giles digital studio-related hardware. The product includes onboard MIDI splitting facilities, and offers a comprehensive assignment control surface, providing excellent status feedback. The MM16 incorporates 16 endless-belt faders with integral LED arrays, which instantly display recalled data from the 64 Programs and 128 Snapshots. **Basic Specifications & Suggested List Price:** Dedicated switched provide program select, transport and sequence facilities. There are 2 groups of MIDI ports, each with an Input, a Thru and 6 Outputs. Inputs are also provided from 2 footswitches. Available in either a desk-top version or a 19" rack-mounted module at \$2,500.

**QSC AUDIO PRODUCTS INC.**

1675 Mac Arthur Blvd.; Costa Mesa, CA 92626; (714) 957-7158. **Product Name:** QSCControl. **Contact:** Joyce Jorgenson, public relations mgr. **Date Product Introduced:** 10/92. **Product Description & Applications:** The QSCControl is a MediaLink™ based sound system control application. It connects QSC EX Series amplifiers to the MediaLink™ network and allows computer control and monitoring capabilities. QSCControl uses VNOS™ (Visual Network Operating System) MediaLinks™ software interface, to enhance the user's ability to customize control panels and easily view network configurations. Storage and recall are also possible. **Basic Specifications & Suggested List Price:** QSCControl hardware and VNOS software prices are TBA.



SPECTRAL SYNTHESIS INC.  
SynClock™

**SPECTRAL SYNTHESIS INC.**

19501 144th Ave. NE, Ste. #1000A; Woodinville, WA 98072; (206) 487-2931. **Product Name:** SynClock™. **Contact:** Mark Doenges, VP, mktg. **Date Product Introduced:** 6/93. **Product Description & Applications:** The SynClock™ converts multiple-clock sources to 3 discrete digital audio clock outputs to enable the synchronizing of digital audio systems to the rest of your studio. Inputs accepted are composite video or black burst, SMPTE LTC, MTC, Word, Super-clock (Oversampled Word), and AES/EBU. The clock outputs are Word, Super-clock and AES/EBU, VITC or MTC input can be converted to LTC output. The single-rack unit SynClock™ is MIDI or front panel controllable. **Basic Specifications & Suggested List Price:** The SynClock™ uses industry-standard connectors and electrical specifications. Supports custom frequencies and standards of 32, 44.1 and 48kHz. Super-clock oversampling at 128, 256 and 384 (spectral sync). Internal clock generation using AES 11 specification crystals available as an option. The SynClock™ suggested retail is \$1,995.

**STUDIO TECHNOLOGIES INC.**

5520 W. Touhy Ave.; Skokie, IL 60077; (708) 676-9177. **Product Name:** Studicomm. **Contact:** Gordon Kapes Inc. **Date Product Introduced:** 4/93. **Product Description & Applications:** The StudioComm series work with digital audio workstations to provide a full set of monitoring and communications functions. Features include control room and studio monitoring, and integrated headphone system, dubbing and communications functions that include talk to studio speakers, talk to phones and slate. **Basic Specifications & Suggested List Price:** Components include the Model 50 Central Controller and Model 51 Control console (\$1,799 for both), Model 35 Talent amplifier (\$159), Model 38 Talent Amplifier (\$249).

**TIMELINE VISTA INC.**

2401 Dogwood Way; Vista, CA 92083; (619) 727-3300. **Product Name:** Micro Lynx VITC option card. **Contact:** Tim Cuthbertson. **Date Product Introduced:** 7/93. **Product Description & Applications:** The Micro Lynx VITC Option card is a state-of-the-art, micro-processor-based vertical internal time code (VITC) reader that installs inside the Micor Lynx system unit. The VITC card integrates directly with the Micro Lynx machine controllers and eliminates the need for an external VITC to LTC translator. The VITC option card is used in audio-for-video, post-production applications, when a VITC reading capability is required and the VTR is not equipped to supply serial time code. **Basic Specifications & Suggested List Price:** Automatic or manual line selection mode. Automatic switch between LTC & VITC at 1/3rd play speed. Valid VITC code, type and line status display. Allocation to any of the three Micro Lynx machines. Suggested list price \$750.

**CABLES AND CONNECTORS**

**ALCATEL COMPONENTS C/O IMAGE COMM.**

4301 W. 69th St.; Chicago, IL 60629; (312) 585-1212. **Product Name:** "Jaws" IDC/XLR Connector. **Contact:** Larry Niles, mktg. mgr. **Date Product Introduced:** 1/93. **Product Description & Applications:** 3-pin XLR microphone connector incorporating IDC (insulation displacement contacts). Which means no soldering is involved to connect cable wires to the connector pins. (We are the first to have this. Neither Switchcraft nor Neutrik can do this.) **Basic Specifications & Suggested List Price:** Suggested retail 100 pcs. male \$2 each, female \$2.09.

**BELDEN WIRE & CABLE**

2200 U.S. 27 South, PD Box 1980; Richmond, IN 47375; (800) BELDEN-1. **Product Name:** Fiber Optic Trunk Cables. **Contact:** John Hitch, mktg. comm. mgr. **Date Product Introduced:** Early 1993. **Product Description & Applications:** Belden's Fiber Optic Trunk cables have a multifiber tube design consisting of 4-240 single-mode fibers contained in loose, gel-filled, color-coded buffer tubes. They ensure unlimited bandwidth and channel capacity to accommodate increased programming and also eliminate noise and interference, allowing better picture quality. **Basic Specifications & Suggested List Price:** Belden Fiber Optic Trunk cables are available in armored and all di-electric versions and meet Bellcore (TB-NWT-00020) and BEA (DE-90) specifications. Price ranges from \$.20-\$4.00 per fiber foot depending upon construction and fiber count.

**CANARE USA**

511 5th St., #G; San Fernando, CA 91340; (818) 365-2446. **Product Name:** BCJ-XJ-TR Impedance Transformers. **Contact:** Barry Brenner, GM. **Date Product Introduced:** 1992. **Product Description & Applications:** For all AES/EBU digital audio lines. Converts 110 ohm XLR to 75 ohm BNC. Applications for digital facilities: DAT, DAW, D1, D2, D5. **Basic Specifications & Suggested List Price:** Suggested list: \$55.

**CANARE USA**

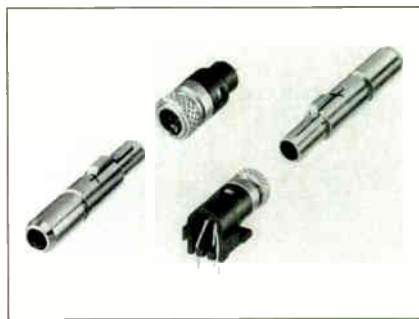
511 5th St., #G; San Fernando, CA 91340; (818) 365-2446. **Product Name:** BCJ-XJ-TRA. **Contact:** Barry Brenner, GM. **Date Product Introduced:** 3/93. **Product Description & Applications:** Digital audio transformer. Converts AES/EBU 110 ohm XLR to 75 ohm BNC coaxial cable. **Basic Specifications & Suggested List Price:** Suggested list: \$55.

**LEMO USA INC.**

335 Tesconi Cr.; Santa Rosa, CA 95401; (800) 444-5366. **Product Name:** LEMO Connectors. **Contact:** Karen Beeher, adv. supervisor. **Date Product Introduced:** 1993 (late). **Product Description & Applications:** LEMO debuts a space saving alternative to traditional patch panels. With LEMO's unique push/pull design, connectors disengage simply and smoothly with an axial pull on the connector's outer shell requiring finger clearance on just two sides of the connector. **Basic Specifications & Suggested List Price:** LEMO's patch panels measure 19" in length and can accommodate an array of connector designs from 50 or 75 ohm single or multicore/triaxial inserts to a variety of signal or mixed insert variations. The internal patch panel linking can be direct or made with microswitched adapters assuring signal normalization in coaxial and triaxial connectors. Panel pricing begins at approximately \$963 (this includes 30 sockets per panel — others may vary) and delivery is stock to 14 weeks.

**MOGAMI/MARSHALL ELECTRONICS INC.**

PD Box 2027; 5649 Mesmer Ave.; Culver City, CA 90230; (310) 390-6608. **Product Name:** Mogam EZ-ID CL-2 Snake Cable, Series 3040. **Contact:** Clyde Schultz, general manager. **Date Product Introduced:** 5/93. **Product Description & Applications:** Super flexible construction, soft matte PVC jacket, channel numbers printed on jacket, cross linked polyethylene insulation. Meets all NEC requirements for CL2. Ideal for use in microphone and line level applications. Series 3040 snake cable is also designed for use to interconnect sound systems, console equipment, recording studio apparatus, and in radio, TV, and production facilities. **Basic Specifications & Suggested List Price:** Available in 2, 4, 8, 12, 16, 24, 32 and 48 channel construction. 25 awg. cond., XLPE insulation; 25 awg. drain wire; serve shield; capacitance: 12p F/m (3.7 pF/ft.). Inductance: 0.6p H/m; insulation resistance: 10<sup>12</sup> mΩ min. Temperature rating: -20°C +70° c. Suggested price on 4-channel \$1,20/ft.



NEUTRIK USA INC.  
Nanocon

**NEUTRIK USA INC.**

195 Lehigh Ave.; Lakewood, NJ 08701; (908) 901-9488. **Product Name:** Nanocon. **Contact:** Kenneth Smalley, product mgr. **Date Product Introduced:** 6/93. **Product Description & Applications:** 3-pole sub miniature connector. The smallest multi pin connector in the world. Has the patented Neutrik chuck type strain relief. Contacts are machined and gold plated. Housings are machined metal and very robust. The panel receptacles can be solder type or PC mountable, vertical or horizontal. The connectors are locking and polarized. Modular components for greater user flexibility. **Basic Specifications & Suggested List Price:** Please contact factory for specifications and local distribution if required.

**REDCO AUDIO**

300 Long Beach Blvd.; Stratford, CT 06497; (203) 378-8045; (800) 572-7280. **Product Name:** Redco ADAT cables. **Contact:** Andy Friend, sales mgr. **Date Product Introduced:** 3/93. **Product Description & Applications:** ADAT cables for Alesis and Tascam digital using Mogami oxygen free wire. Available in any connector configuration and length. Custom cable assembly for studio installations.

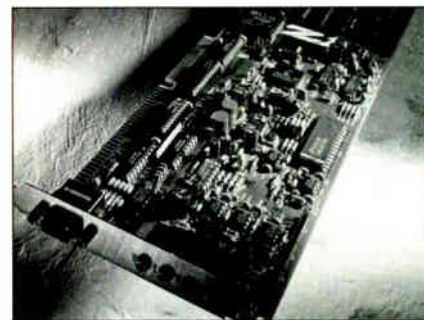
**THE RIP-TIE COMPANY**

PD Box 77394; San Francisco, CA 94107; (415) 543-0170. **Product Name:** Rip-Tie Velcro Cable Wraps. **Contact:** Michael Fennell, owner. **Date Product Introduced:** 1992. **Product Description & Applications:** Velcro cable wraps to organize and identify cable bundles for musical equipment. Also keeps cords and wires neat and easy to store and fasten to equipment. **Basic Specifications & Suggested List Price:** 1"x6" or 9" (various lengths) Velcro straps. 1"x6" 10-pack \$23.95. 1"x9" 10-pack \$26.95, etc. Also 10 colors to choose from.

**WIREWOKS CORPORATION**

380 Hillside Ave.; Hillside, NJ 07205; (908) 686-7400. **Product Name:** Broadway Latching System (BLS). **Contact:** Angela Kelly, customer service mgr. **Date Product Introduced:** Spring 1993. **Product Description & Applications:** Wireworks BLS Latching System withstands the rigors of live performance and touring applications. BLS is available on multicable components group products sized form 3-27 channels. BLS design eliminates protruding latches which can be prone to damage. Chassis mount connectors no longer need to be protected with special handles and recessed panels. Latch components (on females) lock into keeper components (on males) for positive mating. Latches store on connector sides when not in use. **Basic Specifications & Suggested List Price:** \$30 for BLS set of latches and keepers.

**COMPUTER HARDWARE AND SOFTWARE**



ANTEX ELECTRONICS  
Series 3/Model Z1 Digital Audio Adapter

**ANTEX ELECTRONICS**

16100 S. Figueroa St.; Gardena, CA 90248; (310) 532-3092. **Product Name:** Series 3/Model Z1 Digital Audio Adapter. **Contact:** Richard Gross, VP sales. **Date Product Introduced:** Spring 1993.

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**Product Description & Applications:** PC-compatible digital MPC audio adapter with superior sound, higher performance and more features than any other sound board. Professional quality direct-to-disk digital sound sampling and reproduction. Sample rates as high as 50kHz. Plug-in upgrade for Antex Z.Wav, 32-voice, 16-bit wavetable synthesizer. High-level drivers allow programmers and developers to write their own application programs or integrate high-quality stereo digital audio into application programs. **Basic Specifications & Suggested List Price:** 16-bit ISA, programmable 20 mips DSP chip; 64x oversampling with Sigma Delta conversion with digital filtering; compression formats include 4:1 MS-ADPCM, DVI, CDI, CD-ROM XA, 8- and 16-bit PCM; MIDI interface with on-board buffer; 20Hz-20kHz frequency response; list price of \$595.

## ANTEX ELECTRONICS

16100 S. Figueroa St., Gardena, CA 90248; (310) 532-3092. **Product Name:** Z.Wav MIDI sound module. **Contact:** Richard Gross, VP sales. **Date Product Introduced:** Summer 1993. **Product Description & Applications:** A professional-quality general MIDI sound module configured in a unique daughtercard design. Features 16-bit professional sound samples and gives PC users 32-voice professional-level music and sound effects. Integrates with Antex Series 3/Model Z1 digital audio adapter. Has low-profile design and does not require an adjacent open slot in the CPU. Plug-in compatible with the SoundBlaster 16 ASP. Utilizes wavetable synthesis for high-quality digitally sampled instruments and sound effects. **Basic Specifications & Suggested List Price:** 4 MB of CD-quality sounds in ROM; includes 128 high-quality digital instrument samples and 47 drum and percussion sounds; 32-part polyphony; 16-part multitrack capability; 16-bit PCM technology; sample rate of 31.25kHz; frequency response of 20Hz-15kHz; dynamic range 90dB. List price \$295.

## ATARI

1196 Borregas; Sunnyvale, CA 94089; (408) 745-2000. **Product Name:** Atari Falcon 030. **Contact:** James Grunke, dir. Atari Music. **Date Product Introduced:** 11/92 Europe, 3/93 USA. **Product Description & Applications:** Falcon 030 is the first consumer-priced computer system to incorporate CD-quality digital audio and digital signal processing (DSP) technology directly on the motherboard. Specs include: Motorola 68030 CPU and 56001 DSP chip, 8 16-bit digital audio DMA record and playback channels, stereo A/D and D/A conversion, multitasking OS, MIDI I/O. **Basic Specifications & Suggested List Price:** 1meg unit=\$799, 4meg=\$999, 4meg/80MB HD=\$1,299.

## AWARE INC.

Dne Memorial Drive; Cambridge, MA 02142; (617) 577-1700. **Product Name:** Aware AudioSuite™ Productivity Products. **Contact:** David Hartley, VP sales. **Date Product Introduced:** 4/93. **Product Description & Applications:** This comprehensive software package for IRIS Indigo™ and compatible workstations contains everything you need to prepare high-quality compressed audio for distribution on CD-ROMs, across local area and wide networks, and for satellite broadcast. Aware AudioSuite offers a choice of software-based compression and decompression options, including MPEG, the emerging international standard for digital radio broadcast and CD-ROM publishing as well as Aware's own MultiRate algorithm, with a lossless operation mode that preserves the complete signal information from the original file, making it suitable for audio archiving purposes. **Basic Specifications & Suggested List Price:** Aware AudioSuite offers four software-based compression options, including MPEG-1, MPEG-2, MultiRate lossless and MultiRate high-resolution compression modes, with compression ranging from 2:1, to 48:1. Unique output scalability feature allows a single file to be played back at a variety of resolutions up to 48kHz, assuring playback compatibility across a wide variety of CPUs. Three powerful graphical user interfaces are included, such as Psycho™, which lets you design, test and compare custom compression settings. Price: \$495 U.S.

## AWARE INC.

Dne Memorial Drive; Cambridge, MA 02142; (617) 577-1700. **Product Name:** Aware Speed of Sound™ Library Vol 1: SFX. **Contact:** David Hartley, VP sales. **Date Product Introduced:** 8/93. **Product Description & Applications:** The single CD-ROM disc puts more than seven hours of professional quality, stereo sound effects on-line from any CD-ROM drive with over 1,200 sfx in all, digitally recorded at 16-bits, 44.1kHz. Drawn from the Sound Ideas General 6000 Series. Aware Speed-of-Sound is a comprehensive collection compatible for use with a wide range of professional audio and multimedia applications packages for both Macintosh® computers and

Silicon Graphics® workstations. Built-in, interactive BrowsFX™ librarian speeds sound selections and auditioning. No special audio or DSP hardware required for use. **Basic Specifications & Suggested List Price:** Contains 1,204 sound effects comprising over 7 hours total time, recorded at 16 bits, 44.1 kHz in AIFF-C format, compressed using Aware MPEG encoding. Sound files can be retrieved in a variety of industry-standard formats including AIFF, OMF1, and WAV and at variable sample rates and sizes. Interoperable MegaDisc™ CD-ROM format ensures that the same disc can be used on both Macintosh computers and Silicon Graphics workstations. Scalable playback function allows library to be used on a variety of CPUs, from entry level to high end. Price: \$250 U.S.

## BLUE GROUP

1001 Ridge Ave.; Clearwater, FL 34615; (813) 442-1665. **Product Name:** Phone Byte. **Contact:** Ben L. Urnberger, pres. **Date Product Introduced:** 6/93. **Product Description & Applications:** Phone Byte is a hard drive-based recorder specifically designed for phone bits at demanding, high-performance stations. Phone Byte can automatically record calls, quickly edit, and air immediately or store for later. Phone Byte allows easy stacking of several bits to be played in sequence or rapid repeat of a particular bit, in general allows editing and handling that isn't practical with tape, even with a full-time editor. **Basic Specifications & Suggested List Price:** High-quality audio (15kHz) \$4,995 includes: Phone Byte software, sound card, control card, control cable and terminal block (requires computer 386-40 or better with 200 meg drive or larger).

## CROWN

PD Box 1000; Elkhart, IN 46515-1000; (219) 294-8000. **Product Name:** Crown IQ Turbo Software. **Contact:** Joe Wisler, Pro audio liaison. **Date Product Introduced:** 4/93. **Product Description & Applications:** Crown Turbo software for use with the Crown IQ computer control system, provides real-time monitoring and instant control of every audio system facet. It allows the user to decide what level of complexity to work with, from building a simple on/off switch to a multiple-component screen in full color. In effect, IQ Turbo can be likened to a giant box of "electronic crayons" that can be used to create a personalized system. **Basic Specifications & Suggested List Price:** IQ Turbo requires a minimum of a 16-MHz, 386 5K-equipped PC with one megabyte of extended memory and VCA graphics. It also supports Super-VGA graphics and a 3-button mouse. Price \$550.

## DIGITAL AUDIO LABS

14505 21st Ave. N., Ste. 202; Plymouth, MN 55447; (612) 473-7626. **Product Name:** The EdDitor for Windows. **Contact:** Jeff Wilson, mktg. **Date Product Introduced:** 4/93. **Product Description & Applications:** Powerful yet easy-to-use stereo waveform editor for IBM compatibles. Running under Windows 3.1, the EdDitor provided extremely fast cut-and-paste editing, as well as fades, crossfades, mixing and bass & treble EQ. The catalog feature allows MIDI triggering of soundfiles. The Playlist makes it easy to do song remixes, or to do SMPTE triggering of sounds. **Basic Specifications & Suggested List Price:** \$250.

## EAST-WEST

1631 Woods Drive; Los Angeles, CA 90069; (213) 848-8436. **Product Name:** Bob Clearmountain Drums II. **Contact:** Doug Rogers. **Date Product Introduced:** 5/93. **Product Description & Applications:** Drums II is Clearmountain's follow-up to the highly successful sample compact disc-Drums I. Drums II features dynamically recorded drum samples to enable absolute realism when triggered with a source that mimics dynamics. **Basic Specifications & Suggested List Price:** Available on audio compact disc for \$129 and CD-ROM for Akai, E-mu, Sample Cell, Kurzweil, Roland for \$399.

## ESE

142 Sierra St.; El Segundo, CA 90245; (310) 322-2136. **Product Name:** ES-770. **Contact:** Bill "R", factory sales eng. **Date Product Introduced:** 4/93. **Product Description & Applications:** Perfect for applications including: control of tape machines in duplication systems, control in editing suites of equipment such as character generators/mixer/effects/recorders and satellites. The ES-770 is an IBM PC/compatible controller system. The system allows up to 5,000 events to be stored in memory for time control applications. Eight relay outputs expandable to 64, can control or automate and entire studio or station. **Basic Specifications & Suggested List Price:** \$995.

## GEFEN SYSTEMS

6261 Variel Ave., Ste. C; Woodland Hills, CA 91367; (818) 884-6294. **Product Name:** M&E Windows. **Contact:** Hagai Gefen, president. **Date Product Introduced:** 4/93. **Product Description & Applications:** M&E Windows is a software package for IBM and compatibles running under Microsoft Windows 3.1. M&E catalogs, searches and locates any sound effect or production music cut available on CD. Gefen Systems supplies databases files for all available sound effects and production music libraries. M&E Organizer puts the sound editor in control with unique software & hardware packages that search, locate and play sound libraries on CDs. **Basic Specifications & Suggested List Price:** Software requirements: A 386 or 486 PC with a 80MB Hard Drive. List price: \$250 for application plus \$25 for each library database.

## HARMONIC SYSTEMS INC.

PD Box 488; Fairfax, CA 94978; (415) 485-5242. **Product Name:** StudioPal. **Contact:** Jim Wheaton, pres. **Date Product Introduced:**

11/92. **Product Description & Applications:** StudioPal is a conversion-calculator program for the Macintosh. It converts between all forms of SMPTE time code, sequencer timing, feet & frames, delay settings, note frequencies, chord intervals, rhythmic note values, sample rates, cents, megabytes, capstan frequency, and general units of time and distance (English and metric). Mixed unit, computations are supported. MIDI reference chart, tempo-lap function, history window and copy-paste capability are included. Current version is 1.21. **Basic Specifications & Suggested List Price:** Requires a Mac SE or newer. Works best with system 6.X or newer. Uses 150K of RAM. Not a desk accessory. List price \$69.95 (plus tax and shipping). Available from the manufacturer directly or from better music retail stores.

## HIREPOINT SOFTWARE

PD Box 38; Silverado, CA 92676; (714) 649-2207. **Product Name:** Hirepoint. **Contact:** Algis Renkus. **Date Product Introduced:** 10/92. **Product Description & Applications:** Plots advance bookings, acct. rec., maintenance costs, quotes, contracts, subhires, marketing functions and many more. Software is specifically designed for P.A. companies, audio-visual & lighting businesses. **Basic Specifications & Suggested List Price:** \$495.

## INTERVAL MUSIC SYSTEMS

12335 Santa Monica Blvd. #244; Los Angeles, CA 90025; (310) 478-3956. **Product Name:** sBASE. **Contact:** Scott Morgan, president. **Date Product Introduced:** Spring 1993. **Product Description & Applications:** A sample cataloging utility for Akai S1000/S1100 and S900/S950 series samplers. sBASE talks over MIDI and creates a zoomable, hierarchical overview of the samplers' memory. This enables the user to monitor unused samples in memory as well as create complete directory of an entire sound library across hard drives, SyQuest carts, CD-ROM and floppy disks. **Basic Specifications & Suggested List Price:** Requires Mac Plus or greater, System 6.0.3 or greater, 800K-2000K memory partition, Supports MIDI Time Piece, fast and cable modes. Compatible (but does not support) OMS. 32-bit compatible, Quadra compatible \$149 suggested list (\$289 bundled with sEDIT).

## INTERVAL MUSIC SYSTEMS

12335 Santa Monica Blvd. #244; Los Angeles, CA 90025; (310) 478-3956. **Product Name:** sEDIT. **Contact:** Scott Morgan, president. **Date Product Introduced:** Spring 1993. **Product Description & Applications:** A remote program and keygroup editor for Akai S1000/S1100 series samplers. In addition to bringing up all editing parameters to the computer screen, sEDIT includes algorithmic functions for quickly generating complete, multisampled and mapped programs. All edits are carried out in real-time over MIDI. Users may name programs and samples from the computer keyboard and print program and sample lists. **Basic Specifications & Suggested List Price:** Requires Mac Plus or greater, System 6.0.3 or greater, 800K memory partition, Support MIDI Time Piece fast and cable modes. Compatible (but does not support) OMS. 32-bit compatible, Quadra compatible. \$189 suggested list.

## KEY ELECTRONICS INC.

7515 Chapel Ave.; Ft. Worth, TX 76116; (817) 560-1912. **Product Name:** MP-128 Parallel-MIDI Interface. **Contact:** Charles Phelan. **Date Product Introduced:** 3/93. **Product Description & Applications:** External parallel (printer port) MIDI interface. Features 8 independent ports (128 channels). May be used in conjunction with a standard MIDI card or stand alone for music and multimedia applications. Use with virtually all IBM PC compatible computers. **Basic Specifications & Suggested List Price:** Suggested retail \$199.95 Centronics type printer port meeting IBM PC standards. Eight output ports, software addressable. 5 mA current loop per MIDI 1.0 Windows included. 1.5x3.1x4.9 inches. 11 ounces.

## KEY ELECTRONICS INC.

7515 Chapel Ave.; Ft. Worth, TX 76116; (817) 560-1912. **Product Name:** MP-328 Parallel-MIDI Interface. **Contact:** Charles Phelan. **Date Product Introduced:** 3/93. **Product Description & Applications:** External parallel (printer port) MIDI interface. Features 2 MIDI in ports, SMPTE, and 8 independent out ports. Designed for the studio, and stand alone applications with Laptop, Notebook and other slotless computers. Use with all IBM-PC-compatible computers. **Basic Specifications & Suggested List Price:** Suggested retail \$299.95 Centronics type printer port meeting IBM standards. Eight port MIDI out. Dual MIDI in & SMPTE. Windows 3.1 MME compatible multiport driver included. External transformer, 9V DC @100MA and 6' Parallel cable included.

## MARK OF THE UNICORN INC.

1280 Mass Ave; Cambridge, MA 02138; (617) 576-2760. **Product Name:** MIDI Express. **Contact:** Daniel Rose. **Date Product Introduced:** 1/93. **Product Description & Applications:** A MIDI/patch Bay/SMPTE interface that provides 96 MIDI channels with six independent MIDI outputs and four independent MIDI inputs. Includes eight user and eight factory-preset memory locations for stand-alone operation. Functions as a multicable computer interface and MIDI merger/router patch bay. Other features include: SMPTE reader/generator with freewheeling, convenient MIDI in and out ports on the front panel, and a RS-422 thru port for a modem or printer. The MIDI Express is housed in a single-space 19" rack-mountable chassis. Can be used for music and multimedia production. \$349 retail.

## MARK OF THE UNICORN INC.

1280 Mass Ave; Cambridge, MA 02138; (617) 576-2760. **Product Name:** MIDI Express PC. **Contact:** Daniel Rose. **Date Product Intro-**

duced: 1/93. **Product Description & Applications:** A MIDI/Patch Bay/SMPTE interface that provides 96 MIDI channels with six independent MIDI inputs and outputs. Functions as a multicable computer interface and MIDI merger/router patch bay. Other features include: SMPTE reader/generator with freewheeling and convenient MIDI in & out ports on the front panel. The MIDI Express is housed in a single space 19" rack-mountable chassis. Can be used for music and multimedia production. \$295 retail.

**MAXELL CORPORATION—PRO PRODUCTS**  
22-08 Rte. 208; Fair Lawn, NJ 07410; (201) 794-5900. **Product Name:** Magneto Optical Disks. **Contact:** Patricia Byrne, product mgr. **Date Product Introduced:** 5/93. **Product Description & Applications:** Magneto Optical Disks are available in 3.5" and 5.25" and are compatible with any ISD standard drive. The main characteristics of these products are 1) extended margins for operational diversity including improved resolution and high S/N ratio, enhanced writing/erasing capability at low external magnetic fields, wide erasing margins, and 2) long life due to the development of a high-grade plastic substrate combines with a reliable recording layer. **Basic Specifications & Suggested List Price:** 5.25"—\$300-\$600, 3.5"—\$70.

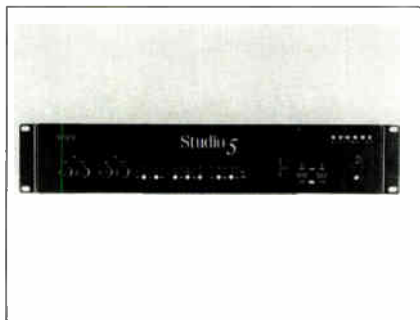
**MIDIMAN**  
236 W. Mountain St., Ste. 108; Pasadena, CA 91103; (818) 449-8838; (800) 969-6434. **Product Name:** Portman PC. **Contact:** Michael Paul Inman, national sales mgr. **Date Product Introduced:** 10/92. **Product Description & Applications:** Parallel and serial MIDI interfaces for IBM and compatible computers. **Basic Specifications & Suggested List Price:** 1 MIDI in and 1 MIDI out. Professional series interfaces. Retail \$119.95

**MIDISOFT CORPORATION**  
PD Box 1000; Bellevue, WA 98009; (206) 881-7176; FAX: (206) 883-1368. **Product Name:** MIDISOFT Studio for Windows Ver. 3.10. **Contact:** Chuck Robb, dir. mktg. services. **Date Product Introduced:** 7/93. **Product Description & Applications:** Studio for Windows is ideal for home entertainment, performance and multimedia/business applications. Music displays instantly in real-time as standard notation. Notes can be entered and edited with mouse. Supports all graphics, sounds and MIDI cards compatible with Windows 3.1. Rearrange, combine, adapt pre-existing MIDI files or your own creations. Version 3.10 has dozens of new features, including a mixer view for easy track and instrument adjustments as well as great enhancements to printed output of music. **Basic Specifications & Suggested List Price:** IBM PC/compatible, 286+, 2MB (386+, 4MB recommended), Microsoft Windows 3.1 and mouse windows supported sound card or MIDI interface (for playback), MIDI musical instrument (optional) SRP \$249.95.

**MIDISOFT CORPORATION**  
PD Box 1000; Bellevue, WA 98009; (206) 881-7176; FAX: (206) 883-1368. **Product Name:** Music Mentor with Recording Session. **Contact:** Chuck Robb, dir. mktg. services. **Date Product Introduced:** 10/92. **Product Description & Applications:** This is the first Windows-based multimedia environment that combines music education and entertainment with a sequencer for music creation. Learn about the basics of music (melody, harmony, rhythm, etc.), reading music, then take a tour of music history from early to modern. Then use recording session to examine and edit the music samples used in Music Mentor, or create new songs, highlighted in real-time as standard music notation, for use in home or office. **Basic Specifications & Suggested List Price:** IBM PC/compatible, 286+, 2MB RAM (386+, 4MB recommended), Microsoft Windows 3.1 and mouse, Windows supported sound card or MIDI interface (for playback), MIDI musical instrument (optional). SRP \$149.95.

**NETWORK MUSIC INC.**  
11021 Via Frontera; San Diego, CA 92127; (619) 451-6400. **Product Name:** Sonic Graffiti. **Contact:** Bruce Tucker, VP, business and legal affairs. **Date Product Introduced:** 11/92. **Product Description & Applications:** A unique collection of over 100 high-fidelity, stereo sounds for your PC including modern office effects (fax, telephone, copier, etc), musical cues (short instrumental tracks), animal sounds (moo, growl, snort, oink, etc.), silly sayings (shwing!, wrong!, not!, etc.), and whacky sounds (kiss, sex tub, autopsy, etc.). Sonic Graffiti is available on 5 high-density diskettes (3.5" or 5.25") and is designed specifically for use with the Microsoft Windows Sound System. **Basic Specifications & Suggested List Price:** Five diskettes packed with over 100 sounds for \$19.95. Requires IBM or compatible computer with Microsoft Windows Sound System and six megabytes of hard drive space.

**OPCODE SYSTEMS INC.**  
3950 Fabian Wy., Ste. 100; Palo Alto, CA 94303; (415) 856-3333. **Product Name:** Studio 5. **Contact:** Paul de Benedictis, comm. dir. **Date Product Introduced:** 1/93. **Product Description & Applications:** The Studio 5 is Opcode's top-of-the-line MIDI interface with synchronization and patch bay capabilities. With 15 independent MIDI INs and OUTs, a whopping 240-channel compatibility, the ability to chain multiple Studio 5s together, and much more, the Studio 5 sets a new standard for professional MIDI/SMPTE hardware. The Studio 5 combines the functions of a MIDI interface, a MIDI patch bay, a MIDI processor, and a SMPTE synchronizer in a single, powerful unit. As an interface, it lets the computer independently communicate with each of the 15 MIDI INs and MIDI OUTs. **Basic Specifications & Suggested List Price:** Requirements: Macintosh 512K, Macintosh Plus, Classic, LC, Macintosh



OPCODE SYSTEMS INC.  
Studio 5

SE, Macintosh II Series; Quadra 700, 900; MIDI instrument. Retail price: \$995.



OPCODE SYSTEMS INC.  
Studio Vision 1.5

**OPCODE SYSTEMS INC.**  
3950 Fabian Wy., Ste. 100; Palo Alto, CA 94303; (415) 856-3333. **Product Name:** Studio Vision 1.5. **Contact:** Paul de Benedictis, comm. dir. **Date Product Introduced:** 1/93. **Product Description & Applications:** Studio Vision combines Opcode's professional sequencing software program, Vision, with the ability to record and edit digital audio. This powerful capability eliminates multitrack syncing situations when combining MIDI and "live" tracks. For example, the user can add vocals, guitar, saxophone, or any live instrument or voice to MIDI sequences. Studio Vision works in conjunction with Digidesign's Pro Tools, Sound Tools or Audiomeia card and allows playback of up to four mono digital audio channels simultaneously (with Pro Tools) or two digital audio channels material limited only by hard disk space. **Basic Specifications & Suggested List Price:** Requirements: Macintosh SE/30 or Macintosh II Family, Digidesign Pro Tools, Sound Tools or Audiomeia Card, MIDI interface with optional SMPTE capabilities. Hard Disk: a mono recording requires 5 megabytes per minute. Optional: DAT/IO digital interface or PRT/IO analog interface. Retail price: \$995. System 7 compatible.

**PASSPORT DESIGNS INC.**  
100 Stone Pine Rd.; Half Moon Bay, CA 94019; (415) 726-0280. **Product Name:** Passport Producer. **Contact:** Phillip Malkin, product mgr. **Product Description & Applications:** Passport Producer™ software: for creating and delivering spectacular interactive multimedia productions. This software enables you to combine and present multimedia file: including PICT, PICS, QuickTime, Video, AIFF (8-bit anc 16-bit digital audio), and MIDI, with accurate time-based synchronization. Passport Producer provides both internal and external editors and links to the most popular software packages used for creating content.

**PERSONAL COMPOSER**  
3213 W. Wheeler St., Ste. #140; Seattle, WA 98199; (206) 524-5447. **Product Name:** Personal Composer for Windows. **Contact:** Susan Miller, CEO. **Date Product Introduced:** 9/93. **Product Description & Applications:** Personal Composer for Windows provides sophisticated page layout and typesetting features as well as comprehensive and flexible access to MIDI. PCW gives you global control over spacing of all elements; a split screen mode that lets you simultaneously edit two sections of the same file or different files and a drag-enclose selective zoom. You can have multiple onscreen mixers with up to 32 faders each, which operate in real time. Dynamic and tempo markings affect MIDI playback. **Basic Specifications & Suggested List Price:** Minimum 386 or faster, hard disk, minimum 4 MB. RAM, Microsoft Windows 3.1, a printer supported by Windows 3.1, MIDI card or soundboard \$440.

**RADIUS**  
1710 Fortune Dr.; San Jose, CA 95131; (408) 434-1010; (800) 227-2795 ext. 3F. **Product Name:** VideoVision Studio. **Date Product Introduced:** 6/93. **Product Description & Applications:** With VideoVision Studio, you can capture and playback full-screen, full-motion; 30 frames & 60 field-per-second digital video directly to and from your hard disk, VideoVision Studio delivers hardware-accelerated JPEG compression and decompression of each individual video frame, so

—LISTING CONTINUED ON NEXT PAGE

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—LISTING CONTINUED FROM PREVIOUS PAGE

you can perform non-linear, frame-accurate digital video editing. VideoVision Studio also digitizes stereo audio simultaneously and stores it with the video for easier input and editing. **Basic Specifications & Suggested List Price:** VideoVision Studio consists of a video interface card, a JPEG-compression and decompression daughter card, a connector panel for external video and audio connections, and comprehensive software controls for \$4,499. It can also be purchased as an upgrade to the existing VideoVision card for \$1,999.



SEALEVEL SYSTEMS INCORPORATED  
AV-CDM

**SEALEVEL SYSTEMS INCORPORATED**

PD Box 830; Liberty, SC 29657; (803) 843-4343. **Product Name:** AV-CDM. **Contact:** Technical support staff. **Date Product Introduced:** 2/93. **Product Description & Applications:** The AV-CDM allows the IBM-PC to control multiple video, DAT, MIDI, and PA-422 devices. The AV-CDM provides 2 individually configurable serial ports for MIDI, SMPTE-207M, PA-422 or RS-232. Applications include: Windows-based video and audio systems, real time production mixing and stage and theatre production control. Software provided with the AV-CDM includes: Diagnostics, Windows MIDI device driver and example code. MIDI, PA-422 and SMPTE-207M only versions also available. **Basic Specifications & Suggested List Price:** Each serial port on the AV-CDM is configurable as CDM1-CDM4; on any other I/O address up to 3FF Hex. Each port features individually configurable IRQ selections (2-7, 10-12, 15), DB-9 female connectors provide the physical interface for the serial ports, as required by the SMPTE-207M specifications. Part# 3086. Price \$249.



STEINBERG U.S.  
ACI ADAT Computer Interface

**STEINBERG U.S.**

17700 Raymer St., Ste. 1001; Northridge, CA 91325; (818) 993-4091. **Product Name:** ACI ADAT Computer Interface. **Contact:** Steinberg. **Date Product Introduced:** 8/93. **Product Description & Applications:** The ACI is a synchronizing and MMC device which is designed to interface an Alesis ADAT with a personal computer recording system. The ACI allows Steinberg's Cubase or any MIDI sequencer utilizing MIDI machine control to control the ADAT's tape transport functions. The ACI uses the proprietary timing information from the ADAT recorder to time lock with Cubase. It is possible with this system to have the master control sequencer completely automate the recording process. **Basic Specifications & Suggested List Price:**

The ACI interfaces via two 9-pin sync in/out connectors along with MIDI connections. Suggested retail \$399.

**STEINBERG U.S.**

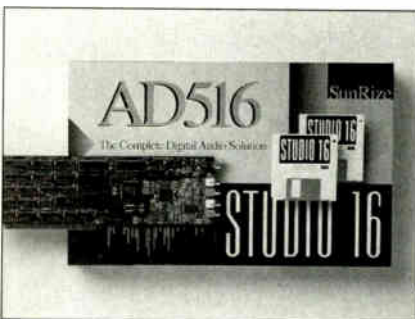
17700 Raymer St., Ste. 1001; Northridge, CA 91325; (818) 993-4091. **Product Name:** Cubase Audio Mac (16-track) (+score). **Contact:** Steinberg. **Date Product Introduced:** 10/93. **Product Description & Applications:** Cubase Audio is an integrated MIDI/digital recording and score printing system for the Mac. Now featuring full 16 discrete tracks of audio playback. Full professional sequencing along with postscript-compatible score printing are combined with a complete digital audio work environment. Macintosh version requires Digidesign hardware. Other versions for Windows and Atari computers. **Basic Specifications & Suggested List Price:** Non-destructive quantizer, mixer maps, MIDI machine control, unlimited number of virtual tracks, 16 discrete audio tracks for playback, wave form editor, banish silence function, for audio calibrate to tape, audio "Q" point quantize, Timebandit and Sound Designer Link, normalize audio, mix feature. SMPTE. Suggested retail \$999.



SUNRIZE INDUSTRIES  
DD524

**SUNRIZE INDUSTRIES**

2959 S. Winchester Blvd.; Campbell, CA 95008; (408) 374-4962. **Product Name:** DD524. **Contact:** Dean Tucker, mktg mgr. **Date Product Introduced:** 9/93. **Product Description & Applications:** The DD524 provides digital audio interface for use with SunRize's Studio 16 multitrack audio hard disk recording and editing systems for the Commodore Amiga. The DD524 provides AES/EBU and S/PDIF digital connections for DAT player/recorders and CD Players. This allows lossless transfer of audio in the digital domain to and from the hard drive. The DD524 allows for hard drive backup to DAT. **Basic Specifications & Suggested List Price:** S/PDIF (RCA connections), AES/EBU (XLR connections), supports 16 or 24 bit samples, 48K or 44.1K sampling rates, stereo, Zorro II Autoconfig card for the Commodore Amiga, A2000, A3000 and A4000. List price: \$749.



SUNRIZE INDUSTRIES  
Studio 16 v 3.0/AD516

**SUNRIZE INDUSTRIES**

2959 S. Winchester Blvd.; Campbell, CA 95008; (408) 374-4962. **Product Name:** Studio 16 v 3.0/AD516. **Contact:** Dean Tucker, mktg mgr. **Date Product Introduced:** 9/93. **Product Description & Applications:** Studio 16/AD516 is a 16-bit, 8-track hard disk recording system for the Commodore Amiga. With it, you can record an unlimited number of stereo audio tracks to hard disk, edit and mix them, and then play back, synchronized to SMPTE time code. Studio 16 V 3.0, includes many new and updated features including: Non-linear graphical time line cue list with SMPTE lock, 8-channel mixer with automated mixing, non-destructive wave form editor, and real time effects like echo, flange and delay. **Basic Specifications & Suggested List Price:** 16-bit, 8-tracks, 10 MIP DSP, SMPTE time code reader, sampling rates from 5.5-48kHz, stereo, Zorro II Autoconfig card for the Commodore Amiga A2000, A3000 and A4000. List price: \$1,495.

**TIME DESIGNS**

127 Walk Circle; Sania Cruz, CA 95060; (408) 454-9734. **Product Name:** MIDINOME. **Contact:** James Dale Lewis. **Date Product Introduced:** 1992. **Product Description & Applications:** The MIDINOME is a fully programmable, visual MIDI metronome. Using a visual metronome enables a performer to comfortably play along to a click

track or sequencer without the need for headphones or excessive monitor levels, which could damage hearing. **Basic Specifications & Suggested List Price:** The MIDINOME responds to: MIDI beat clocks, song position pointer or note on/off commands. It has large bright LEDs which are easy to follow and can be seen from a distance.

**TRIPP LITE**

500 N. Orleans; Chicago, IL 60610-4188; (312) 329-1601. **Product Name:** Isobar Ultra Surge Suppressor. **Contact:** Sales support. **Date Product Introduced:** 11/93. **Product Description & Applications:** Isobar Ultra Surge Suppressor features diagnostic indicators to warn of improper outlet wiring, loss of ground, loss of protection circuitry and loss of AC power. Features all-metal housing, superior RFI/EMI noise filtering and Ultimate Lifetime Insurance which covers connected equipment up to \$25,000 for protecting computers, keyboards, MIDI equipment, etc. **Basic Specifications & Suggested List Price:** Multiple component circuitry, isolated filter banks, all-metal housing, 6 ft. grounded AC cords, optional fax/modem protection, retail prices start at \$89.95 for Isobar 4 Ultra.

**TRUE IMAGE AUDIO**

349 W. Felicita Ave., Ste. 122; Escondido, CA 92025; (619) 480-8961. **Product Name:** MacSpeakerz V 3.0. **Contact:** Sharon Alsop, mktg. dir. **Date Product Introduced:** 1992. **Product Description & Applications:** Mac Speakerz V 3.0 now with Bandpass speaker design! **Basic Specifications & Suggested List Price:** Any Macintosh Plus or later with a minimum of 1 MB memory. System 7 compatible. List price \$349

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Long Life DAT tape

**APOGEE ELECTRONICS CORP.**

3435 Deean Park Blvd., Ste. 211; Santa Monica, CA 90405; (310) 314-1700. **Product Name:** Long Life DAT tape. **Contact:** Angie Orduno. **Date Product Introduced:** 7/93. **Product Description & Applications:** The evolutionary Apogee DAT, ultra long life. 15 patents for shell design and high resistance to oxidation give it unprecedented reliability with an archivability factor unmatched by any other tape. Trust your masters to Apogee DAT—it'll be there when you need it!

**BASF CORP. INFORMATION SYSTEMS**

35 Crosby Dr.; Bedford, MA 01730; (617) 271-4000. **Product Name:** Digital Master 931. **Contact:** Terence D. O'Kelly, dir. sales/mktg. **Date Product Introduced:** 9/93. **Product Description & Applications:** For stationary-head digital recorders. High mechanical robustness on business delivers signal stability. Extreme coating smoothness ensures low level error correction. Accurate straightness of edge means exact tape tracking. Precision metal edge delivers precise tape operation. Compatible with IEC Reference tape; no need to realign recorder. **Basic Specifications & Suggested List Price:** Available in 1/2" and 1" reels: 5,000', 7,500', 10,000'.



BASF CORPORATION INFORMATION SYSTEMS  
M.D.D. Master Rewritable Magneto Optical Disk

**BASF CORP. INFORMATION SYSTEMS**

35 Crosby Dr.; Bedford, MA 01730; (617) 271-4000. **Product**

**Name:** M.O.D. Master Rewritable Magneto Optical Disk. **Contact:** Terence D. O'Kelly, dir. sales/mktg. **Date Product Introduced:** 9/93. **Product Description & Applications:** For professional audio & video applications, M.O.D. Master can be recorded, read and erased as often as you wish. Surpasses existing ISO and ECMA standards, delivered pre-formatted and guaranteed error free. Absolutely perfect data transfer is ensured. Minimum life expectancy 15 years. **Basic Specifications & Suggested List Price:** Available in 3.5" 128MB and 5.25" 594MB and 5.25" 652MB.

### DIC DIGITAL

222 Bridge Plaza S.; Fort Lee, NJ 07024; (201) 224-9344. **Product Name:** Beta Cam SP. **Contact:** Kevin Kennedy. **Date Product Introduced:** 4/93. **Product Description & Applications:** DIC digital is pleased to introduce its arrival into the professional videocassette market. Betacam SP is the predominant production video format used today in ENG, location video and the "on air" segments of the broadcast industry. DIC's Betacam SP videocassette tape utilizes the Microfinity Plus metal particle for the most optimum video and audio performance. Betacam SP is available in 5, 10, 20 and 30-minute lengths.



DIC DIGITAL  
HQ Series DAT Cassette

### DIC DIGITAL

222 Bridge Plaza S.; Fort Lee, NJ 07024; (201) 224-9344. **Product Name:** HQ Series DAT Cassette. **Contact:** Kevin Kennedy. **Date Product Introduced:** 6/93. **Product Description & Applications:** DIC digital is pleased to introduce its newest addition to digital audio tape market. The HQ cassette is a high-quality, professional-grade DAT cassette. The HQ series contains a new slip sheet design to eliminate jamming in all DAT machines, APRS labeling system, packed in an unbreakable, reusable and recyclable polypropylene cases and comes with a lifetime guarantee. The HQ series is available in 10, 20, 30, 60 and 120-minute lengths.

### LEXTRON MEDIA INC.

4525 Wilshire Blvd., Ste. 150; Los Angeles, CA 90010; (213) 965-6200. **Product Name:** Video Cassette Shells. **Contact:** Roy G. Lunel, VP sales. **Product Description & Applications:** Lextron Media Inc. is one of the world's largest manufacturers of quality video cassette housings.



SHAPE INC.  
Mark 10 SC Pro Audio Cassette

### SHAPE INC.

PO Box 366; Biddeford Industrial Park; Biddeford, ME 04005; (207) 282-6155. **Product Name:** Mark 10 SC Pro Audio Cassette. **Date Product Introduced:** 8/93. **Product Description & Applications:** The Mark 10 SC Pro ("American Pro") is Shape's answer to a tape-loaded version of the Mark 10. The essence of the Mark 10 design is a patented independent bridge that delivers the most consistent, accurate and stable azimuth alignment possible. Designed by professionals for all studio mastering applications and highest-quality tape duplication, and by exclusive agreement with BASF wherever a high-quality, high-performance audio cassette is demanded, the Mark 10 exclusively loaded with BASF Superchrome tape and is available in lengths of 10, 30, 60 and 90 minutes. **Basic Specifications & Suggested List Price:** High-impact, polystyrene audio cassette shell featuring the exclusive Mark 10 patented independent azimuth stabilizing bridge mechanism. Exclusively loaded with BASF's

highest quality Superchrome tape and is available in 10, 30, 60 and 90-minute lengths. Available at a significant discount direct to the professional through Shape. Also available at retail, price for a C-90 being \$2.99-\$3.19.



TDK ELECTRONICS CORPORATION  
DA-R16

### TDK ELECTRONICS CORPORATION

12 Harbor Park Dr.; Port Washington, NY 11050; (516) 625-0100. **Product Name:** DA-R16. **Contact:** Bruce Youmans. **Date Product Introduced:** 11/92. **Product Description & Applications:** The new TDK 16-minute, DA-R16 was developed as an economical alternative to longer DAT tape lengths. Especially designed for studio and broadcast applications (including demo tapes), the DA-R16 provides reliability and durability while delivering high output across the full frequency band. **Basic Specifications & Suggested List Price:** The DA-R16, a 16-minute DAT tape, has a suggested retail price of \$8.99.

### 3M CO AVMD

3M Center Bldg. 223-5N; St. Paul, MN 55144-1000; (800) 245-8332. **Product Name:** 3M 275 LE. **Contact:** Mark Fuhrer, nat'l sales mgr. **Date Product Introduced:** 4/93. **Product Description & Applications:** 3M 275 LE digital audio tape for digital audio mastering. **Basic Specifications & Suggested List Price:** 275 LE is designed for DASH and PD open-reel digital audio open-reel recorders.

### 3M CO AVMD

3M Center Bldg. 223-5N; St. Paul, MN 55144-1000; (800) 245-8332. **Product Name:** 3M Digital Audio Cassette. **Contact:** Mark Fuhrer, nat'l sales mgr. **Date Product Introduced:** 10/93. **Product Description & Applications:** 3M digital audio cassette for SVHS digital audio recorders. **Basic Specifications & Suggested List Price:** 3M digital audio cassettes are designed for SVHS and Hi8 digital audio recorders.

### MICROPHONES

### AC-CETERA INC.

3120 Banksville Rd.; Pittsburgh, PA 15216; (800) 537-3491. **Product Name:** Mic-Eze Pig-E-Bak™. **Contact:** Mark Tarshis, mgr. **Date Product Introduced:** 6/93. **Product Description & Applications:** Pig-E-Bak™ is a dual clamping system that provides instant access to mount "a direct feed microphone" to an existing mic. The center of the dual clamps adjusts for height, angle & distance. The clamp pads are made of a shock & vibration isolation material to avoid unwanted noise. The clamps are also equipped with an important locking system to ensure against accidental slipping and secures a proper alignment of the mic. Pig-E-Bak is made in the USA. **Basic Specifications & Suggested List Price:** Quick & easy access to mount your direct feed mic, adjustable to height, angle & distance, protective pads, locable clamps. Lightweight and durable. List price: \$30.95.

### AC-CETERA INC.

3120 Banksville Rd.; Pittsburgh, PA 15216; (800) 537-3491. **Product Name:** Mic-Eze® Microphone System. **Contact:** Mark Tarshis, mgr. **Date Product Introduced:** 6/93. **Product Description & Applications:** Mic-Eze® microphone system is an integrated dynamic microphone, holder and clamp combined into one flexible & portable unit. Recording studios, sound engineers, broadcasters, videographers and drummers will appreciate the elimination of separate units in micing many situations. We have developed a system that securely clamps to many structures (including other mics & goosenecks), hides unsightly wires, adjusts for exact microphone placement for the best possible sound and weighs about one pound. **Basic Specifications & Suggested List Price:** One piece mic, holder & mount, unparalleled adjustability, lockable positioning, shock-vibration & mark-resistant, quick & easy setup & break down, lightweight, two-year warranty, made in USA.

### AKG ACOUSTICS INC.

1525 Alvarado St.; San Leandro, CA 94577; (510) 351-3500. **Product Name:** C522 MS Stereo Mic with UM52 Matrix (C522MS+UM52). **Contact:** Joey Wolpert, product mgr. **Date Product**

—LISTING CONTINUED ON NEXT PAGE

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—LISTING CONTINUED FROM PREVIOUS PAGE

**Product Description & Applications:** The C522 MS (mid/side) stereo mic designed for studio/location production. The rechargeable nicad or phantom power C522 MS outputs independent mid and side signals which can be discretely recorded and then later combine to XY (matrixed stereo) in post-production. In the field, you can use the optional, battery-powered UM52 matrix box (available separately or included with the Model C522MS+UM52) to monitor the mid or XY signal through headphones while selectively generating M/S or XY at the balanced outputs. **Basic Specifications & Suggested List Price:** Type: three pre-polarized condenser transducers providing front facing cardioid and laterally oriented figure-eight; frequency response: 50-20kHz; sensitivity 25mV/Pa; maximum SPL for 1% THD @ 1kHz: 128dB SPL; equivalent noise level: 20dBA. Supplied with stand adapter, shock mount, foam windscreen and cables in carrying case. Pro user net: C522 MS: \$1,699, C522MS+UM52: \$2,799.

### AKG ACOUSTICS INC.

**1525 Alvarado St.; San Leandro, CA 94577; (510) 351-3500.** **Product Name:** CK68ULS Dual Shotgun Capsule. **Contact:** Joey Wolpert, product mgr. **Date Product Introduced:** 4/93. **Product Description & Applications:** New addition to the C460 modular system, the CK68ULS combines two shotgun capsules into one. Using a divisible interference tube, the user can convert from long to short shotgun applications easily without compromising sonic integrity. The CK68ULS is extremely resistant to humid working conditions. Unit comes in matte-black finish. Typical applications: sound recording in film and television, front of stage reinforcement, synching sound to picture in sports reporting and interviews in noisy environments. **Basic Specifications & Suggested List Price:** Type: combined pressure gradient/interference microphone; frequency range: 20 to 1800Hz; sensitivity: 30mV/Pa; polar patterns: directional/ultradirectional; equivalent noise level (A weighted): 14dBA; maximum SPL: 124dB; C460B preamp/powering module incorporates -10dB pad and two selectable bass cut slopes. CK68 supplied with carrying case, foam windscreens and frequency-response plot. Pro user net: \$649 (CK68 only).

### AKG ACOUSTICS INC.

**1525 Alvarado St.; San Leandro, CA 94577; (510) 351-3500.** **Product Name:** The Vintage TL (C414B/TLII). **Contact:** Joey Wolpert, product mgr. **Date Product Introduced:** 10/93. **Product Description & Applications:** The Vintage TL, a new version of the multipattern and transformerless C414, combines the sonic characteristics of AKG's classic C12 tube mic with electronics that exceed all digital recording requirements. The mic is distinguished from the standard C414B/ULS by its gold front grill and lettering. The Vintage TL is available in matched stereo pairs with shock mounts and custom case (C414B/TLII stereo). **Basic Specifications & Suggested List Price:** Polar pattern: cardioid, hypercardioid, omnidirectional, Figure-8; frequency response: 10-20kHz; sensitivity: 12.5mV/Pa; equivalent noise level: 14dBA; max SPL for 0.5% THD: 146dB (166dB with -20dB pre-attenuation); dynamic range: 132dB minimum; supplied with case, stand adapter and windscreen. Pro user net: C414/TLII: \$1499, C414/TLII Stereo: \$3599.

### AUDIO-TECHNICA U.S. INC.

**1221 Commerce Dr.; Stow, OH 44224; (216) 686-2600.** **Product Name:** Condenser Microphone AT873R. **Contact:** Garry Elliott, nat'l sales mgr. **Date Product Introduced:** 10/93. **Product Description & Applications:** A small handheld condenser microphone with interchangeable elements. The AT873R can be converted to an omni, subcardioid, cardioid or the supplied hypercardioid polar pattern. A self-contained neumatic shock mount keeps hand and mechanical noise to a minimum including the difficult low-frequency region that causes problems in sound reinforcement when subwoofers are used. High SPL handling, smooth frequency response and low self-noise make this microphone ideal for live sound, on-location recording and vocal groups especially gospel. **Basic Specifications & Suggested List Price:** Professional net \$225. 50-20,000Hz response. -42dBV @ 1Pa output. Self-noise 23dB A weighted.

### BEYERDYNAMIC

**56 Central Ave.; Farmingdale, NY 11735; (516) 293-3200.** **Product Name:** HEM 191/HEM 192 Headworn Mic. **Contact:** Michael Solomon, mktg. mgr. **Date Product Introduced:** 1/93. **Product Description & Applications:** Two brand-new headworn microphones from beyerdynamic, the HEM 191 and HEM 192 are, respectively, cardioid and omnidirectional gooseneck mounted miniature electret condenser microphones for use in applications such as drumming or keyboard playing which require the hands to be free, but still allow

freedom of movement for the wearer. The great advantage of these two new mics is that they are mounted on extremely thin and very flexible goosenecks, so that they can be pushed out of the way and pulled back again with the absolute minimum of effort. **Basic Specifications & Suggested List Price:** Both mics are supplied with headband, or in EM191 and EM192 versions, without, for mounting beyer DT100 and DT150 headphones, and no doubt, a few innovative users will come up with some interesting headware of their own design. Frequency response is between 20Hz and 20kHz and phantom power of 8 to 52 volts is required. Output is via 3-pin XLR connector. List price \$619.

### CHIAYO ELECTRONICS CO. LTD.

**15812 SW Upper Boones Ferry Rd.; Lake Oswego, OR 97035; (800) 732-8999.** **Product Name:** DR-505. **Contact:** Mark Shepard. **Date Product Introduced:** 5/93. **Product Description & Applications:** VHF diversity wireless microphone system. Handheld lapel, headset, and guitar systems. Pilotone™ for interference-free operation. Can be used for speech, vocals, or guitars. **Basic Specifications & Suggested List Price:** Dynamic range: 100dB. S/N ratio: 100dB, balanced and unbalanced outputs, 1,000' range. Suggested list price: \$699.

### CHIAYO ELECTRONICS CO. LTD.

**15812 SW Upper Boones Ferry Rd.; Lake Oswego, OR 97035; (800) 732-8999.** **Product Name:** R-505 Wireless Mic System. **Contact:** Mark Shepard. **Date Product Introduced:** 5/93. **Product Description & Applications:** VHF high-band 160-250MHz. Handheld & lapel systems with Pilotone™. Can be used for speech, vocals, or guitar systems. **Basic Specifications & Suggested List Price:** Dynamic range: 100dB, S/N ratio: 100dB, 1,000' operating range. Suggested list price: \$569.

### CROWN INT'L

**PO Box 1000; Elkhart, IN 46515-1000; (219) 294-8000.** **Product Name:** CM-311 Headworn Microphone. **Contact:** Bob Herrold, product mgr. **Date Product Introduced:** 4/93. **Product Description & Applications:** The Crown CM-311 is a lightweight headworn microphone that sounds as good as a handheld. The CM-311 allows incredibly high monitor levels without feedback and incredibly low bleed thru from on stage instruments. For wireless transmitters, use the CM-311/E. **Basic Specifications & Suggested List Price:** Two versions available: CM-311 comes w/bodypack, CM-311/E connects directly to any wireless transmitter. Specs: electret condenser; freq. response: 50Hz-15,000Hz; S/N ratio: 67dB at 94dB SPL. Cardioid polar pattern. Price: CM-311 \$279; CM-311/E \$198.

### ELECTROSONICS INC.

**581 Laser Rd. NE; Rio Rancho, NM 87124; (800) 821-1121.** **Product Name:** UDR195. **Contact:** Gordon Moore, sales mgr. **Date Product Introduced:** 4/93. **Product Description & Applications:** Modular UHF/VHF, ratio diversity receiver with pilot tone squelch, unique dual-band companding for superior audio and 75kHz deviation for high signal-to-noise ratio. UM195 will accommodate any lavalier mic on the market. UT195 is available with Shure SM87 capsule with other capsules available later. **Basic Specifications & Suggested List Price:** UHF or VHF frequencies—UDR195 \$3800, UM195 \$1050, UT195 \$1600.

### LIGHTSPEED TECHNOLOGIES INC.

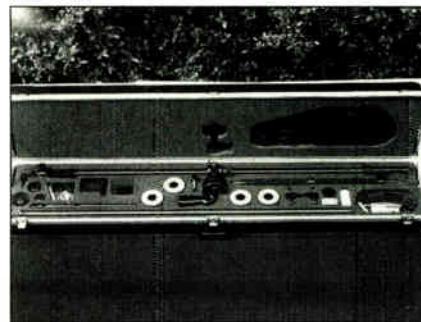
**15812 SW Upper Boones Ferry Rd.; Lake Oswego, OR 97035; (800) 732-8999.** **Product Name:** LightSPEED 3000D Wireless Microphone System. **Contact:** John Boone, mktg. mgr. **Date Product Introduced:** 1/93. **Product Description & Applications:** A true diversity systems with Tone-code squelch to eliminate RF interference. Special shock-mounted electronics are housed in a .060 solid steel case enables the 3000D to withstand extreme physical abuse. Backed with a 5-year warranty parts and labor. Ideal for rentals and mobile sound system applications. **Basic Specifications & Suggested List Price:** Frequency range 160-250 MHz VHF (21 available from stock). Dynamic range: over 105dB. Signal to noise: over 105dB, balanced and unbalanced line or mic levels. 1,600' operating ranges, suggested list price \$1,100.

### LIGHTSPEED TECHNOLOGIES INC.

**15812 SW Upper Boones Ferry Rd.; Lake Oswego, OR 97035; (800) 732-8999.** **Product Name:** Tracer TK-150 Noise-Canceling Headset Microphone. **Contact:** Mark Shepard, dir. of sales. **Date Product Introduced:** 6/93. **Product Description & Applications:** The TK-150 is a headset microphone with a noise-canceling condenser element. The noise-canceling characteristics electronically cancels background noise, provides high resistance to feedback, while maintaining excellent intelligibility and fidelity. It is an excellent alternative for musicians who sing and play drums, keyboards, or stringed instruments. **Basic Specifications & Suggested List Price:** Frequency response: 100Hz-12kHz, operating voltage: 2.0-7.0 volts. Available connectors 3.5mm plug, 4 pin Hirose, or pigtail. The suggested list price is \$99.

### LIGHT WAVE SYSTEMS

**7760 Burnet Ave.; Van Nuys, CA 91405; (818) 780-3002.** **Product Name:** Cuemaster® Microphone Boom. **Contact:** Leslie Drever, sales mgr. **Date Product Introduced:** 4/93. **Product Description & Applications:** New lightweight portable fully cueable mic boom for soundstage and location. Cuemaster can either rotate or directly aim a microphone in any direction. Boom arm is counter weighted and is held by an adjustable riser mast that is held by a belt harness. Cuemaster comes with a custom foam hard case which includes all accessories (a color monitor & tuner) and instruction manual. **Basic**



LIGHT WAVE SYSTEMS  
Cuemaster® Microphone Boom

**Specifications & Suggested List Price:** Boom arm extends five to sixteen feet with a four-foot extension. Weight (net) with riser mast is 6.5 lbs. 25 ft. mic. cable with instant change feature. Direct and rotational accessories four 1Kg counter weights, 2.9" color monitor/tuner. Tools, etc. 5-yr. warranty. \$4,995.



LIGHT WAVE SYSTEMS  
Windguard

### LIGHT WAVE SYSTEMS

**7760 Burnet Ave.; Van Nuys, CA 91405; (818) 780-3002.** **Product Name:** Windguard. **Contact:** Leslie Drever, sales mgr. **Date Product Introduced:** 4/93. **Product Description & Applications:** New low-cost windscreen/mount combination in mini and super-sized configuration. For use in ENG, EFP and stationary placement. Windguard uses a pistol grip handle or swivel yoke. Windguard units can be fitted with Superscope covers or Windmaster. Windguard utilizes our patented "Dead Air Volume" design for a slip-on windscreen for superb wind noise rejection. **Basic Specifications & Suggested List Price:** Mini & Super Windguard weigh in at 1/4 to 3/4 lbs. depending on type. They are extremely tough and durable. Prices start at \$175. Warranty is for 2 yrs. Units are easily repairable at low cost.

### THE MARTIN GUITAR COMPANY

**510 Sycamore St.; Nazareth, PA 18064; (800) 345-3403.** **Product Name:** MEQ-932 Preamp System for Acoustic Guitar. **Contact:** Your Local Authorized Martin Dealer. **Date Product Introduced:** 1/93. **Product Description & Applications:** The Martin Guitar Company has recently introduced a new active equalization and preamplification system for optional installation on all new Martin and Sigma Acoustic guitars. The MEQ-932 represents the latest developments in acoustic amplification giving the guitarist optimum flexibility in sound reinforcement. It provides diverse tonal variation with controls which are easy to use. **Basic Specifications & Suggested List Price:** The jack panel features two separate signal outputs. An XLR output accepts standard microphone cable for use with P.A. systems, mixing boards and consoles. A 1/4" output jack accepts standard guitar cable, providing a low impedance output to a guitar amplifier and activates the onboard master volume, preset wave and slider control system. Retail price \$379.

### MILLENNIA MEDIA

**PO Box 277611; Sacramento, CA 95826; (916) 363-1096.** **Product Name:** Breakout Adaptor. **Contact:** John La Grou. **Date Product Introduced:** 10/93. **Product Description & Applications:** A +130 volts (DC) breakout adaptor for the Millennium Media HV-3 microphone preamplifier. Allows all Bruel & Kjaer 4000 Series high-voltage microphone to receive +130 volts without the need to feed into active audio gain stages. For use only with Millennium Media HV-3 high-voltage mic preamp. **Basic Specifications & Suggested List Price:** Employs Neutrik black chrome shells, galvalutium gold pins, Mogami Nexlex mic cable. Manufactured in Sacramento, California. Retail \$150/each.

### NADY SYSTEMS INC.

**6701 Bay St.; Emeryville, CA 94608; (510) 652-2411; FAX: (510) 652-5075.** **Product Name:** 950GS UHF Wireless Microphone/Instrument System. **Contact:** Joe Territo, PR manager. **Date Product Introduced:** Spring 1993. **Product Description & Applications:** The Nady 950GS UHF wireless system features the quietest RF link of any UHF wireless system available. The receiver features 40 fre-

quency synthesized, user-selectable channels, in four groups of ten channels. It is available on many frequency bands for worldwide applications. The receiver also features True Diversity, balanced XLR/unbalanced 1/4" output, bass boost and exclusive hiss mute circuitry. Nady 950GS transmitters are available in handheld, instrument and lavalier models. **Basic Specifications & Suggested List Price:** Dynamic range: 120dB. Frequency response: 25Hz-20kHz, THD: less than .5%. Frequency stability: better than .005%. PLL synth. range: 200 ft. adverse conditions, up to 1,500 ft. line of sight. Image rejection: 80dB image and spurious rejection. List prices start at \$2,749.



NEUMANN (USA)  
TLM 193

**NEUMANN (USA)**

6 Vista Dr., PO Box 987; Old Lyme, CT 06371; (203) 434-5220. Product Name: TLM 193. Contact: Jeff Alexander, product mgr. Date Product Introduced: 4/93. **Product Description & Applications:** The TLM 193 is a large diaphragm double membrane cardioid condenser microphone offering state-of-the-art performance in a value-conscious package. The TLM 193 is the perfect microphone for both the budget-conscious project studio and larger facility that wants the quality, durability, longevity and glorious sound which has earned Neumann its reputation. The package includes the microphone, swivel mount and wooden jewelers case. **Basic Specifications & Suggested List Price:** Frequency response 20Hz-20kHz self-noise, 10dBA, maximum SPL 140dB, dynamic range 130dB, retail price \$1,295.



RAMSA/PANASONIC PRO AUDIO  
Ramsa WX-RP410/RP700 Wireless  
ENG/EFP Mic System

**RAMSA/PANASONIC PRO AUDIO**

6550 Katella Ave.; Cypress, CA 90630; (714) 373-7277. Product Name: Ramsa WX-RP410/RP700 Wireless ENG/EFP Mic System. Contact: Steve Woolley, nat'l sales & mktg. mgr. **Product Description & Applications:** Working at the UHF/800MHz radio frequency, the diversity wireless system features the WX-RP410 UHF transmitter and the WX-RP700 UHF receiver. The compact WX-RP410/RP700 offers a Phase Locked Loop (PLL) synthesizer system using digital switching to assure stable, long-range transmission. Both receivers and transmitter feature 30 channel selection, allowing users interference-free operation in "crowded" situations and inventory flexibility. **Basic Specifications & Suggested List Price:** WX-RP410 transmitter- \$1,850. WX-RP700 receiver \$2,950.

**SAMSON WIRELESS**

PD Box 9068; Hicksville, NY 11802-9068; (516) 932-3810. Product Name: UHF Synth Series. Contact: Dave Olivier, nat'l sales mgr. **Product Description & Applications:** Multichannel system featuring an RF level display on front panel facilitating selection of clearest frequency in crowded wireless environments. Visual display w/multi-stage LEDs depicts exact amount of RF interference on any given frequency. 74 available frequencies in both receiver and transmitter II available for simultaneous use. Single and dual receiver. **Basic Specifications & Suggested List Price:** True diversity formats, belt-pack, hand-held transmitters, rotary channel selection controls, mute switch sensitivity control, battery indicator and on/off power switch. Systems start at \$2,549.98. FOR MORE INFORMATION ABOUT MIX LISTINGS SEE PAGE 255.



SENNHEISER ELECTRONIC CORP.  
SKM 5000

**SENNHEISER ELECTRONIC CORP.**

6 Vista Dr.; Old Lyme, CT 06371; (203) 434-9190. Product Name: SKM 5000. Contact: Albert Zang. Date Product Introduced: 1/94. **Product Description & Applications:** The SKM 5000 UHF is a handheld transmitter design with new state-of-the-art frequency synthesis electronics. The wireless microphone with its 16 switchable frequencies, Hi Dyn Plus compander circuit (108dB S/N), audio frequency 5 stage, preamplifier has dynamic range of 151dB SPL. The SKM 5000 can operate for 3.5 hours on rechargeable battery pack or longer on conventional batteries. **Basic Specifications & Suggested List Price:** 50-20,000Hz, 50 milliwatt RF transmission power, super cardioid, condenser capsule.

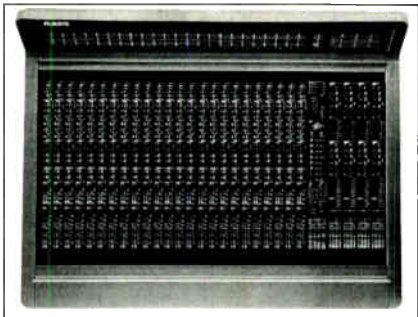


SHURE BROTHERS  
Beta 87 Microphone

**SHURE BROTHERS**

222 Hartrey Ave.; Evanston, IL 60202-3696; (708) 866-2200. Product Name: Beta 87 Microphone. Contact: customer service. Date Product Introduced: 1/93. **Product Description & Applications:** The Beta 87 is the first electret condenser microphone to join the acclaimed Beta Series. The Beta 87 combines exceptionally smooth, tailored response with a true super cardioid pattern which provides greater gain before feedback. Features high sound pressure level capability, low-noise electronics and full electro-magnetic shielding. 3-stage pop filter minimizes breath noise. Improved shock mounting and wide dynamic range. **Basic Specifications & Suggested List Price:** Supercardioid condenser. Frequency response: 50 to 18kHz. Impedance: 150Ω (90Ω actual). Output level: (at 1kHz). Open circuit voltage: -74dB (0.2 mv). OdB = -1 volt per microbar. End-user suggested price \$420.

**MIXING CONSOLES**



ALESIS  
X-2 Recording console

**ALESIS**

3630 Holdredge Ave.; Los Angeles, CA 90016; (310) 558-4530. Product Name: X-2 Recording console. Date Product Introduced: —LISTING CONTINUED ON NEXT PAGE

mmms AL-3 console with 6 stereo inputs and 32 mono inputs. new communications module & new master module. **Basic Specifications & Suggested List Price:** \$70,533.

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—LISTING CONTINUED FROM PREVIOUS PAGE



**360 SYSTEMS**  
DigiCart/II

character front panel readout of all functions, operations and menu items; Dolby AC-2 data compression (5.33 ratio); BCD parallel interface, GPI closures, ES-Bus serial interface. Suggested list price: \$4,995.

**VESTAX MUSICAL ELECTRONICS CORP.**

2860 Cordelia Rd., Ste. 120; Fairfield, CA 94585; (707) 427-1920. Product Name: MR-66S. Contact: Bruce Yerman, VP. Date Product Introduced: 1/93. Product Description & Applications: 6-track cassette multitrack recorder. Synchronizable with another MR66S or MR44S using MSX-2 synchronizer. 2-speed, dbx noise reduction, built-in patch bay. **Basic Specifications & Suggested List Price:** Frequency response 20Hz-18kHz; S/N ratio 75dB (with dbx); list price \$1,299.

**VESTAX MUSICAL ELECTRONICS CORP.**

2860 Cordelia Rd., Ste. 120; Fairfield, CA 94585; (707) 427-1920. Product Name: MR44S. Contact: Bruce Yerman, VP. Date Product Introduced: 1/93. Product Description & Applications: 4-track cassette multitrack recorder. Synchronizable with another MR44S or MR66S using MSX-2 synchronizer. 2 speed, dbx noise reduction. **Basic Specifications & Suggested List Price:** Frequency response 20Hz-18kHz; S/N ratio 70dB (with dbx); list price \$699.

**SIGNAL PROCESSORS**

**ADA SIGNAL PROCESSORS INC.**

420 Lesser St.; Oakland, CA 94601; (510) 532-1152. Product Name: Micro Lab. Contact: Chris Keller, marketing. Date Product Introduced: 1/93. Product Description & Applications: Miked guitar cabinet Emulator facilitates recording direct from preamp to mixer. Emulates 1x12", 2x12", 4x12" speaker arrays. Open or closed back cabinets. Vintage or std. speakers. Microphone proximity and axis adjustments. Full stereo. **Basic Specifications & Suggested List Price:** 1 rackspace, 6 lbs. 1/4" XLR stereo outputs, hard-wired direct bypass outs. List: \$219.95

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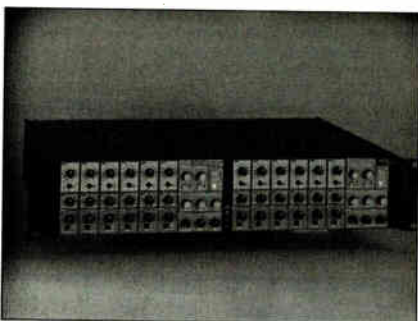
**SIGNAL PROCESSORS**



**ALESIS**  
AI-1

**ALESIS**

3630 Holdredge Ave.; Los Angeles, CA 90016; (310) 558-4530. Product Name: AI-1. Contact: John Maher, comm. mgr. Date Product Introduced: 1/93. Product Description & Applications: ADAT to AES/EBU and SPDIF converter. Allows pairs of tracks to be transferred between DAT, CD or hard disk editor and ADAT's. The AI-1 also provides real-time sample rate conversion 44.1 or 48kHz. Format conversion between AES/EBU and SPDIF optical or co-ax can be used independent of ADAT. **Basic Specifications & Suggested List Price:** List \$895.



**APOGEE SOUND INC.**  
CRQ-12 Parametric Equalizer

**APOGEE SOUND INC.**

1150 Industrial Ave.; Petaluma, CA 94952; (707) 778-8887. Product Name: CRQ-12 Parametric Equalizer. Contact: Ken DeLoria, pres. Date Product Introduced: 2/93. Product Description & Applications: The CRQ-12 parametric EQ is ideal for sonically shaping large complex sound systems. The CRQ-12 features multi-mode operation, six filters per channel, two outputs per channel with separate level controls, bypass level controls and fan cooling for frequency stability. **Basic Specifications & Suggested List Price:** Distortion: less than 0.003%. Maximum output: +25dBu, dynamic range: 115dB, bypass level controls: variable for each of four outputs. Suggested list price: \$2,680.

**AUDIO LOGIC**

8760 South Sandy Parkway; Sandy, UT 84070; (801) 566-8800. Product Name: D20 Programmable Alignment Delay. Contact: Kent Swenson. Date Product Introduced: 7/93. Product Description & Applications: Configurable input/output combinations; 2 in/2 out, 2 in/4 out, 2 in/6 out digital delays. Each output may be assigned to either input. Digitally controlled gain 32 presets, computer interface optional. **Basic Specifications & Suggested List Price:** List price TBA. Dynamic range > 100 dB. XLR input and outputs maximum delay stereo 1.3 sec. standard, 2.6 sec. mono may be expanded.

**AUDIO TEKNOLOGY INC. (ATI)**

9017-C Mendenhall Ct.; Columbia, MD 21045; (410) 381-7879. Product Name: Pro-Rack Products. Contact: Dan Abelson, nat'l sales mgr. Date Product Introduced: AES 1993. Product Description & Applications: ATI will introduce a new line of rack mountable audio processing products taken from the industry-leading paragon mixing console technology. Using ATI patented Electroformers and compressor circuitry these products will allow ATI quality outboard gear to be used by sound companies and installed systems.

**BAG END LOUDSPEAKER SYSTEMS**

PO Box 488; Barrington, IL 60011; (708) 382-4550; FAX: (708) 382-4551. Product Name: ELF-M. Contact: John Vitale. Date Product Introduced: 10/93. Product Description & Applications: The ELF-M is the first low cost ELF electronics featuring stereo hi pass outputs with limiters and a mono sum double integrated ELF output for use with ELF type subwoofer cabinets. ELF cutoff frequency and high pass frequency are preset at factory and field adjustable by changing plug in resistors inside unit. Flush mounted screw driver adjust controls include ELF gain, ELF concealment threshold, ELF

polarity, high pass gain, and hi pass limiter threshold. **Basic Specifications & Suggested List Price:** ELF-M is a one-rackspace mounted unit with a separate power supply. Features include balanced inputs, unbalanced outputs, ELF dual integrator response down to 16Hz with uniform phase, LED threshold indicators for ELF concealment and high pass limiting. Suggested list price \$895.

**BEHRINGER**

PO Box 9068; Hicksville, NY 11802-9068; (516) 932-3810. Product Name: Auto Com MDX 1000. Contact: Bob Caputo, product mgr. Date Product Introduced: 7/93. Product Description & Applications: The Autocom features intelligent program detection with the auto switch deriving attack and release times automatically from the respective program material. The result is musically intuitive dynamics control with no "pumping" or "breathing" regardless of the amount of compression. The Autocom also features manual attack and release controls, hard and soft knee switching, stereo and dual-mono operation, and specifications reflecting performance greatly beyond its affordable price. **Basic Specifications & Suggested List Price:** Noise floor-98dBu, frequency response 10Hz to 100kHz, THD<.03%, servo-balanced inputs/outputs. Suggested retail price \$329.99.

**BEHRINGER**

PO Box 9068; Hicksville, NY 11802-9068; (516) 932-3810. Product Name: Dualflex II. Contact: Bob Caputo, product mgr. Date Product Introduced: 7/93. Product Description & Applications: The Dualflex II is a multiband sound enhancer featuring Behringer's dual "Natural Sonic" processor with VSP (variable sound processing). This allows the user to change parameter settings, sweeping between the classic and pop settings to create different variations of enhancement/excitement type processing. A tunable high-pass filter allows tailoring of the high frequency enhancement. With level-independent circuitry the Dualflex II uses ALC (automatic level control) to solve varying input level problems. The Dualflex II also features a frequency switchable bass processor for enhancement of the lower frequencies. **Basic Specifications & Suggested List Price:** High-pass filter corner freq. 1kHz to 8kHz, bass processor-50Hz/100Hz, noise floor- 96dBu, THD<0.005% at 0dBu, frequency response 20Hz to 20kHz (flat), servo-balanced inputs. Suggested retail price \$279.99.

**BEHRINGER**

PO Box 9068; Hicksville, NY 11802-9068; (516) 932-3810. Product Name: Ultraflex EX3000. Contact: Bob Caputo, product mgr. Date Product Introduced: 7/93. Product Description & Applications: The Ultraflex is a multiband sound enhancer featuring Behringer's "Natural Sonic" processor. A tunable high-pass filter allows tailoring of the high frequency enhancement. The Ultraflex also features Behringer noise reduction to solve noise problems found inherently in Enhancer/Exciter products. The Ultraflex offers a frequency switchable bass processor for enhancement of the lower frequencies. The Ultraflex's most unique feature is a surround sound simulator, spatially enhancing the width of the stereo field. **Basic Specifications & Suggested List Price:** High-pass filter corner freq. 1kHz to 8 kHz, bass processor- 50Hz/100Hz, noise floor -94dBu and outputs, frequency response:20Hz-20kHz (flat), THD < 0.008%, servo-balanced inputs. XLR and TRS connectors, solo switch for effect only. Suggested retail price: \$349.

**BEYERDYNAMIC**

56 Central Ave.; Farmingdale, NY 11735; (516) 293-3200. Product Name: MV100 Stereo Mic Preamp. Contact: Mike Solomon, mktg. mgr. Date Product Introduced: 1/93. Product Description & Applications: The new high performance MV100 stereo pre-amplifier from beyer may be light in weight and small in size but that's just what you need for stereo miking on location and its host of innovative features and top quality circuitry will ensure that your recording does not suffer from the limitations of the amplification circuitry built in to portable DAT recorders and the like. Measuring just 145mmx85mmx40mm, the MV100 packs in two balanced XLR inputs, 3.5" mini-jack and phone line outputs, on/off switch with indicator, LED indicators for overload and battery status and a three position input attenuation switch and two position low-frequency roll-off switch. Power is provided by two PP3 batteries or from an external supply and switchable phantom power of 8-12 volts or 48 volts is supplied for condenser microphones. List price is \$1,200.

**BSS, A DIV. OF AKG ACOUSTICS INC.**

1525 Alvarado St.; San Leandro, CA 94577; (510) 351-3500. Product Name: Varicurve System. Contact: David Angress. Date Product Introduced: 4/93. Product Description & Applications: Varicurve is an advanced system of parametric EQ processing and control elements which can be tailored to suit any audio production environment. From a single stereo 6-band unit up to 32 channels of programmable equalization, each processing element can be individually controlled via MIDI, PA-422, SMPTE or radio remote control. **Basic Specifications & Suggested List Price:** The FCS-926 combines a digitally controlled analog parametric filter set with intuitive assignable controls, fully interactive graphic display and intelligent spectrum analyzer. The FCS-900 is a hand-held remote controller capable of addressing a system of up to 16 individual FCS-920 and/or FCS-920 units via a standard radio mic link or XLR cable.

**CIRCUIT RESEARCH LABS INC.**

2522 W. Geneva Dr.; Tempe, AZ 85282; (602) 438-0888. Product Name: Amigo AM. Contact: Valerie Hummer, mktg. mgr. Date Product Introduced: 4/93. Product Description & Applications: CRL has taken its best technology and combined it into one high performance unit. The Amigo AM is a complete matrix stereo audio pro-

quency synthesized, user-selectable channels, in four groups of ten channels. It is available on many frequency bands for worldwide applications. The receiver also features True Diversity, balanced XLR/unbalanced 1/4" output, bass boost and exclusive hiss mute circuitry. Nady 950GS transmitters are available in handheld, instrument and lavaliere models. **Basic Specifications & Suggested List Price:** Dynamic range: 120dB. Frequency response: 25Hz-20kHz. THD: less than .5%. Frequency stability: better than .005%. PLL synth. range: 200 ft. adverse conditions, up to 1,500 ft. line of sight. Image rejection: 80dB image and spurious rejection. List prices start at \$2,749.



NEUMANN (USA)  
TLM 193

**NEUMANN (USA)**

6 Vista Dr., PO Box 987; Old Lyme, CT 06371; (203) 434-5220. Product Name: TLM 193. Contact: Jeff Alexander, product mgr. Date Product Introduced: 4/93. Product Description & Applications: The TLM 193 is a large diaphragm double membrane cardioid condenser microphone offering state-of-the-art performance in a value-conscious package. The TLM 193 is the perfect microphone for both the budget-conscious project studio and larger facility that wants the quality, durability, longevity and glorious sound which has earned Neumann its reputation. The package includes the microphone, swivel mount and wooden jewelers case. **Basic Specifications & Suggested List Price:** Frequency response 20Hz-20kHz self-noise, 10dBA, maximum SPL 140dB, dynamic range 130dB, retail price \$1,295.



RAMSA/PANASONIC PRO AUDIO  
Ramsa WX-RP410/RP700 Wireless  
ENG/EFP Mic System

**RAMSA/PANASONIC PRO AUDIO**

6550 Katella Ave.; Cypress, CA 90630; (714) 373-7277. Product Name: Ramsa WX-RP410/RP700 Wireless ENG/EFP Mic System. Contact: Steve Woolley, nat'l sales & mktg. mgr. Product Description & Applications: Working at the UHF/800MHz radio frequency, the diversity wireless system features the WX-RP410 UHF transmitter and the WX-RP700 UHF receiver. The compact WX-RP410/RP700 offers a Phase Locked Loop (PLL) synthesizer system using digital switching to assure stable, long-range transmission. Both receivers and transmitter feature 30 channel selection, allowing users interference-free operation in "crowded" situations and inventory flexibility. **Basic Specifications & Suggested List Price:** WX-RP410 transmitter- \$1,850. WX-RP700 receiver \$2,950.

**SAMSON WIRELESS**

PO Box 9068; Hicksville, NY 11802-9068; (516) 932-3810. Product Name: UHF Synth Series. Contact: Dave Olivier, nat'l sales mgr. Product Description & Applications: Multichannel system featuring an RF level display on front panel facilitating selection of clearest frequency in crowded wireless environments. Visual display w/multi-stage LEDs depicts exact amount of RF interference on any given frequency. 74 available frequencies in both receiver and transmitter II available for simultaneous use. Single and dual receiver. **Basic Specifications & Suggested List Price:** True diversity formats, belt-pack, hand-held transmitters, rotary channel selection controls, mute switch sensitivity control, battery indicator and on/off power switch. Systems start at \$2,549.98. FOR MORE INFORMATION ABOUT MIX LISTINGS SEE PAGE 255.



SENNHEISER ELECTRONIC CORP.  
SKM 5000

**SENNHEISER ELECTRONIC CORP.**

6 Vista Dr.; Old Lyme, CT 06371; (203) 434-9190. Product Name: SKM 5000. Contact: Albert Zang. Date Product Introduced: 1/94. Product Description & Applications: The SKM 5000 UHF is a handheld transmitter design with new state-of-the-art frequency synthesis electronics. The wireless microphone with its 16 switchable frequencies, Hi Dyn Plus compander circuit (108dB S/N), audio frequency 5 stage, preamplifier has dynamic range of 151dB SPL. The SKM 5000 can operate for 3.5 hours on rechargeable battery pack or longer on conventional batteries. **Basic Specifications & Suggested List Price:** 50-20,000Hz, 50 milliwatt RF transmission power, super cardioid, condenser capsule.

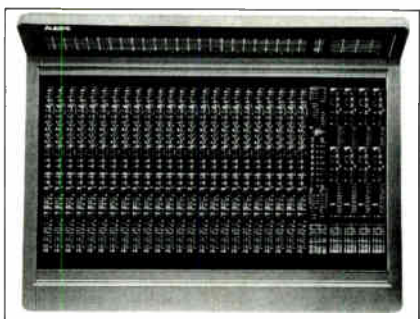


SHURE BROTHERS  
Beta 87 Microphone

**SHURE BROTHERS**

222 Harirey Ave.; Evanston, IL 60202-3696; (708) 866-2200. Product Name: Beta 87 Microphone. Contact: customer service. Date Product Introduced: 1/93. Product Description & Applications: The Beta 87 is the first electret condenser microphone to join the acclaimed Beta Series. The Beta 87 combines exceptionally smooth, tailored response with a true super cardioid pattern which provides greater gain before feedback. Features high sound pressure level capability, low-noise electronics and full electro-magnetic shielding. 3-stage pop filter minimizes breath noise. Improved shock mounting and wide dynamic range. **Basic Specifications & Suggested List Price:** Supercardioid condenser. Frequency response: 50 to 18kHz. Impedance: 150Ω (90Ω actual). Output level: (at 1kHz). Open circuit voltage: -74dB (0.2 mv). Odb = 1 vclt per microphone. End-user suggested price \$420.

**MIXING CONSOLES**



ALESIS  
X-2 Recording console

**ALESIS**

3630 Holdridge Ave.; Los Angeles, CA 90016; (310) 558-4530. Product Name: X-2 Recording console. Date Product Introduced: —LISTING CONTINUED ON NEXT PAGE



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—LISTING CONTINUED FROM PREVIOUS PAGE

**1/93. Product Description & Applications:** 24 channel, 24 in-line tape monitor console with 6 aux sends, 2 cue busses and 8 stereo returns. Perfectly suited for use with the Alesis ADAT digital multitrack recorder. As in-line design, the X-2 is space efficient while providing main input 100 mm length row faders and tape input 45 mm faders. Comes equipped with three 56 pin ELCO® connectors for up to 3 ADATS. 24 in-line tape inputs and 8 stereo effects returns, 64 inputs. **Basic Specifications & Suggested List Price:** \$6,495. Frequency response: 20Hz to 20kHz, +0/-1dB. THD: less than .15% 20Hz to 20kHz EIN-128dBu Ref. 150 $\mu$ . Crosstalk: 90dB channel to channel @ 1kHz. signal to noise: -95dB single channel. Max voltage gain: +62dB mic input of master output. Front panel: mic trim, line trim, hi, lo, hi mid, and lo mid EQ, sweepable bandwidth (Q) and much more.

**ALLEN AND HEATH**

8760 S. Sandy Parkway; Salt Lake City, UT 84070; (801) 566-8800. **Product Name:** GL2. **Contact:** Lynn Martin, nat'l sales mgr. **Date Product Introduced:** 9/93. **Product Description & Applications:** The GL2 is a multi-functional rackmount mixer that was designed to fit virtually any sound reinforcement or recording application; in live applications, the GL2 performs as a front of house mixer or a full function monitor mixer with wedge mix and is suitable for an array of hybrid applications; dedicated subgroups, tape returns and direct outs on each channel make the console perfect for multitrack recording or live recording via 2-track sends and returns on RCA jacks. **Basic Specifications & Suggested List Price:** The GL2 offers 10 mic/line inputs and 2 stereo inputs, four auxiliary returns, a comprehensive input strip featuring individual channel phantom power, PFL with LED, mute with LED, four band EQ with 2 sweepable mids, EQ in/out switch and an option for bussing with any console.

**AMEK TECHNOLOGY GROUP PLC**

Amek/TAC US Operations; 10815 Burbank Blvd.; North Hollywood, CA 91601; (818) 508-9788. **Product Name:** BIG by Langley. **Contact:** Steve Harvey, national sales mgr. **Date Product Introduced:** 1/93. **Product Description & Applications:** BIG by Langley is an extraordinarily versatile and cost effective console that is an ideal partner for the new range of affordable digital multitracks. Designed by Graham Langley, BIG combines the power of AMEK Supertrue automation with a unique Voice Recall system and Virtual Dynamics. The flexible dual-path, inline design and AMEK's renowned EQ further highlight a compact console that offers unprecedented quality and value to the smaller studio or production room. **Basic Specifications & Suggested List Price:** Two rugged steel chassis and motherboard frameworks house either 28 or 44 inline modules, 4 stereo effects returns and 4 fader controlled stereo line inputs/subgroups. 12 multitrack busses, 8 aux sends with 18 efx busses on mixdown, 4 band parametric AMEK EQ splitable between mixdown and channel paths. List price (fully automated): \$25,000 to \$34,500.

**AMEK TECHNOLOGY GROUP PLC**

Amek/TAC US Operations; 10815 Burbank Blvd.; North Hollywood, CA 91601; (818) 508-9788. **Product Name:** RECALL by Langley. **Contact:** Steve Harvey, national sales mgr. **Date Product Introduced:** 4/93. **Product Description & Applications:** RECALL by Langley is the first live mixing console with recall automation in a price range that is affordable for SR rental companies and modest venues. RECALL provides advanced audio facilities, stunning EQ, a Recall system which memorizes the positions of all critical console knobs and switches, Virtual Dynamics and the Showtime fader, mute and switch automation system (derived from AMEK's acclaimed Supertrue). Snapshot's of different setups can be easily memorized and loaded from disk between sets or before a performance. **Basic Specifications & Suggested List Price:** Suitable for both FOH and monitor applications. 40 and 24 input frames with 8 mono & 2 stereo returns. Inputs feature 4 band EQ with swept pass filters and 12 individually muted aux sends. RECALL boasts input metering, automated MIDI event triggering, 8 VCA faders, 8 Audio Group faders, 8 Matrix faders, dual VCA faders for stereo mix and mono output fader.

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**AMS NEVE (SIEMENS AUDIO)  
Logic 3**

**AMS NEVE (SIEMENS AUDIO)**

7 Parklawn Dr.; Bethel, CT 06801; (203) 744-6230. **Product Name:** Logic 3. **Contact:** Adrian Weidmann. **Date Product Introduced:** 4/93. **Product Description & Applications:** Logic 3 is a fully integrated digital audio console. Main features include an innovative assignable control surface which incorporates four motorized faders, 16 Logicator and a high resolution color TFT screen. Full & total automation of dynamics EQ, EBA & level make this 32 input digital console a powerful partner to the AudioFile digital audio editor. **Basic Specifications & Suggested List Price:** Priced at \$65,000, the Logic 3 is a powerful integrated mixing console to the AudioFile. New pricing of the AudioFile at under \$50,000 can now provide the speed and the benefits at your budget level.

**API AUDIO PRODUCTS INC.**

7655-G Fullerton Rd.; Springfield, VA 22153; (703) 455-8188. **Product Name:** Legacy Console. **Contact:** Dan Zimbelman, dir. of sales. **Date Product Introduced:** 6/93. **Product Description & Applications:** The API Legacy is an all discrete console design, based around the simplicity of the classic consoles and many new features. The Legacy's name comes from the continued success of the vintage API consoles. The signal path is the same as it has always been, keeping that "API Sound" intact with the advantages of newer features and a 5 year parts warranty. **Basic Specifications & Suggested List Price:** 32x24 up to 96 x48 with without MNTR section. Price range from \$130,000 to ?

**AUDIOARTS ENGINEERING**

7305 Performance Dr.; Syracuse, NY 13212; (315) 452-5000. **Product Name:** Audio Mixing Console MR-40. **Contact:** Mark Kallman, sales mgr. **Date Product Introduced:** 1992. **Product Description & Applications:** AudioArts® Engineering manufactures digital quality audio consoles, studio furniture and processing equipment. The MTX series consoles fill a need where the music store mixers won't cut it. All MTX consoles are configured per client specifications. The MR-40 and R series audio production consoles provide audio performance exceeding that of digital sources. Rack mounted processing equipment is of the highest spec. performance in the industry. AudioArts® pre-engineered studio furniture will add elegance to any production facility. **Basic Specifications & Suggested List Price:** Typical console performance: dynamic range of 113db, frequency response of  $\pm$ 1/4db (20Hz-20KHz), THD of .002%. The 4200C parametric EQ with 4 bands per channel; 10X range extender. Filters are reciprocal curve design. 2700B 1/3 octave graphic EQ; precision control and non-interactive filters. Many more models... Call for product information and pricing.

**AUDIO-TECHNICA U.S. INC.**

1221 Commerce Dr.; Stow, OH 44224; (216) 686-2600. **Product Name:** Smart Mixer™ Automatic Microphone AT-MX341. **Contact:** Garry Elliott, nat'l sales mgr. **Date Product Introduced:** 9/93. **Product Description & Applications:** Self-contained 1/2 rack 4-channel automatic microphone mixer. Stackable to provide multiple inputs in groups of 4. One mic only functions, or multiple mic on, selectable DIP switch on front panel. Line level output, TTL logic output. Unit Logic controlled by digital processor. Phantom supplied to mic inputs. Master threshold adjust and individual level controls on each channel. Link jacks for more mixers AT-MX341 or DT100 teleconferencing system. Security inserts for fixed installations where tamper-proof operation is required. **Basic Specifications & Suggested List Price:** Professional net \$799. Rack-mount supplied. Balanced XLR F inputs. Balanced XLR M output. Transformer inputs and output.

**BENCHMARK MEDIA SYSTEMS INC.**

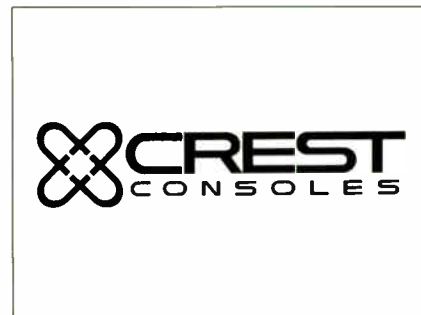
5925 Court Street Rd.; Syracuse, NY 13206; (315) 437-6300. **Product Name:** Junior Audio Director Plus. **Contact:** Rory Rall, sales mgr. **Date Product Introduced:** 8/93. **Product Description & Applications:** The Jr. Audio Director Plus is a 4 to 2 channel mixer/mode controller. Select any or all of 4 inputs. The Jr. Plus provides output modes of stereo, mono, left, right and stereo reverse. Right channel polarity control is provided to correct polarity inversion in source material that causes sum and difference swapping in stereo broadcasts. **Basic Specifications & Suggested List Price:** 2M $\Omega$  balanced inputs; CMR > 100dB to 2kHz. 75dB @ 20kHz; 60 $\Omega$  balanced outputs; THD = 0.00088% THD @ 2kHz, 0.0011% @ 20kHz; bandwidth = 160 kHz; adjustable gain; rack mountable, \$490.

**BENCHMARK MEDIA SYSTEMS INC.**

5925 Court Street Rd.; Syracuse, NY 13206; (315) 437-6300. **Product Name:** Junior Audio Director™. **Contact:** Rory Rall, sales mgr. **Date Product Introduced:** 10/92. **Product Description & Applications:** The Junior Audio Director is a stand-alone product providing mode and level control of a stereo source. It provides output modes of stereo, mono, left, right and stereo reverse. Additionally, right channel polarity control is provided to give mono back to the listener. **Basic Specifications & Suggested List Price:** 2M $\Omega$  balanced inputs; CMR > 100dB to 2kHz, 75dB @ 20kHz; 60 $\Omega$  balanced outputs; THD = 0.00088% @ 2kHz, 0.0011% @ 20kHz; mono mode adjustable gain between -6dB to -3dB; input gain = off to  $\pm$ 15dB; rack mountable; \$390 including power supply.

**COOPER SOUND SYSTEMS**

31952 Paseo de Tania; San Juan Capistrano, CA 92675-3919; (714) 248-1361. **Product Name:** D-1 Aux. Module. **Contact:** Andrew Cooper, owner. **Date Product Introduced:** 10/92. **Product Description & Applications:** The D-1 Aux. Module, a modular accessory channel for the CS 106 +1 audio mixer, further expands the capabilities of the Cooper mixer. The D-1 interfaces the CS 106+1 with the new Nagra-D recorder, coupling the superb sound of the latest in 4-track recording technology with the highest quality location mixer available. In addition to mixing to four tracks, the D-1 also converts the CS 106+1 into a 6x4 + aux mixer, providing two extra aux busses for film and video location recording. **Basic Specifications & Suggested List Price:** THD + N: .005%, frequency response: 20-20 K  $\pm$  0.2dB, outputs: +4dBu, balanced. List prices: \$895.



**CREST AUDIO INC.  
Crest Century VX**

**CREST AUDIO INC.**

100 Eisenhower Dr.; Paramus, NJ 07652; (201) 909-8700. **Product Name:** Crest Century VX. **Contact:** Crest consoles div. mgr. **Date Product Introduced:** 1/93. **Product Description & Applications:** The Crest Consoles Century VX is the latest high-end console in the Century Series. Available in four and eight bus configurations and six frame sizes, the Century VX has eight (selectable any or all) VCA subgroups. The VX employs eight discrete aux sends in addition to Crest's mono bus. Completely comprehensive metering makes the Century VX a breeze to set-up and monitor. Each input and group has a five-segment LED signal meter which is complemented by a thorough back-lit mechanical meter bridge. Like all Century Series consoles the VX has been designed to give unmatched reliability in both touring and installation applications, while offering the cleanest signal paths through the finest componentry.

**DDA**

448 Post Rd.; Buchanan, MI 49107; (800) 695-1010. **Product Name:** DDA Q II Console. **Contact:** Allan Nichols, dir of sales and mktg. **Date Product Introduced:** 4/93. **Product Description & Applications:** 24, 32 40 or 48 inputs, LED meters. True LCR (left center right) assignments. Balanced mic, line inserts and direct outs, 8 full time aux sends, 8 mute groups. **Basic Specifications & Suggested List Price:** Ideal for theatre and live applications when true left center right pan is required.

**DOD ELECTRONICS**

8760 South Sandy Parkway; Sandy, UT 84070; (801) 566-8800. **Product Name:** 1642XLR. **Contact:** Bryan Wright. **Date Product Introduced:** 1/93. **Product Description & Applications:** Professional 16 channel, 4 bus mixer. Monolithic mic preamps for superior performance and reliability, 3 band EQ, configurable pre EQ; post EQ pre fader and post fader auxiliaries, 16 XLR and 1/4" inputs, 16 inserts, 6 sends into 4 stereo returns, 48 volt phantom power, external power supply. **Basic Specifications & Suggested List Price:** 10Hz to 50kHz bandwidth, THD & noise < 0.02%, 85dB max voltage gain typical, 12dB fader reserve gain, better than -60dB at 1kHz crosstalk, 15dB cut/boost high and low EQ-12dB cut/boost mids, \$1,199.95

**D&R ELECTRONICA B.V.**

Weesp, Holland; **Product Name:** Vision Mixing Console. **Contact:** Paul Westbrook, pres. **Date Product Introduced:** 3/93. **Product Description & Applications:** The D&R Vision was designed for a number of applications. Sound reinforcement, MIDI and multitrack studios, and post audio/video production. It can be custom ordered with more than 60 inputs or as little as a rack mount version. Such

features as four band sweepable EQ and 8 aux sends per module make this mixer a serious contender at an affordable price. **Basic Specifications & Suggested List Price:** Like all D&R consoles, the Vision is superior to all of its competition and priced very competitively. Price ranges from just under \$20,000 for over 60 inputs and the rack mount version starting at \$4,000.



**EUPHONIX  
CS2000**

### EUPHONIX

10647 Riverside Dr.; North Hollywood, CA 91602; (818) 766-1666. Product Name: CS2000. Contact: Rich Nevens, system specialist. **Date Product Introduced:** 4/93. **Product Description & Applications:** The CS2000 is a digitally controlled analog audio mixing system. The CS2000's control surface is a powerful digital interface which remotely controls the analog circuitry residing in the Audio Tower. SnapShot Recall™ enables all controls & switches on the console to be stored and instantly recalled within 30ms. The system also includes Total Automation™ which allows every control and switch to be dynamically automated to code. **Basic Specifications & Suggested List Price:** A 48 fader Mix Controller is only 4' 10" wide. Frequency response: 15Hz-30Hz, +0.1/-0.2dB; Distortion: < 0.005% THD, IMD SMPTE. Crosstalk: < -90dB @ 1kHz. Noise (line in to mix out) < -90dB @ unity gain. Prices from \$140,000.

### HARRISON BY GLW

437 Atlas Dr.; Nashville, TN 37211; (615) 331-8800. Product Name: Series Twelve. Contact: Gary Thielman, advanced products mgr. **Date Product Introduced:** 9/93. **Product Description & Applications:** Series Twelve is the new console from Harrison by GLW. The control surface is designed for the future allowing large numbers of inputs to be controlled by a space efficient work surface providing fast access to any number channels. The execution system consists of remote control mic preamplifiers, full function input channels, output channels, monitoring system, and router switcher. The Support System, a powerful Macintosh computer, houses Harrison high speed video/serial processing hardware.

### INNOVATIVE ELECTRONIC DESIGN

9701 Taylorsville Rd.; Louisville, KY 40299; (502) 267-7436. Product Name: IED Model 4400/4800 Series Automatic Mixers. Contact: Tom Roseberry, VP, mktg. and sales. **Date Product Introduced:** 4/93. **Product Description & Applications:** The IED Model 4400/4800 Series Automatic Mixers represent the latest in truly automatic mixer technology. While incorporating the innovative features of the popular IED 4000 Series automatic mixers, the newer IED 4400/4800 Series Automatic Mixers have incorporated features that enhance their adaptability to new installations as well as existing markets. **Basic Specifications & Suggested List Price:** 4400/4 gated mic \$1,875. 4800/8 gated mic \$3,000. Proprietary discriminator circuit, digital attenuator control for a number of open mics, priority, output, auto/manual switch, filibuster, combine switch, 15 VDC Phantom power, last mic on, line voltage 120VAC, simple to set up and operate.

### INTELLIGENT AUDIO PRODUCTS

PD Box 3339; Littleton, CO 80161; (303) 789-4494. Product Name: AM 581B Selective Automatic Mixer. Contact: Scott Nelson, sales. **Date Product Introduced:** 6/93. **Product Description & Applications:** The AM 581B automatically combines up to eight microphone level inputs into one perfectly blended output. Mixer computes average of all inputs and adjusts gain of each to match the average. Multiple units can be "daisy-chained" to increase the number of inputs combined to the single output. Ideal applications are orchestral, background vocals, choir or any setting where perfect blend is needed and console channels or tape tracks are at a premium. **Basic Specifications & Suggested List Price:** Available as either a stagebox or rackmount unit; rackmount will accept line level inputs. With its extremely low noise level and full band width, the AM 581B is equally valuable in studio and live applications. List price: \$899.

### MIDAS

448 Post Rd.; Buchanan, MI 49107; (800) 695-1010. Product Name: XL 3-48. Contact: Allan Nichols, dir of sales & mktg. **Date Product Introduced:** 5/93. **Product Description & Applications:** The Midas XL-3 console with 8 stereo inputs and 32 mono inputs. New communications module & new master module. **Basic Specifications & Suggested List Price:** \$70,533.

### MYTEK TECHNOLOGIES

PO Box 1023; New York, NY 10276; (212) 388-2677. Product Name: Hi-8 Recording Console. Contact: Michal Jurewicz. **Date Product Introduced:** 1/94. **Product Description & Applications:** Hi-8 console is a high performance line level recording console designed for those demanding users who want to get the most out of their outboard mic preamps. By using an ultra short signal path, careful design and the highest quality parts (plastic faders), the Hi-8 console outperforms all large studio consoles on the market. Several custom options are available. **Basic Specifications & Suggested List Price:** 16 line inputs by 8 group outputs by 2 monitor outputs, rack mounted. Options include: built-in AD 2018 analog to digital converter (18-bit, 107dB dynamic range) for live to two track recordings, rack-mounted patchbay row and several choices of in/out connectors. Several consoles can be daisy-chained for multiple in/outs. Prices start \$3,900.

### NATHANIEL ELECTRONICS

PO Box 126; Vergennes, VA 05491; (802) 877-2182; FAX: (802) 877-3817. Product Name: CM-16 16-Channel Cue Mixer. Contact: Joel Melnick, owner. **Date Product Introduced:** 8/93. **Product Description & Applications:** The CM-16 is a miniature 16 track mixer that allows each musician in a recording session to create their own headphone mix, freeing the engineer from constantly trying to please several people. The mixers daisy chain (up to eight of them) from a buffer box that simply plugs in-line with the multitrack harness, and features on-board talkback facilities. Channels have level, pan and reverb controls. Two headphone outputs have separate master levels. **Basic Specifications & Suggested List Price:** Exceptionally clean, quiet, accurate; S/N ratio greater than 100dB; studio quality on board reverb with 6 algorithm selections; buffer has on-board talkback mic preamp and line-in to accept console talkback feed; power fed to mixers via channel harness eliminating clumsy AC line cords; available in 24-track version.

### PENNY & GILES INC.

2716 Ocean Park Blvd., Ste. 1005; Santa Monica, CA 90405; (310) 393-9014; FAX: (310) 450-9860. Product Name: PGF8000 Series Faders. Contact: Neal Handler. **Date Product Introduced:** 3/93. **Product Description & Applications:** The 8000 Series fader combines innovative track design with rapid assembly techniques, providing Penny & Giles' high quality performance within an extremely cost-effective pricing structure. The new design uses advanced conductive plastic materials for both the wiper track and the stainless steel-loaded plastic-moulded case, and the faders are retrofit-compatible with many existing consoles. Designed for a life expectancy of 1 million operations, the 8000 Series underlines Penny & Giles' continuing commitment to pioneer controller technology. **Basic Specifications & Suggested List Price:** All basic law variants are readily available—audio taper, linear and VCA. Dverpress for "pre-fade listen", tack and micro-switch options are all provided. Quality is not compromised, even though prices are highly competitive. Inquire for specific prices to P&G Inc. at the above address.

### SAMSON AUDIO

PO Box 9068; Hicksville, NY 11802-9068; (516) 932-3810. Product Name: MPL 2242 Professional Mixer. Contact: Dave Olivier, nat'l sales mgr. **Product Description & Applications:** Designed for a variety of recording and live applications—22 channel mixer w/6 stereo and 10 mono channels, 10 XLR inputs for MIDI musicians and live applications, 19" rack-mount device on table top mixer, 4 buses, PFL + in-place soloing functions, 4 band EQ on each channel, 6 aux sends and 4 stereo returns, built-in headphone amp, inserts on all XLR mic channels. **Basic Specifications & Suggested List Price:** Frequency range of 15Hz to 30 kHz, 10±1dB, overall signal to noise ratio of approximately 128dB. Suggested retail price: \$1,129.



**SHURE BROTHERS  
FP32A Portable  
Stereo Mixer**

### SHURE BROTHERS

222 Hartrey Ave.; Evanston, IL 60202-3696; (708) 866-2200. Product Name: FP32A Portable Stereo Mixer. Contact: customer service. **Date Product Introduced:** 4/93. **Product Description & Applications:** The FP32A is setting the new standard in field production for portable stereo mixers. It is so quiet and improved that it is ideal for OAT and other digital recording media. The Shure FP32A is a 3

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input, 2 output portable mixer specifically designed for remote audio recording, electronic field production, electronic news gathering and location film production. It can be battery operated for at least 8 hours or powered by any 12 to 30 VDC power supply. **Basic Specifications & Suggested List Price:** Dynamic range over 100dB. 48V phantom and 12V T (A-B) power. LED indicators of input levels, output peaks, limiter action and low battery. Frequency response: 20 to 20kHz  $\pm$ 2dB. Duetput noise (input controls off): master full off: < -100dB, 20 to 20kHz, master full on: < -80dB, 20 to 20kHz. End user price \$1,795.

### SOLID STATE LOGIC

320 W. 46th St., New York, NY 10036; (212) 315-1111. **Product Name:** SL 8000 GB Dn-Air console. **Contact:** Piers Plaskitt, CEO (N. America). **Date Product Introduced:** 4/93. **Product Description & Applications:** The SL8000 GB provides a high level of functionality in three operational modes through the provision of Master status switching. Broadcast mode is used for on-air application; remix configures the console for remixing material from multitrack; record provides a full-range of tracking/overdubbing features. Recent installations include CBS and NBC. **Basic Specifications & Suggested List Price:** Variety of frame sizes and configurations. Mono or stereo I/O modules. Four stereo subgroups and two stereo output buses accessible from either signal pan, plus 24-track routing. Eight VCA control groups. Separate tape send output on every channel. Master Status Switching. In-line channel stripe with EQ and dynamics. Selectable solo modes. Comprehensive source selection and monitoring.



SONY ELECTRONICS INC.  
DMX-S6000 Series Audio Post-Production Console

### SONY ELECTRONICS INC.

3 Paragon Dr., Montvale, NJ 07645; (201) 930-1000. **Product Name:** DMX-S6000 Series Audio Post-Production Console. **Contact:** Karl Kussmaul, product mgr. **Date Product Introduced:** 9/93. **Product Description & Applications:** The DMX-S6000 Series Audio Post Production Consoles are designed for audio sweetening and digital mixdown applications. This fully digital console series is a perfect complement to Sony DASH multitrack digital recorders providing the ultimate in sound quality. Many options are available to meet the customer's requirements. **Basic Specifications & Suggested List Price:** Available in 24, 32, 48, and 64 input frame sizes. Dynamic moving fader automation and snap shot control surface automation are standard. List prices starting at approximately \$300,000.

### SOUNDTRACS PLC

Box 9068, Hicksville, NY 11802-9068; (516) 932-3810. **Product Name:** Solo Live 8. **Contact:** Bob Caputo, product mgr. **Date Product Introduced:** 1/93. **Product Description & Applications:** Solo Live 8 is an eight bus front of house sound reinforcement console rich in features while maintaining recording quality specifications. Standard features include 4 mute groups for rapid scene changes (also present on effects returns) a full meter bridge with mechanical VU meters, signal present LEDs on each channel, individual 48v select, 4 band dual mid swept EQ, 6 discrete aux sends, solo in place, discrete switchable pre/post mono level, 2 track return-to-mix, and 4 bussable stereo effects returns with 60mm faders. **Basic Specifications & Suggested List Price:** 8 bus, 6 discrete aux sends, balanced in/outs, channel, group and master inserts, 100mm faders (60mm on returns), 4 mute groups, external PSU, internally modular design, mic input noise -128dBu, channel crosstalk >90dB. Suggested retail price 24-input \$ 7,799.99. 32-input \$9,399.99.

### SOUNDTRACS PLC

Box 9068, Hicksville, NY 11802-9068; (516) 932-3810. **Product Name:** Solo Logic. **Contact:** Bob Caputo, product mgr. **Date Product Introduced:** 1/93. **Product Description & Applications:** Solo Logic is a VCA and Mute automated, inline recording console. The Logic, with 12 bit VCA automation (4,096 step resolution) and highly accurate mute processing (1/120th of a second) requires no external computer or sequencer. Fader local status control features include record, play, trim, and isolate. Other standard features include MIDI machine control, auto nulling, a full meter bridge, 4 band dual mid-sweep EQ (switchable), 6 aux sends (switchable), direct outs/float-ing sub groups. **Basic Specifications & Suggested List Price:** 12 bit VCA resolutions (4096 steps), 1/4 frame Mute accuracy (1/120 sec.), MIDI machine control, dual MIDI ports, external PSU, internally modular design, balanced In/Outs, individual +4/-10 jumpers, mic input noise -128dBu, channel crosstalk >90dB. Suggested retail price 24 input \$12,499.99, 32 input \$14,999.99.

### SOUNDTRACS PLC

Box 9068, Hicksville, NY 11802-9068; (516) 932-3810. **Product Name:** Solo Monitor. **Contact:** Bob Caputo, product mgr. **Date Product Introduced:** 1/93. **Product Description & Applications:** Solo Monitor is specifically designed as a stage monitor console and as a complement to the Solo Live 8. With 10 dedicated monitor outputs (full parametric EQ on each), cue wedge feed with selectable source, 4 mute groups on all channels, 4 band dual mid swept EQ on all input channels, mic splitter on board, signal present LEDs, and output meters conveniently located next to the output faders the Solo Monitor clearly performs high above its price. **Basic Specifications & Suggested List Price:** 24 or 32 input, 10 discrete monitor groups, balanced in/outs, channel and group inserts, 4 mute groups, external PSU, internally modular design, mic splitter, mic input noise -128dBu, channel crosstalk >90dB. Suggested retail price 24-input \$5,999.99; 32-input, \$7,949.99.

### STUDIOMASTER INC.

3941 Miraloma Ave., Anaheim, CA 92807; (714) 524-2227. **Product Name:** Diamond Pro Series 3 bus. **Contact:** Jim Giordano, nat'l sales mgr. **Date Product Introduced:** 1/93. **Product Description & Applications:** 3 bus mixers available as 8x3, 12x3 and 16x3. Features include: balanced mic and line inputs inserts on channels & L/R outputs, 3 band EQ, 4 aux sends, PFL, 48v phantom power, independent L/R and mono assign per channel, channel clip LED, 60mm faders, XLR balanced L/R and mono outputs, dual stereo returns w/level, pan and feed to aux 4, headphone and stereo record/playback bus, 8x3 and 12x3 rack mountable. Ideal for all reinforcement applications. **Basic Specifications & Suggested List Price:** Specifications include: full mic/line complement on all channels. Frequency response: 20Hz to 20kHz (+/- 0.5dB), mic EIN = -128.5 dB, S/N: all channels routed = -86dB, dynamic range = 111dB, maximum output = +27dBu, fully regulated internal P.S.U. List price: 8x3 = \$679.95, 12x3 = \$899.95 16x3 = \$1,099.95.

### STUDIOMASTER INC.

3941 Miraloma Ave., Anaheim, CA 92807; (714) 524-2227. **Product Name:** Diamond Pro Series 4 bus. **Contact:** Jim Giordano, nat'l sales mgr. **Date Product Introduced:** 1/93. **Product Description & Applications:** 4 buss mixers available as 16x4x3 and 24x4x3. Features include: balanced mic and line inputs, inserts on channels, groups & L/R outputs 3 band EQ, 4 aux sends (2 pre, 2 post), PFL, 48V phantom power, independent L/R and group assignments, channel clip LED, 60mm faders, XLR balanced L/R and mono outputs, dual stereo returns w/level, pan and feed to aux 4, headphone and stereo record/playback bus. Ideal for all sound reinforcement applications. **Basic Specifications & Suggested List Price:** Basic specifications include: full mic/line complement on all channels. Frequency response: 20Hz to 20kHz (+/- 0.05dB), mic EIN: -128.5, S/N: -86dB (all channels routed), dynamic range: 111dB, maximum output: +27dBu fully regulated internal P.S.U. List prices: 16x4x3: \$1,595, 24x4x3: \$2,095.

### STUDIOMASTER INC.

3941 Miraloma Ave., Anaheim, CA 92807; (714) 524-2227. **Product Name:** STAR System. **Contact:** Jim Giordano, nat'l sales mgr. **Date Product Introduced:** 4/93. **Product Description & Applications:** 18x8x2 inline mixing console. Features include: 8 main mic/line, 8 tape /line inputs and 10 stereo line inputs (4 w/EQ) provides 36 inputs with a very small 'foot print.' Other features include: PFL/Solo in place, inserts, input mutes, input swap switching, bus mutes on main channels and line inputs, main channels are normalised and switchable to L/R bus incorporating 2 full parametric equalizers. Designed to accommodate 8 track digital or analog recording, broadcast, keyboards etc. **Basic Specifications & Suggested List Price:** Basic specifications include: frequency response: 20Hz to 20kHz (+0dB-0.5dB), mic EIN: -129dBu, signal to noise (ref 0VU) 1 channel to direct out: -92dB, distortion: (mic to L/R out at 30dB gain) 0.0025%. Dynamic range: 108dB. Suggested list price: \$1,595.

### TOA ELECTRONICS INC.

601 Gateway Blvd., Ste. 300; South San Francisco, CA 94080; (800) 733-7088. **Product Name:** M-1264 Rack-Mount Stereo Mixer & M-1212E Mixer/Expander. **Contact:** Jeffrey Pallin. **Date Product Introduced:** 4/93. **Product Description & Applications:** Value-oriented, reliable, and easy to operate. The new M-1264 rack-mount mixer from TOA Electronics brings wide-ranging versatility to commercial applications of all description. A true stereo matrix mixer occupying only 2 rackspace, the unit can serve as a single mono or stereo mixer, or it can offer the same, capabilities as those found on up to five independent mono mixers. Capable of being utilized as a stand-

alone mixer or a sub-mixer for the M-1264, TOA's M1212E mixer/expander can be connected to the M-1264 via a supplied bus link cable. When the units are linked, the same mix buses carry identical signals in each of the units, thereby providing multiple isolated outputs for each mix bus. **Basic Specifications & Suggested List Price:** With the suggested retail prices of \$1,798 and \$1,958 respectively, the M-1264 stereo mixer and M-1212E stereo mixer/expander come standard with security covers 19" rack-mount hardware.

### TOA ELECTRONICS INC.

601 Gateway Blvd., Ste. 300; South San Francisco, CA 94080; (800) 733-7088. **Product Name:** ix-11000 Digital Mixing System. **Contact:** Jeffrey Pallin. **Date Product Introduced:** 4/93. **Product Description & Applications:** Designed expressly for television production, video post-production and recording applications the ix-11000 digital mixing system includes a compact console and a free-standing signal processing rack. Duffitted with color touch-sensitive LCD screens the console allows users to quickly accomplish mixing tasks by simply touching or pointing to windows and virtual switches on-screen. Motorized faders add to the user's user-friendly ergonomics and operators can access any desired function through a single step. In total, the ix-11000 is equipped with 256 inputs and outputs. For added flexibility, both analog and digital signals can be patched entirely within the digital domain. Full dynamic automations allows all of the control parameters in the system to be recorded or played back every 1/4 frame of SMPTE time code. **Basic Specifications & Suggested List Price:** List price for a configuration of 256x256 is \$500,079.

### TRIDENT AUDIO USA

3091 N. Lima St., Burbank, CA 91504; (818) 972-1050. **Product Name:** Trident Series 90. **Contact:** Wayne Freeman, pres. **Date Product Introduced:** 1/93. **Product Description & Applications:** The Trident 90 features 24 multitrack buses, ten auxiliary buses, in-line monitoring with monitor fader, integrated switch and fader automation, machine control, versatile bargraph metering, and 4 stereo effects returns. All inputs and outputs are electronically balanced, including insert points and all buses are balanced. Each I/O module has three independent signal paths that can be assigned to the stereo bus with EQ and aux sends available in all paths. A line 2 signal path with EQ, is provided on each module. The primary equalizer for the Ninety is a 4-band semi-parametric type with selectable Q on the two midrange bands. The midrange bands may be in either the channel path or the monitor path. **Basic Specifications & Suggested List Price:** 40 position frame fitted with 32-channels \$112,850. 40 position frame fitted with 40-channels \$123,000. 56 position frame fitted with 48-channels \$165,000. 56 position frame fitted with 56-channels \$163,900.

### TWECOMM

1631 King James Dr., Pittsburgh, PA 15237-1573; (412) 369-8770. **Product Name:** Twecomm Redundant Power Supply Adaptor. **Contact:** Terry Kulchar, pres. **Date Product Introduced:** 9/92, with new modules for '94. **Product Description & Applications:** Twecomm redundant power supply adaptors provide a method to redundantly power professional mixing consoles from two power supplies simultaneously. Twecomm Adaptors are in use throughout the world providing protection from console failure due to loss of an entire power supply of a single voltage within an individual supply. Changeover is accomplished without annoying pops or clicks or switching transients. Simply install between supplies and console with furnished pin for pin compatible connectorized cables. **Basic Specifications & Suggested List Price:** LEDs and test points for each voltage from both supplies. No connection to AC mains is required. Suited for European 220V 50Hz. Prices range from \$680 to \$1,025 depending on model. Models of: Yamaha PM-4000, 3000, 2800, 1800, Ramsa WR Series, Soundcraft, all models including Europa, Vienna, Sony 2000 and 2900.

### WHEATSTONE CORP.

7305 Performance Dr., Syracuse, NY 13212; (315) 452-5000. **Product Name:** Wheatstone® A-6000 Compact Audio Production Console. **Contact:** Suzin D. Harris. **Date Product Introduced:** 4/93. **Product Description & Applications:** Wheatstone's A-6000 audio console for radio and television production offers over 125 input module features combinations. The A-6000 provides an uncomplicated control panel and simple console operation. The open architecture mainframe is a "drop though the counter" design. Wheatstone's exclusive Bus-Minus™ system allows every input channel to produce its own output to an IFB. There are four conventional mix-minus buses, and inputs that can be assigned to up to four, fully metered, stereo master, bus outputs. **Basic Specifications & Suggested List Price:** Range: 30,000-45,000. Sizes: # of input positions: 24, 28, 30, 38. # of buses: 4 stereo program, 4 mix-minus, 2 auxiliary send.

### YAMAHA CORP. OF AMERICA

6600 Drangethorpe Ave., Buena Park, CA 90622; (714) 522-9011. **Product Name:** DMP9-16, -8 Digital Mixing Processor. **Contact:** Pro Audio Dept. **Date Product Introduced:** 11/93. **Product Description & Applications:** Professional 16 and 8 channel rack-mounted digital mixers designed for sub-mixing of electronic instruments on stage or in the studio. Mixer parameters can be stored, recalled and automated via MIDI control. Two built-in digital effects processors. Input channels can be linked for stereo operation. Each channel includes: 4 aux sends, 2-band 20Hz-20kHz parametric EQ, pan, input pad, channel delay, solo key, peak meter and phase-reverse. Inputs 1 & 2 accommodate line (1/4" phone) or mic (XLR) sources. Two digital stereo inputs for direct interface to samplers, R-DAT and a range of digital sources. Multiple analog

and digital outputs. Multiple units may be cascaded to provide more inputs. **Basic Specifications & Suggested List Price:** DMP9-16: 16 inputs, 2 stereo outputs, 2 stereo aux returns; DMP9-8: 8 inputs, 1 stereo output and 1 stereo aux return. Dynamic range: greater than 92dB. 24-bit mix bus; 32-bit EQ; A/D converters: 16-bit  $\Delta \Sigma$ . D/A converters: 18-bit. Frequency response: 4Hz-22kHz. Suggested retail price: to be announced.

**YAMAHA CORP. OF AMERICA**

6600 Orangethorpe Ave., Buena Park, CA 90622; (714) 522-9011. **Product Name:** MV1000. **Contact:** Pro Audio Dept. **Date Product Introduced:** 10/93. **Product Description & Applications:** The MV1000 is a compact multi-source rack mount mixer designed for night clubs, restaurants, commercial spaces, churches, theatres and rehearsal spaces, it allows the user to combine microphone and stereo and line sources and route them to multiple zone outputs. **Basic Specifications & Suggested List Price:** 7 stereo inputs, 6 mic inputs with 2 band EQ. Two independent main stereo outputs, mono sum output, on board digital effects, background music input, record input/output facilities, monitor facilities and compression are also provided.

**MONITORS AND LOUSPEAKERS**

**ACOUSTIC RESEARCH**

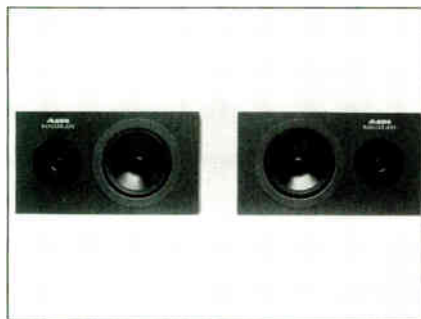
330 Turnpike St., Canton, MA 02021; (617) 821-2300. **Product Name:** AR AV 511. **Contact:** Mark Waker, dir. of mktg. **Date Product Introduced:** 11/92. **Product Description & Applications:** Compact, powered high-performance speaker system for location monitoring, mobile recording, broadcast, presentations. Fully magnetically shielded auto on-off (signal dependent) auto switch to DC if AC fails. **Basic Specifications & Suggested List Price:** Each speaker unit incorporates 35W amp, 5" woofer, 1" tweeter, aluminum enclosures. AC power supply (120-240V), 12-25 V DC \$499 pair, weight 8 lbs. each. Black or computer color.

**ACOUSTIC RESEARCH**

330 Turnpike St., Canton, MA 02021; (617) 821-2300. **Product Name:** AR Limited Loudspeaker. **Contact:** Mark Waker, dir. of mktg. **Date Product Introduced:** 1/93. **Product Description & Applications:** High-resolution, low-distortion 3-way loudspeaker for mid-field monitoring and mastering applications. Acoustic suspension low frequency section with unique all-dome mid-high frequency section. Vertical array places HF unit between 2 MF units to create virtual point source. All are soft domes. **Basic Specifications & Suggested List Price:** 12" LF driver, 2x3" MF drivers, 1" HF driver. Crossover points- 300Hz, 2.5kHz, 12 gauge cable throughout (including all inductors). Nom. impedance 4 $\Omega$ , min impedance 4 $\Omega$  - 2.5dB at 38Hz and 20kHz. 2.83V produces 88dB at 1 meter 200 watts RMS, 800 watts peak. Price \$6,875/black pair.

**ADA SIGNAL PROCESSORS**

420 Lesser St., Oakland, CA 94601; (510) 532-1152. **Product Name:** Stackable 12. **Contact:** Chris Keller, marketing. **Date Product Introduced:** 1/93. **Product Description & Applications:** 1x12 Celestion-loaded guitar speaker cabinet, 100w 8 $\Omega$ . Unique slanted baffle. Stackable vertically or horizontally. Locking corner hardware. Excellent for high-powered, highly compact & portable guitar amp systems. **Basic Specifications & Suggested List Price:** 1x12 Celestion 8 $\Omega$  100w. internal performance enhancing electronics. 35lbs. List: \$319.95.



**ALESIS**  
Monitor One

**ALESIS**

3630 Holdredge Ave., Los Angeles, CA 90016; (310) 558-4530. **Product Name:** Monitor One. **Contact:** John Maher, comm. mgr. **Date Product Introduced:** 1/93. **Product Description & Applications:** The Alesis Monitor One™ Studio Reference Monitor are high efficiency, high acoustic output 6.5", two-way nearfield studio reference monitors featuring Alesis's exclusive SuperPort™ technology for tighter, more accurate low frequency transient response and proprietary Alesis designed transducers capable of 100 watts continuous program power. A polymeric rubber coated enclosure reduces acoustic reflections for accurate imaging and non-slip console meter bridge mounting. The low profile mirror image design is configured for precise acoustic imaging in close-field monitoring applications. **Basic Specifications & Suggested List Price:** Impedance: 4 $\Omega$ , fre-

quency range: 45Hz to 20kHz; input power 100 watt program, 200 watt maximum sensitivity: 88dB/1 watt/1 meter; crossover: 2500Hz; proprietary 6.5" low frequency driver with Alesis SuperPort™ technology; proprietary 1" soft dome high frequency driver. Dimensions: 15" h x 8.25" w x 8.5" d. Suggested US domestic retail price: \$349.



**APOGEE SOUND INC.**  
MPTS-1 (Motion Picture Theater System One)

**APOGEE SOUND INC.**

1150 Industrial Ave., Petaluma, CA 94952; (707) 778-8887. **Product Name:** MPTS-1 (Motion Picture Theater System One). **Contact:** Ken DeLoria, pres. **Date Product Introduced:** 11/93. **Product Description & Applications:** The MPTS-1, designed by the THX division of LucasFilm Ltd. is licensed by THX for post production facilities, dubbing stages, film and video screening rooms and small cinemas. Incorporating a sophisticated twelve output processor, the tri-amped system is accurate and linear for professional use while capable of breathtaking realism and dramatic impact. **Basic Specifications & Suggested List Price:** Frequency response (whole system): 20Hz to 18kHz +/-3dB, SPL: 118dB cont. 124dB peak. Dispersion: 60 degrees horizontal, 40 degrees vert. Suggested List Price: \$21,255.



**ATM FLY-WARE**  
Internal Brace Hardware Kits

**ATM FLY-WARE**

20960 Brant Ave., Carson, CA 90810; (310) 639-8282. **Product Name:** Internal Brace Hardware Kits. **Contact:** Jack Noble, project mgr. **Date Product Introduced:** 4/93. **Product Description & Applications:** Internal brace hardware is used to add structural strength to enclosures of all types. The Internal braces distribute loads and provide an attachment point for the safe suspension of enclosures. A kit is a complete set of braces and fastener hardware. **Basic Specifications & Suggested List Price:** 2x21B 3/8"-kit is a complete kit for sturdy enclosures. 2x81B 3/8"-kit is a complete kit for added security. Kits come with complete instructions. Prices from \$40 to \$68.

**ATM FLY-WARE**

20960 Brant Ave., Carson, CA 90810; (310) 639-8282. **Product Name:** Swivel Ring Fittings. **Contact:** Jack Noble, project mgr. **Date Product Introduced:** 4/93. **Product Description & Applications:** Offset swivel rings should be used where loads are not in alignment with the enclosure being suspended. Unlike an eye bolt the ATM Fly-Ware OSRV1 and OSRV2 fittings will accept loading in any direction. Currently, fittings are available for 3/8" fasteners. **Basic Specifications & Suggested List Price:** The OSRV1-3/8" is an offset swivel ring fastener to be attached using one 3/8" bolt. The OSRV2-3/8" is an offset swivel ring fastener to be attached using two 3/8" bolts. Both fasteners are rated at an 800 lbs. working load limit. \$27.

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lations. **Date Product Introduced:** 4/93. **Product Description & Applications:** The Panaray sound system is based on innovative array and transducer designs. This Bose professional product provides increased audio performance, elegant aesthetics and ease of installation for a wide variety of indoor, installed applications. Typical uses are full-range music reinforcement systems for theatres, auditoriums, nightclubs, churches and synagogues as well as high-level voice-only systems for large commercial spaces like transportation terminals. **Basic Specifications & Suggested List Price:** The Panaray System is modular and its components consist of a lightweight, mid-high frequency array enclosure, the 502A, a compact, powerful bass unit, the 502B Acoustimass® Bass Enclosure, and the 502C systems controller a 1U rack-mount equalization/crossover unit. A complete line of installation accessories are offered for simple application.

tional passive magnetic radiation shields to inhibit video monitor distortion. Priced at \$4,795 a pair (model Audigo SGI until 12/31/93).

**CIRCUITS MAXIMUS CO. INC. (CMCI)**  
**9017-B Mendenhall Ct.; Columbia, MD 21045; (410) 381-7970.** **Product Name:** CMCI Wireless Monitors. **Contact:** Dan Abelson, nat'l sales mgr. **Date Product Introduced:** 10/93. **Product Description & Applications:** CMCI will introduce their new UHF wireless monitor system, designed to provide high quality monitors anywhere on stage. Coupled with the ITE-20 Ear worn monitors, the system allows reduced stage volumes and long-term hearing protection.

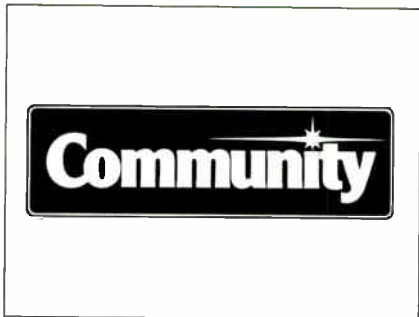
**AUDIX**

**19439 SW 90th Ct.; Tualatin, OR 97062; (503) 692-4426.** **Product Name:** M-Series Pure Reference. **Contact:** Clifford Castle. **Date Product Introduced:** 7/93. **Product Description & Applications:** The "M" series pure reference monitors consists of two models, both geared for critical mixdown and playback applications. Model 8 is a two-way close field monitor with spectacular bass and imaging. With only 1 cubic ft. of internal volume, the 2dB down point is 40Hz and it is flat (within 2dB) to 20K. Model 10 is a two-way playback monitor consisting of two 7" kevlar woofers and a 1" dome tweeter with a 4th order phase corrected crossover. Both speakers offer high power handling, very stable resistive loads, minimal phase angle shift and state-of-the-art sonic performance. **Basic Specifications & Suggested List Price:** Model 8: Frequency response 40-20K, components woofer: 1x7", components tweeter: 1x1" dome, crossover point: 2.2K, sensitivity: (1w-1m): 87.5dB, imp.: 8Ω, size (hxwx): 15x9.5x11", RMS power handling: 100 watts, 200 watts peak, finish: sand coat, price (list per pair): \$1,995. Model 10: frequency response: 38-20K, components woofer: 2x7", components tweeter: 1x1" dome, crossover point: 2.2K, sens. (1w-1m) 89dB, imp. 4Ω, size (hxwx): 22x10x13.5", RMS power handling: 200 watts, 350 watts peak, finish: sand coat, price (list per pair): \$2,995.

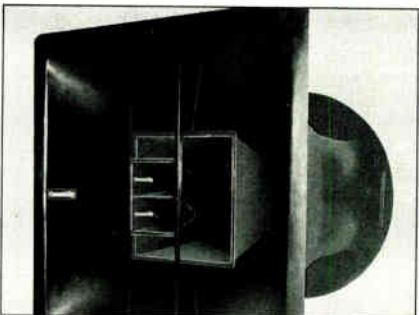


**CADPRO CHICAGO INCORPORATED**  
**Audigo One**

**CADPRO CHICAGO INCORPORATED**  
**2525 E. Dakton, Ste. C-33; Arlington Heights, IL 60005; (708) 640-1853; FAX: (708) 640-1868.** **Product Name:** Audigo One. **Contact:** Paul F. Bergetz, prod. mgr. **Date Product Introduced:** 9/93. **Product Description & Applications:** Near field reference monitors designed to complement workstations used for hard disk recording, digital media production and music mixdown. The enclosure is constructed of MDF using a tapered transmission line. The drivers are set in a closely coupled, linear phase (no more than 15 degrees shift at crossover point), mirror image group radiating forward. Driver array integrates a Morel MDT33 tweeter crossed at 6500Hz with a DynAudio D54AF midrange crossed at 650Hz to the low frequency driver, an AUDIGO LFM8. **Basic Specifications & Suggested List Price:** FR 50Hz to 20kHz ±2.5dB at 100dB. Maximum SPL 120dB. All measurements are at 1 meter on axis. THD>2%. Impedance >4Ω. Phase ± 75 degrees 50Hz to 20kHz. Power requirements', 250 watts minimum to 1,000 watts maximum per channel x two (must be bi-amped). Dimensions 14.8"Hx10.8"Wx14"D. Weight 50 lbs. Optional passive magnetic radiation shields to inhibit video monitor distortion. Priced at \$2,995 a pair (model Audigo One until 12/31/93).



**COMMUNITY PROFESSIONAL SOUND SYSTEMS**  
**Leviathan II™ M4 Tri-Axial Loudspeaker Horn**



**COMMUNITY PROFESSIONAL SOUND SYSTEMS**  
**Leviathan II™ M4 Tri-Axial Loudspeaker Horn**

**BAG END LOUSPEAKER SYSTEMS**

**PD Box 488; Barrington, IL 60011; (708) 382-4550; FAX: (708) 382-4551.** **Product Name:** S10E-B. **Contact:** John Vitale, sales mgr. **Date Product Introduced:** 10/93. **Product Description & Applications:** The S10E-B is a .8 cubic foot subwoofer enclosure with an E-10 ten-inch ELF driver. System requires an ELF dual integrator (ELF-1 or ELF-M) electronics to operate driver below resonance providing a flat frequency response down to 8Hz or 16Hz depending upon electronics model. Enclosure features the Bag End traditional, beautifully oiled, Finland birch cabinet construction with solid vinyl coated reproduction for nearfield reference applications. **Basic Specifications & Suggested List Price:** The S10E-B provides a flat frequency response from 16Hz to 80Hz., operating below system resonance the impedance is very uniform (nominally 8 ohms). Power handling is 150 watts continuous sine wave and 600 watts peak. Suggested retail price \$325.



**BARBETTA ELECTRONICS**  
**HA-3 High Accuracy Audio Monitor**

**BARBETTA ELECTRONICS**

**5301 Commerce Ave. #4; Moorpark, CA 93021; (805) 529-3607.** **Product Name:** HA-3 High Accuracy Audio Monitor. **Contact:** Tony Barbetta, pres. **Date Product Introduced:** 2/93. **Product Description & Applications:** These two-way self-powered speaker systems offer accurate audio reproduction for nearfield reference applications. Low frequency bandwidth extends to Co., or C below open E of a standard bass, and tweeter power bandwidth extends beyond the range of hearing. Frequency response and tonal characteristics are of very high fidelity across the entire audible range. **Basic Specifications & Suggested List Price:** High bandwidth FET power amplifiers, phase coherent precision active crossover networks, special design speaker drivers, and sophisticated design techniques together with newly developed technology were used in the development of these systems. Power headroom of 360 watts per channel is provided by built in power units.

**BOSE CORP.**

**The Mountain; Framingham, MA 01701; (508) 879-7330.** **Product Name:** Panaray Sound System. **Contact:** Carolyn Cinotti, public re-



**CADPRO CHICAGO INCORPORATED**  
**Audigo SGI**

**CADPRO CHICAGO INCORPORATED**  
**2525 E. Dakton, Ste. C-33; Arlington Heights, IL 60005; (708) 640-1853; FAX: (708) 640-1868.** **Product Name:** Audigo SGI. **Contact:** Paul F. Bergetz, prod. mgr. **Date Product Introduced:** 9/93. **Product Description & Applications:** Near field reference monitors designed to complement Silicon Graphics Indigo workstations used for hard disk recording, digital media production and music mixdown. The enclosure is constructed of MOF and sculptured cast epoxy, using a tapered transmission line. The drivers are set in a closely coupled, linear phase (no more than 15 degrees shift at crossover point), mirror image group radiating forward. Driver array integrates a Morel MOT33 tweeter crossed at 6500 Hz with a DynAudio D54AF midrange crossed at 650Hz to the low frequency driver, and AUDIGO LFM8. **Basic Specifications & Suggested List Price:** FR 50Hz to 20kHz ±2.5dB at 100dB. Maximum SPL 120dB. All measurements are at 1 meter on axis. THD >2%. Impedance >4Ω. Phase ±75 degrees 50Hz to 20kHz. Power requirements, 250 watts minimum to 1000 watts maximum per channel x two (must be bi-amplified). Dimensions 14.8"Hx10.8"Wx14"D. Weight: 50 lbs. Op-

**COMMUNITY PROF. SOUND SYSTEMS**

**333 E. Fifth St.; Chester, PA 19013-4511; (215) 876-3400.** **Product Name:** Leviathan II™ M4 Tri-Axial Loudspeaker Horn. **Contact:** John T. Wiggins. **Date Product Introduced:** 4/93. **Product Description & Applications:** Community president Bruce Howze designed the Leviathan II™ M4 Tri Axial™ to solve acoustical problems associated with large public gathering spaces. The Leviathan II™ is a colossal six 15" low frequency driver bass horn containing an M4 co-ax for loud, clear voice and music for stadiums. See the Leviathan II at Booth 418. **Basic Specifications & Suggested List Price:** Dimensions: 72"Hx72"Wx84"D; weight: 750 lbs.; maximum output: 136dB, 40Hz to 16kHz, 146dB peak; coverage: 40 degrees x 20 degrees nominal.

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**EASTERN ACOUSTIC WORKS INC.**

One Main St., Whitinsville, MA 01588; (508) 234-6158; FAX: (508) 234-8251. Product Name: KF852/BH852 Stadium Array VA™ Systems. Contact: Christian Doering, dir. of communications. Date Product Introduced: 10/93. Product Description & Applications: The new BH852 Low Frequency Virtual Array™ System and KF852 Mid/High Virtual Array™ System are designed to complement EAW's true three-way full-range KF850 and SB850 subwoofer in Stadium Array Systems. Stadium Array Systems are easily scalable from medium-sized halls to large arenas and outdoor events. They offer increased efficiency and output capabilities, along with all the benefits of Virtual Array™ Technology, such as consistent horizontal dispersion, coherent output and predictable performance in arrays. Basic Specifications & Suggested List Price: The KF852 includes a 2" exit compression driver and two 10" midrange cones, coupled to the air using Kenton G. Forsyth's midbass horn and displacement plug design. The BH852 includes two 15" woofers, each loaded with a 55"x40" bass horn constructed of 3mm birch plywood, reinforced with resonance-damping structural foam. Both the KF852 and BH852 enclosures are precisely matched to the KF850, simplifying the construction of large arrays.

**EASTERN ACOUSTIC WORKS INC.**

One Main St., Whitinsville, MA 01588; (508) 234-6158; FAX: (508) 234-8251. Product Name: SM Series High-Definition Stage Monitors. Contact: Christian Doering, dir. of communications. Date Product Introduced: 10/93. Product Description & Applications: The product of fifteen years' engineering research into stage monitor design and manufacture, Eastern Acoustic Works' new High-Definition stage monitors are optimized for a variety of demanding on-stage applications. The 1x12" two-way SM200H has an ultra-low profile design that is gaining rapid acceptance among video production professionals. Like other high-definition stage monitors, the SM200H employs a newly developed low-distortion titanium diaphragm compression driver. This advanced two-inch compression driver is coupled to the air using EAW's unique WGP™ high-frequency subsystem. The WGP™ has less throat distortion than conventional horns, producing a more natural sound. Its 20° conical coverage pattern gives the artist greater freedom of movement than allowed by ordinary horn-loaded designs. Basic Specifications & Suggested List Price: Along with an expanded coverage area, the SM200 exhibits extraordinary resistance to feedback. Thanks to EAW's design philosophy of flat power response across the operating bandwidth, SM200H's will play loud enough for any concert stage without radical equalization and time-consuming "tweaking" of notch filters. In certain applications, tight directional control is more important than visually unobtrusive design.



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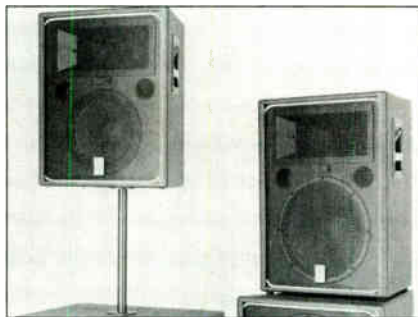
**ECLIPSE RESEARCH CORPORATION**

PO Box 8299; Incline Village, NV 89452-8299; (702) 832-0666; FAX: (702) 831-5349. Product Name: Omnisphere™ Model OS2000-SHP. Contact: Bob Cozair, Ted Haugum. Date Product Introduced: 2/93. Product Description & Applications: The Omnisphere™ OS-2000-S series speaker system is specifically engineered for large area coverage for arena, gymnasium, or multipurpose rooms. This flyable high-power multiple array features a patent-pending design, utilizing a laminated composite elliptical cabinet, large format, phase coherent co-axial drivers and a high pressure phase plug within a 360° wave guide manifold. The high powered model, which uses 15" coaxial transducers with 2" compression drivers will easily cover 20,000 sq. ft. Basic Specifications & Suggested List Price: List price: \$4,848. Frequency response: 40Hz to 15 kHz ±6dB, maximum SPL: EIA RS-426-A (134 dB, radiation geometry: 360° horizontal/360° vertical), power handling: 1,000 watts RMS, transducer sensitivity: (1 watt @ 1 meter) each drive = 98dB SPL, input connection: Neutrik NL4MP, mounting: Aeroquip Hardware w/1.25 forged eye bolt, weight: 188 lbs.

**ECLIPSE RESEARCH CORPORATION**

PO Box 8299; Incline Village, NV 89452-8299; (702) 832-0666; FAX: (702) 831-5349. Product Name: Omnisphere™ OS2000-C. Contact: Bob Cozair, Ted Haugum. Date Product Introduced: 4/93. Product Description & Applications: The newly released OS2000-C is a low profile, 24"x24" drop-in large format speaker system. The baffle fits a standard "T" bar ceiling system and the phase plug protrudes into the room 5.75". A standard OS2000-C uses a 12" transducer with 1" compression driver, as a high-power upgrade the

OS200-CHP utilizes a 15" with a 2" compression driver combo. An ideal solution for those rooms requiring high SPL, accurate phase coherence and smooth frequency response such as disco & showrooms. Basic Specifications & Suggested List Price: List price: \$1,590. Frequency response: 40 Hz to 15 kHz ± 6dB. Maximum SPL: 123dB, radiation geometry: 360° horizontal x180°vertical, power handling: 300 watts RMS, (OS2000-C, 500 watts (OS200-CHP)).



FENDER-SUNN PRO AUDIO  
SPL Tour Series Sound Reinforcement Loudspeakers

**FENDER-SUNN PRO AUDIO**

7975 N. Hayden Rd.; Scottsdale, AZ 85258; (602) 596-7121; FAX: (602) 596-1384. Product Name: SPL Tour Series Sound Reinforcement Loudspeakers. Contact: Michael Schwartz, mgr., Pro Audio Products. Date Product Introduced: 5/93. Product Description & Applications: An integrated system of nearfield, medium throw and long throw professional touring concert sound loudspeaker cabinets. Initial models include the 118-s subwoofer, the 215-s subwoofer, the 2912 full range/mid high pack enclosure; the 2915 full range enclosure, and the Fender RigSafe™ integrated loudspeaker flying hardware system. Too many features and details to include here. A top grade system for discriminating users, yet affordably priced to be within the reach of almost any rental company or pro user. Basic Specifications & Suggested List Price: Suggested U.S. retail price: SPL 118-s: \$599.99, SPL 215-s: \$899.99, SPL-2912: \$699.99, SPL-2915: \$799.99. Please contact your nearest authorized Fender-Sunn pro audio dealer for pricing and applications of Fender RigSafe systems.

**FRAZIER**

Rte. 3, Box 319; Morrilton, AK 72110-9532; (501) 727-5543. Product Name: F1620/F1630 Large Venue CAT Stage/Auditorium Systems. Contact: James R. Truelsen, VP sales and marketing. Date Product Introduced: 4/93. Product Description & Applications: The Frazier F1620/F1630 are modular full range loudspeaker systems particularly suited for use in large church or auditorium installations, where the upper module can be easily suspended above the altar or under the proscenium with the subwoofer module placed out of the way on the floor or below the stage. In clubs, theaters or other presentation areas, the upper module may be positioned on the subwoofer and placed on the floor or stage. The system comes from the factory assembled, tested and ready to operate, providing the highest level of quality assurance while minimizing installation cost. Basic Specifications & Suggested List Price: Coincident Aligned Transducers (CAT™) technology with acoustic waveguide (U.S. Pat. 5,046,581); F1620-60"x40", F1630-90"x40"; compact design only 67 3/4" H (both modules) x25 1/4" Wx17 1/4" D; heavy duty components-1-HD 18", 2-12" woofers, 1-1" compression driver; 400 watts power handling (AES); 34 Hz-17 kHz± 3dB; suggested list \$2,960.

**FRAZIER**

Rte. 3, Box 319; Morrilton, AK 72110-9532; (501) 727-5543. Product Name: VSE-Vector Synthesis Ensemble. Contact: James R. Truelsen, VP sales and marketing. Date Product Introduced: 9/93. Product Description & Applications: Frazier introduces Vector Synthesis Ensemble (VSE™) for large venues that require sound reinforcement systems to provide full band output, predictable directivity control, and the flexibility to mount and orient arrays that contour coverage to match venue requirements. The new VSE™ system is based upon an active crossover design specifically tailored for use with Frazier's Coincident Aligned Transducer designs. Components include a 60"x40" co-axial horn (VSE-76), a 90"x40" co-axial horn (VSE-79), a low frequency unit housing two 18" HD drivers, and active, single rack electronics (VSE-X7). Basic Specifications & Suggested List Price: Pricing available Aug. '93, product availability Sept. '93.

**FUTURE SONICS INC.**

PO Box 187; Pineville, PA 18946; (215) 598-8828. Product Name: Hardliner. Date Product Introduced: 10/93. Product Description & Applications: The Hardliner™ is a dual channel amplifier designed for at-ear monitoring applications. Signal is provided to the performer via a hardwired belt pack. In addition to full stereo operation, a pannable auxiliary channel is provided for supplemental signal inclusion into the mix. Used in conjunction with Future Sonics Ear Monitors®, the single rack space Hardliner can provide performers with unparalleled live monitoring quality. Future Sonics has scheduled a mid-fall release for the Hardliner™.

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The Traveler

### GALAXY AUDIO

625 E. Pawnee, Wichita, KS 67211; (316) 263-2852; (800) 369-7768; FAX: (316) 263-0642. **Product Name:** The Traveler. **Contact:** G.L. Graves, prod. coord. **Date Product Introduced:** 1/93. **Product Description & Applications:** The Traveler is a portable rechargeable battery-powered public address system, practice amp, or powered vocal or field production monitor. Weighing only 8.5 lbs, The Traveler delivers 25 watts of clean power for up to 20 hours on a single charge, and features 3 band EQ, two independently controlled channels, (1 balanced XLR, 1 balanced 1/4" w/switch selectable gain), on board 12 volt phantom power, and RCA line level output. **Basic Specifications & Suggested List Price:** Frequency response: 150Hz-15kHz, sensitivity: 91dB, maximum avg. power: 25 watts, battery power supply: 2-rechargeable 12 volt sealed lead acid batteries, enclosure material: black ABS plastic, standard accessories: strap handle, battery charger. Dimensions: 6.75"x10.94"x6". Suggested retail price: \$449.

### INTEGRATED MUSIC SYSTEMS INC.

1791 W. Kirham Way, Salt Lake City, UT 84119; (801) 966-7148. **Product Name:** S 6.5cx. **Contact:** Dan James, CEO. **Date Product Introduced:** 6/93. **Product Description & Applications:** 6.5" coaxial near field reference monitor. 20 watt 8Ω solid oak cabinet unpowdered or powered with optional 10" studio linear sub-woofer from \$288 a pair to \$844/pair powered with subwoofer.

### KOSS CORPORATION

4129 N. Port Washington Rd., Milwaukee, WI 53212; (414) 964-5000. **Product Name:** HB/500. **Contact:** Cameryne Roberts, mktg. asst. **Date Product Introduced:** 1/93. **Product Description & Applications:** The HB/500 is a high band cordless infrared stereo phone system. The system includes a battery operated stereo phone, infrared transmitter and AC adaptor. Stereo phone features a neodymium iron boron magnet, two layer free standing voice coil, and low mass diaphragm for a more uniform frequency response and improved sound quality. Transmitter projects a high powered signal less susceptible to light interference than other infrared systems. Covers up to 500 sq. ft. **Basic Specifications & Suggested List Price:** Frequency response = 20-20,000Hz, <1% 7.5 oz. with batteries. \$119.99.

### KOSS CORPORATION

4129 N. Port Washington Rd., Milwaukee, WI 53212; (414) 964-5000. **Product Name:** Porta Pro 2000. **Contact:** Cameryne Roberts, mktg. asst. **Date Product Introduced:** 1/93. **Product Description & Applications:** Designed with the executive traveler in mind, the Porta Pro 2000 delivers studio quality sound in a collapsible, portable design. This stereo phone features unique accessory ear cushions that convert the hear-through foam ear cushion design to a closed leatherette design for better isolation and deep bass. The Porta Pro 2000 is covered by Koss' No-Questions Asked lifetime warranty. **Basic Specifications & Suggested List Price:** Frequency response = 10-25,000Hz, 32Ω, 101dB SPL, THD at 95dB SPL = <0.1%. \$69.99

### KRK MONITORING SYSTEMS

16462 Gothard St., Unit D, Huntington Beach, CA 92647; (714) 841-1600; FAX: (714) 375-6496. **Product Name:** Model 6000. **Contact:** Craig M. Hill. **Date Product Introduced:** 9/93. **Product Description & Applications:** The Model 6000 is a small compact close-field monitor, with a very linear response and high power handling. Designed for recording studios, post-production, broadcast, project studios and remote recording. **Basic Specifications & Suggested List Price:** List price: \$649 pr. Specs: 2-way monitor 6.5" woofer

and 1.5" kevlar tweeter; power handling: 75 watts; sensitivity: 91dB; frequency response: ±3dB 64Hz-15kHz.

### KRK MONITORING SYSTEMS

16462 Gothard St., Unit D, Huntington Beach, CA 92647; (714) 841-1600; FAX: (714) 375-6496. **Product Name:** Model 7000T. **Contact:** Craig M. Hill. **Date Product Introduced:** 9/93. **Product Description & Applications:** The new 7000T was designed to replace the popular model 7000, utilizing the same components in a slightly larger phase-aligned enclosure. Designed for recording studios, post-production, broadcast, project studios and remote recording. **Basic Specifications & Suggested List Price:** List price: \$1,095 pr. Specs: 2-way phase aligned monitor, 7" kevlar woofer and 1.5" kevlar tweeter; power handling: 150 watts sensitivity- 91dB; frequency response: 50Hz-15kHz ± 3dB.

### KRK MONITORING SYSTEMS

16462 Gothard St., Unit D, Huntington Beach, CA 92647; (714) 841-1600; FAX: (714) 375-6496. **Product Name:** Model 9000TX. **Contact:** Craig M. Hill. **Date Product Introduced:** 9/93. **Product Description & Applications:** The model 9000TX utilizes the same existing phase aligned cabinet and drivers as the model 9000 with a newer improved crossover upgrade. Designed for recording studios, post-production, broadcast, project studios and remote recording. **Basic Specifications & Suggested List Price:** List price: \$1,900 pr. Specs: 2 way phase aligned monitor, 9" woofer and 1.5" kevlar tweeter; power handling: 150 watts; sensitivity: 92dB; frequency response: 45 Hz-19kHz ± 3dB.

### KRK MONITORING SYSTEMS

16462 Gothard St., Unit D, Huntington Beach, CA 92647; (714) 841-1600; FAX: (714) 375-6496. **Product Name:** Model 1300TW. **Contact:** Craig M. Hill. **Date Product Introduced:** 9/93. **Product Description & Applications:** The model 1300TW utilizes the same existing phase-aligned cabinet and drivers as the model 1300W with the addition of a newly designed polyglass, higher power handling woofer. Designed for recording studios, post-production, broadcast, project studios and remote recording. **Basic Specifications & Suggested List Price:** List price: \$3,300 pr.; Specs: 3 way phase aligned monitor, 12" woofer, 5" kevlar midrange, 1.5" kevlar tweeter; power handling: 200 watts; sensitivity: 90dB; frequency response: 38Hz-19kHz.

### E. M. LONG

4107 Dakmore Rd., Oakland, CA 94602; (510) 531-8725. **Product Name:** NFM™ 2001. **Contact:** Edward M. Long. **Date Product Introduced:** 7/93. **Product Description & Applications:** The NFM™ 2001 self powered monitor is now available in matched pairs from E.M. Long. Designed by Ed Long to meet strict Nearfield Monitor™ specifications, the NFM™ is Time Aligned™ and features the patented ELF™ bass system. The NFM™ 2001 is the first compact monitor capable of reproducing bass below 30Hz. It is intended for field use by producer/engineers who must work in various studios and for mixing and editing engineers who want hear the complete range of sound not offered by other close field monitors. **Basic Specifications & Suggested List Price:** Frequency response: ±3dB 30Hz to 20kHz; maximum SPL 112dB @ 1 meter; drivers: 8" ELF™ bass, 4" midrange, 1" treble; enclosure size: 19"x13"x12"; finish: black on oak veneer; weight: 80 lbs./pair shipping; price: \$490/pair.

### E. M. LONG

4107 Oakmore Rd., Oakland, CA 94602; (510) 531-8725. **Product Name:** SM-TAB. **Contact:** Edward M. Long. **Date Product Introduced:** 7/93. **Product Description & Applications:** E.M. Long of Nearfield Monitor™ is now producing the SM-TAB compact, Time Align® surround monitor. The SM-TAB is designed specifically for mixing and editing rooms used to produce Dolby® surround sound material for movies and videos. Originally designed by Ed Long for the CRM100/SS custom surround monitor systems supplied to ABC-TV and Sony Music, the SM-TAB is now available in matched pairs. Their compact size allows easy placement in the rear of crowded mixing rooms. **Basic Specifications & Suggested List Price:** Frequency response: ±3dB 70Hz to 15kHz; power required: 93dB 1 meter watt; power recommended: 65 watts per channel (116dB SPL/pair); impedance: 8Ω nominal, 6Ω minimum; drivers: 8" coaxial; enclosure size: 16"x10"x8", finish: black on oak veneer; weight: 46 lbs./pair shipping; price: \$1,490/pair.



**MCCAULEY SOUND INC.**

BGW/McCauley 2200 Powered Subwoofer System

### MCCAULEY SOUND INC.

13608 94th Ave. E.; Puyallup, WA 98373; (206) 848-0363; (800) 468-AMPS; FAX: (206) 841-3050. **Product Name:** BGW/McCauley

2200 Powered Subwoofer System. Contact: Sales. Date Product Introduced: 7/93. Product Description & Applications: "2200" is a self-contained, powered subwoofer system, utilizing 4 proprietary 600-watt 15" McCauley drivers powered by a 1,000-watt per channel BGW amp. High and low pass filters allow full bandwidth inputs, plus anti-clipping circuit prevents misuse. This unique self-contained system safely uses 2,200 watts of power for a variety of uses, from touring applications to sound reinforcement. Basic Specifications & Suggested List Price: Frequency response (130Hz-550Hz) -3dB. L/F limit (-10dB); 22Hz (-6dB); 26Hz. Dimensions: H33 3/4" x 42 3/4" Wx31"D. Built-in anti-clipping eliminator circuitry. Pro Net prices start at U.S. \$4,279.

**MCCAULEY SOUND INC.**

13608 94th Ave. E.; Puyallup, WA 98373; (206) 848-0363; FAX: (206) 841-3050. Product Name: McCauley Coaxial Loudspeaker. Contact: Bruce Anderson, sales division. Date Product Introduced: 2/93. Product Description & Applications: McCauley's Field Serviceable Coax Speakers are comprised of two components: a compression driver/magnet assembly and a basket. Magnet assemblies can be coupled to any choice of nine basket selections. With a choice of 1" or 2" compression drivers, this provides eighteen potential combinations of coaxial speakers. McCauley's coaxial speakers allow you to freely interchange baskets and magnets within minutes. Basic Specifications & Suggested List Price: Prices range from \$708 to \$1,015 depending on selection of driver and basket. Specs are dependent upon choice of basket and driver combination.

**MEYER SOUND LABORATORIES INC.**

2832 San Pablo Ave.; Berkeley, CA 94702; (510) 486-1166. Product Name: MSL-2A. Contact: Mark Johnson, dir. sales & mktg. Date Product Introduced: 3/93. Product Description & Applications: The MSL-2A is a bi-amplified, full-range loudspeaker system for professional sound reinforcement. Designed to take advantage of the peak power capabilities of the newer generation of amplifiers, its applications include touring as a main or fill system, and fixed installation in churches, clubs or discos. Basic Specifications & Suggested List Price: Frequency response is 40-18kHz and maximum peak SPL is 139dB. The system consists of 15" LF driver and a 2" (throat diameter) HF driver mounted on a 70°H by 60°V horn. Rigging options include ring and stud fittings or nut plates. The MSL-2A utilizes the S-1 Control Electronics Unit. Suggested list price is \$3,200.

**MEYER SOUND LABORATORIES INC.**

2832 San Pablo Ave.; Berkeley, CA 94702; (510) 486-1166. Product Name: MSL-5. Contact: Mark Johnson, dir. sales & mktg. Date Product Introduced: 7/93. Product Description & Applications: The MSL-5 is a very high-power loudspeaker system for professional sound reinforcement. Designed for precise pattern control, the MSL-5 can be used as a main system (in conjunction with the DS-2 mid bass loudspeaker) in medium to large-scale sound reinforcement applications or as a delay fill in very large scale systems. Basic Specifications & Suggested List Price: Frequency response is 120-16kHz and maximum continuous SPL is 110dB at 100 ft. The system consists of two 12" LF drivers and three 2" (throat diameter) HF drivers. Coverage for a single unit is 30°. The MSL-5 utilizes the M-10A Control Electronics Unit. Suggested list price is \$14,750.

**MILLER & KREISEL SOUND CORPORATION**

10391 Jefferson Blvd.; Culver City, CA 90232; (310) 204-2854. Product Name: S-90 Speaker. Contact: Charles Back, exec. VP. Date Product Introduced: 6/93. Product Description & Applications: Close-field monitor delivers highly accurate sound and precise imaging with ruler-flat response. Terminated transmission line tweeter has extremely low coloration and time-domain "smearing." 2 pi and 4 pi room response switchable. High-frequency response switchable. Trapezoidal cabinet with diffraction-reducing front-baffle foam treatment. Excellent transient response and dynamic range, precise match to M&K S-5000 THX front channel speaker system. Optimum performance in combination with and M&K powered subwoofer. Basic Specifications & Suggested List Price: Frequency response 72-20kHz ±2dB. 12"Hx11 5/8"W x9 3/4"D. 17 lbs. Suggested list price \$750/pair standard version. \$825/pair with terminated transmission line tweeter and magnetic shielding.

**OAP AUDIO PRODUCTS**

5627 O'Rourke Rd.; Buford, GA 30518; (404) 945-1033. Product Name: Concert Pro-Ax. Contact: Michael D'Rouke. Date Product Introduced: 9/93. Product Description & Applications: High-quality, touring speaker system based on a patented, horn-loaded coaxial design. Components are two 15" woofers, one 10" midrange, and one 4" diaphragm compression driver. Basic Specifications & Suggested List Price: Frequency response: 45 to 20,000Hz. Size 40"Hx26"Wx24"D. Weight: 200 lbs. 1,200 watt power handling with 134dB output capability.

**POLK AUDIO**

5601 Metro Drive; Baltimore, MD 21215; (410) 358-3600. Product Name: RM 5000. Contact: Al Baron, mktg. mgr. Date Product Introduced: 10/93. Product Description & Applications: The RM 5000 is a compact, finely finished home theater front stage system. This 4-piece system is comprised of 2 satellites, a center channel speaker and a subwoofer which are sonically matched. Ease of placement and complete sonic integration are insured for demanding home theater installations, while the dense stone-like cabinets



POLK AUDIO  
RM 5000

blend with their surroundings. Basic Specifications & Suggested List Price: Frequency response: 42-18kHz, 8Ω impedance; efficiency: 88dB. J.S. retail \$1,099.

**PROFESSIONAL AUDIO SYSTEMS**

660 N. Twin Oaks Valley Rd., #101; San Marcos, CA 92069; (619) 591-0360. Product Name: RS-1, TDC System 1. Contact: Larry Doran, pres. Date Product Introduced: 1/93. Product Description & Applications: The RS-1 is a compact, high-output coaxial loudspeaker system designed to deliver full-range performance. Featuring a trapezoidal cabinet, the RS-1 allows arrays to wrap around a point, thereby reducing overall array dimensions to maximize coherence and minimize interference. The RS-1 features a two-pole passive crossover with Time Offset Correction and passive equalization. Basic Specifications & Suggested List Price: Frequency response: 50Hz to 16kHz. Power handling: 600 W. Sensitivity: 100dB 1W/1M. Nominal dispersion: 60 degree horizontal, 30 degree vertical. Dimensions: 17"Wx35"x24"D. List price: \$1,195 each.

**PROFESSIONAL AUDIO SYSTEMS**

660 N. Twin Oaks Valley Rd., #101; San Marcos, CA 92069; (619) 591-0366. Product Name: TDC Studio Monitor 1. Contact: Larry Doran, pres. Date Product Introduced: 10/93. Product Description & Applications: A two-way bi-amplified studio monitor. The low frequency component is a fifteen with large linear excursion. The high frequency is a one-inch compression driver on a 30x60 degree constant coverage horn. The active crossover is included and features linear phase filters, time offset correction and active parameter modification. Basic Specifications & Suggested List Price: Recommended power: 100W high, 300W low. Frequency response: 37Hz to 20kHz. Maximum continuous SPL: pair = 128dB at 1 meter. Dimension: 25"Hx19.5"Wx18.5"D. List price: \$4,800 per pair including active crossover.

**PROFESSIONAL TECHNOLOGIES**

Box 282A Rd. 1; Rome, NY 13440; (315) 337-4156. Product Name: PT 102 HD. Contact: John Puleo, chief eng. Date Product Introduced: 6/93. Product Description & Applications: The PT 102 HD is a high-power, high-output speaker system consisting of two bass drivers and a horn mid-tweeter arranged in a symmetrical configuration to maintain the soundfields polar integrity. The crossover utilizes high-quality plastic film capacitors and heavy-gauge air core coils to eliminate saturation distortion. The tweeter has a self-reset protective device. Applications include, but are not limited to, live performances and clubs. Basic Specifications & Suggested List Price: Drivers: two 10" bass drivers, one horn mid-tweeter, frequency response: 39Hz-20kHz ±3dB, pwr. handling: 500 watts, sensitivity at 1 watt/meter, 105dB, nominal impedance 4Ω, carpet or epoxy cover v-neer, protective corners and grille; dimensions HxWxD 34.5x13x13. Price \$2,100 per pair.

**RADIAN AUDIO ENGINEERING INC.**

4520 Eisenhower Circle; Anaheim, CA 92807-1821; (714) 693-9277. Product Name: 4500 Series Compression Drivers. Contact: Jeff Phillips. Date Product Introduced: 10/93. Product Description & Applications: Thermally-advanced compression driver series, featuring excellent transient response, low distortion and high power handling. Leading-Edge materials and Ferrofluid set new standards for performance. Available in 1", 1.4" and 2" throat sizes. Basic Specifications & Suggested List Price: Please inquire at both for specifications and pricing. Quantity pricing and DEM contracts available.

**RADIAN AUDIO ENGINEERING INC.**

4520 Eisenhower Circle; Anaheim, CA 92807-1821; (714) 693-9277. Product Name: MM8TA. Contact: Jeff Phillips. Date Product Introduced: 1/93. Product Description & Applications: Compact 8" coaxial studio monitor featuring Time-Align® precision crossover and compression driver tweeter. Yields exceptionally good time response for pinpoint imaging. Optional ELF™ subwoofer system available. Basic Specifications & Suggested List Price: 8" M-roll surround woofer, through-firing compression tweeter with 1.75" diaphragm. 60-22kHz response, 93dB sensitivity, 150W power handling. \$990 per pair MSRP.

**RENKUS-HEINZ INC.**

17191 Armstrong Ave.; Irvine, CA 92714; (714) 250-0166. Product Name: CE-3 CoEntrant Loudspeaker System. Contact: Carl Doran

—LISTING CONTINUED ON NEXT PAGE

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—LISTING CONTINUED FROM PREVIOUS PAGE

**waldt. Date Product Introduced:** 4/93. **Product Description & Applications:** The CE-3 is a 3-way loudspeaker system featuring a Co-Entrant design that provides true point source performance with natural signal alignment and tightly controlled dispersion from 500Hz to 20kHz. Its unique design features dual 1" HF drivers and dual 6.5" mid range drivers coupled to a common horn and a horn-loaded 12" woofer. The CE-3's outstanding performance and high-level output make it ideally suited for a wide variety of live entertainment applications. **Basic Specifications & Suggested List Price:** The trapezoidal CE-3 is only 32.5" tall, 21" wide and 23.75" deep and weighs 150 lbs. It produces an output SPL of 130dB continuous program from 70Hz to 20kHz; provides controlled 60x40 dispersion. Pro net price is \$3,300.

### RENKUS-HEINZ INC.

**17191 Armstrong Ave., Irvine, CA 92714; (714) 250-0166. Product Name:** CE-3 M/H CoEntrant Loudspeaker System. **Contact:** Carl Dorwaldt. **Date Product Introduced:** 4/93. **Product Description & Applications:** The CE-3 M/H is a long-throw 60x40 loudspeaker system that delivers an amazingly high 136dB SPL level for a cabinet of its small size. Its unique CoEntrant Waveguide design provides true point source performance with natural signal alignment and tightly controlled dispersion from 250Hz to 20kHz. It features six 1" HF drivers and six 6.5" mid-range drivers coupled to a common horn. The CE-3 M/H's small size, high-level output and controlled dispersion make it ideal for use on large clusters. **Basic Specifications & Suggested List Price:** The trapezoidal CE-3 M/H is only 32.5" tall, 21" wide and 23.73" deep, yet it handles 1,500 watts of power and delivers an output SPL of 136dB continuous program, from 250Hz to 20kHz. Pro Net price is \$5,100.

### RESONANCE D.B.A. DIGITAL DESIGNS

**100 N. Quapah, Suite K, Oklahoma City, OK 73107-6631; (405) 946-4500. Product Name:** Digital Designs Club Series: Models DDCS112-TFB, DDCS112-SC, DDCS115-TFB, DDCS115-SC. **Contact:** Alice Sandhu, sales and mktg. **Date Product Introduced:** 7/93. **Product Description & Applications:** The Digital Designs Club Series monitors are 12" & 15" 2-way speakers designed for nightclubs, karaoke bars and smaller environments. Highs are clean, mids are smooth and bass is rich. A 35mm compression tweeter is used for smooth, clear and undistorted sounds at high volume levels. Woofers are cast aluminum and have a double-vented motor structure to ensure maximum cooling for hours of deep club thumping bass. Available in black-lacquered trapezoid and carpet covered square cabinets. **Basic Specifications & Suggested List Price:** DDCS112-SC: impedance: 8 $\Omega$ , efficiency: 94dB, frequency response:  $\pm$ 3dB 42Hz-18kHz, dispersion (-6dB) 15kHz constant 60°, power handling: 200 RMS watts, tweeter, comp. driver 1x1.5", woofer 1x12", list each \$680 pr. DDCS115-SC, 4 $\Omega$  impedance, efficiency: 96, frequency response: 38Hz-18kHz, dispersion: 15kHz constant 60°, power handling: 250 RMS watts, tweeter, comp. driver: 1x1.5", woofer: 1x15", list each \$906 pr. SC is a square carpeted cabinet. TFB is a trapezoid cabinet produced in a black texture lac finish and is extra. Call for pricing.

### RESONANCE D.B.A. DIGITAL DESIGNS

**100 N. Quapah, Suite K, Oklahoma City, OK 73107-6631; (405) 946-4500. Product Name:** Digital Designs Club Series: Models M6-OU, M6-OB, M26-OU, M26-OB. **Contact:** Alice Sandhu, sales and mktg. **Date Product Introduced:** 3/93. **Product Description & Applications:** The Digital Designs Magma Speakers are a new series of monitors setting groundbreaking standards in terms of price and performance. These speakers utilize the technology from the critically acclaimed "B" Series reference monitors also made by Digital Designs to ensure natural uncolored monitoring. Cabinets are made of medium density fiberboard over genuine oak veneer and are available unfinished or in black lacquer. **Basic Specifications & Suggested List Price:** M6-OU: 4 $\Omega$  impedance, efficiency 94dB, frequency response: 45Hz-20kHz  $\pm$ 3dB, power handling: 100 (RMS watts), tweeter, liquid cooled 20mm, woofer 1x6.5", dimensions: 13.5x9x11, list \$199 each. M26-OU: 8 $\Omega$  impedance, efficiency: 96dB, frequency response: 38Hz-20kHz  $\pm$ 3dB, power handling 200 (RMS watts), tweeter, liquid cooled 20mm, woofer 2x6.5", dimensions: 18.5x10x15", list each \$299. OU is oak finished. OB is oak black lacquer and is \$20-\$35 extra. Grilles are optional at \$5.00 each.

### ROOMTUNE INC.

**1607 State Rt 39 NW, Dover, OH 44622; (216) 343-3600. Product Name:** Chameleon Loudspeaker. **Contact:** Michael Green, pres. **Date Product Introduced:** 1/93. **Product Description & Applications:** Two-way, bass-reflex loudspeaker employs internal clamping to tune cab-

inet resonances. **Basic Specifications & Suggested List Price:** Response: 40Hz to 20kHz  $\pm$ 3.0dB; impedance: 8 $\Omega$  nominal; drivers: 1" fabric dome tweeter, 8" kevlar cone woofer; sensitivity: 87 dB @ watt, 1 meter; power: 50 to 150 watts; dimensions: 48" tall x12" wide x16.5" deep; cabinets: internally clamped, suggested list price: \$3,450.

### RUSH SOUND

**1284 S. Lyon St., Santa Ana, CA 92705; (800) 959-7874. Product Name:** 333. **Contact:** Michael Goddard, mktg. dir. **Date Product Introduced:** 10/93. **Product Description & Applications:** The 333 is a powered monitor speaker for use in near and mid field monitoring applications. It incorporates a 65w Rush Sound amplifier driving a 7" polypropylene woofer and 1" dome tweeter. It uses an equalized bass reflex alignment to extend its bass response to 34Hz. **Basic Specifications & Suggested List Price:** Response: 34Hz to 20kHz,  $\pm$ 2.5dB; peak output: 110dB at 2m (pair); size: 12.0"x19.0"x10.5"; input 7: 10K $\Omega$ ; sensitivity: adjustable via potentiometers; finish: black oak; suggested retail price: \$895/pair (factory discrete) with 30 day money-back trial program.



SOLO ELECTRONICS  
H500 Studio Horn Monitor

### SOLO ELECTRONICS

**2462 Tripaldi Way, Hayward, CA 94545; (510) 887-8016. Product Name:** H500 Studio Horn Monitor. **Contact:** Chris Lau, sales mgr. **Date Product Introduced:** 6/93. **Product Description & Applications:** Solo H500 is a 3 way monitoring system for mid-field application. The most attractive feature of the H500 is the extraordinary trait of the solid cherry wooden horn, each of them is carefully hand-made to the precise measurements and detailed for acoustic horn lens purpose. The H500 also provided many unique features like: mid-range attenuator, MDF cabinet construction, computer optimized crossover network, Solen "Fast Capacitor", Cardas internal wires and double gold plated 5 way binding posts. **Basic Specifications & Suggested List Price:** Type: 3 way 4 drivers, 2x8" base reflex ported; impedance: 6 $\Omega$  normal; crossover frequencies: 1kHz, 18 kHz, frequency response: 45-27kHz  $\pm$ 3dB, sensitivity: 96dB/1W/1M, dimensions: 18/5"D x 24"Wx17"H, weight: 71 lbs. Net each. Price: \$2,480/pr.

### TURBOSOUND

**9288 Gorst Rd., Mazomanie, WI 53560; (608) 767-3333. Product Name:** Floodlight. **Contact:** Dan Abelson, pres. **Date Product Introduced:** 7/93. **Product Description & Applications:** Turbosound will show the all new Floodlight System, derived from our award-winning Flashlight technology. Intended for professional sound reinforcement, the Floodlight provides a true constant coverage of 50° throughout the frequency range of 150-17kHz. Designed for both permanent installation and touring applications, the Floodlight offers wide range reproduction on some drivers from 150-8kHz. **Basic Specifications & Suggested List Price:** The Floodlight is a two-box system consisting of 2x15" low frequency enclosure, coupled with an all horn loaded mid/hi enclosure featuring a high power 12" low mid, a 6.5 high-mid device and a 1" compression driver.

### USCO AUDIO ENGINEERING

**2623 Canyon Dr., Hollywood, CA 90068-2417; (213) 465-4370; (800) 932-6456. Product Name:** DB-2N1 Subwoofer System. **Contact:** Bruce Maddocks, chief engineer. **Date Product Introduced:** 1/93. **Product Description & Applications:** The DB-2N1 system is designed as a mono summing subwoofer for use in under/behind console placement. The system incorporates an adjustable level, high pass feed thru to console-top speakers requiring only one power amp for subwoofer/satellite operation. The subwoofer system may be used with any console top loudspeaker. **Basic Specifications & Suggested List Price:** Components: 10" poly woofer with foam surround, sensitivity: 88dB 1w/m, frequency response: 35 cps-100Cps  $\pm$ 3dB, power handling: 120 watt/music, impedance: 8 $\Omega$  nominal, dimensions: 12"Wx12"Dx12"H, list price: DB-2N1 \$345/ea.

### USCO AUDIO ENGINEERING

**2623 Canyon Dr., Hollywood, CA 90068-2417; (213) 465-4370; (800) 932-6456. Product Name:** Surround Monitor Package. **Contact:** Bruce Maddocks, chief engineer. **Date Product Introduced:** 1/93. **Product Description & Applications:** USCO Audio's surround monitor package is a 5 speaker system incorporating two new loudspeakers to its Reference Monitor series to fill the needs of surround sound production. The left and right channels are handled by USCO's DFW-3C. The rear/side channel audio is handled by the SP-2, a two way system. A mono summing subwoofer (DB-2N1) is also

available for low frequency extension to the system. **Basic Specifications & Suggested List Price:** DFW's use a down-firing woofer and mirrored driver placement. Diffraction & reflection are minimized by rounded cabinet edges. Crossovers are hand made and matched. Wiring is oxygen free, and kept minimum, permitting maximum power transfer to the loudspeaker. List prices: DFW-3 \$690/pr, DFW-3c \$368/ea., SP-2 \$356/pr, DB-2N1 \$345/ea.



WRIGHT MICROPHONES & MONITORS  
Wright Monitors

### WRIGHT MICROPHONES & MONITORS

**2091 Faulkner Road, N.E., Atlanta, GA 30324; (404) 321-3886. Product Name:** Wright Monitors. **Contact:** Tom Wright. **Date Product Introduced:** 12/92. **Product Description & Applications:** Mid- and rear-field studio monitor loudspeakers. Coaxial configuration with proprietary mounting/phase plug assembly allows drivers to run in polarity at all frequencies, front baffle and cabinet design minimizes baffle and interior reflection anomalies. High power handling. **Basic Specifications & Suggested List Price:** WFM-I: mid-field 15" woofer, suggested retail price: \$4,000. WFM-II: near-field 10" woofer, suggested retail price: \$2,000. WFM-III: near-field 8" woofer, suggested retail price: \$1,000. All systems are two-way, 12dB/octave crossovers.

### YAMAHA

**6600 Orangehope Ave., Buena Park, CA 90622; (714) 522-9011. Product Name:** Wave Force Series Loudspeakers. **Contact:** Pro Audio Dept. **Date Product Introduced:** 10/93. **Product Description & Applications:** Professional loudspeaker systems for sound reinforcement in public facilities, civic halls, theaters and houses of worship. **Basic Specifications & Suggested List Price:** Four Models WF 206, WF 215SB, WF112, WF115. WF 206 combines two 6" woofers and a 2" compression driver mounted to a spherical horn. SB 215SB-compact 2x15" subwoofer, WF112 and WF115 12" and 15" trapezoid enclosures utilizing spherical horns.



YORKVILLE SOUND  
Pulse PW

### YORKVILLE SOUND

**550 GranRt Ct., Pickering, ON, L1W 3Y8 Canada; (416) 837-8481. Product Name:** Pulse PW. **Contact:** Bud Mayer (716) 297-2920. **Date Product Introduced:** 4/93. **Product Description & Applications:** Active sub woofer integrates amp, speaker and enclosure for total control system. A linear computer monitors voice coil voltage and current to control excursion and temperature. A sweeping multiple filter dynamically optimizes system response according to program demand. System can accommodate speaker load or line level input and features stereo satellite speaker jacks. **Basic Specifications & Suggested List Price:** Freq. response: 40-125Hz, sensitivity: 100dB, impedance: 4 $\Omega$  max SPL: 128dB, crossover point: 100Hz (18dB per octave), 22"Hx22"Wx18"D, wgt: 50 lbs., 600 watts program power handling, 2x10" speakers, speaker and line level inputs accommodated. List: \$899.

### MUSIC PRODUCTS

### AIRCRAFT PRODUCTION LIBRARIES

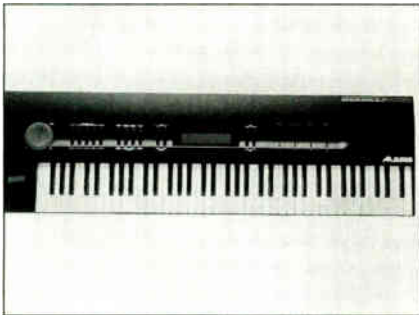
**162 Columbus Ave., Boston, MA 02116; (800) 343-2514; FAX: (617) 542-7222. Product Name:** ADS UP! Music for Commercials.



Contact: Paul Greenberg, Mark Cuddy sales reps. **Date Product Introduced:** Fall 1993. **Product Description & Applications:** Ads Up! Music for Commercials is a series of production music CDs created exclusively for commercial spot production. Each CD is filled with music that has the right attitude, the right instrumentation and the right energy to create great commercial spots. Every selection is pre-cut to broadcast lengths of :60, :30, :10 and :05. The first Ads Up! CD is available as of September 1993. **Basic Specifications & Suggested List Price:** Call one of our reps at (800) 343-2514 for more information and pricing.

**AKAI DIGITAL**

P.O. Box 2344; Ft. Worth, TX 76113; (817) 336-5114. **Product Name:** CD3000. **Date Product Introduced:** 6/93. **Product Description & Applications:** The CD3000 is a sample-player with a built-in CD-RDM drive. It is supplied with 5 CD-RPM discs created by Leading Sound Developers. While not equipped with A/D converters, the CD3000 can record digitally from standard audio CDs. All samples and programs can be edited. **Basic Specifications & Suggested List Price:** 32-voice polyphony, 10 analog outputs (stereo +8), SCSI port, digital audio I/O, 8MB RAM exp. to 16MB, resonant low-pass filters, digital effects. List price: \$3,995.



**ALESIS**  
QuadraSynth™

**ALESIS**

3630 Holdredge Ave.; Los Angeles, CA 90016; (310) 558-4530. **Product Name:** QuadraSynth™. **Contact:** John Maher, comm. mgr. **Date Product Introduced:** 1/93. **Product Description & Applications:** 64-voice/76 keymaster keyboard; 16 megabytes of onboard sample ROM, built-in QS Parallel Matrix Effects™ section comprising 4 completely independent signal processing buses. 4 assignable outputs and a ROM card slot for future wavform updates. True 64-voice polyphony. **Basic Specifications & Suggested List Price:** \$1,495. Sound generation method: 16-bit PCM 48kHz sample ROM w/sweepable filter per voice. Number of voices: 64 voice polyphony. Available wavform memory: 6 megabytes of onboard sample ROM + ROM card slot. Program memory: QS Program Mate™ (128 preset, 128 user), QS Mix Mode™ (128 preset, 128 user). Digital interface: fiber-optic output.

**ANGEL CITY AUDIO DESIGN**

2 Liberty Place; Middletown, CT 06457; (203) 347-5166. **Product Name:** PCM library for Korg T Series Synthesizers—New Releases. **Contact:** Jim Fellows. **Date Product Introduced:** 10/93. **Product Description & Applications:** All samples and programs are designed specifically for use with the T's tone generator/synthesis system. New titles include 26 brushed snare samples, 16 ambient snare samples, 12 bodhran samples, Rhodes piano, Bihorn harmonium, analog synths, arpeggiator loops, ARP 2600, Minimoog, Clavinet D6, DW8000, DX7 piano, Forte piano, harpsichord, bouzouki, Irish harp, Wheatstone concertina, Hammond B3 #2, cello, drums and percussion from Africa, etc. **Basic Specifications & Suggested List Price:** Each disk contains 1 meg of sample data and approx. 50 programs. All disks also include a generous selection of demonstration songs and written documentation. Price \$10-\$37.50 per disk. All disks also include a generous selection of demonstration songs and written documentation. Price \$10-\$37.50 per disk. Available direct from Angel City only. Visa/Mastercard/COD accepted. Can ship worldwide. Express service available.

**ASSOCIATED PRODUCTION MUSIC**

6255 Sunset Blvd., Ste. 820; Hollywood, CA 90028; (213) 461-3211; (800) 543-4276. **Product Name:** Carlin Music Library. **Contact:** Cassie Lord. **Date Product Introduced:** 1/93. **Product Description & Applications:** Launched in 1988, Carlin is one of APM's most recent additions. Carlin contains over 110 CDs. Musical styles range from the "mighty Wurlitzer" to contemporary "house music" to Mozart. Carlin has an ongoing commitment to fulfill the needs of all the productions and post-production media. **Basic Specifications & Suggested List Price:** Licensing may be obtained on either a per-production or annual blanket basis. Please call for details.

**ASSOCIATED PRODUCTION MUSIC**

6255 Sunset Blvd., Ste. 820; Hollywood, CA 90028; (213) 461-3211; (800) 543-4276. **Product Name:** Castle Music Library. **Contact:** Cassie Lord. **Date Product Introduced:** Summer 1993. **Product Description & Applications:** The Castle Music library is the newest addition to the roster of production music libraries currently represented by APM. Castle fills that unique niche in the business by pre-

senting new Australian and American composers, Mars Lasar, Phil Rigger & Phil Beazley. With musical styles ranging from current rock to new age atmospheres. **Basic Specifications & Suggested List Price:** Rights to license Castle may be obtained on either a per-production or annual blanket basis. Please call for details.

**BALOWIN PIANO & ORGAN COMPANY**

422 Wards Corner Rd.; Loveland, OH 45140; (513) 576-4500. **Product Name:** Baldwin DVP80 Digital Piano. **Contact:** Roy Hanson, div VP musical prod. development. **Date Product Introduced:** 1/93. **Product Description & Applications:** The Baldwin DVP80 digital piano has an 88-note velocity sensitive keyboard with weighted keys and a rotary hammer mechanism for realistic piano touch. Features include 32-note polyphony with 51-note dual generator board system, 15 standard voices, 74 additional preset voices plus percussion and an automatic accompaniment section. The DVP80 is available in two different furniture styles and finishes. **Basic Specifications & Suggested List Price:** 300-watt RMS high-resolution audio amps (3-channel), high-compliance 10" bass woofer, 2 wide-range mid-to-high frequency driver speakers with ferro fluid voice coils, MIDI in/out/through, stereo line-level audio input/output. Suggested retail \$5,839.

**CAPITOL/OGM PRODUCTION MUSIC**

6922 Hollywood Blvd., Ste. 718; Hollywood, CA 90028; (213) 461-2701. **Product Name:** OGM Premium Production Music. **Contact:** Ole Georg, managing director. **Date Product Introduced:** 1/93. **Product Description & Applications:** CDs released in the new OGM Premium Series. The OGM Broadcast Sweepers Program, The New Desktop CD-ROM Series and "a First" ... classical vocal recording.

**DDRUM**

300 Long Beach Blvd.; Stratford, CT 06497; (203) 380-0000; (800) 882-0098. **Product Name:** ddrum 3 System. **Date Product Introduced:** 10/93. **Product Description & Applications:** Studio-quality percussion systems for studios and professional drummers and percussionists. Available with the ddrum position intelligent pads or the ddrum triggers for maximum flexibility and durability. Use the internal sounds, or dump your own sounds into the module via DAT, SCSI or MIDI sample dump. A digital acoustic drum kit with guaranteed "WYPIWYG", what you play is what you get. Very user-friendly with the ddrum "one-hand access" editing system. **Basic Specifications & Suggested List Price:** 10X Trig-inputs, 16-bit linear format, 44.1 kHz sampling rate, sample merge, SCSI, DAT interface, MIDI sample dump, sampling expansion card. 2X PCMCIA 1.0 JEIDA memory card. 300 mbyte total memory. Attack sample function, 16X dynamic filters, response time 1ms, 5 octaves tuning range, 8X assignable outputs 18-bit D/A, MIDI in/out. \$4,995.

**DIMENSION MUSIC & SOUND EFFECTS INC.**

P.O. Box 1149; Okeechobee, FL 34973-1149; (813) 763-4107; (800) 634-0091. **Product Name:** Music and Sound Effects. **Contact:** Rex M. Bell, pres. **Product Description & Applications:** Dimension is well-known for its digital collection of production music and holographic sound effects on CD. The collection consists of 60 CDs of music and 12 CDs of SFX. Production music is available on MIDI files, and SFX are available on Hyperflex. Our themes run from classical to rock, from jazz to country, to industrial and corporate. We also do custom jingles and post scoring. **Basic Specifications & Suggested List Price:** Dimension sound effects range from \$40 to \$200 per CD. Production music CDs are \$69.95 to \$100. All are digitally recorded and mastered.

**DW LABS INC.**

P.O. Box 882; Millburn, NJ 07041; (201) 376-8453. **Product Name:** D3P MultiDistortion. **Contact:** Jeff Davis, mktg. dir. **Date Product Introduced:** 9/93. **Product Description & Applications:** The D3P allows the user to select a clean preamp, blues distortion, rock distortion or metal distortion. The unit also provides level, tone and distortion controls. An LED indicates on/off status. Sounds are top-notch, low-noise. Uses a 9-volt battery or AC power supply. **Basic Specifications & Suggested List Price:** Suggested list is \$135.00, power supply is \$10.95. Overall gain is +12db.

**DW LABS INC.**

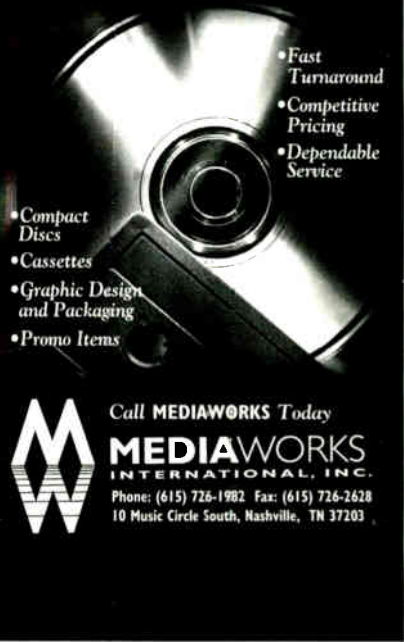
P.O. Box 882; Millburn, NJ 07041; (201) 376-8453. **Product Name:** T3 Preamp. **Contact:** Jeff Davis, mktg. dir. **Date Product Introduced:** 9/93. **Product Description & Applications:** The T3 preamp provides high-quality preamp capability for the electric or acoustic player. The unit provides level, bass, midrange, and treble controls. An LED is provided to indicate on/off status. The unit works on a 9-volt battery. An external AC power supply. **Basic Specifications & Suggested List Price:** Overall boost level up to +12db. Suggested list price is \$135. External 9-volt power supply is \$10.95.

**ENGINEERED PERCUSSION**

24416 S. Main St. #310; Carson, CA 90745; (310) 549-1171; FAX: (310) 549-7208. **Product Name:** AXIS Bass Drum Pedals. **Contact:** Thomas Aylesbury, sales mgr. **Date Product Introduced:** 1/93. **Product Description & Applications:** Engineered Percussion AXIS pedals give drummers ultimate performance in either acoustic or electronic drum pedal applications. Three AXIS pedal configurations are currently available, and the design is "modular." The AXIS-A single pedal can be upgraded to an AXIS-E, electronic trigger pedal. Either version can be converted to an AXIS A-II double pedal. All AXIS pedals feature an "all-machined" construction with no cast parts and the AXIS pedals feature ball-bearings at all critical pivot points. **Basic Specifications & Suggested List Price:** List prices: AXIS A \$245; AXIS E \$345; AXIS A-II \$565.

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| AMPEX  | 489DM120-SL   | 20 | 8.87  |
| 3M     | ST-120-HS     | 20 | 10.88 |
| 3M     | ST-120-SL     | 20 | 10.07 |
| FUJI   | ST-120-SL     | 10 | 7.38  |
| MAXELL | ST-120XRS-SL  | 10 | 7.90  |
| MAXELL | ST-126BQ*-LB  | 10 | 8.15  |
| SONY   | UXST-120VB-SL | 10 | 9.50  |
| SONY   | MQ ST-120-SL  | 10 | 9.75  |
| TDK    | ST-120XP-LR   | 10 | 7.99  |
| TDK    | CM-120-SL     | 10 | 8.12  |

**HI-8MM FOR USE IN TASCAM DA-88 MULTITRACK RECORDERS.**

|        |                 |    |       |
|--------|-----------------|----|-------|
| 3M     | P6-120HXP       | 10 | 12.28 |
| FUJI   | P6-120MP        | 10 | 6.95  |
| MAXELL | P6-120HG/BQ*    | 10 | 7.08  |
| MAXELL | P6-120 HMBQ*    | 10 | 8.28  |
| MAXELL | XRMP-120        | 10 | 6.93  |
| SONY   | P6-120 HMP      | 10 | 8.12  |
| SONY   | P6-120 HMPX PRO | 10 | 12.17 |
| TDK    | P6-120 MP       | 10 | 7.60  |

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**EPIPHONE COMPANY**

1818 Elm Hill Pike; Nashville, TN 37210; (615) 871-4500. Product Name: Les Paul Std. Contact: Jim Rosenberg, pres. Date Product Introduced: 10/92. Product Description & Applications: Arched, carved top, rosewood fingerboard with trapezoid inlays, solid, glued neck joint. Basic Specifications & Suggested List Price: \$629. Built 100% to Gibson's specifications.

**EPIPHONE COMPANY**

1818 Elm Hill Pike; Nashville, TN 37210; (615) 871-4500. Product Name: PR-6-E. Contact: Jim Rosenberg, pres. Date Product Introduced: 10/92. Product Description & Applications: Thin body, Venetian cutaway, arched top & back, euphonic "V" parametric EQ, translucent colors. Basic Specifications & Suggested List Price: \$649. Heritage cherry sunburst, trans. amber, trans red, tobacco sunburst. Also available with a select figured top (silky oak) (\$659).

**FIRSTCOM/MUSIC HOUSE/CHAPPELL**

13747 Montfort Dr., Ste. 220; Dallas, TX 75240; (214) 934-2222. Product Name: FirstCom Library Releases Featuring Artist Ray Russell. Contact: Andrea Bergeron, mktg. admin. coordinator. Date Product Introduced: 3/93. Product Description & Applications: "The Blues Album" is the first of six original discs scheduled for the FirstCom Library to be composed by guitarist/composer Ray Russell. Additional discs to be released in June and September of 1993. Basic Specifications & Suggested List Price: For additional information on the FirstCom Library or other FirstCom products, contact 1-800-858-8880.

**FIRSTCOM/MUSIC HOUSE/CHAPPELL**

13747 Montfort Dr., Ste. 220; Dallas, TX 75240; (214) 934-2222. Product Name: FirstCom Library releases featuring American Gramophone artists. Contact: Andrea Bergeron, mktg. admin. coordinator. Date Product Introduced: 3/93. Product Description & Applications: FirstCom and American Gramophone Records have entered into a long-term agreement whereby American Gramophone artists will create music for FirstCom's music library. Six titles were released in March with more scheduled for June and September. Basic Specifications & Suggested List Price: For additional information on FirstCom Library or other FirstCom products, call 1-800-858-8880.

**FROM THE TOP PRODUCTIONS**

3005 Copper Knoll; Charlottesville, VA 22901; (804) 974-7168. Product Name: Korg T-Series Wavesequences. Contact: Dominic Guss, pres. Date Product Introduced: 6/92. Product Description & Applications: A unique disk that allows the Korg T-Series keyboards to play wavesequences from its internal ROM waveforms. Also contains other patches for a total of over 600 sounds on one disk. Basic Specifications & Suggested List Price: \$35 per disk. Please contact us for additional info.

**FROM THE TOP PRODUCTIONS**

3005 Copper Knoll; Charlottesville, VA 22901; (804) 974-7168. Product Name: Performance Sample Library. Contact: Dominic Guss, pres. Date Product Introduced: 6/93. Product Description & Applications: An absolute "no compromise" musical instrument and live performance sample library developed for the Kurzweil K2000 and soon to be available on audio CD and other formats. These samples were captured in their most natural state using the finest equipment available and all were recorded in acoustically state-of-the-art environments. Our unique sampling architecture offers many advantages over other libraries. Basic Specifications & Suggested List Price: Our Performance Sample Library was designed to bring otherwise sterile, one-dimensional sequences new life and human feel that no machine could ever possibly match. Our libraries are frequently being updated. Please contact us for current price list and literature.

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THE HOLLYWOOD EDGE  
Laughs, Cheers & Applause

**THE HOLLYWOOD EDGE**

7060 Hollywood Blvd. Ste. 1120; Hollywood, CA 90028; (213) 466-6723. Product Name: Laughs, Cheers & Applause. Contact: Scott Whitney, mktg. dir. Date Product Introduced: 10/93. Product Description & Applications: From huge sports, convention and concert crowds to small studio audiences and a baby's giggle, the new Hollywood Edge sound effects collection, Laughs, Cheers & Applause, will supply you with the material you need to bring your production to life. Weighing in at over 200 effects, Laughs, Cheers, & Applause will make your production a definite heavyweight contender. "The Hollywood Edge is the best sound effects library without a doubt" Oliver Stone, director. Basic Specifications & Suggested List Price: Laughs, Cheer, & Applause comes fully indexed on 2 compact discs, and is a must for anyone in the audio business of film, broadcast, video, music and theater. Call (800) 292-3755 for more details.

**INVISION INTERACTIVE INC.**

269 Mount Hermon Road, Ste. #105; Scotts Valley, CA 95066-4029; (408) 438-5530. Product Name: CD-ROMs. Contact: Denny Mayer, VP sales. Date Product Introduced: 10/93. Product Description & Applications: InVision pioneered the CD-RDM business with its AudioFont™ Library, the world's most extensive collection of sounds. Now we're pleased to announce coming soon: Lightware Volume 7 for Akai's S1000/1100 and CD3000, a special edition of Hot New Sounds, Lightware Volume 2 Pop and Electric, and Lightware Volume 3 Classical and Acoustic for the Akai S Series and CD3000. Also new: Volume 2 Pop, Electric and orchestral Lightware for Digidesign's SampleCell. Basic Specifications & Suggested List Price: InVision is breaking the price barrier! Our prices are so low you can't afford not to own them. Our whole library of CD ROMs is priced incredibly low at just \$188 each. (note: K2000 samplers require a 2.0 o.s. to use these CD ROMs.)

**INVISION INTERACTIVE INC.**

269 Mount Hermon Road, Ste. #105; Scotts Valley, CA 95066-4029; (408) 438-5530. Product Name: PlusONE. Contact: Denny Mayer, VP sales. Date Product Introduced: 1/93. Product Description & Applications: PlusOne is a sound memory upgrade for Korg's M1 and M1R workstations. PlusONE adds 4 megabytes of new PCM ROM data, plus 100 new combis., 100 new programs, 46 new multisounds and over 40 percussion sounds. The all-new digital sounds compliment but don't replace existing M1 sounds. Also: Look for InVision exclusive killer 2 megabyte PCM cards to support Korg's O1W available soon! Basic Specifications & Suggested List Price: Available from Invision and Korg dealers, installation at a Korg authorized service center protects the original factory warranty. New sounds include: Solo Flute and Violin, Rock Organs, Distortion Guitar, Electric Bass, Digital/Analog Synths, Harp, Electric Pianos, Marimba, Acoustic Guitar, Rap Drums and Ethnic Percussion. \$395 including install.



JAMES & ASTER INC.  
Undercover Records, Earthlight Productions

**JAMES & ASTER INC.**

115 East 23rd Street; New York, NY 10010; (212) 982-0300. Product Name: Undercover Records, Earthlight Productions. Contact: Rob Aster, pres.; Michael Lau, mktg. mgr. Date Product Introduced: 3/93. Product Description & Applications: UnderCover

Records bridges the gap between commercial records and music library. UnderCover features the sounds of charted recording artists and television composers. This music is appropriate for story telling and programming with impact. Musical styles include: orchestral-Americana, thematic pop, rock, dance, urban, cajun, new age, contemporary jazz and drama. The Earthlight CD label features the music of the mallet and percussion virtuoso Craig Peyton. The music has elements of contemporary jazz, world beat and new age. Basic Specifications & Suggested List Price: UnderCover CDs contain over 60 minutes of music. Full-length themes are followed by 0:60, 0:30 and 0:15 second cut downs. Some alternate mixes are provided. Flexible licensing arrangements available. Call for free brochure.

**KAT INC.**

300 Burnett Rd.; Chicopee, MA 01020; (413) 594-7466. Product Name: Pole KAT. Contact: Rod Squier, customer support. Date Product Introduced: 1/93. Product Description & Applications: The poleKAT from KAT is a great way to play hi-hat, cymbals, and effects. It features a two zone (or mono, selectable) playing surface and was designed for play with the shaft of a drumstick. Its elegant design and responsive feel make the poleKAT a great add on to any acoustic or electronic setup. Suggested List just \$169.

**KORG USA INC.**

89 Frost St.; Westbury, NY 11590; (516) 333-9100. Product Name: i3 Interactive Music Workstation. Contact: Laura Delia, mktg. assistant. Date Product Introduced: 7/93. Product Description & Applications: The i3 Interactive Music workstation is a full-featured professional music workstation that functions as a versatile compositional tool using built-in existing patterns with accompanying instrument, call "Styles," which can be edited, combined or looped and stored as a new pattern. Each style contains 4 variations, 2 intros, 2 fills and 2 endings, with 6 different sequences made up of 6 tracks of drums, percussions, bass guitar, electric and acoustic guitar and saxophone. The full range scanning feature allows the i3 to scan the entire keyboard and accurately display and reproduce any complex chord exactly as it is being played. Basic Specifications & Suggested List Price: 61-note keyboard, intelligent auto accompaniment system, with styles, patterns and arrangements, 128 general MIDI programs (RDM), 64 programs (RAM), program card slot, FDD disk drive, dynamic digital multi-effects, built-in 16-track sequencer, 32-voice polyphony, 40,000-note sequencer, over 10,000 tracks of pre-recorded music data stored in ROM and 48 different musical styles to choose from. Price: TBA.

**MANHATTAN PRODUCTION MUSIC**

311 W. 43rd St. Suite 702; New York, NY 10036; (800) 227-1954; (212) 333-5766 in NY state. Product Name: Chesky Records Classical Series. Contact: Ron Goldberg, nat'l sales mgr. Date Product Introduced: 6/93. Product Description & Applications: Over 50 CDs of classical music all transferred digitally from the original master recordings. Includes composers such as Beethoven, Mozart, Strauss, Stravinsky and more. Also available—Manhattan Production Music Library and Audiophile Sound Effects series. Basic Specifications & Suggested List Price: Priced according to market conditions.

**THE MARTIN GUITAR COMPANY**

510 Sycamore St.; Nazareth, PA 18064; (800) 345-3403. Product Name: D-1 Acoustic Guitar. Contact: Your Local Authorized Martin Dealer. Date Product Introduced: 1/93. Product Description & Applications: The D-1 closely resembles other standard Martin dreadnoughts. Many revolutionary design elements have been incorporated to improve stability and playability. The D-1 represents the lowest priced guitar in Martin's line of American-made quality instruments. It has a two-piece solid mahogany back coupled with veneered mahogany sides. The 3-ply sides provide an extraordinary dimensional stability. Basic Specifications & Suggested List Price: The D-1 has a unique "A Frame" brace which ties directly into a laminated alder neck block adding support to the soundhole area. The fingerboard has been designed to be straight and free of any stress. This ensures that all frets are playable, that the action can be set lower, and the truss rod adjustments are truly effective. Retail price \$995 (hardshell case included).

**METRO MUSIC PRODUCTIONS**

645 W. End Ave.; New York, NY 10025; (800) 697-7392; (212) 799-7600. Product Name: "Move It!" - Volume 11. Contact: Patty Anglin, nat'l sales rep. Date Product Introduced: 9/93. Product Description & Applications: Newest CD Volume in the Metro Music Production Library (see "New Audio Products for Film Productions" Mix, July 1993). "Move It!" is a searing-hot mix of new high-energy music for broadcast, audio post, corporate video. Fat beats, hip-hop, techno-funk, sports rock, house and club grooves, and more. Basic Specifications & Suggested List Price: The Metro Library is available on an annual blanket, per-production, or needle-drop basis. Over 270 titles, the Metro library is unique. It's music you can't get anywhere else! Call for a demo CD.

**MIDI SOLUTIONS INC.**

816-810 W. Broadway; Vancouver, BC, V5Z 4C9 Canada; (800) 561-MIDI(6434). Product Name: Footswitch Controller. Contact: John Fast, pres. Date Product Introduced: 1/93. Product Description & Applications: MIDI Solutions Footswitch Controller sends out preprogrammed MIDI messages using an external footswitch (not included). Messages include note, controller, pitch bend, pro-

—LISTING CONTINUED TOP OF NEXT COLUMN

gram change, start/stop, or system exclusive messages (up to 20 bytes/message). The unit is programmed by MIDI System Exclusive commands and settings are retained even after unplugged. **Basic Specifications & Suggested List Price:** Connections: MIDI in, MIDI out, 1/4" phone jack connection for footswitch. All input messages echoed to output, powered by the MIDI signal, includes MIDI indicator LED. \$79.

**MIDI SOLUTIONS INC.**

816-810 W. Broadway; Vancouver, BC, V5Z 4C9 Canada; (800) 561-MIDI(6434). **Product Name:** Merger. **Contact:** John Fast, pres. **Date Product Introduced:** 1/93. **Product Description & Applications:** MIDI Solutions Merger is a 2 in/1 out MIDI Merger that merges all types of MIDI message including system-exclusive dumps. It may be chained together with additional mergers for as many inputs as required. **Basic Specifications & Suggested List Price:** Connections: MIDI In1, MIDI In2, MIDI out. Powered by the MIDI signal, includes MIDI Indicator LED. \$59.

**MIDI SOLUTIONS INC.**

816-810 W. Broadway; Vancouver, BC, V5Z 4C9 Canada; (800) 561-MIDI(6434). **Product Name:** RELAY. **Contact:** John Fast, pres. **Date Product Introduced:** 1/93. **Product Description & Applications:** MIDI Solutions Relay is a MIDI-controlled relay. A 1/4" phone jack provides an easy connection to many devices such as multitrack punch-in jacks and most footswitch inputs. MIDI Solutions Relay may be set to respond to program change, system exclusive messages (up to 20 bytes/message), and up to 10 different note or controller messages. The unit is programmed by MIDI Syst. Ex. commands and settings are retained even after unplugged. **Basic Specifications & Suggested List Price:** Connections: MIDI in, MIDI out, 1/4" phone jack for relay connections, fuse. Relay contact ratings: 3W 150V 0.5A. All input messages echoed to output, powered by the MIDI signal, includes MIDI indicator LED. \$99.

**MIDI SOLUTIONS INC.**

816-810 W. Broadway; Vancouver, BC, V5Z 4C9 Canada; (800) 561-MIDI(6434). **Product Name:** THRU. **Contact:** John Fast, pres. **Date Product Introduced:** 1/93. **Product Description & Applications:** A 1-in/2-out MIDI thru box that allows an additional MIDI output to be added at any point in the MIDI chain. It may be chained together with other Thrus if more than 2 outputs are required. MIDI Solutions Thru passes all types of MIDI data including system-exclusive dumps. **Basic Specifications & Suggested List Price:** Connection: MIDI in, MIDI Thru1, MIDI Thru2. Powered by the MIDI signal, include MIDI indicator LED. \$29.

**NETWORK MUSIC INC.**

11021 Via Frontera; San Diego, CA 92127; (619) 451-6400. **Product Name:** Brainstorm. **Contact:** Bruce Tucker, VP business and legal affairs. **Date Product Introduced:** 8/93. **Product Description & Applications:** Brainstorm—the next generation of production elements. Conceived, recorded, processed and digitally mastered by a team of award-winning sound designers, Brainstorm offers over 500 cuts on 7 CDs including clip sounds, atmospheres, musical loops, kicker, punctuators, stagers, glides, sweeps, audio logos, drones, sparkles, zaps, missiles, lasers, jets, winds and 2 CDs of rhythm-driven music. **Basic Specifications & Suggested List Price:** Over 500 cuts on 7 CDs; one-time license fee still to be determined.

**OMNIMUSIC**

6255 Sunset Blvd. Ste. 803; Hollywood, CA 90028; (213) 962-6494; (800) 828-6664. **Product Name:** Omni CD #61 "Kidstuff". **Contact:** Jerry Burnham, nat'l sales dir. **Date Product Introduced:** Spring 93. **Product Description & Applications:** "Kidstuff" contains a wealth of music pertaining to children of all ages—from simple nursery rhymes to video games cartoons, music boxes etc. Omnimusic currently supplies over 95 CDs of music and sound effects to all media. This CD contains full-length and commercial length cuts. **Basic Specifications & Suggested List Price:** Licensing rights may be obtained on either a laserdrop or annual blanket basis. Please call for details.

**OMNIMUSIC**

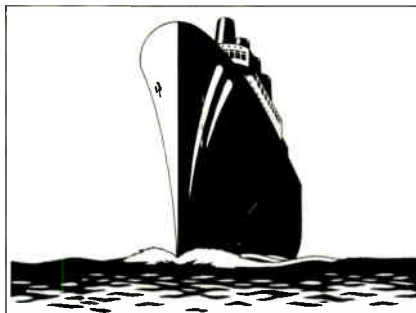
6255 Sunset Blvd. Ste. 803; Hollywood, CA 90028; (213) 962-6494; (800) 828-6664. **Product Name:** Omni CD 62 "Sweat". **Contact:** Jerry Burnham, nat'l sales dir. **Date Product Introduced:** Spring 1993. **Product Description & Applications:** "Sweat" contains hard driving tracks with sports in mind—featuring rock violinist Mark Wood. All tracks are full-length, :30 and :60 in length. **Basic Specifications & Suggested List Price:** Rights to license music may be obtained on either a per-production or annual blanket basis.

**OVAL WINDOW AUDIO**

33 Wildflower Ct.; Nederland, CO 80466; (303) 447-3607. **Product Name:** Multi-Sensory Sound Lab. **Contact:** Norman Lederman, dir. R&D. **Date Product Introduced:** 6/93. **Product Description & Applications:** Developed with support from the U.S. Department of Education, the Multi-Sensory Sound Lab simultaneously transforms sound into vibrations felt through the system's floor and colorful visual images displayed on special technology. Applications include instruction in acoustics and physics, music and speech therapy, and multisensory music performance. **Basic Specifications & Suggested List Price:** The Multi-Sensory Sound Lab is a modular customized system. Price will depend on features selected and size of vibrating floor.

**PHILADELPHIA MUSIC WORKS INC.**

PD Box 947; Bryn Mawr, PA 19010; (800) 368-0033. **Product Name:** AVB Production Music Library. **Contact:** Andy Mark, pres/exec producer. **Date Product Introduced:** 9/93. **Product Description & Applications:** The AVB Production Music Library is a new library designed for A/V and broadcast applications. The initial library contains 10 CDs, each containing full and underscore versions, :60 and :30 "link" cuts. Arranged by style, each CD is color-coded for easier reference. AVB is available on a very reasonable annual blanket license basis. **Basic Specifications & Suggested List Price:** Pricing of the AVB Production Music Library is \$400 per year. This price includes an additional 4 CDs per year after the basic 10 CDs. AVB is licensed on annual blanket basis.



THE PRODUCERS SOUND EFFECTS LIBRARY  
The Producers Sound Effects Library

**THE PRODUCERS SOUND EFFECTS LIBRARY**

8033 Sunset Blvd. Ste. #289; Hollywood, CA 90046; (213) 969-0339; (800) 826-3397; FAX: (213) 969-0248. **Product Name:** The Producers Sound Effects Library. **Contact:** Melinda Miller, sales rep. **Date Product Introduced:** 6/93. **Product Description & Applications:** CD ROM libraries for samplers and workstations. The current CD-ROM contains over 1,600 samples and 600 megabytes of data. Call for pricing for the CD-ROM in your format. The Producers Sound Effects library also offers sound effects on audio CDs. CDs are released categorically. Categories released to date: Applause, Backgrounds, Crowds, Doors, Science Fiction, Rain and Thunder, Telephones, Traffic and Water. Also, the FX Directory—a sound effects cataloging tool. **Basic Specifications & Suggested List Price:** Buy-out. CDs offered individually for greater savings and selectability. Call for current pricing.

**PRODUCTION GARDEN MUSIC**

2411 NE Loop 410, Ste. #126; San Antonio, TX 78217; (800) 247-5317; (210) 599-9439; FAX: (210) 599-1254. **Product Name:** Production Garden Music Library. **Contact:** Mel Taylor, pres. **Date Product Introduced:** 10/92. **Product Description & Applications:** Broadcast production music library featuring over 2,000 cuts on 22 CDs (:60a, :30s and work parts). A/V video library with long-form cuts: 329 themes plus edits on 21 CDs. New European library with 441 themes on 19 CDs. Eight different Sound Effects libraries available starting at \$495; over 20,000 effects total. Music CDs available individually or in sets; lease or "buy-out."

**QCCS PRODUCTIONS INC.**

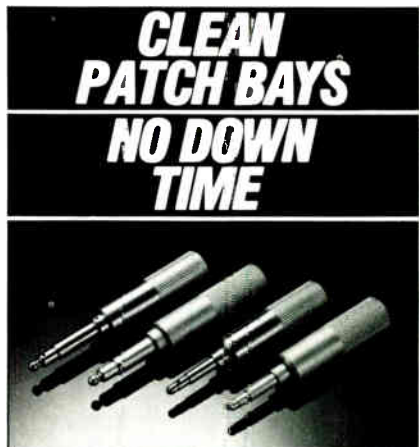
1350 Chambers St.; Eugene, OR 97402; (503) 345-0212. **Product Name:** PBTM Music Library Vol. 7. **Contact:** Michael Brewer. **Date Product Introduced:** 1Q/92. **Product Description & Applications:** Buy out CD music library. Recent releases: Nov. '92, Hot Tracks Vol 8 sports, Dec. '92 Contemporary Variety Vol 9, March '93 New Age Music Vol 10, J.-ne '93 Contemporary Variety Vol 11. **Basic Specifications & Suggested List Price:** Each CD discs = between 50 min. and one hour of music at \$70 per disc. By-out price. Free catalog, 24-hour demo/info line. Writers of national broadcast music!

**RIVER CITY SOUND PRODUCTIONS**

PD Box 750786; Memphis, TN 38175; (800) 755-8729. **Product Name:** Buy-out Production Music Library. **Contact:** Bob Pierce. **Date Product Introduced:** 12/92. **Product Description & Applications:** Broadcast series Volume 3. Buy-out production music CD containing a song length :30, :15, :10 versions of the following categories: sports, mellow, corp/industrial, country, rock, hi-tech, urban, new age and misc. Specialty series "wedding," "nature" and "country" are also new CDs now available. **Basic Specifications & Suggested List Price:** "Broadcast Series" production music library CDs are \$59 per disc. "Specialty Series" production music library CDs are \$59 per disc.

**SCHOLZ RESEARCH AND DEVELOPMENT**

1560 Trapelo Rd.; Waltham, MA 02154; (617) 890-5211. **Product Name:** Rockman A12-50. **Contact:** Matt Belyea. **Date Product Introduced:** 1/93. **Product Description & Applications:** 50 watt guitar combo amplifier. With a 12" speaker and Ultimatum Distortion™ circuit. Channel switching, aux input, headphone output, fx loop, direct out. Made in the USA. **Basic Specifications & Suggested List Price:** 2-channel, 50 watt 12" speaker, \$349.95.



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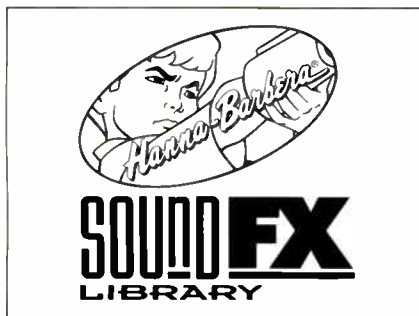
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**SOUND IDEAS**  
Sound Ideas Hanna-Barbera Sound Effects Library

**SOUND IDEAS**

105 W. Beaver Creek Rd., Ste. 4; Richmond Hill, ON, L4B 1C6 Canada; (800) 387-3030. **Product Name:** Sound Ideas Hanna-Barbera Sound Effects Library. **Contact:** Brian Nimens, pres. **Date Product Introduced:** Fall 1993. **Product Description & Applications:** The (new) Hanna-Barbera Sound Effects library. An amazing collection of comedy, effects on 4 CDs. All sounds carefully selected from the wealth of material in the Hanna-Barbera sound archives; digitally remastered to preserve these classic effects and give them new life in the modern sound studio. **Basic Specifications & Suggested List Price:** 4 compact discs. Exclusively distributed by Sound Ideas.



**SOUND IDEAS**  
Sound Ideas Warner Bros. Sound Effects Library

**SOUND IDEAS**

105 W. Beaver Creek Rd., Ste. 4; Richmond Hill, ON, L4B 1C6 Canada; (800) 387-3030. **Product Name:** Sound Ideas Warner Bros. Sound Effects Library. **Contact:** Brian Nimens, pres. **Date Product Introduced:** Spring 1993. **Product Description & Applications:** The Warner Bros. Sound Effects library. 1,500 digitally remastered effects on 5 side-splitting CDs. As well as authentic sounds selected from the Warner Bros. sound department, the collection includes special effects from Emmy Award-winning sound designer Russell Brower. **Basic Specifications & Suggested List Price:** Over 1,500 sounds on 5 compact discs. Offer your productions something very special with the famous and familiar sound effects associated with Warner Bros. Exclusively distributed by Sound Ideas.

**TRF PRODUCTION MUSIC LIBRARIES**

747 Chestnut Ridge Rd.; Chestnut Ridge, NY 10977; (800) 899-MUSIC. **Product Name:** The PYRAMID Production Music Library. **Contact:** Ken Gilman, VP. **Date Product Introduced:** Spring 1993. **Product Description & Applications:** More than 100 new digitally recorded production music library compact disc releases, each with an average of 75 to 80 minutes of music. These new releases have been added to the 50,000 selections on more than 4,000 discs already in the TRF libraries. These new releases will make productions come to life with discs containing full-length and underscored versions, alternate mixes, jingle-length and sting versions. Choose from "Music From Many Lands," "The Sweet Smell of Success" and "New Classical" to name of few, as well as from the largest collec-

tion of classical music in the world, the largest collection of ethnic music and a complete sound effects series. **Basic Specifications & Suggested List Price:** All new releases as well as other TRF CDs can be licensed at very economical rates.

**TRF PRODUCTION MUSIC LIBRARIES**

747 Chestnut Ridge Rd.; Chestnut Ridge, NY 10977; (800) 899-MUSIC. **Product Name:** The PYRAMID Production Music Library. **Contact:** Ken Gilman, VP. **Date Product Introduced:** Spring 1993. **Product Description & Applications:** The new Pyramid Production Music library introduced with 13 initial CDs designed for broadcast, AV and film applications and will feature real country, real rock, sports/action, light jazz, light industrial, urban contemporary, new classical, Americana, comedy/children, technopop, solo instruments and jingles. Pyramid is being introduced with its regular series (PRY 701-709) and 4 special jingle series (PRY A01-A04) is being added to the vast collection of over 50,000 selections already contained in the various TRF Libraries, the largest and by far the most extensive source of production music in the world. Among the other well-known TRF libraries are BMG on the RCA label, Black Rock, Bosworth, Folkways, MP 2000, Image and Tele Music. **Basic Specifications & Suggested List Price:** All Pyramid CDs as well as all other TRF CDs can be licensed at very economical rates.

**ZETA MUSIC**

2230 Livingston St.; Oakland, CA 94606; (800) 622-6434. **Product Name:** VS-104/105 Strados Violin Pickups. **Contact:** Randy Shamber, mktg. sales mgr. **Date Product Introduced:** 1/93. **Product Description & Applications:** The VS-104 Strados pickups gives the violinist the ability to amplify the sound of their acoustic violin at necessary stage volumes without any feedback or thin tone. Each string rests on a separate tuned beam or finger which contains the pickup for that string. This patented technology is what makes the sound project a warmth and clarity at any volume. **Basic Specifications & Suggested List Price:** Includes bridge/pickup assembly, tail piece with fine-tuners for each string 3.5mm output jack and a 20' cable VS-104 4-string is \$295. VS-105 5-string is \$395.

**ZETA MUSIC**

2230 Livingston St.; Oakland, CA 94606; (800) 622-6434. **Product Name:** Zeta Uprite Bass. **Contact:** Randy Shamber, mktg. sales mgr. **Date Product Introduced:** 1/93. **Product Description & Applications:** The first solid body electric double bass to capture the feel and tone of a traditional upright. Optional multi-out cable into the multi-out DIN convertor allows each string to be run to a different recording channel or stack. Both plucking and bowing styles are faithfully reproduced by Zeta's patented bridge transducer system which utilizes four separate preamps and a pair of pickups per string. Rugged design makes the instrument roadworthy. **Basic Specifications & Suggested List Price:** String length = 41.5 inches, adjustable 7/8 scale. Length 58", width 14", depth 6", weight 14 lbs. Gig bag and Omni swivel stand are options that are available. List price \$4,995.

**RECORDING DEVICES**

**ACCURATE SOUND CORPORATION**

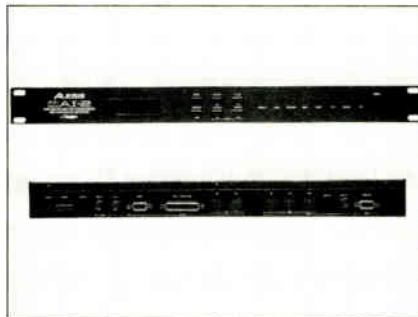
3475-A Edison Way; Menlo Park, CA 94025; (415) 365-2843. **Product Name:** Duplicator Upgrade Kit. **Contact:** Ronald M. Newdell, pres. **Date Product Introduced:** 7/93. **Product Description & Applications:** Record/Reproduce electronics and bias amplifier to upgrade older loop bin high speed audio cassette to high speed (64:1) and improved fidelity kit is complete with heads, cables, electronics and hardware for field installation. **Basic Specifications & Suggested List Price:** Basic loop bin master & 5 slave upgrade to 64:1 less than \$15,000. 8MHz bias, two switchable EQ positions bias for ferric and chrome tape.

**AKAI DIGITAL**

PO Box 2344; Ft. Worth, TX 76113; (817) 336-5114. **Product Name:** DR4 Hard Disk Recorder. **Date Product Introduced:** 7/93. **Product Description & Applications:** 4-track, 4-in/4-out digital hard disk recorder. The DR4 is a self-contained rack-mountable device, not an add-in card for computers. Up to 4 units can be chained for 16-track operation. The DR4 combines random-access editing with a familiar tape-machine style of user interface. **Basic Specifications & Suggested List Price:** TRS 1/4" balanced analog input/output (+4 or -10 switchable); XLR and RCA digital I/O; 18-bit 64x oversampling A/D; 18-bit 8x oversampling D/A; max. of 7 SCSI hard drives (up to 300B total capacity). Memory locations: 108. List price-\$1,995.

**ALESIS**

3630 Holdrege Ave.; Los Angeles, CA 90016; (310) 558-4530. **Product Name:** AI-2. **Date Product Introduced:** 1/93. **Product Description & Applications:** The Alesis AI-2 multipurpose audio/video synchronization interface by TimeLine acts as a stand-alone chase synchronizer for the ADAT 8-track digital recording system. It also supports Sony 9-pin protocol for direct connection to video editors. TimeLine has also allowed for connection to its Micro and Lynx synchronizer systems. MIDI Machine Control and MIDI Time Code are also available. **Basic Specifications & Suggested List Price:** \$995. SMPTE, EBU, time code chase lock, auto detect 30, 29.97 (NTSC) or (PAL), 25 FPS, supports drop-frame and nondrop time code. Inter-



**ALESIS**  
AI-2

nal and external word clock interface, external video sync., Sony P-2 (9-pin) BVU 95Q emulation, supports MIDI Time Code, direct interface Micro Lynx (TimeLine) or Lynx.



**ALESIS**  
BRC Master Remote with  
RMB Remote Meter Bridge

**ALESIS**

3630 Holdrege Ave.; Los Angeles, CA 90016; (310) 558-4530. **Product Name:** BRC Master Remote with RMB Remote Meter Bridge. **Date Product Introduced:** 1/93. **Product Description & Applications:** For large ADAT systems (16 to 128 tracks), the BRC Master Remote Control reads and generates SMPTE time code, generates MIDI time code and MIDI clocks, provides control over timing, individual track delays, tape offsets, track selection, automatic record rehearsal and punch-in, and allows for complex copy and paste assembly editing. The RMB Remote Meter Bridge provides 32 channels of remote LED metering for a multiple ADAT system. **Basic Specifications & Suggested List Price:** BRC \$1,995. RMB \$995. BRC: 400 autolocation points, 20 song start points, punch in and out points, MIDI tempo maps, SMPTE offsets and more can be stored in the first 2 minutes (data header) of the ADAT tape. Alphanumeric display lets you name each live point and song. RMB: 32 channels of 15 segment LED bar graph indicators, four 9 pin D-Sub connectors for ADAT.

**AMP SERVICES**

224 Datura St. Ste. 614; W. Palm Beach, FL 33401; (407) 659-4805. **Product Name:** Ceramic Slant Guides for all Sony 1" Video Recorders. **Contact:** Tom Rappolt. **Date Product Introduced:** 1/93. **Product Description & Applications:** Solid ceramic guide pins for all Sony 1" slant guide assemblies. Pins are guaranteed against wear for life and are milled and precisely aligned in customer's assembly by Amp Services. **Basic Specifications & Suggested List Price:** \$250 complete. Both pins mounted and aligned.

**AMP SERVICES**

224 Datura St. Ste. 614; W. Palm Beach, FL 33401; (407) 659-4805. **Product Name:** Duplication Slave Heads. **Contact:** Tom Rappolt. **Date Product Introduced:** 3/93. **Product Description & Applications:** Improved high-speed cassette duplication slave heads. Glass bonded ferrite heads designed for both Gauss and Electrosond equipment.

**ATHAN CORPORATION**

50 S. Linden Ave., #10; South San Francisco, CA 94080; (415) 589-5206. **Product Name:** Tension Guide Swing-Arm Assembly. **Contact:** Diane Athanasiou. **Date Product Introduced:** 1/93. **Product Description & Applications:** The Tension Guide Swing-Arm Assembly has been manufactured for the Otari MTR-90 series audio machines, the Otari digital machines and the Mitsubishi digital machines. This new product is designed to withstand bending to eliminate tape-path misalignment. Plus, the new Swing-Arm limits unnecessary head wear caused from misaligned tape-path. Its unique design and high-grade materials are the factors which prevent the arms from bending by supporting the pressure of torque on the shafts. **Basic Specifications & Suggested List Price:** Athan's part number and Swing-Arm Assembly varies per machine type. P/N ATH-ARM-90.2: MTR-90I, MTR9II Lots A-P; P/N ATH-ARM-90.3: MTR-90II Lots Q&R, MTR90III, MTR-100A, Otari digital machines

(DTR-900) & all Mitsubishi digital machines. The cost per Arm Assembly is \$225 (US dollars). Plus, a two-year guarantee is provided.

**AVID TECHNOLOGY INC.**

**Metropolitan Technology Park; Tewksburg, MA 01876; (508) 640-6789. Product Name: Avid AudioVision™. Contact: Ron Franklin, audio sales support mgr. Date Product Introduced: 12/92. Product Description & Applications:** Avid AudioVision is the first mid-priced digital audio workstation to offer integrated sync-locked digital full motion picture. The system is directly compatible with Avid Media Composer and features a graphical time line audio editing interface which makes learning the system easy and intuitive. Powerful database management and special modes such as ADR/loop record make it one of the most comprehensive editing workstations available. The system features EDL auto-conform and machine control. **Basic Specifications & Suggested List Price:** 24 virtual tracks, JPEG digital video, 44.10 and 48K sample rate noncompressed digital audio AES-EBU (SPDIF) inputs and outputs, 32 levels of undo and redo, NTSC and PAL, open media framework, send machine control, options for optical disk, removable magnetic drives, networking and others. Pricing starts at under \$35,000 for complete systems.

**BLUE GROUP**

**1001 Ridge Ave.; Clearwater, FL 34615; (813) 442-1665. Product Name: DigiStation. Contact: Ben L. Umlberger, pres. Date Product Introduced: 6/93. Product Description & Applications:** Hard drive automation, high quality audio and special attention to special timing concerns of executing a satellite format to perfection. DigiStation brings a host of timing features that offer a level of extra performance to the sound of your radio station. These include break length correction, and auto liner play, which fixes the dead air sometimes heard after breaks. DigiStation is easy to operate and includes error checking to prevent human errors. **Basic Specifications & Suggested List Price:** High quality audio (15kHz) (Dolby AC-2 compression), 170 min. recording standard. \$8,500 includes UPS, printer, factory diagnostic modem.

**BY THE NUMBERS**

**PO Box 8359; Incline Village, NV 89452-8359; (702) 831-4459. Product Name: Colossus. Contact: Brad S. Miller. Date Product Introduced: 6/93. Product Description & Applications:** Second generation discrete 4-channel PCM digital audio processor, portable for location recording, 12V DC/120V AC/240V AC 60 cycle. Advance bit rate A-D converters assure 16-bit linearity; 96dB of channel separation, with 102dB of dynamic range with pre-emphasis. Useful tool for "soundfield" recording new multichannel film formats such as SR-D, DTS, or SDDS. A-D conversions of multichannel mixes, live 4 or 2 channel programs, colorless I/O quality. **Basic Specifications & Suggested List Price:** NTSC compatible to all professional and some semi-pro and consumer media as well, tape or optical disc. Frequency response is flat from 2Hz-20kHz; 96dB of channel separation; 96dB of signal-to-noise and 102dB of dynamic range with pre-emphasis. +4/-10 I/O, DC offset controls, 29 lbs, black, \$22,500.

**CLARK & ASSOCIATES**

**318 E. Calhoun; Macomb, IL 61455; (309) 837-2244. Product Name: HDS-1000. Contact: Bill Clark, pres. Date Product Introduced: 7/93. Product Description & Applications:** Hard-disk based digital audio storage system, featuring up to 6 simultaneous channels for rec/play, 3RUx19" standard rack construction, uncompressed audio, and complete expandability. Broadcast on-air and production studios, recording editing studio for commercial sound application, etc. **Basic Specifications & Suggested List Price:** 2-6 I/O channels, 16-bit digitizing resolution, less than .1% harmonic distortion, S/N ratio better than 80dB, usable dynamic range. Basic system price is approximately \$13,000, depending on overall configuration.



CREATION TECHNOLOGIES INC.  
RADAR

**CREATION TECHNOLOGIES INC.**

**400 Brooksbank Ave.; North Vancouver, BC Canada V7J 1G9; (800) 665-4175. Product Name: RADAR. Contact: Tom Lang. Date Product Introduced: AES 1993. Product Description & Applications:** RADAR, from Creation Technologies, is a tapeless multitrack digital recorder, offering 8- to 196-discrete tracks. With the RC-1 remote control, it can be used as simply as any digital multitrack tape recorder, like Otari, Sony or Studer. With the RE-8 remote editor, it can be used in random-access mode, with cut and paste edit-

ing and undo/redo. Parts and labour are guaranteed for five years, a new standard of reliability in professional audio recorders. **Basic Specifications & Suggested List Price:** Recording time: 20 minutes. Format: hard disk. S/N: >92dB. Sampling frequencies: 32, 44.056, 44.1, 48kHz, ±15% with Varispeed. Linear time code: 24, 29, 97, 30) DF and 30 NonDF, 25 NonDF EBU. Audio I/D: balanced or unbalanced, at +4 or -10, selectable. Digital I/D: AES/EBU, S/PDIF, SCSI, RAJARlink. 24-tracks, less than \$20,000.

**DENON AMERICA INC.**

**222 New Rd.; Parsippany, NJ 07054; (201) 575-7810. Product Name: DN-77DR. Contact: Michael Stelts, product mgr. Date Product Introduced: 8/93. Product Description & Applications:** Denon's new bidirectional twin output cassette deck offers all the features pros expect from a dual-well cassette deck, plus some that put DN-77DR in a class of its own. Twin outputs offer enhanced flexibility allowing each cassette deck to work independently. Each deck contains a pitch control for ±12% adjustment. Of course, Denon uses their Amorphous heads with up to 5 times the life of conventional Permalloy. **Basic Specifications & Suggested List Price:** Suggested list \$850.



DOREMI LABS  
DAWN IIx

**DOREMI LABS**

**4927 Glen Arden Ave.; Covina, CA 91724; (818) 966-2454; FAX: (818) 966-6554. Product Name: DAWN IIx. Contact: Camille Rizko. Date Product Introduced: 10/93. Product Description & Applications:** The DAWN IIx, is a low-cost multitrack digital audio recorder/editor. Its recording media is either a hard disk or a removable optical cartridge. It works in either master or slave modes. A basic recorder has 8 tracks with 2 inputs and a mixed 2 outputs. It can be expanded by chunks of 8 tracks up to 48 tracks. Volumes, fades and mixing are achieved entirely in the digital domain via on-board DSP. Inputs and output file formats are compatible with DAWN II existing formats as well as AIFF and OMF formats. It is use in audio-for-video applications, as well as for radio productions. **Basic Specifications & Suggested List Price:** Dawn IIx: resolution 18-bit; dynamic range: >104dB; sampling rate: 323, 44.1 and 48kHz; variable playback speed; locks to all SMPTE formats as well as to video house sync; input channels: 2 expandable to 4; output channels 2 (8 tracks mixed to a stereo bus via a DSP 56001 chip); AES/EBU 24 bits digital inputs and outputs. List price: \$12,500 including software.

**DOREMI LABS**

**4927 Glen Arden Ave.; Covina, CA 91724; (818) 966-2454; FAX: (818) 966-6554. Product Name: DAWN Software Version 4.0. Contact: Camille Rizko. Date Product Introduced: 10/93. Product Description & Applications:** Dawn software version 4.0 is a major rewrite of the successful DAWN software. Its main new features are: 1) new, redesigned interface featuring a user-definable vertical or horizontal mix view; 2) sample-accurate editing; 3) intuitive individual or global editing; 4) a new sequencer with MID track capabilities; 5) unlimited number of cues; 6) virtual tracks capability; 7) industry-standard track sheet; 8) DSP capabilities including Time Scaling; pitch shifting and digital sample rate conversion; 9) can load and auto-conform CMX compatible edit decision list. **Basic Specifications & Suggested List Price:** Software 4.0 reads earlier DAWN files formats as well as OMF formats. Sound file format is industry-standard AIFF. EDL format is either DAWN, OMF or CMX or MIDI. List price: Software 4.0: \$995.

**DORROUGH ELECTRONICS**

**20434 Corisco St.; Chatsworth, CA 91311; (818) 998-2824. Product Name: AES/EBU Audio Meter. Contact: Kay Dorrough. Date Product Introduced: 4/93. Product Description & Applications:** AES/EBU dual parameter audio meter. The new digital reading meter features selectable peak-hold throughout the entire range of either 40 or 60dB. Over indication at top 0 LED. Design follows the same presentation as the Dorrough loudness analog reading meters. **Basic Specifications & Suggested List Price:** Specifications and suggested list: 2-channels per meter, specify either 40 or 60dB range, available in vertical or horizontal configurations, requires 12-24V DC, 0.5A. \$850.

**FAIRLIGHT E.S.P.**

**Unit 5 Skyline PL.; Frenchs Forest N.S.W., Australia; (213) 460-4884 (in U.S.A.). Product Name: MFX Tower. Contact: John Lancelotti. Listing continued on next page.**

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—LISTING CONTINUED FROM PREVIOUS PAGE

en, U.S. sales. **Date Product Introduced:** 5/93. **Product Description & Applications:** MFX Tower is designed as a mid-level introduction to the powerful Fairlight MFX-2 editing system. Fairlights unique Turbo-SCSI interface allows eight channels of continuous playback from the Tower's internal maxtor optical disk drive. The optical drive allows true plug and play with Fairlight's larger MFX-2 system. **Basic Specifications & Suggested List Price:** 12 output/3.3 hours of hard disk storage internal MO drive providing 1.5 hours/side dedicated controller (MFX panel). Machine control standard/17" monitor/digital in/out. Price: \$50,000.

### FOSTEX CORPORATION OF AMERICA

15431 Blackburn Ave., Norwalk, CA 90650; (310) 921-1112. **Product Name:** D-10 Stereo Master Recorder. **Contact:** Steve Cunningham. **VP. Date Product Introduced:** 4/93. **Product Description & Applications:** Fostex Model D-10, a stereo master digital recorder, can be programmed to start playing the instant audio modulation begins. RAM scrubbing and jog/shuttle may be used for pin-point cueing and up to 100 location points may be stored and recalled. Two D-10s may be connected via their GPI ports for assembly editing. **Basic Specifications & Suggested List Price:** 48/44.1 kHz sampling frequencies, 16-bit linear quantization, 8M bit, 5 sec. (48 kHz max) RAM, digital I/O AES/EBU standard, MSRP \$2,850.

### FOSTEX CORPORATION OF AMERICA

15431 Blackburn Ave., Norwalk, CA 90650; (310) 921-1112. **Product Name:** RD-8. **Contact:** Steve Cunningham. **VP. Date Product Introduced:** 10/93. **Product Description & Applications:** Fostex Model RD-8, an 8-track ADAT compatible recorder records SMPTE time code on the subcode area of the tape. Other features include pull-up and pull-down, 44.1 and 48kHz sampling, an on-board chase/lock synchronizer, 11 position, 7 segment LED and LCO displays. The RD-8 is completely compatible with the Alesis ADAT format. **Basic Specifications & Suggested List Price:** 48/44.1 kHz sampling frequencies, complete ADAT compatibility, including fiber-optic I/O ports. RS-422 port for STL emulation. MSRP \$4,795.

### JL COOPER ELECTRONICS

12500 Beatrice St., Los Angeles, CA 90066; (310) 306-4131. **Product Name:** dataMaster. **Contact:** Chuck Thompson, VP sales & mktg. **Date Product Introduced:** 1993. **Product Description & Applications:** dataMaster is a professional synchronizer for the popular Alesis ADAT. It allows ADAT to sync to all types of computer-based systems and video editors via SMPTE time code. With the inclusion of MIDI machine control, dataMaster provides unprecedented integration of ADATs digital audio into virtually any professional audio/video application. **Basic Specifications & Suggested List Price:** \$749.95. 1) Sync ADAT via SMPTE. 2) Sync ADAT to analog recorders to create a hybrid system. 3) Does not waste an audio track. 4) SMPTE reader/generator. 5) SMPTE Flywheeling. 6) Translates ADATs control functions to/from MIDI Machine Control. 7) Sony 9-pin option. 8) User-selectable offset times. 9) Easy to read backlit LCD w/contrast control. 9) MIOI merging.

### JVC PROFESSIONAL PRODUCTS

41 Slater Dr., Elmwood Park, NJ 07407; (201) 794-3900. **Product Name:** XO-PIPRO. **Contact:** Matthew Weiner, product mgr. **Date Product Introduced:** 5/93. **Product Description & Applications:** The XO-PIPRO is the world's smallest and most versatile portable DAT. The "baby DAT" is SCMS free and includes full I/O editing, A, time and a full range of modular components. The system includes a detachable ADC, a digital output M/S mic that can be attached to the main body or utilized with the pistol grip and battery module (included). Ultrathin aluminum cast molding and remote control make this an ideal field recorder. **Basic Specifications & Suggested List Price:** List price \$1,750. Mic frequency response 40-16k. DAT frequency response 10-22k. ADC (module and mic) 1-bit 64X O/S. DAC 18-bit 8X O/S.

### KORG USA INC.

89 Frost St., Westbury, NY 11590; (516) 333-9100. **Product Name:** SoundLink with V3.0 Software. **Contact:** Laura Oelia, mktg. assistant. **Date Product Introduced:** 4/93. **Product Description & Applications:** SoundLink combines an 8-track hard disk recorder/editor with an automated digital mixer complete with equalization and effects processing. Additional functions include a 16-track MIDI recorder/sequencer and full synchronization to time code and digital

—LISTING CONTINUED TOP OF NEXT COLUMN

al audio signals. Version 3.0 features include reduced segment size, stereo EQ, time compression and sample rate conversion, programmable fades, threshold recording and support for the Exabyte 8500 tape drive. SoundLink is a dedicated hardware device, shipped complete, and optimized for use in audio and video post applications. **Basic Specifications & Suggested List Price:** 8-track recorder, 8-channel mixer, 16-track sequencer, 8 analog inputs, 10 analog outputs, 2-channel assignable digital input, 2-channel assignable digital output, 110 minutes of recording time @ 48kHz sample rate, expandable to over 11 hours, 8mm streaming tape back-up system, LTC and VITC timecode inputs, external machine control. Complete systems start at \$37,000.

### MARANTZ PROFESSIONAL PRODUCTS

1000 Corporate Blvd., Ste. D; Aurora, IL 60504; (708) 820-4800. **Product Name:** CDR610. **Contact:** Steve Kish, business development mgr. **Date Product Introduced:** 7/93. **Product Description & Applications:** The CDR610 is a stand-alone CD recorder capable of producing Orange and Red Book standard CDs. The COR610 can be used for producing reference CDs for compiling sound effects, for making CDs for on-air radio playback and for making CD for repetitive audio applications such as amusement parks. Additionally many duplication houses are accepting CDs produced on the CDR610 as a source for the glass master. **Basic Specifications & Suggested List Price:** Supports full range of analog and digital I/O including AES/EBU, IEC-958I and TOS link optical. Comes with full-featured wired remote with 9-pin connector for automation by other machines. Cascade circuitry allows synchronous start of up to 4 CDRs. Suggested list price \$4,000.

### MARANTZ PROFESSIONAL PRODUCTS

1000 Corporate Blvd., Ste. D; Aurora, IL 60504; (708) 820-4800. **Product Name:** PMD510. **Contact:** Steve Kish, business development mgr. **Date Product Introduced:** 9/93. **Product Description & Applications:** The PMD510 is a dual cassette deck with completely independent wells. Separate inputs and outputs allow playback on one well and record on the other, playback of two different programs or recording of two different programs. Optically sensing change from side to side, well to well, and deck to deck enables unlimited continuous recording. **Basic Specifications & Suggested List Price:** Separate inputs and outputs for each well, pitch control on each well, switchable headphone monitoring, real-time counters, Dolby B, C and HX Pro; optically sensing auto-reverse. RC-5 jacks for remote control. Suggested list price: \$799.

### MEDIA TECHNOLOGIES/LYREC

80 Orville Dr., Bohemia, NY 11716; (516) 563-1121. **Product Name:** C-300 Analog High Speed Duplication Slave. **Contact:** Rainer Zapfy, pres. **Date Product Introduced:** 6/93. **Product Description & Applications:** The new C-3000 analog high-speed duplicating slave is factory ready for field conversion to DCC format. Conversion can be made in less than three hours by changing head-stack and record electronics. The C-3000 is the ideal solution for those who want to enjoy the state of the art audio quality for analog and at the same time be prepared for the future. Any two recording speeds can be selected from 32, 40, 64, 80, 96, 100 and 128:1.

### MICRO TECHNOLOGY UNLIMITED

PO Box 21061; 6900 Six Forks Rd; Raleigh, NC 27619-1061; (919) 870-0344; FAX: (919) 870-7163. **Product Name:** MicroEditor 2.3 Software for MicroSound DAWs. **Contact:** David B. Cox, pres. **Date Product Introduced:** 10/93. **Product Description & Applications:** MicroEditor 2.3 Software for MicroSound DAWs upgrades support for 4 in/out tracks with real-time automated digital mixing of 3-4 stereo, segments (depending on hard drive), with 50 stereo track off-line mixing. Video and SMPTE sync-lock provides master audio-for-video or sync to ATRs. Multimedia 8-/16-bit Wavefile mastering greatly improves low-cost cards. Loop automatic dialog replacement is efficient with overdub recording in sync while playing a mix project, or automated effects send for additional of any effects. **Basic Specifications & Suggested List Price:** Windows 3.03.1 and MSDOS 4/5/6.0 based application. Requires full MTU MicroSound digital audio workstation for maximum DAW performance, or MicroSound Peripheral installed in user supplied 386/486 based AT computer with high-speed SCSI or IOE drives. Upgrade price \$199 or free to annual contract MicroSound users.

### MICRO TECHNOLOGY UNLIMITED

PO Box 21061; 6900 Six Forks Rd; Raleigh, NC 27619-1061; (919) 870-0344; FAX: (919) 870-7163. **Product Name:** MicroSound. **Contact:** David B. Cox, pres. **Date Product Introduced:** 10/93. **Product Description & Applications:** MicroSound digital audio workstations now provide 4-in/out track operation, with Oisk-Layering™ up to 50 segments at any location within a mix. Each track can have multiple audio segments anywhere, not limiting to one event at a time on a track. Simultaneous playing the mix while recording in sync greatly enhances production efficiency. The MicroSound AT-DSP56 board speed has been increased 60%, decreasing full-length 8-track mixes to under 1.5 minutes per minute of length. **Basic Specifications & Suggested List Price:** Upgrade to 4 in/out tracks for existing MicroSound digital audio workstations: \$1,850. Full MicroSound rack mount, 486 core workstation with 4 track and digital I/O, starting at \$11,145. Oisk-Layering™ up to 50 stereo tracks at any location with a mix is standard.



NAGRA/PHI TECH  
Nagra-D

### NAGRA/PHI TECH

4605 N. Stiles; Oklahoma City, OK 73105; (405) 521-9000. **Product Name:** Nagra-D. **Contact:** Bob Gelernter, dir. of sales; Danny Grimes, prof. specialist. **Date Product Introduced:** 2/93. **Product Description & Applications:** Nagra-D, a 4 channel 24-bit digital portable sync field recorder with full SMPTE/EBU time code. The rotary VHS head design provides approximately 1 hour 4-channel/2 hour stereo on a 5" reel of standard 1/4" digital tape. **Basic Specifications & Suggested List Price:** Number of channels: 2 or 4. Auxiliary tracks: SMPTE/EBU timecode, cue, control. Record time: 5" reel 2 channel=1 hour 56 min.; 4 channel=58 min. 7" reel 2 channel=3 hour 52 min; 4 channel=1 hour 56 min. Sampling frequencies: 32kHz, 44.1kHz, 48kHz. Digital In/Out: 24-bits (AES). Analog In/Out: 18-bits.

### PROFESSIONAL AUDIO WORKS (P.A.W.)

17939 Chatsworth St. #505; Granada Hills, CA 91344; (818) 363-4072; FAX: (818) 360-8145. **Product Name:** TC-50 Time Code Kit. **Contact:** Linda or Barry Ross, owners. **Date Product Introduced:** 1992. **Product Description & Applications:** The P.A.W. TC-50 Time-code/FM processor retrofit system was originally designed and built in 1987 for Otari Corp., CA, for use on most MX and MTR series of two-track recorders. Soon after it was announced that 50% of all TC-50 sales had been installed on Ampex ATR-100 series, MCI/Sony 110 series and Studer A-80 series alike. Since 1990, the TC-50 has been sold as a P.A.W. product and as always a PTC-50TT (7.5 ips version) test tape is included with each system. **Basic Specifications & Suggested List Price:** List: \$1,795.

### SAKI MAGNETICS

26600 Agoura Rd.; Calabasas, CA 91302; (818) 880-4054. **Product Name:** Magnetic Tape Heads. **Contact:** Robert LaViolette, director/mktg. & sales. **Date Product Introduced:** 7/93. **Product Description & Applications:** Saki's newly developed long-life replacement heads for KABA and Telex cassette duplicators are made of hot-pressed, glass-bonded ferrite and can last up to six times longer than conventional heads. Features include lower cross-talk and distortion, longer life, lower maintenance, and improved sonic performance.

### SIMON-KALOI ENGINEERING LTD.

707 Clear Haven Dr.; or 710 N. Oak Pt. Dr.; Agoura Hills, CA 91301; (818) 707-9980; (818) 707-0465. **Product Name:** Message Man. **Contact:** Rick Simon, Dennis Kaloi. **Date Product Introduced:** 6/93. **Product Description & Applications:** Message Man is a revolutionary digital audio record/playback device. It records multiple messages directly to RAM with no tape or moving parts. Sampling rates to 28kHz. Maximum length 2 min. 24 sec. An integrated 10 watts amp and speaker. Unique RAMcard feature for direct digital mastering and duplication. Perfect for advertising, safety, public address, robotics and much more.



SOLID STATE LOGIC  
OmniMix

### SOLID STATE LOGIC

320 W. 46th St.; New York, NY 10036; (212) 315-1111. **Product Name:** OmniMix. **Contact:** Piers Plaskitt, CEO (N. America). **Date Product Introduced:** 4/93. **Product Description & Applications:**



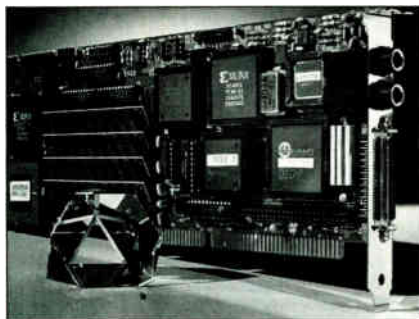
OmniMix is a larger relative of the Scenaria digital audio/video production system. In addition to the random access recording, editing and mixing capabilities of Scenaria, OmniMix additionally provides a configurable output bus structure suitable for a variety of surround sound formats, plus dynamic multiformal panning and signal processing with SSL's MotionTracking™ and Spatial Processing™. **Basic Specifications & Suggested List Price:** 24-track random access audio recorder/player, multitrack editor, 38-channel fully functional mixing system, digital video systems, configurable bus structure, hierarchical submixes, dynamic multichannel panning, integral DSP functions



SONY ELECTRONICS INC.  
PCM-9000 Masterdisc Recorder

**SONY ELECTRONICS INC.**

3 Paragon Dr., Montvale, NJ 07645; (201) 930-1000. **Product Name:** PCM-9000 Masterdisc Recorder. **Date Product Introduced:** 9/93. **Product Description & Applications:** The PCM-9000 Masterdisc recorder is designed for use in CD mastering and 2-track mix-down applications where the highest possible audio quality is desired. The PCM-9000 utilizes new magneto-optical disc-based format allowing quick random access and simple editing. Many options are available to meet customer's requirements. **Basic Specifications & Suggested List Price:** Can record up to 100 minutes at 16-bit sampling; 80 minutes at 20-bits; and 60 minutes at 24-bits. List price in basic configuration is approximately \$45,000.



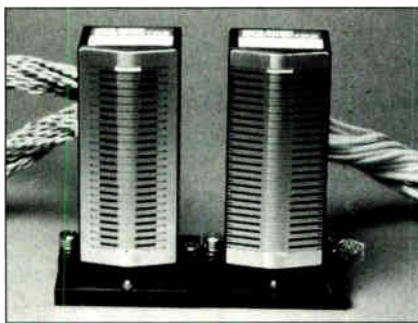
SPECTRAL SYNTHESIS INC.  
AudioPrisma™

**SPECTRAL SYNTHESIS INC.**

19501 144th Ave. NE, Ste. #1000A; Woodinville, WA 98072; (206) 487-2931. **Product Name:** AudioPrisma™. **Contact:** Harold Drews, sales. **Date Product Introduced:** 9/93. **Product Description & Applications:** The AudioPrisma™ random-access multitrack digital audio system is a combination single board AT peripheral with Prismatic™ software running under MS Windows. Record and/or play up to 12 tracks of simultaneous audio with real-time mixing, EQ and professional sync features. Software workalike to StudioTracks™ 2.0 so experience on one is useful on the other. True pro product either as an editor or as a stand alone production system. Use for radio production, industrial, project music, dialog and more. **Basic Specifications & Suggested List Price:** Spectral I/O for 2, 4, or 8 channel A/D D/A, 92dB S/N at input. Each of 12 mix channels includes multiband EQ. Locks time base to video, black burst, or LTC so that system can chase as well as trigger to time code. The AudioPrisma™ including Prismatic™ software retails for \$3,995.

**SPECTRAL SYNTHESIS INC.**

19501 144th Ave. NE, Ste. #1000A; Woodinville, WA 98072; (206) 487-2931. **Product Name:** AutoTracks™. **Contact:** Harold Drews, sales. **Date Product Introduced:** 7/93. **Product Description & Applications:** The AutoTracks™ CMX compatible auto-conform utility records original sound for picture into a Spectral Synthesis workstation, while automatically placing the sound according to the picture edit list. Individual segments, reels or complete projects can be formed. **Basic Specifications & Suggested List Price:** The AutoTracks™ auto-conform software is \$395 without machine control, and requires an AudioEngine™ or AudioPrisma™ hardware subsystem for the non-linear recording. Machine control is a software option requiring a special break-out connector for 9 pin communication. Check for pricing.



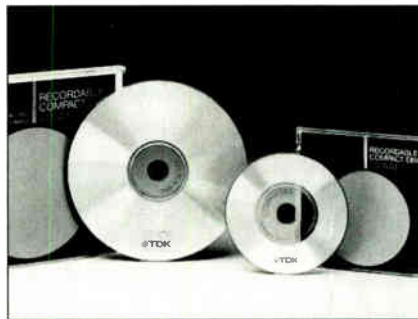
SPRAGUE MAGNETICS  
SMI Long-wearing  
Tapeheads

**SPRAGUE MAGNETICS**

15720 Stagg St., Van Nuys, CA 91406; (818) 994-6602 (CA); (800) 553-8712. **Product Name:** SMI Long-wearing Tapeheads. **Contact:** John M. Austin, audio products mgr. **Date Product Introduced:** 6/93. **Product Description & Applications:** Sprague Magnetics offers a new long-wearing 24-track tapehead for use on the Otari MTR90 Series. **Basic Specifications & Suggested List Price:** List price for the head is \$2,500.

**STUDER EDITECH**

1370 Willow Rd., Menlo Park, CA 94025; (415) 326-7030. **Product Name:** Dyaxis II. **Contact:** Gerry Kearby, VP sales & mktg. **Date Product Introduced:** 10/92. **Product Description & Applications:** Dyaxis II is a modular multitrack digital audio workstation. Available in configurations from 4 to 24 channels, Dyaxis II represents the state-of-the-art in recording, editing and digital signal processing power. New for 1993, plug and play, which provides hard disk performance on an inexpensive 3 1/2" optical disk and the D11 console with transport and editing controls along with moving faders. **Basic Specifications & Suggested List Price:** Each module contains 4-channels of analog and digital I/O. All popular digital formats supported. Reads and writes SMPTE, VITC and microfilm Tach (read only). Real-time DSP includes, gain, fades 5-band parametric EQ.



TDK ELECTRONICS  
CORPORATION  
CD-R

**TDK ELECTRONICS CORPORATION**

12 Harbor Park Dr., Port Washington, NY 11050; (516) 625-0100. **Product Name:** CD-R. **Contact:** Bruce Youmans. **Date Product Introduced:** 6/93. **Product Description & Applications:** TDK offers several write-once recordable compact discs designed to give professional audio engineers high performance digital recording of both music and computer data. The TDK CD-W08EL and CD-W12EL are designed for 100% compatibility with all CD writer/recorders as well as all CD players and CD-ROM drives. **Basic Specifications & Suggested List Price:** The TDK CD-R line includes CD-W12, a 63-min, 580 MB disc (SRP \$70); CD-W12EL, a 74-min, 680 MB disc (SRP \$80); CD-W08, an 18-min, 160 MB disc (SRP \$50); and rounding out the CD-R line is the 21-min, 190 MB CD-W08EL (SRP \$55).

**360 SYSTEMS**

18740 Oxnard St., Tarzana, CA 91356; (818) 342-3127; FAX: (818) 342-4372. **Product Name:** DigiCart/II. **Contact:** Doug Leighton, mktg. **Date Product Introduced:** 4/93. **Product Description & Applications:** DigiCart/II digital audio recorder and mini-workstation records up to 8 hours 16-bit stereo audio on hard disk and up to 68 minutes on removable disks. Features include nondestructive editing, instant access to cuts with immediate starts, programmable playlists, Dolby AC-2 data compression, serial interface and optional time code capture. Three dedicated remote control units complement and expand DigiCart/II's features list with programmable preset "hot-keys" and cut and stack "find" functions. **Basic Specifications & Suggested List Price:** Removable Bernoulli disks: 30, 50 & 68 minutes, internal hard disk drive 2 hours standard, 5 & 8 hours optional; records up to 1,000 cuts in any of 10 directories; large-

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360 SYSTEMS  
DigiCart/II

character front panel readout of all functions, operations and menu items; Dolby AC-2 data compression (5.33 ratio); BCD parallel interface, GPI closures, ES-Bus serial interface. Suggested list price: \$4,995.

**VESTAX MUSICAL ELECTRONICS CORP.**

2860 Cordelia Rd., Ste. 120; Fairfield, CA 94585; (707) 427-1920. Product Name: MR-66S. Contact: Bruce Yerehman, VP. Date Product Introduced: 1/93. Product Description & Applications: 6-track cassette multitrack recorder. Synchronizable with another MR66S or MR44S using MSX-2 synchronizer. 2-speed, dbx noise reduction, built-in patch bay. Basic Specifications & Suggested List Price: Frequency response 20Hz-18kHz; S/N ratio 75dB (with dbx); list price \$1,299.

**VESTAX MUSICAL ELECTRONICS CORP.**

2860 Cordelia Rd., Ste. 120; Fairfield, CA 94585; (707) 427-1920. Product Name: MR44S. Contact: Bruce Yerehman, VP. Date Product Introduced: 1/93. Product Description & Applications: 4-track cassette multitrack recorder. Synchronizable with another MR44S or MR66S using MSX-2 synchronizer. 2 speed, dbx noise reduction. Basic Specifications & Suggested List Price: Frequency response 20Hz-18kHz; S/N ratio 70dB (with dbx); list price \$699.

**SIGNAL PROCESSORS**

**ADA SIGNAL PROCESSORS INC.**

420 Lesser St.; Oakland, CA 94601; (510) 532-1152. Product Name: Micro Lab. Contact: Chris Keller, marketing. Date Product Introduced: 1/93. Product Description & Applications: Miked guitar cabinet Emulator facilitates recording direct from preamp to mixer. Emulates 1x12", 2x12", 4x12" speaker arrays. Open or closed back cabinets. Vintage or std. speakers. Microphone proximity and axis adjustments. Full stereo. Basic Specifications & Suggested List Price: 1 rackspace, 6 lbs. 1/4" & XLR stereo outputs, hard-wired direct bypass outs. List: \$219.95

**Want More Information?**

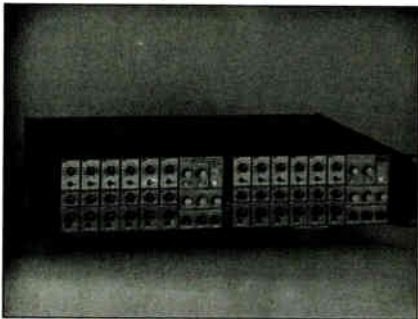
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ALESIS  
AI-1

**ALESIS**

3630 Holdredge Ave.; Los Angeles, CA 90016; (310) 558-4530. Product Name: AI-1. Contact: John Maher, comm. mgr. Date Product Introduced: 1/93. Product Description & Applications: ADAT to AES/EBU and SPDIF converter. Allows pairs of tracks to be transferred between DAT, CD or hard disk editor and ADAT's. The AI-1 also provides real-time sample rate conversion 44.1 or 48kHz. Format conversion between AES/EBU and SPDIF optical or co-ax can be used independent of ADAT. Basic Specifications & Suggested List Price: List \$895.



APOGEE SOUND INC.  
CRQ-12 Parametric Equalizer

**APOGEE SOUND INC.**

1150 Industrial Ave.; Petaluma, CA 94952; (707) 778-8887. Product Name: CRQ-12 Parametric Equalizer. Contact: Ken DeLoria, pres. Date Product Introduced: 2/93. Product Description & Applications: The CRQ-12 parametric EQ is ideal for sonically shaping large complex sound systems. The CRQ-12 features multi-mode operation, six filters per channel, two outputs per channel with separate level controls, bypass level controls and fan cooling for frequency stability. Basic Specifications & Suggested List Price: Distortion: less than 0.003%. Maximum output: +25dBu, dynamic range: 115dB, bypass level controls: variable for each of four outputs. Suggested list price: \$2,680.

**AUDIO LOGIC**

8760 South Sandy Parkway; Sandy, UT 84070; (801) 566-8800. Product Name: D20 Programmable Alignment Delay. Contact: Kent Swenson. Date Product Introduced: 7/93. Product Description & Applications: Configurable input/output combinations: 2 in/2 out, 2 in/4 out, 2 in/6 out digital delays. Each output may be assigned to either input. Digitally controlled gain 32 presets, computer interface optional. Basic Specifications & Suggested List Price: List price TBA. Dynamic range > 100 dB. XLR input and outputs maximum delay stereo 1.3 sec. standard, 2.6 sec. mono may be expanded.

**AUDIO TEKNOLOGY INC. (ATI)**

9017-C Mendenhall Ct.; Columbia, MD 21045; (410) 381-7879. Product Name: Pro-Rack Products. Contact: Dan Abelson, nat'l sales mgr. Date Product Introduced: AES 1993. Product Description & Applications: ATI will introduce a new line of rack mountable audio processing products taken from the industry-leading paragon mixing console technology. Using ATI patented Electroformers and compressor circuitry these products will allow ATI quality outboard gear to be used by sound companies and installed systems.

**BAG END LOUDSPEAKER SYSTEMS**

PO Box 488; Barrington, IL 60011; (708) 382-4550; FAX: (708) 382-4551. Product Name: ELF-M. Contact: John Vitale. Date Product Introduced: 10/93. Product Description & Applications: The ELF-M is the first low cost ELF electronics featuring stereo hi pass outputs with limiters and a mono sum double integrated ELF output for use with ELF type subwoofer cabinets. ELF cutoff frequency and high pass frequency are preset at factory and field adjustable by changing plug in resistors inside unit. Flush mounted screw driver adjust controls include ELF gain, ELF concealment threshold, ELF

polarity, high pass gain, and hi pass limiter threshold. Basic Specifications & Suggested List Price: ELF-M is a one-rackspace mounted unit with a separate power supply. Features include balanced inputs, unbalanced outputs, ELF dual integrator response down to 16Hz with uniform phase, LED threshold indicators for ELF concealment and high pass limiting. Suggested list price \$895.

**BEHRINGER**

PO Box 9068; Hicksville, NY 11802-9068; (516) 932-3810. Product Name: Auto Com MDX 1000. Contact: Bob Caputo, product mgr. Date Product Introduced: 7/93. Product Description & Applications: The Autocom features intelligent program detection with the auto switch deriving attack and release times automatically from the respective program material. The result is musically intuitive dynamics control with no "pumping" or "breathing" regardless of the amount of compression. The Autocom also features manual attack and release controls, hard and soft knee switching, stereo and dual-mono operation, and specifications reflecting performance greatly beyond its affordable price. Basic Specifications & Suggested List Price: Noise floor-98dBu, frequency response 10Hz to 100kHz, THD<.03%, servo-balanced inputs/outputs. Suggested retail price \$329.99.

**BEHRINGER**

PO Box 9068; Hicksville, NY 11802-9068; (516) 932-3810. Product Name: Dualflex II. Contact: Bob Caputo, product mgr. Date Product Introduced: 7/93. Product Description & Applications: The Dualflex II is a multiband sound enhancer featuring Behringer's dual "Natural Sonic" processor with VSP (variable sound processing). This allows the user to change parameter settings, sweeping between the classic and pop settings to create different variations of enhancement/excitement type processing. A tunable high-pass filter allows tailoring of the high frequency enhancement. With level-independent circuitry the Dualflex II uses ALC (automatic level control) to solve varying input level problems. The Dualflex II also features a frequency switchable bass processor for enhancement of the lower frequencies. Basic Specifications & Suggested List Price: High-pass filter corner freq. 1kHz to 8kHz, bass processor-50Hz/100Hz, noise floor- 96dBu, THD<0.005% at 0dBu, frequency response 20Hz to 20kHz (flat), servo-balanced inputs. Suggested retail price \$279.99.

**BEHRINGER**

PO Box 9068; Hicksville, NY 11802-9068; (516) 932-3810. Product Name: Ultraflex EX3000. Contact: Bob Caputo, product mgr. Date Product Introduced: 7/93. Product Description & Applications: The Ultraflex is a multiband sound enhancer featuring Behringer's "Natural Sonic" processor. A tunable high-pass filter allows tailoring of the high frequency enhancement. The Ultraflex also features Behringer noise reduction to solve noise problems found inherently in Enhancer/Exciter products. The Ultraflex offers a frequency switchable bass processor for enhancement of the lower frequencies. The Ultraflex's most unique feature is a surround sound simulator, spatially enhancing the width of the stereo field. Basic Specifications & Suggested List Price: High-pass filter corner freq. - 1kHz to 8 kHz, bass processor- 50Hz/100Hz, noise floor -94dBu and outputs, frequency response:20Hz-20kHz (flat). THD < 0.008%, servo-balanced inputs. XLR and TRS connectors, solo switch for effect only. Suggested retail price: \$349.

**BEYERDYNAMIC**

56 Central Ave.; Farmingdale, NY 11735; (516) 293-3200. Product Name: MV100 Stereo Mic Preamp. Contact: Mike Solomon, mktg. mgr. Date Product Introduced: 1/93. Product Description & Applications: The new high performance MV100 stereo pre-amplifier from beyer may be light in weight and small in size but that's just what you need for stereo miking on location and its host of innovative features and top quality circuitry will ensure that your recording does not suffer from the limitations of the amplification circuitry built in to portable DAT recorders and the like. Measuring just 145mmx85mmx40mm, the MV100 packs in two balanced XLR inputs, 3.5" mini-jack and phone line outputs, on/off switch with indicator, LED indicators for overload and battery status and a three position input attenuation switch and two position low-frequency roll-off switch. Power is provided by two PP3 batteries or from an external supply and switchable phantom power of 8-12 volts or 48 volts is supplied for condenser microphones. List price is \$1,200.

**BSS, A DIV. OF AKG ACOUSTICS INC.**

1525 Alvarado St.; San Leandro, CA 94577; (510) 351-3500. Product Name: Varicure System. Contact: David Angress. Date Product Introduced: 4/93. Product Description & Applications: Varicure is an advanced system of parametric EQ processing and control elements which can be tailored to suit any audio production environment. From a single stereo 6-band unit up to 32 channels of programmable equalization, each processing element can be individually controlled via MIDI, PA-422, SMPTE or radio remote control. Basic Specifications & Suggested List Price: The FCS-926 combines a digitally controlled analog parametric filter set with intuitive assignable controls, fully interactive graphic display and intelligent spectrum analyzer. The FCS-900 is a hand-held remote controller capable of addressing a system of up to 16 individual FCS-920 and/or FCS-920 units via a standard radio mic link or XLR cable.

**CIRCUIT RESEARCH LABS INC.**

2522 W. Geneva Dr.; Tempe, AZ 85282; (602) 438-0888. Product Name: Amigo AM. Contact: Valerie Hummer, mktg. mgr. Date Product Introduced: 4/93. Product Description & Applications: CRL has taken its best technology and combined it into one high performance unit. The Amigo AM is a complete matrix stereo audio pro-

cing system for the small to medium market size station. It's easy to install and operate while still providing top quality sound and it works in mono too. The result is outstanding quality with loud and dynamic bass, midrange and treble for your stereo and mono listeners. **Basic Specifications & Suggested List Price:** List \$3,195. Included are a dual band AGC, patented 3 band matrix, limiter, single channel limiting NRSC output filtering plus a full set of controls to customize your station's sound.

**CIRCUIT RESEARCH LABS INC.**

2522 W. Geneva Dr.; Tempe, AZ 85282; (602) 438-0888. **Product Name:** SC100 RBDS Generator. **Contact:** Valerie Hummer, mktg. mgr. **Date Product Introduced:** 4/93. **Product Description & Applications:** The SC100 will generate RBDS signals or RDS signals and (optional) SCA signals by 100% (DSP) digital signal processing. Features include an easy to use menu program, front panel keyboard, large LCD screen for easily entered static data or a remote terminal interface RS232/modem for easy dynamic data input from any PC. **Basic Specifications & Suggested List Price:** Supports full RBDS specifications, 100% DSP subcarrier technology, stand alone or remote PC operation, expandable & upgradable.

**DBX, A DIVISION OF AKG ACOUSTICS INC.**

1525 Alvarado St.; San Leandro, CA 94577; (510) 351-3500. **Product Name:** 166 A. **Contact:** JX Loeb. **Date Product Introduced:** 1/94. **Product Description & Applications:** Update of the industry standard dbx 166 2-channel compressor/limiter, noise gate. The combination of noisegate, OverEasy compressor and peak stop limiting provides complete control of signal dynamics. Applications include controlling variation in mic or instrument levels, raising a signal out of the mix, blending vocals, preventing tape saturation, protecting speaker components and transferring between digital and analog media.

**DEMETER AMPLIFICATION**

2912 Colorado Ave. #204; Santa Monica, CA 90404; (818) 986-7103. **Product Name:** VTCL-2 Stereo Tube Compressor/Limiter. **Contact:** Michael Meltzer, mktg./sales dir. **Date Product Introduced:** 10/93 **Product Description & Applications:** A 2-channel stereo tube compressor/limiter designed by James Demeter utilizing the finest in modern hi-fi concepts and components. The VTCL-2 features an all tube audio path, variable attack and decay, high quality VU meters, 40dB of compression and limiting, electro-optical control, polypropylene capacitors and full regulation of B+ and filament voltages. **Basic Specifications & Suggested List Price:** The VTCL-2 stereo tube compressor/limiter is ideal for all recording, live and broadcast applications. List price is \$1,995.

**DIGITAL MUSIC CORP.**

5312-J Derry Ave.; Agoura Hills, CA 91325; (818) 991-3881. **Product Name:** GCX Ground Control Expander. **Contact:** Tim Walston, product specialist/sales. **Date Product Introduced:** 8/93. **Product Description & Applications:** Companion piece to the Ground Control MIDI foot controller. Allows MIDI control of eight sets of audio loops, each with an in, out, send and return jack. Can be used to switch effects in and out of your signal path or switch between preamps. Loops can also be used as switches for amp channel switching, FX bypass, etc. Features two buffered feed thrus, normalised as a splitter. Transparent, passive switching for guitar racks. **Basic Specifications & Suggested List Price:** Uses high grade, gold relays sealed in nitrogen. Two instrument feed thrus (front to back) with unity gain buffer amplifiers. Phantom powers the ground control foot controller via a regular MIDI cable. Internal power supply. One rack space. List \$350.

**DIGITECH**

8760 S. Sandy Parkway; Sandy, UT 84070; (801) 566-8800. **Product Name:** DHP-55. **Date Product Introduced:** 1/93. **Product Description & Applications:** True stereo digital harmony processor. Creates up to 5 part harmonics with a single note input. It will cleanly shift multiple note inputs. Effects include: intelligent pitch shifting, chord/polyphonic shifting, delay, chorus, flange, compression, EQ, noise gate, dynamic filter effects. **Basic Specifications & Suggested List Price:** 16 bit conversion, 64 times oversampled, 44.667 kHz sample rate, 20Hz to 20kHz bandwidth, 90dB, A weighted dynamic range, THD <0.03%, dual DSP 10 MIPS processors parallelled provide the engine. ±2 octave range. \$1,149.95.



DIGITECH  
TSR-24

—SEE LISTING TOP OF NEXT COLUMN

**DIGITECH**

8760 S. Sandy Parkway; Sandy, UT 84070; (801) 566-8800. **Product Name:** TSR-24. **Date Product Introduced:** 1/93. **Product Description & Applications:** True stereo reverb and multi-effect unit. Two inputs into four outputs, totally assignable. Programmable and custom: routable algorithms. All reverbs and time based effects, dynamic filtering, pitch shifting, equalization, programable mixing and more. Completely MIDI compatible. Software and hardware updatable. **Basic Specifications & Suggested List Price:** 18 bit conversion, 48kHz sample rate, 20Hz to 20kHz frequency response S/N ratio > 90db, dynamic range > 90db, THD < 0.03% @ 1kHz, 64 algorithms, 256 presets, (32 factory algorithms, 128 factory presets). \$799.95.



D.W. FEARN  
VT-1 Vacuum Tube Microphone Preamplifier

**D.W. FEARN**

PO Box 57; Pocopson, PA 19366; (215) 793-2526. **Product Name:** VT-1 Vacuum Tube Microphone Preamplifier. **Contact:** Doug Fearn. **Date Product Introduced:** 3/93. **Product Description & Applications:** The VT-1 recreates the warm sound of classic vacuum tube microphone preamplifiers of the 1960s, updated with superior modern passive components (e.g. Jensen transformers). Extensive computer-aided circuit analysis, unavailable during the vacuum tube era, elevate this design to a new level of performance. It will enhance the sound of all your microphones with warmth and clarity often lost in solid state preamps. **Basic Specifications & Suggested List Price:** Frequency response: ±0.2db 20Hz to 20kHz. THD - noise: <0.2% 20Hz to 20kHz. SMPTE IMD: < 0.02%. Equivalent input noise: -124dBm. Maximum output: +22 dBm. Includes 48V phantom power input PAD (switchable), true VU meter. Factory direct price: \$2,000.



EDINBURGH AUDIO CORPORATION  
Uniwave

**EDINBURGH AUDIO CORPORATION**

3432 Ivy's Walk, Building E; Atlanta, GA 30340; (404) 414-4708. **Product Name:** Uniwave. **Contact:** Jan Somers, VP, mktg. and distribution. **Date Product Introduced:** 9/93. **Product Description & Applications:** Uniwave is a general purpose sound processor designed for the all-digital studio. Plug-in personality modules let Uniwave be used as a noise gate, 8-voice rack-mount synthesizer; compressor/expander, delay line, equalizer and so on. With expansion options, Uniwave can be used as a digital cart machine for DAB, 2-channel digital recorder and more. **Basic Specifications & Suggested List Price:** Standard features include AES/EBU and S/PDIF digital I/O, supporting 32 KSPS, 44.1 KSPS and 48 KSPS, along with MIDI in/out/thru and remote pedal 1/4" jacks. Options include balanced XLR and unbalanced 1/4" analog I/O, advanced coprocessor card, and optical diskette drive with SCSI expansion port. **Suggested list price:** \$695 for base system, \$49-\$95 for personality modules.

**EVENTIDE INC.**

One Alsan Way; Little Ferry, NJ 07643; (201) 641-1200. **Product Name:** DSP 4000 Reverb/Ultra-Harmonizer. **Contact:** Gil Griffith, sales manager. **Date Product Introduced:** 3/93. **Product Description & Applications:** 24 bit digital I/O multi-effects processor with reverb, 6-octave/8 channel pitch shifting, chorus, flange, compressor, gate, EQ, distortion, 32 voice polyphonic synth w/internal sequencer.

—LISTING CONTINUED ON NEXT PAGE

Connect It, Control It

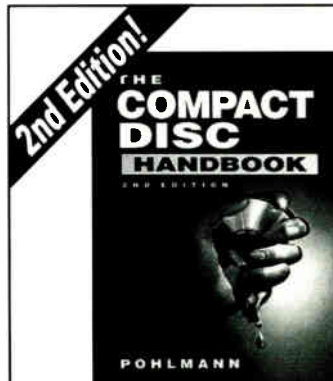
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—LISTING CONTINUED FROM PREVIOUS PAGE

Patch editor allows for connecting up to 40 effect blocks out of 90 available modules in a "virtual patch bay" configuration. Presets can be stored internally or to a PCMCIA standard card. **Basic Specifications & Suggested List Price:** 5-22kHz bandwidth, 18 bit A-D/D-A conversion, 24 bit internal processing, >100 dB dynamic range, 32,44,056, 44.1, & 48 kHz sampling rates. Foot pedal input plus two foot pedal outputs, 2 relay closure outputs for amp switching. List price \$4,995.

**EXCEL AUDIO SYSTEMS**

7063-J Commerce Circle; Pleasanton, CA 94588; (510) 460-3842; FAX: (510) 460-3865. **Product Name:** ISO-Box. **Contact:** Richard Guy. **Date Product Introduced:** 3/93. **Product Description & Applications:** ISO-Box's are magnetic isolators which allow the interconnection of audio components in complex systems without noise problems. ISO-Box's routinely eliminate buzzes, RF noises, SCR dimmer hash, and intermittent noises caused by ground loops and ground currents flowing on a signal carrying lines. ISO-Box's are manufactured in input models, output models, and DI (instrument bridging) models. Based on Reichenbach audio transformers, they provide the quiet interconnection that active units can only promise. **Basic Specifications & Suggested List Price:** Typical performance. Model 6060: Freq. response: -3db @ 200 kHz, THD under 0.001% at normal operating level, max level +25dBu. Priced from \$149. Stereo units available, and quantity discounts available. Units available in mini-packs or rack-mounting kits for multiple or mixed units.



**EXCEL AUDIO SYSTEMS**  
ISO-Split

**EXCEL AUDIO SYSTEMS**

7063-J Commerce Circle; Pleasanton, CA 94588; (510) 460-3842; FAX: (510) 460-3865. **Product Name:** ISO-Split. **Contact:** Richard Guy. **Date Product Introduced:** 7/93. **Product Description & Applications:** 8000 Series ISO-Splits are magnetically coupled microphone splitters which provide a direct and 1, 2 or 3 ground isolated outputs. Based on Reichenbach audio transformers, they provide ruler-flat response and eliminate the AC buzzes and ground noises common with interconnection of multiple mixing consoles. ISO-Splits are rack mounting and have XL inputs, direct outputs and Iso-outputs. Multi-pin connectors are available as an option. The 8-channel units may be gauged to any desired number. **Basic Specifications & Suggested List Price:** Model 8011: One direct/one iso output. Freq. response: -3db @ 150kHz, THD under 0.04%, max level +1dBu. Model 8012: One direct/two iso outputs. Freq. response: -3db @ 88kHz, THD under 0.035%, max level +2dBu. Model 8013: One direct/three iso outputs. Freq. response: -3db @ 48 kHz, THD under 0.06%, max level +10dBu.

*Pro audio dictionaries and technical reference guides are available through the Mix Bookshelf catalog. Call toll-free (800) 233-9604 for your free copy.*



**FENDER-SUNN**  
PRO AUDIO  
SPL-PCN2 Network

**FENDER-SUNN PRO AUDIO**

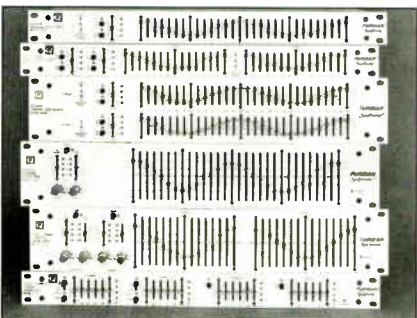
7975 N. Hayden Rd.; Scottsdale, AZ 85258; (602) 596-7121; Fax (602) 596-1384. **Product Name:** SPL-PCN2 Network. **Contact:** Michael Schwartz, mgr., Pro Audio Products. **Date Product Introduced:** 7/93. **Product Description & Applications:** A powerful stereo 2-way/mono 3-way 24 dB/octave Linkwitz/Reiley rackmount electronic crossover network. All front panel controls are recessed for use with the smoked lexan security cover (included), yet accessible (by fingers, no tools required). Variable input levels, output levels and sweepable crossover frequency. Switchable CD horn equalization. Balanced XLR inputs and outputs. 3 year limited warranty. **Basic Specifications & Suggested List Price:** Suggested U.S. retail price: \$399.

**FENDER-SUNN PRO AUDIO**

7975 N. Hayden Rd.; Scottsdale, AZ 85258; (602) 596-7121; Fax (602) 596-1384. **Product Name:** Fender-Sunn SPL PCN-4. **Contact:** Michael Schwartz, mgr., Pro Audio Products. **Date Product Introduced:** 7/93. **Product Description & Applications:** A powerful single-rackspace stereo 3-way mono 4- or 5-way 24dB/octave Linkwitz/Reiley electronic crossover network. Each channel provides a variable input level, low, mid, and high frequency output levels, sweepable crossover frequencies, phase reverse switches on mid and high outputs, mute switches (low, mid and high), switchable CD horn equalization and much more. All controls may be recessed for use with a smoked lexan security cover (provided). XLR input and output connectors. **Basic Specifications & Suggested List Price:** Suggested U.S. retail price: \$499.99.

**FOCUSRITE AUDIO ENGINEERING LTD.**

Unit 2 Bourne End Business Centre; Bourne End Bucks, SL8 5AS United Kingdom; (44) 628 819456. **Product Name:** Red 3. **Contact:** R Saller, tech. dir. **Date Product Introduced:** 7/93. **Product Description & Applications:** Dual stereo compressor and limiter. Transformer coupled, illuminated VU meters. Focusrite proprietary VCA. True stereo mode, only one set of controls. Separate controls for limiter section. **Red range case. Basic Specifications & Suggested List Price:** List price \$3,450. Freq. resp: -3dB @ 5Hz and 120KHz. Output +24dBm into 600Ω. Noise better than -90dB. Distort. 0.002% @ 0dB/1kHz.



**FURMAN SOUND INC.**  
Q-Series Graphic Equalizers Long Throw Slider Models

**FURMAN SOUND INC.**

30 Rich St.; Greenbrae, CA 94904; (415) 927-1225. **Product Name:** Q-Series Graphic Equalizers Long Throw Slider Models. **Contact:** Joe Desmond, sales mgr. **Date Product Introduced:** 4/93. **Product Description & Applications:** Q-152: dual 15 band, double rack space; Q-302: single 30 band, double rack space. Both models are available with an XLR-balanced with an XLR-balanced input/output option. **Basic Specifications & Suggested List Price:** Maximum length 60mm sliders; Constant-Q response for maximum graphic accuracy; "straight wire" bypass guarantees that audio will always reach output; input and output level controls, with ±12dB range; 4-segment LED meters for both input and output; low and high cut knobs sweep from 15 to 135Hz, or 12.5 to 32kHz, at 12dB per octave; provides ±12dB of equalization at ISO 1/3rd (Q-302) and 2/3rds (Q-152) octave frequencies. Prices: Q-152, \$489, Q-302, \$469.

**FURMAN SOUND INC.**

30 Rich St.; Greenbrae, CA 94904; (415) 927-1225. **Product Name:** Q-Series Graphic Equalizers Short Throw Slider Models. **Contact:** Joe Desmond, sales mgr. **Date Product Introduced:** 4/93. **Product Description & Applications:** Q-151: dual 15 band, single rackspace; Q-301 single 30 band, single rackspace; Q-602: dual 30 band, double rackspace; Q-541: quadruple 5 band stereo, single-rack space. All but the Q-541 are available with an XLR-balanced input/output option. **Basic Specifications & Suggested List Price:** Constant-Q response for maximum graphic accuracy; "straight wire" bypass guarantees that audio will always reach the output; output level controls; 4-segment LED meters show output signal levels and overload conditions; low cut buttons provide an 18dB/octave rolloff of frequencies below 20Hz; ±6dB±12dB rear panel range switches with front panel LED indicators (except Q-541, which is fixed at ±10dB); ISO one-third (Q-301 and Q-602) and two-thirds (Q-151) octave frequencies. Prices: Q-151, \$399, Q-301, \$389; Q-602, \$699 Q-541, \$399.

**GENTNER COMM. CORP. PROF. AUDIO PROD.**

1825 Research Wy.; Salt Lake City, UT 84119; (801) 975-7200. **Product Name:** G-2500 "Superhybrid" Telephone Interface. **Contact:** Elaine Jones, mktg. dir. **Product Description & Applications:** The Gentner G-2500 Superhybrid is a telephone hybrid (2-4 wire converter) that can be used with virtually any audio mixer-no special "mix minus" module is needed. The G-2500 uses advanced DSP technology to subtract its own caller audio from the "send" audio going back down the telephone line. The G-2500 may be used for radio talk shows, news interviews, IFB, or other telephone interlocking applications. **Basic Specifications & Suggested List Price:** 1 rack unit; 117/234 vac; direct connection to analog telephone line via RJ-11C jack; multiple units may be stacked and conferenced together; audio inputs and outputs via XLR, balanced line level. Suggested list price: \$1,995.

**GENTNER COMM. CORP. PROF. AUDIO PROD.**

1825 Research Wy.; Salt Lake City, UT 84119; (801) 975-7200. **Product Name:** G-3200 "Superhybrid" Telephone Interface. **Contact:** Elaine Jones, mktg. dir. **Product Description & Applications:** The Gentner G-3200 is an advanced telephone hybrid designed for live studio applications such as television talk shows. A DSP based digital hybrid ensures maximum separation between "send" and "receive" audio on the telephone line, while another DSP acts an acoustic echo canceller to control studio feedback. Multiple units may be stacked for conferencing of callers. **Basic Specifications & Suggested List Price:** 1 rack unit; 117/234 VAC; RJ-11C connection to telephone line; audio inputs and outputs are balanced line level XLR. Unit provides 250 milliseconds of acoustic echo cancellation.

**KENNEDY ELECTRONICS**

6202 Concord Blvd. S.; Inver Grove Hts., MN 55076; (612) 457-1662. **Product Name:** Microphone Preamplifier. **Contact:** Dan Kennedy, owner. **Date Product Introduced:** 11/92. **Product Description & Applications:** Single space mic preamps. 2 and 4 channel models available. Transformer input, discrete amplifier design. Very high current output stages. High impedance, instrument input by-passes, transformer polarity, PAD and phantom switches. **Basic Specifications & Suggested List Price:** 2 channel \$1,200, 4 channel \$1,800.

**KLARK-TEKNIK**

448 Post Rd.; Buchanan, MI 49107; (800) 695-1010. **Product Name:** DN 3600 Equalizer. **Contact:** Allan Nichols, dir. of sales and mktg. **Date Product Introduced:** 4/93. **Product Description & Applications:** Dual channel third-octave equalizer and unbleed notch filters and sweepable low and high pass filters. Large backup Super-twist LCD display with virtual faders and actual curve display modes, 66 memories. Ability to address 64 slave units. **Basic Specifications & Suggested List Price:** \$2,850.

**KRK MONITORING SYSTEMS**

16462 Gothard St., Unit D; Huntington Beach, CA 92647; (714) 841-1600; FAX: (714) 375-6496. **Product Name:** KX3-A & KX2-A Electronic Crossovers. **Contact:** Craig M. Hill. **Date Product Introduced:** 1/93. **Product Description & Applications:** These pure Class A discrete represent a major breakthrough in crossover engineering. The KX3 and KX2 are designed to optimally complement the exacting needs of KRK's main monitoring systems. These are no-compromise systems that take full advantage of all the purity and smoothness that Class A circuitry has to offer. **Basic Specifications & Suggested List Price:** Model KX3-A 3-way mono \$2,200. Model KX2-A 2-way stereo \$2,500. System design- Class A—all discrete Slope-24dB/octave linear summed response maximum input +30dB 10K balanced maximum output +28dB 600Ω unbalanced +34dB 600Ω balanced slow rate-75 volts per microsecond noise-90dB linear distortion-THD IMD less than 0.05%.

**LAKE BUTLER SOUND CO. INC.**

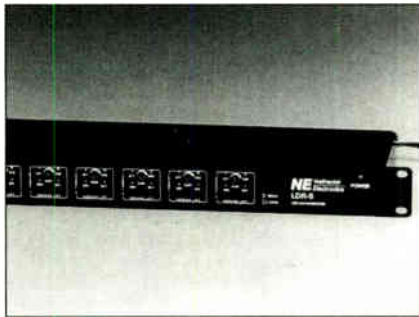
5331 W. Lake Butler Rd.; Windermere, FL 34786; (407) 656-5515. **Product Name:** Micro Mitigator. **Contact:** Emmett Bradford, president. **Date Product Introduced:** 7/93. **Product Description & Applications:** The new Micro Mitigator Series of rack mount Audio & MIDI accessories featuring the MSI-8 to control up to 8 non-MIDI, foot switchable functions with your MIDI foot controller. Uses real relays to switch any amp footswitch as well as switching audio directly. Available in three versions offering 8 relays, 4 continuous controller inputs and 2 stereo effects loops. **Basic Specifications & Suggested List Price:** 1/3 rack space. List price: \$269.

**LEXICON**

100 Beaver St.; Waltham, MA 02154; (617) 736-0500. Product Name: Alex. Contact: Jon Durant, mktg comm; Bob Reardon, product mgr. Date Product Introduced: 5/93. Product Description & Applications: Full rack digital effects processor with 16 presets, 16 user registers, remote control via footswitches, 3 variable parameters per effect. Programs include hall, room, plate, gate and inverse reverb; echo, delay, chorus/delay, and flanging. Basic Specifications & Suggested List Price: List price \$395.

**LEXICON**

100 Beaver St.; Waltham, MA 02154; (617) 736-0500. Product Name: NuVerb. Contact: Jon Durant, mktg comm; Bob Reardon, product mgr. Date Product Introduced: 8/93. Product Description & Applications: Digital effects card for the Macintosh. AES I/O, optional TDM interface. Operates in single (stereo) mode, or split mode (dual mono or cascade configurations.) Effects include random hall, random ambience stereo adjust/delay, compression, rich plate, split chamber, dual delays, compression. Basic Specifications & Suggested List Price: List price \$1,795. TDM interface \$499.



**NATHANIEL ELECTRONICS**  
LDR-8 Line  
Driver/Receiver

**NATHANIEL ELECTRONICS**

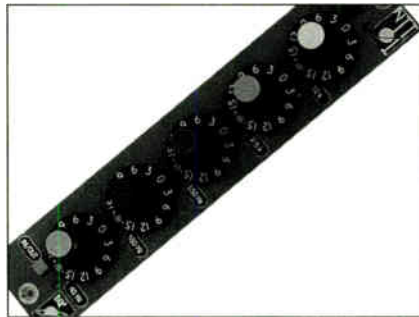
PO Box 126; Vergennes, VA 05491; (802) 877-2182; FAX: (802) 877-3817. Product Name: LDR-8 Line Driver/Receiver. Contact: Joel Melnick, owner. Date Product Introduced: 7/93. Product Description & Applications: The LDR-8 has 8 channels; each can be configured as unbalanced in/balanced out (driver), or as balanced in/unbalanced out (receiver). All channels have separate ground lift switches (with yellow warning indicators) on every input and output activity indicators, overload indicators and gain trim from -14dB to 14dB. The unit is a cost-effective, no compromise solution whenever the need arrives to drive and receive audio long distances successfully w/o the compromises of transformers. Basic Specifications & Suggested List Price: 3Hz to 200kHz, THD:0.007, S/N ratio 103dB, slew rate 9.5 v/μ sec, gain range: ±14dB, drive capability: 10v into 600Ω up to 3000 ft. of cable, sophisticated power up/power down transient protection circuitry. Suggested list price: \$1,433.35.



**LITTLE LABS**  
Little Labs Multi Z Direct Box

**LITTLE LABS**

8033 Sunset Blvd., Ste. 889; Los Angeles, CA 90046; (800) 642-0064; (213) 851-6860. Product Name: Little Labs Multi Z Direct Box. Contact: Jonathan Little, design engr. Date Product Introduced: 1/93. Product Description & Applications: The Little Labs Multiple Z Direct Box is a revolutionary audiophile direct box designed to extract the full tone and dynamics from musical instruments. The Z stands for impedance. Impedance is the most important, but often overlooked variable in obtaining the fullest, clearest, open sound from an electronic musical instrument. The Little Labs Multiple Z Direct Box allows you to select between four different input stage impedances, each with its own optimized electronics. Basic Specifications & Suggested List Price: Features include: ground isolate on input and XLR ground lift on output. Balanced mic/line, unbalanced line, and buffered line driver outputs. Overload indication on input and on output. High level out before overload (+32dB balanced, +26dB unbalanced) audiophile components used throughout. Rack mountable. 4 per 1u space. Factory direct price \$279 U.S.



**NIGHT TECHNOLOGIES**  
INTERNATIONAL INC.  
EQ-2

**NIGHT TECHNOLOGIES INTNL. INC.**

1621B Ventura #12; Encino, CA 91436; (818) 377-8356. Product Name: EQ-2. Contact: James R. Olsen, exec. VP. Date Product Introduced: 9/93. Product Description & Applications: Top quality equalizers for the recording/motion picture/television broadcast & PA industries (EQ-2). This unit has outstanding audio quality and must be heard to be appreciated. Uniquely low phase shift, even when listening through a phase matrix, the image remains stationary. Very low noise, exceptionally high transient response and headroom make this signal processing device extraordinary. Basic Specifications & Suggested List Price: Each module measures 7 x 1 1/2 x 1/8" front panel x 3 3/8" deep, weight 1 1/2 lbs. Audio and power connections are made in a single 9 pin "D" connector. ± 28v @ 60ma. Both units have transformerless balanced inputs and outputs for operation at nominal line levels. The EQ-2 is equipped with a LF cut filter. Frequency response ±0.05dB 10Hz-125kHz, -3dB 5Hz/330kHz. Nominal impedance, input 1Ω, output 2Ω. THD +N 0.005%, headroom +29dBm, clip +30dBm, phase shift 30° max-10° normal operating range. Price: EQ-2 \$2,500.

**NVISION INC.**

PO Box 1658; Nevada City, CA 95959; (916) 265-1000. Product Name: NV5000 Universal Sync Generator. Contact: Sue Evans, mktg. services mgr. Date Product Introduced: 1/93. Product Description & Applications: The NV5000 Series is a 1 RU chassis which functions as a common timing reference for simultaneously locking NTSC video, PAL video, AES/EBU digital audio and SDIF-2 digital audio to a common reference. All outputs are locked together and are available simultaneously. The NV5000 Series can function as a free-running master sync generator, or may be locked to an external 5 MHz rubidium timing reference or external NTSC or PAL video source. Basic Specifications & Suggested List Price: Three models are available: NV5100 provides all digital audio format outputs and a PAL video output. \$3,975 USD. NV5200 provides all digital audio format outputs and an NTSC video output. \$3,975 USD. NV5500 provides all digital audio format outputs with NTSC and PAL outputs. \$7,500 USD.



**MYTEK TECHNOLOGIES**  
AD 2018 Reference Analog to Digital Converter

**MYTEK TECHNOLOGIES**

PO Box 1023; New York, NY 10276; (212) 388-2677. Product Name: AD 2018 Reference Analog to Digital Converter. Contact: Michal Jurewicz. Date Product Introduced: 10/93. Product Description & Applications: AD 2018 is a 1/2-rackspace portable reference A/D converter specifically recommended for mix to DAT applications. The converter incorporates latest advances in conversion technology leaving your mix virtually untouched with clarity and stereo field fully preserved. A gentle limit function with accessible threshold and compression controls allows you to print several dB hotter and gives your mix this analog sound. Basic Specifications & Suggested List Price: 107 dB dynamic range, 1-bit conversion, linear phase and digital filtering, 64X oversampling, "Gentle limit" function limits peaks of up to 6dB over full scale. Optional is an out-board AES/EBU peak VU meter with a peak counter. Multichannel version is also available. Price: \$1,495 for a 2-channel unit.

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## ORBAN, A DIV. OF AKG ACOUSTICS INC.

1525 Alvarado St., San Leandro, CA 94577; (510) 351-3500. Product Name: Orban 428 Studio Dynamics Processor. Contact: Phil Moore, product mgr. Date Product Introduced: 9/93. Product Description & Applications: Orban 428 Studio Dynamics Processor. Dual channel/stereo AGC + compressor w/Spectral enhancement. Combination/feed forward and feed-back control circuitry for multiple applications in the recording studio. Especially suited to broadcast and production. Basic Specifications & Suggested List Price: 30 dB gain reduction range. Signal to noise ratio of 106 dB, balanced input and outputs on XLR connectors. Operates with levels between -20 dBm and +8 dBm. 90-130/180 260 VAC line voltage.



RAMSA/PANASONIC PROFESSIONAL PRO AUDIO  
WZ-DM30 Digital Multi Processor

## RAMSA/PANASONIC PROF. PRO AUDIO

6550 Katella Ave., Cypress, CA 90630; (714) 373-7277. Product Name: WZ-DM30 Digital Multi Processor. Contact: Steve Woolley, nat'l sales & mktg. mgr. Date Product Introduced: 1/93. Product Description & Applications: The WZ-DM30 is a 1-input/4-output 20-bit digital equalizer. 4-way crossover network and four 4-band parametric equalizers. All controllable parameter settings can be stored in 16 event memories in each mode and can be retrieved instantaneously. The WZ-DM30 can be connected to external MIDI equipment such as a synthesizer and an effector. It features 20-bit digital floating AD and MASH (registered) D/A converters to provide a typical dynamic range of 110 dB. Suggested retail price: \$3,600.

## POLYFUSION ELECTRONICS

30 Ward Rd., Lancaster, NY 14086; (716) 681-3040. Product Name: Model 800 "Polyfusion Audio". Contact: Alan Pearce. Date Product Introduced: 3/93. Product Description & Applications: Digital to analog converter, an off board DAC used with CD or DAT transports. Intended for use in high end audio. Very high quality and performance specs suitable for broadcast, recording or industrial applications as well as consumer stereo systems. Basic Specifications & Suggested List Price: 20-bit resolution with 8 times oversampling co-ax and optic inputs, freq. response:  $\pm 2$ dB 10Hz to 20kHz, chain sep. > 100dB, distortion < 0.1% THD +N, S/N > 104dB, 1 3/4" rack mount enclosure, remote power supply. Suggested list price \$3,000 US.

## RANE CORPORATION

10802 47th Ave. W., Mukilteo, WA 98275; (206) 355-6000. Product Name: AP 13. Contact: Ray Bloom, dir. of sales and mktg. Date Product Introduced: 1/93. Product Description & Applications: Single instrument acoustic stereo preamp. Mixes a miniature microphone and a pickup together to get the best combination of tone and gain. Stereo effects and returns provided. Basic Specifications & Suggested List Price: 2 inputs, one for piezo and one for mic. Phantom power available. 7 band graphic EQ, pan and level for each input. Tuner and piezo output, expand inputs, stereo sends & returns. Balanced mic level and unbalanced line level main outputs. \$549.

## RANE CORPORATION

10802 47th Ave. W., Mukilteo, WA 98275; (206) 355-6000. Product Name: MAP 33. Contact: Ray Bloom, dir. of sales and mktg. Date Product Introduced: 2/93. Product Description & Applications: Multi-instrument acoustic processor. Controls 3 separate acoustic stereo inputs, plus a vocal mic input. Each input has programmable level and seven band EQ. Monitor output and stereo

main outputs have seven band EQ. Effect sends and returns with programmable levels for the multi-instrumentalist/vocalist to get the best possible sound and balance on stage. Basic Specifications & Suggested List Price: 3 stereo inputs, each with mic and piezo inputs. 1 vocal mic input with 48 volt phantom power. 1 stereo line input. Effect sends and returns. Balanced main stereo outputs and monitor output. All levels and EQ programmable via front panel and recallable via footswitch or MIDI. List price: \$1,999.

## RE AMERICA INC.

31029 Center Ridge Rd., Westlake, OH 44145; (216) 871-7617. Product Name: RE 660/661 Musician Digital Audio Codec. Contact: Jim Switzer, sales eng. Date Product Introduced: 4/93. Product Description & Applications: Musicam ISO-MPEG layer 2 digital audio codec compressors analog or AES/EBU, S/PDIF digital audio into variable bit rates from 56 kbits to 384 kbits for audio transportation on digital telephone lines. Used for studio to studio links, remote productions, point to multi-point distribution and more. Basic Specifications & Suggested List Price: Mono, dual mono, stereo or joint stereo, 32kHz, 4.1 kHz, 48 kHz sampling frequencies, built-in sample rate equalizer/converter, S/N = 86dB @ 15dBu, operates on any digital network, 56/64/92/112/128/192/256/320/384 kbit/s, 2 x V.35, 2 x 21, 2x RS 422. RE66D Encoder - \$3,795. RE 660 Decoder - \$2,595.

## ROLAND PRO AUDIO/VIDEO GROUP

7200 Dominion Circle, Los Angeles, CA 90040-3696; (213) 685-5141 x337. Product Name: DM-80 Firmware, Version 2.0 ROM. Contact: Bob Todrank. Date Product Introduced: 8/93. Product Description & Applications: New DM-80 Version 2.0 Firmware features were developed in conjunction with the DM-80 Hard Disk Recorder users in order to streamline DM-80 editing. The main improvements are: Audio Profile Display on DM-80-R, group move and group copy, enhanced phrase and take naming, auto record under SMPTE sync, recover unused memory, enhanced copy function, up to 40 markers, mixer snapshots, assignable digital output, improved timing accuracy, rewind/fast forward during playback, improved SMPTE time entry, enhanced back-up function, remove silence, grouping of mixer faders, phrase clean-up, SMPTE offsets. Basic Specifications & Suggested List Price: Nominal upgrade charge to registered owners.

## ROLAND PRO AUDIO/VIDEO GROUP

7200 Dominion Circle, Los Angeles, CA 90040-3696; (213) 685-5141 x337. Product Name: SRC-2 Dual Sample Rate Converter. Contact: Bob Todrank. Date Product Introduced: 2/93. Product Description & Applications: The SRC-2 provides a multitude of digital conversion and mixing features to the professional user at a very affordable price. The SRC-2 gives you the capability of mixing two stereo digital signals at differing sample rates into one stereo digital output at any selectable sample rate with balance and overall level control. Typical applications for the SRC-2: digital layback to D2 video, transfer of digital field recordings, CD mastering and preparation, use as an "intelligent digital patch-bay" with any digital audio control room, digital signal level balancing, digital transfers in and out of digital audio workstations from any and all AES/EBU digital sources, provide digital crosslades between two different digital sources. Basic Specifications & Suggested List Price: Inputs A & B: input connectors- XLR, coaxial and optical, input signal gain can be controlled in precision steps of 6 dB, indicator showing approximate incoming sample rate. (48kHz, 44.1kHz, 32kHz). Ability to select between wide and narrow capture range of incoming digital signal clocks. Narrow position: within 0.15% of standard frequencies (32kHz, 44.1kHz, or 48kHz). Wide position: capture any sample rate between 30kHz-52kHz. Suggested list price: \$2,595.

## RSP TECHNOLOGIES

2870 Technology Drive, Rochester Hills, MI 48309; (313) 853-3055. Product Name: Circle Sound Music Surround Decoder. Contact: Jim Chowning, sales mgr. Date Product Introduced: 6/93. Product Description & Applications: The Circle Sound Music Surround Decoders process utilizes the ambient and directional information already present in the original media to generate its multi-dimensional sound field. The Circle Sound Decoder will enhance stereo recording as well as encoded surround material with even greater surround effect while keeping the rear channels stereo. No information is added that is not part of the source material. Applications include professional music only recording, audio/video productions, live sound and commercial sound. Basic Specifications & Suggested List Price: Circle Sound Decoder List price: \$469. Six outputs: left, right, center, rear left, rear right, and sub-woofer offer 1/4" and phono jacks, single rack space, dynamic range 116dB, mx. I/O level +20dB, frequency response  $\pm 0.5$ dB 20Hz to 30kHz, master level, rear level, and center level controls.

## RSP TECHNOLOGIES

2870 Technology Drive, Rochester Hills, MI 48309; (313) 853-3055. Product Name: Circle Sound Music Surround Encoder. Contact: Jim Chowning, sales mgr. Date Product Introduced: 6/93. Product Description & Applications: The Circle Sound Music Surround Encoder now makes it possible to record any project in surround. Based on the popular 4-2-4 matrix process Circle Sound offers a music surround format as well as popular cinema only surround. Without adding any artificial delays or reverbs Circle Sound surround systems allow complete 360° panning while keeping stereo in the rear channels. Applications include professional recording for music only and audio video productions and live

sound. Basic Specifications & Suggested List Price: Circle Sound Encoder List Price \$899, max I/O level +24dBu, 10Hz to 30kHz  $\pm 0.5$ dB, dynamic range: 121dB, single rackspace, 8 lbs., four XLR or 1/4" inputs for left, right, center and surround, with left and right XLR or 1/4" outputs.

## SABINE MUSICAL MANUFACTURING CO.

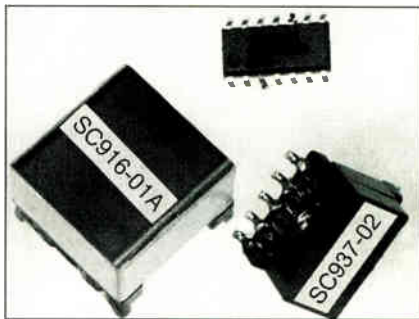
4637 N.W. 6th St., Gainesville, FL 32609; (904) 371-3829. Product Name: FBX-1200/2400 Feedback Extremator. Contact: Nancy Haynes, comm. dir. Date Product Introduced: 7/93. Product Description & Applications: The FBX-1200 and 2400 Feedback Extremators represent the newest generation of Sabine's quality automatic feedback controllers. These powerful DSP-based FBXs allow increased flexibility and performance, and have the power to control sound quality and eliminate feedback faster, more accurately and with more gain than ever before possible. Features include extremely narrow filters that control automatic feedback sensing and elimination, real-time analysis, digital signal delay, programmable noise gate, preset configurations, changeable global parameters and password protection. Basic Specifications & Suggested List Price: Both the FBX-1200 and FBX-2400 are sold at prices lower than less capable programmable analog parametric equalizers, and each version is available with optional balanced line transformers. Call Sabine at (904) 371-3829 for pricing information.

## SABINE MUSICAL MANUFACTURING CO.

4637 N.W. 6th St., Gainesville, FL 32609; (904) 371-3829. Product Name: FBX-900 Feedback Extremator. Contact: Nancy Haynes, comm. dir. Date Product Introduced: 1992. Product Description & Applications: The FBX-900 Feedback Extremator further develops and improves Sabine's award-winning concept of a microprocessor-controlled notch filter. Utilizing digital signal processing technology, the FBX-900 automatically detects and eliminates feedback. When feedback occurs, the FBX-900 automatically assigns one of its very narrow 1/10 octave digital notch filters to cancel only the feedback. No matter what you are currently using to control feedback, the FBX-900 will eliminate it faster and with less tonal change than any other conventional method. Basic Specifications & Suggested List Price: The FBX-900 is sold at prices lower than less capable programmable analog parametric equalizers, and it is available with optional balanced line transformers. Call Sabine at (904) 371-3829 for pricing information.

## SCHOLZ RESEARCH AND DEVELOPMENT

1560 Trapelo Rd., Waltham, MA 02154; (617) 890-5211. Product Name: Ultimatum Guitar Preamp. Contact: Matt Belyea. Date Product Introduced: 9/93. Product Description & Applications: Guitar preamp/multiprocessor. Includes Ultimatum Distortion™ circuitry, compressor, 5 band EQ, Smart Gate™ noise reduction. Fully programmable with 100 memory locations. Basic Specifications & Suggested List Price: 1U rack size. \$699.



SCIENTIFIC CONVERSION INC.  
AES/EBU Surface Mount  
Transformer

## SCIENTIFIC CONVERSION INC.

42 Truman Dr., Novato, CA 94947; (415) 892-2323. Product Name: AES/EBU Surface Mount Transformer. Contact: Maura Vrydagga, sales; Jon Paul, technical. Date Product Introduced: 8/93. Product Description & Applications: The SC 937-02 is a low profile surface mount version of its popular low capacitance, low noise AES/EBU transformer. It features a low capacitance shielded design which reduces radiated and received noise and provides decreased jitter and better audio quality in noisy environments. An additional benefit is reduction of emitted high frequency common mode noise which improves equipment performance for EMI/ FCC compliance. This is especially important in professional and high-end consumer applications. The new transformer is available in a 11x5mm package with 8 pins. Part has a 1:1 ratio, other ratios are available. Basic Specifications & Suggested List Price: Bandwidth: 10kHz-10MHz, capacitance: 1.5 PF, size: 0.210"x0.370"x0.440L", ratio: 1:1 (others available), cost: \$5.50 for 1,000.

## SCIENTIFIC CONVERSION INC.

42 Truman Dr., Novato, CA 94947; (415) 892-2323. Product Name: Improved AES/EBU Transformer. Contact: Maura Vrydagga, sales; Jon Paul, technical. Date Product Introduced: 7/93. Product Description & Applications: SC 916-01A is an improved version of the low capacitance, shielded transformer featuring even lower inter-

winding capacitance, vacuum impregnation, 10kHz-10MHz bandwidth and lower leakage inductance. Applications include A/D, D/A converters, CD players, format converters, etc. The improved specifications minimize noise entry into critical power, ground and clock circuits, suppress EMI, and reduce the jitter and noise caused by clock beats between interconnected systems. The SC916-01A design results in exceptional common-mode noise rejection of 47dB at 1.544MHz. **Basic Specifications & Suggested List Price:** Size: 0.5"x0.5"x0.5", bandwidth: 10kHz-10MHz, capacitance: 1.5 PF, ratio: 1:1, cost: \$6.00/1,000.

### SESCOM INC.

2100 Ward Dr., Henderson, NV 89015; (702) 565-3400. **Product Name:** Field Pro-Series. **Contact:** Franklin J. Miller, president. **Date Product Introduced:** 4/93. **Product Description & Applications:** The Field Pro-Series are eleven field audio devices. They help the professional audio person perform their duties without hassles. They are designed with field problems in mind. **Basic Specifications & Suggested List Price:** The Field Pro-Series includes mix-mixers, DA's, both video and audio, Teleco interfaces, mic splitters and combiners direct boxes, both active and passive. Prices range from \$150-\$450.

### SOUND SCULPTURE

5741 Arapahoe Rd. Ste. 2A; Boulder, CO 80303; (303) 442-1954. **Product Name:** Switchblade 16. **Contact:** Ken Czepelka, pres. **Date Product Introduced:** 8/93. **Product Description & Applications:** The Switchblade 16 switching system offers advanced mixing and patching of signal processing devices. Using a 16x16 "continuous" matrix design, the Switchblade allows parallel and series mixing of effects (in any order and combination) with programmable gain everywhere. Responds to MIDI continuous control to sweep gains in real time. Features silky smooth preset to preset switching and studio quality signal paths. Designed to be a powerful companion for both professional stage setups and studio rack effects. **Basic Specifications & Suggested List Price:** 16 inputs (1/4" hi-z), 16 outputs, 1U height, 8 relay control outputs. MIDI in, out (thru) and footswitch jacks. 75 presets. Preset Manager. Headroom: 7.5 VPP. Bandwidth: 10Hz-25kHz. Signal path: true matrix. Gains: -42dB to 6dB. Full MIDI implementation, Autosweep, variable preset change time, copy, backup, direct sequencer control. \$2,299.

### SOUND TRANSFORM SYSTEMS

1615 Broadway #712; Oakland, CA 94612; (510) 465-6896; FAX: (510) 465-4656. **Product Name:** Serge Modular Music Synthesizer System. **Contact:** Rex Probe, pres. **Date Product Introduced:** 10/92. **Product Description & Applications:** The Serge Synthesizer is a studio quality custom analog modular music system featuring a full line of 60 different audio signals, control voltage/logic generation and processing modules—many unique in the industry, including: wave shapers, trimbre modifiers, quad and stereo panners, multichannel mixers, multimode filters, and precision oscillators, all voltage controlled! **Basic Specifications & Suggested List Price:** Portable as well as E.I.A. rack mounted style packaging is available with systems starting as low as \$1,250. Please call, fax, or write us for a free catalog and new product announcements on our latest modules.

### SPECK ELECTRONICS

925 S. Main St., Fallbrook, CA 92028; **Product Name:** Model 316 16 channel equalizer. **Date Product Introduced:** 6/93. **Product Description & Applications:** The Model 316 offers 16 independent channels of 3 band fully sweepable EQ in only three rack spaces and is designed to operate with all popular 16 channel mixers. **Basic Specifications & Suggested List Price:** Each channel has 6 controls; low frequency sweep 50Hz to 500Hz with 15 dB boost/cut, mid-frequency sweep 500Hz to 5kHz with 15dB boost/cut, and high frequency sweep 5kHz to 15kHz with 15dB boost/cut. Each channel has a EQ bypass switch and input-output jacks. Price: \$698.

### SUMMIT AUDIO INC.

PD Box 1678; Los Gatos, CA 95030; (408) 395-2448. **Product Name:** Summit Modulators. **Contact:** Michael Papp, pres. **Date Product Introduced:** 6/93. **Product Description & Applications:** Summit Audio Inc. will be introducing a modular vacuum tube signal processing which will consist of: a mic preamp, D-Box, EQ, compressor, and limiter. An additional module in this line is a DSP based stereo peak and average meter featuring various scales. A custom rack/frame/power supply, as well as other configurations for 1 or more modules will be offered. **Basic Specifications & Suggested List Price:** Module sizes will have standard width 1.5" and height 5.25". Depths will be either 3.125" or 6" depending on the unit. Power requirements will be 5V, ±15V, ±24V.

### SYTEK AUDIO SYSTEMS CORP.

2424 W. Irving Park Rd.; Chicago, IL 60618; (312) 588-4477. **Product Name:** EQ4-M1 and EQ4B-M1 and EQX4-M1D. **Contact:** Mike Stoica Badescu, sales. **Date Product Introduced:** 3/93. **Product Description & Applications:** Four-band parametric EQ and one-channel microphone preamp. Switchable bandwidth or adjustable bandwidth from 1/3rd to 1 octave, Bassel polynomial design, XLR balanced input/output. EQX4-M1D is a digitally controlled version true RS232C, MIDI, PA 422 interface under Windows 3.1 software. Low EMI internal toroidal transformer for power supply for either 117/220 VAC 50/60 Hz. **Basic Specifications & Suggested List Price:** Retail price for EQ4-M1 is \$1,437. Retail price for EQ4B-M1 is \$1,687. Retail price is EQX4-M1 is \$1,868.

### SYTEK AUDIO SYSTEMS CORP.

2424 W. Irving Park Rd.; Chicago, IL 60618; (312) 588-4477. **Product Name:** MPX-4A and MPX-4D. **Contact:** Mike Stoica Badescu, sales. **Date Product Introduced:** 2/93. **Product Description & Applications:** MPX-4A and MPX-4D Bit is the third-generation upgrade of MP-4 Quad microphone preamplifier, transformerless design with extreme low noise and low distortion properties and gain of 70dBm. T.H.D. is below 0.002%. SNR- 96dBm and EIN: -134dBm. Peak indicator, mute, phase invert and 48V phantom power for each channel, XLR balanced input/output and low EMI interna. toroidal transformer for power supply for either 117/220 VAC 50/60Hz. MPX-4D It's a digitally-controlled version of MPX-4A under Windows 3.1 software. Low EMI internal toroidal transformer for power supply for either 117/220 VAC 50/60Hz. **Basic Specifications & Suggested List Price:** True RS 232C MIDI PA422. Retail price for MPX4-A is \$980 and for the MPX-4D is \$1,300. Inquiries are invited and for more information for a full line product, contact Mike Stoica at Sytek Audio Systems Corp.



TECH 21 INC.  
SansAmp Bass DI

### TECH 21 INC.

1600 Broadway; New York, NY 10019; (212) 315-1116. **Product Name:** SansAmp Bass DI. **Contact:** Neal Ostberg, national sales manager. **Date Product Introduced:** 11/92. **Product Description & Applications:** Tube amplifier Emulator, specifically for bass, engi-

neered for direct recording and live performances. Combines operational convenience of a direct box with the warmth, presence and punch of a miked-up bass amp system. Trimmable internal controls (presence, drive, level, blend) adjust clarity, tonality and gain structure. Can be tailored from crystal clean to crunchily overdrive. Also capable of functioning as an active transparent direct box. **Basic Specifications & Suggested List Price:** Input: 1/4" ; impedance: 1M Ω. Parallel output: 1/4" , unity to input. XLR balanced output: mic level, impedance: minimum 600Ω. Frequency response: low: 10Hz or better; high harmonic content: 20kHz or better (varies according to setting). Power: phantom or 9V battery (operable 100+ hours). Wt. 11 oz. Made in USA. Retail: \$195 list.

### TECH 21 INC.

1600 Broadway; New York, NY 10019; (212) 315-1116. **Product Name:** SansAmp GT2. **Contact:** Neal Ostberg, national sales manager. **Date Product Introduced:** 5/93. **Product Description & Applications:** Tube amplifier Emulator for studio and live applications. Portable pedal format offers choice of amplifier type, modification, and speaker cabinet/mic placement configurations to "build" a complete virtual tube amp set-up. Features on-board, 2-band post EQ, and universal output for multiple uses: record direct to tape, in mix-downs; as a pre-amp or outboard effect with guitar or bass amp; direct to P.A. system, home stereo; drive power amp. **Basic Specifications & Suggested List Price:** Input: 1/4" ; impedance: 1M Ω. Output: 1/4" ; output impedance: minimum 600Ω. Maximum output level: 0 dB. Frequency response: low: 10Hz or better; high harmonic content: 20kHz or better (varies according to setting). Power: optional DC adaptor or 9V battery (operable 100+ hours) Current consumption: 4.5mA. Wt. 12 oz. Made in USA. Retail: \$195 list.

### TROISI ENGINEERING AND DESIGN

27 Almeria Cir.; Westford, MA 01886; (508) 692-7768. **Product Name:** Comp. **Contact:** Peter Troisi, pres. **Date Product Introduced:** 10/92. **Product Description & Applications:** Companion digital products provide very high quality conversion (up to 20-bit) for analog and digital signals. **Basic Specifications & Suggested List Price:** ADC: 16, 18 & 19 bits- \$1,295. DAC: 16, 18, & 20 bits- \$1,200. Clock conversion: AES to AES clock conversion, 20 bits \$1,000.

### TROISI ENGINEERING AND DESIGN

27 Almeria Cir.; Westford, MA 01886; (508) 692-7768. **Product Name:** K Series Signal Processing. **Contact:** Peter Troisi, pres. **Prod-**

—LISTING CONTINUED ON NEXT PAGE

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—LISTING CONTINUED FROM PREVIOUS PAGE

**Product Description & Applications:** A series of analog signal processing modules including EQs (parametric), dynamic EQs, dynamic controllers and distribution amps and analog to digital and digital to analog converter modules. **Basic Specifications & Suggested List Price:** EQ 518: \$600. DQ 520: dynamic EQ \$600. XCOM 636 dynamic controller \$600. DA510 distribution amp 1x5 \$300. ADC/DAC digital modules \$1,000.

### TUBE TECH (LYDKRAFT)

**Product Name:** Tube Tech LCA-2A. **Contact:** David Schechterson. **Date Product Introduced:** 4/93. **Product Description & Applications:** 2-channel all tube compressor/limiter stereo linkable has six attack/release presets as well as manual control. **Basic Specifications & Suggested List Price:** Separate compressor and limiter. Freq. response: 5 Hz to 50 kHz (±3dB). Very low noise <-85.

### VALLEY AUDIO PRODUCTS INC.

**Product Name:** Model 460 X-Gate/NR. **Contact:** Mike Joseph, dir. of sales and mktg. **Date Product Introduced:** 9/93. **Product Description & Applications:** The Model 460 is an 1U rack-mount, two-channel device providing frequency-selective gating and noise reduction. Each channel consists of an automatic gate and an expander with controls that include continuously variable threshold, slope, range, attack, release and hold. Input level and gain metering is displayed. The noise reduction section is a single knob control dynamic filter with dedicated metering. Channels may be linked, operating in bypass and key listen modes. **Basic Specifications & Suggested List Price:** The (\$679) Model 460 supports +4dBm and -10dBu level inputs and outputs on XLRs and 1/4" jacks. Front panel controls include low filters from 20Hz to 2.5 kHz, high filters from 156 Hz to 20kHz, threshold from -40dB to +20dB, range from 0 to 90dB and release from .05 sec to 5 sec/20dB.

### VALLEY AUDIO PRODUCTS INC.

**Product Name:** Model 730 Digital Dynamics Processor. **Contact:** Mike Joseph, dir. of sales and mktg. **Date Product Introduced:** 9/93. **Product Description & Applications:** The Model 730 is a 1U rack-mount device providing digital, waveform sensitive, stereo compression, keyable expansion and gating, high frequency comp/limiter, digital level control, peak limiting and silbance control. The Model 730 lets you combine multiple, simultaneous threshold setpoints (knees) and segment ratios to create custom transfer curves. In addition to the usual threshold, attack, release, ratio and gain controls, it includes setpoint, slope, range, pre-delay, delay hold, mix and stereo spread. There are 99 user program locations in battery-backed memory. **Basic Specifications & Suggested List Price:** The (\$2,000) Model 730 supports +4dBm and -10dBu analog inputs and outputs on XLRs, using 18-bit converters and a 24-bit internal data path. Digital inputs and outputs include AES/EBU, S/PDIF, S-DIF-2, RS-232, RS-422 and TOSLINK optical. The unit can mix analog and digital inputs and simultaneously feed analog and digital outputs. Frequency response is 30Hz to 50kHz; a 75Ω Word Sync interface and MIDI in and out are included.

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**WHITE INSTRUMENTS, DIV. OF C VAN R INC.**  
1514 Ed Bluestein Blvd., Ste. 108; Austin, TX 78721; (512) 389-3800. **Product Name:** White Model 155 Pink Noise Tube. **Contact:** Jeff Van Ryswyk, nat'l sales mgr. **Date Product Introduced:** 1/93. **Product Description & Applications:** Phantom-powered pink noise generator packaged in a mic size tube with an XLR connector at one end. **Basic Specifications & Suggested List Price:** Pro-user price: \$155.

**WHITE INSTRUMENTS, DIV. OF C VAN R INC.**  
1514 Ed Bluestein Blvd., Ste. 108; Austin, TX 78721; (512) 389-3800. **Product Name:** White Model 4828. **Contact:** Jeff Van Ryswyk, nat'l sales mgr. **Date Product Introduced:** 1/93. **Product Description & Applications:** Dual channel EQ, 3-rack space 28 band slider controlled EQ with a sub patch. **Basic Specifications & Suggested List Price:** Pro user price: \$1,200.

### XTA ELECTRONICS

**Product Name:** DS400 Mic/Line Distribution System. **Contact:** Jack Kelly, pres. **Date Product Introduced:** 4/93. **Product Description & Applications:** The DS400 is a 4-channel mic/line distribution unit providing 4 outputs per channel. The inputs, F.O.H. and monitor outputs are electronically balanced. There are also two transformer isolated output. Each channel has a 0, 15, or 30dB gain with a headroom indicator for optimum level setting. The connections can be via multi-pin or XLR. The DS400 is a compact 1u unit powered by the PS400 Dual Power Supply. Each DS400 connects individually to the power supply via a D-Type connector. Up to 14 DS400's (56 channels) can be powered via each PS400. The DS400 has a maximum output level of +18dBm. E.I.N. is -102dBm at 0dB gain; -12dBm at 30dB gain. Distortion is less than .01% at +4dB output. 48V power is provided on each channel.

### YAMAHA CORP. OF AMERICA

**Product Name:** DA2X 2-Ch D/A Converter. **Contact:** Pro Audio Dept. **Date Product Introduced:** 3/93. **Product Description & Applications:** Professional 20-bit digital-to-analog converter provides lab-standard performance. THD of less than 0.001%. 2Hz-22kHz frequency response and 110 dB dynamic range. Ideal for CD mastering, digital recording and video production applications in which high dynamic range and extremely low distortion specs are required. Includes three digital input formats for interface to a wide range of digital recorders, mixing consoles, signal processing devices. Front panel and internal level trims permit fine calibration of output level ±4 dB. Switchable "vari-speed" mode allows DA2X to accept digital signals with pitch variation of up to ±12%. **Basic Specifications & Suggested List Price:** D/A conversion: 20-bit processing (1-bit ΔΣ PDM DAC, 8-times oversampling filter.) Sampling frequencies: 48kHz, 44.1kHz, 32kHz, auto-select, and variable pitch mode. Dynamic range: 110dB. THD< 0.001%. Frequency response: 2Hz-22kHz ±1dB. Inputs: AES/EBU, S/PDIF, Yamaha. De-emphasis circuit. Outputs: +4dBm nominal, +24dB maximum, balanced XLR, and digital "through" connector. Internal phase select. Height: 1 rack unit. **Suggested retail price:** \$1,899.

### YAMAHA CORP. OF AMERICA

**Product Name:** FMC2 Digital Format Converter. **Contact:** Pro Audio Dept. **Date Product Introduced:** 11/93. **Product Description & Applications:** Two channel, bi-directional format converter, allows interface of Yamaha digital I/O product to wide range of digital products from other manufacturers. Simultaneously converts AES/EBU and CD/DAT digital signals to Yamaha digital format, and Yamaha format to AES/EBU and CD/DAT. Yamaha format signals can be emphasized or de-emphasized. For use with DMC1000, DMR8, DRU8 and all processors with Yamaha format 2-channel digital I/O. **Basic Specifications & Suggested List Price:** Format: CD/DAT input: IEC-958 consumer use; RCA-pin type connector. AES/EBU input: XLR connector. Yamaha format: 8-pin DIN type. External word clock input: BNC-R type connector. Indicators: emphasis, PLL-LOCK, UNLOCK. Height: 1 rack unit. **Suggested retail price:** TBA.



YAMAHA CORP. OF AMERICA  
SPX990 Professional Multi-Effect Processor

### YAMAHA CORP. OF AMERICA

**Product Name:** SPX990 Professional Multi-Effect Processor. **Contact:** Pro Audio Dept. **Date Product Introduced:** 5/93. **Product De-**

**scription & Applications:** True stereo effect processor with exceptional sonic performance for use in recording, sound reinforcement and broadcast applications. 20-bit A/D, D/A conversion provides smooth natural effects and over 100dB dynamic range. In addition to the main effect, signal processing (EQ, compression, gate, harmonic driver, and distortion) can be added before and after the main effect. Storage of 100 user-presets on removable RAM card. Easy operation with velocity sensitive data wheel and front panel keys. Other features include: new reverberation programs, intelligent pitch change, tempo-based delay time programming and more. **Basic Specifications & Suggested List Price:** Inputs, outputs: +4dBm/-20dBm (switchable) w/balanced XLR and TRS 1/4" connectors. 20-bit A/D, D/A converters. Dynamic range: 106dB; frequency response: 20Hz-20kHz ±5dB. MIDI in, MIDI out/through connectors. **Suggested retail price:** \$1,099.

### ZOOM CORPORATION

**Product Name:** Zoom 9120. **Contact:** Jack Knight, prod. mgr. **Product Description & Applications:** The Zoom 9120 Advanced Sound Environment Processor combines 22 authentic ambiances and warm lush effects with a friendly intuitive front panel layout to create an advanced effects processor. The 9120 stores 99 programs in memory and allows extended storage via MIDI SysEx. Editing is controlled by three data entry knobs with full visual indication. Further features include a vocal eliminator, delay time calculator, sweepable flanging, surround simulation and pedal controlled pitch bending. **Basic Specifications & Suggested List Price:** 16-bit stereo A/D conversion with 64x oversampling, 16-bit D/A conversion, 1/4" inputs and outputs w/+20/+4dBm adjustment, 90dB dynamic range, 1u rackspace, MIDI in/out and control input. **Suggested list price:** \$599.99.

### ZOOM CORPORATION

**Product Name:** Zoom 9200. **Contact:** Jack Knight, prod. mgr. **Product Description & Applications:** The Zoom 9200 Advanced Reverberation Processor's highly flexible design allows for the creation of some very unique effects. 31 different effect algorithms and 13 different I/O configurations make the 9200 suitable for any type of application. Four independent XLR inputs and outputs and a large LCD viewing screen allow for easy interfacing and programming. The 9200 has 99 factory programs in RDM, 99 user memories in RAM and 99 card memories. **Basic Specifications & Suggested List Price:** Four XLR inputs and outputs. 16-bit A/D and D/A conversion. MIDI in/out/through. Frequency response 16Hz to 20kHz. Dynamic range of >90dB. **Suggested list price:** \$2,100.

### TEST EQUIPMENT

### ASACA/SHIBASOKU CORP. OF AMERICA

**Product Name:** AD725D Automatic Distortion Analyzer. **Contact:** Teresa Baker. **Date Product Introduced:** NAB 1993. **Product Description & Applications:** Wideband distortion ratio measurements of fundamental frequencies 4Hz-11kHz. High-performance impedance converter, BEF and noise reduction circuits enable very low distortion measurements down to lower than -120dB (0.0001%). Harmonic analysis circuit enables measurement of components of each harmonic distortion (from the 2nd to 5th). It is possible to select from 3 kinds of response speed in the RMS and AVG. The input level adjustment, the selection of the measuring range and the synchronization of the fundamental frequency rejection filter are automatic. GP-1B is provided standard. **Basic Specifications & Suggested List Price:** This analyzer is ideal for testing and evaluating the performance of high-quality audio equipment and other applications where very low distortion measurements are required. Also, this unit can be used as a high sensitive level meter of 10µV full scale in the level measurement mode. \$11,600.

### ASACA/SHIBASOKU CORP. OF AMERICA

**Product Name:** AG31A Digital Audio Test Generator. **Contact:** Teresa Baker. **Date Product Introduced:** NAB 1993. **Product Description & Applications:** Generates four kinds of digital codes, 3 serial and 1 parallel, which conform to AES/EBU standards, EIAJ CP-340 standard, normal sampling and oversampling serial signals for evaluating D/A converters, and a parallel output for connection to another measuring device or other external device. Generates several digital waveforms, including Sine wave code and special waves such as impulse, M series PN noise, etc. Can generate L/R channels independently as well as select the desired channel outputs. **Basic Specifications & Suggested List Price:** The AG31A is ideally suited for applications to measure the characteristics of an amplifier, effects device, digital mixer, as well as for testing DAT, or digital VTRs, or other equipment provided with digital sound circuitry. It is also used for applications in designing and testing high-accuracy digital audio equipment, and for the evaluation of D/A converters. \$16,000.

### AUDIO PRECISION

**Product Name:** ATS-1 Audio Test System. **Contact:** Tom Mintner, dir. of sales, USA. **Date Product Introduced:** 6/93. **Product Description & Applications:** Audio Precision has just introduced the new ATS-1 audio test system for audio-frequency testing applications in manufacturing production test, quality assurance and engineering devel-

opment laboratories. The ATS-1 complies with the most recent IEE-488 2 recommendations for programmability, but also includes an emulation of the Hewlett-Packard 8903B command set. Compared to the most commonly used competitive instrument, the ATS-1 performs most testing tasks about 50% faster. A National Instruments LabWindows driver is furnished to simplify program generation. All functions are fully programmable. **Basic Specifications & Suggested List Price:** Twelve measurement functions are selected from the front panel by individual push-buttons. Input and output connector options include BNC, banana jack, XLR, WE310, phone jack, and Siemens. Signal connectors may be located on either the front or rear panel of the instrument. The optional rack mounting kit provides for slides or fixed mounting. A built-in loudspeaker permits audible monitoring of the signal being measured.

**AUDIO PRECISION**

**PO Box 2209; Beaverton, OR 97075; (503) 627-0832. Product Name:** Low Bit Rate Testing. **Contact:** Tom Minter, dir. of sales, USA. **Date Product Introduced:** 9/93. **Product Description & Applications:** More and more digital audio transmission and recording is using low-bit-rate coding to reduce bandwidth and space requirements. All of the techniques use algorithms based on psychoacoustic modeling to discard information falling below audible masking thresholds. Conventional single-tone testing techniques provide insufficient medium stress to reveal perceptible distortions; test results are usually deceptively good. **Basic Specifications & Suggested List Price:** Audio Precision's System One + DSP includes multitone testing capability that more closely simulates actual music and can better exercise and measure the true performance of low-bit rate coders. Newly developed tests can provide rapid results of frequency and phase response, total distortion versus frequency, and noise versus frequency. The DSP multitone testing capability is included with all System One + DSP and System One Dual Domain. Audio Precision will be demonstrating this capability on several current compressed digital audio devices during the exhibit.



**FM SYSTEMS INC.**  
SPM-1 Stereo Performance Meter

**FM SYSTEMS INC.**

3877 S. Main St.; Santa Ana, CA 92707; (800) 235-6960. **Product Name:** SPM-1 Stereo Performance Meter. **Contact:** Frank McClatchie, pres. **Date Product Introduced:** 1/93. **Product Description & Applications:** The only meter that is able to measure the actual stereo content of music as it is being played. Enables precise positioning of microphones for optimum dynamic stereo separation as well as identifying and correcting the frequencies causing phasing problems in the recording environment. Particularly useful during mix-down to optimize stereo measures up to 50dB. **Basic Specifications & Suggested List Price:** Stereo separation in 1dB steps with 1dB accuracy up to 35dB-50dB. Operates at any normal program level. Separation measurements are not level dependent. Price \$1,250. This is a cross-correlation computer. Measurements are not level-dependent. Price \$1,250. This is a cross-correlation computer.



**GOLD LINE**  
EZ Test System

**GOLD LINE**

PO Box 500; W. Redding, CT 06896; (203) 938-2588. **Product Name:** EZ Test System. **Contact:** Martin Miller. **Date Product Introduced:** 3/93. **Product Description & Applications:** The EZ Test System is a light weight assortment of measurement instruments in a

rugged carry case that permits the user to make the most frequently required audio measurements. Included in the EZ Test System is a dB meter, sine wave generator, frequency and impedance meter plus a gated pink noise source. Additionally, a digital, real time audio spectrum analyzer with sound level meter. Optional software can be added to the Spectrum Analyzer to do: RT-60, loudspeaker timing, and distortion (THD) measurements. **Basic Specifications & Suggested List Price:** The list price for the EZ Test System is \$2,300. Additional hardware options can be added to provide 30 nonvolatile memories which can be printed via either a parallel port centronics printer or an RS232 port. New software continues to be written for the digital Spectrum Analyzer. All new software can be added to pre-existing units in the field.

**JASONI ELECTRONICS**

3149 E. Desert Inn Rd. #94; Las Vegas, NV 89121; (702) 791-3394. **Product Name:** TAS-1000 Tape Analyzer System. **Contact:** D. Peluso, Erik Jason. **Date Product Introduced:** 10/92. **Product Description & Applications:** The Jasoni TAS-1000 audio tape analyzer system was designed to monitor via calibrated VU meters and speaker system, the properly terminated output performance of analog audio tape equipment. IE: tape cartridge, R-R, cassette record and reproduce machines using test tapes. A low distortion sine oscillator with a variable sweep, in 2 ranges 20-20,000Hz for record response observation. Fast accurate stereo alignment using pink noise, the results shown on the L+R meter or more accurate on external X & Y display. **Basic Specifications & Suggested List Price:** Pink noise gen for "0" error alignment. Sine Osc, 0.5% distortion. Response ±1dB. Built in termination 600/10k. Balanced in/out. Reads noise down to -70dB. Accepts level from -10 to 4dB for a preset level of source. All I.C.'s socketed. RFI filtered. \$1,395 list.



**NEUTRIK USA INC.**  
A2 Audio Measurement System

**NEUTRIK USA INC.**

195 Lehigh Ave.; Lakewood, NJ 08701; (908) 901-9488. **Product Name:** A2 Audio Measurement System. **Contact:** Kenneth Smalley, product mgr. **Date Product Introduced:** 11/92. **Product Description & Applications:** Neutrik's A2 an all-in-one 2-channel audio generator, analyzer and oscilloscope. All common audio measurements can be displayed numerically and as frequency or amplitude sweeps on a liquid crystal graphic display. Display images can then transferred to a printer via the unit's parallel port or stored internally in non-volatile memory. Optional MS-DOS software allows the sequencing of tests including the setting of tolerance envelopes. **Basic Specifications & Suggested List Price:** Generator: 10Hz/100kHz, -71dBu/+30dBu, THD+N typ. -92dB, output impedance 15/150/600. Signal—sine/square/warbled sine/pink & white noise/IMD. Analyzer: level -120dBu/46dBu, +0.1dB, true RMS, frequency 10Hz/200kHz ±0.05%. Phase ± degree, noise -108dBu, W+F ±3%, THD & IMD 10mV, -200V; \$5,900.

**PROFESSIONAL AUDIO WORKS (P.A.W.)**

17939 Chatsworth St. #505; Granada Hills, CA 91344; (818) 363-4072; FAX: (818) 360-8145. **Product Name:** PTC-50 TT Series Test Tapes. **Contact:** Linda or Barry Ross, owners. **Date Product Introduced:** 1992. **Product Description & Applications:** P.A.W. offers a complete line of time code and pilot standards 1/4" test tapes. The PTC-50TT is the 7.5 ips tape having 5 minutes of each IEC Pub. #94-1-0 center-track and 250 nwb/m full-track time code. The PTC-50TT-15 is the 15 ips version of above having 3 minutes of each center and full-track time code. The PTC-50TT-P is the 7.5 ips pilot tape which contains both stereo and mono pilot standards compatible with Nagra-Sync™ and Neo-Pilot™ respectively. **Basic Specifications & Suggested List Price:** Test tapes list at approximately \$60 each.

**WIREWOKS CORPORATION**

380 Hillside Ave.; Hillside, NJ 07205; (908) 686-7400. **Product Name:** TEN-4 Speaker Cable Tester. **Contact:** Angela Kelly, customer service mgr. **Date Product Introduced:** Spring 1993. **Product Description & Applications:** Now there is finally a way to check out speaker cables terminated with Neutrik NL4 Speaker connectors: Wireworks TEN-4 Speaker Cable Tester. This handy, pocket-size product also test cables terminated with phone plugs — or with Speakon and phone plugs in any combination. Rugged chassis, easy operation, up-front circuit identification, convenient LED indicators, long-lasting 9-volt battery power source, and superior Wireworks quality. TEN-4: your technician kit won't be complete without it!

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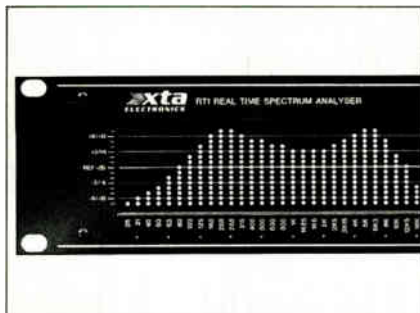
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**Basic Specifications & Suggested List Price:** TEN-4 —\$129. Chassis: 0.050" steel weld construction. Durable black textured finish, white epoxy silk screen. Size: 1/37"x2"x5.45" overall. Weight: 13oz.



**XTA ELECTRONICS**  
RT1 Real Time Analysis System

### XTA ELECTRONICS

80 Sea Lane; Farmingdale, NY 11735; (516) 249-1399. **Product Name:** RT1 Real Time Analysis System. **Contact:** Jack Ke Ly, pres. **Date Product Introduced:** 6/93. **Product Description & Applications:** The RT1 is a powerful analysis tool combining 1/3 octave RTA, SPL meter, RT60 analysis, and swept frequency analyzer. Signal outputs include controllable pink noise and sine wave oscillator. The RT1 can output directly to a printer or to a computer via RS232. Comparison curves can be made referenced to memory, or a real-time measurement. A high-quality measurement microphone is included. **Basic Specifications & Suggested List Price:** The RT1 has mic and line inputs. The 1/3 octave fillers are ANSI type E Class 2. Display range  $\pm 7$ dB in 1dB resolution or  $\pm 14$ dB in 2dB resolution, relative to the attenuator setting. SPL readout provided via LCD.

## Get Listed in Mix Directories

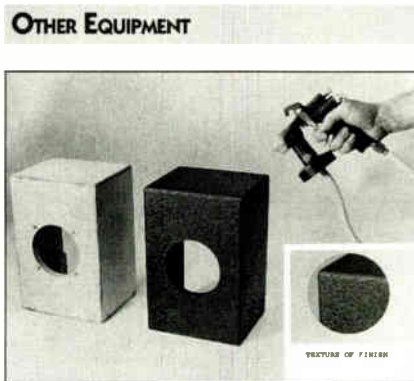
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### OTHER EQUIPMENT



**ABILENE RESEARCH & DEVELOPMENT CORP.**  
Texturelac

### ABILENE RESEARCH & DEVELOPMENT CORP.

PD Box 294; Hewlett, NY 11557; (516) 791-6943; FAX: (516) 791-6948. **Product Name:** Texturelac. **Contact:** Elgin Miller, gen. sales mgr. **Date Product Introduced:** 2/93. **Product Description & Applications:** Texturelac was developed in 1969 and has become the standard paint finish in the industry for speaker boxes, cases & equipment. Spray on with standard spray gun—resembles leather. In February 1993 a new low Voc coating was developed that dries to a hard mark-resistant finish by varying the air and fluid pressures. You can obtain many types of texture at lower Voc standards, contact company for further details. **Basic Specifications & Suggested List Price:** 2 gallon pail introductory price \$44.50 per gal. Voc content 4.6 to 7.4 lbs per gallon.

### APEX MACHINE COMPANY

3000 NE 12th Terr.; Ft. Lauderdale, FL 33334; (305) 565-2739. **Product Name:** CD-63. **Contact:** Bob Coningsby, sales VP. **Date Product Introduced:** 6/93. **Product Description & Applications:** We have just introduced our new CD-63 semi-automatic compact disc printing machine. The CD-63 is capable of printing and UV drying three colors on CDs at a rate of 20 parts per minute. The CD-83 uses the dry offset printing process as the means of decorating the CDs and incorporated on the CD-83 is an ultraviolet dryer to cure the ink. This system will produce a very high-quality imprint, incorporates rapid plate changeover, and is extremely cost-effective for even the low-volume producer. **Basic Specifications & Suggested List Price:** Printing compact discs in up to three colors at production rates of 20 parts per minute. Copy change over time of less than 2 minutes. Utilizes dry offset printing and UV drying.

### APEX MACHINE COMPANY

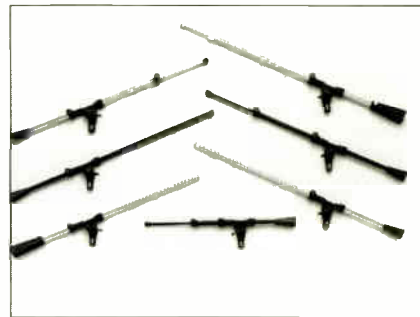
3000 NE 12th Terr.; Ft. Lauderdale, FL 33334; (305) 565-2739. **Product Name:** HSCD-1. **Contact:** Bob Coningsby, sales VP. **Date Product Introduced:** 6/93. **Product Description & Applications:** We have just introduced our new high speed HSCD-1 CD printing machine. This incredible new system can print a five color photograph on CDs at 100 parts per minute. The HSCD-1 uses a direct printing process and a photopolymer printing plate as the means of imprinting on CDs. The plates are secured to the machine via a segmented drum which can be preregistered offline to minimize the copy changeover time, and a five color photograph can be changed in less than two minutes. The HSCD-1 printer is modular and can be purchased as a one color machine, and additional colors can be added later. **Basic Specifications & Suggested List Price:** Printing compact discs in up to five colors at production rates of 100 PPM. Copy changeover time of less than two minutes. Utilizes direct printing and UV drying. Cost will vary depending upon specifications.

### ARTEL COMMUNICATIONS CORPORATION

22 Kane Industrial Dr.; Hudson, MA 01749; (508) 562-2100. **Product Name:** SL4000. **Contact:** Philip Bailey, sales mgr. **Date Product Introduced:** 3/93. **Product Description & Applications:** The SL4000 multichannel fiber-optic video transmission system provides 6 broadcast-quality video channels plus associated audio, data and alarm signals over a single optical fiber. Featuring digital time division multiplexed technology the SL4000 supports both point-to-point and multidrop video transmission applications. **Basic Specifications & Suggested List Price:** Exceeds RS-250C short haul ANSI standards, supports up to 6 digital audio channels for each video channel. 12-bit digital technology, modular design. List price: \$25,500-\$60,500.

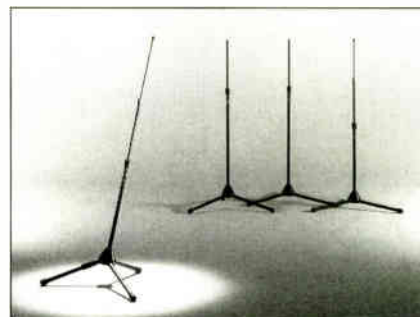
### ATLAS/SOUNDOLIER

1859 Intertech Dr.; Fenton, MD 63026; (314) 349-3110. **Product Name:** Atlas Sound® Performer Series Booms. **Contact:** Nora Steele, mkg. communication spec. **Date Product Introduced:** Spring 1993. **Product Description & Applications:** Atlas/Soundolier adds seven new Performer Series Booms to the Atlas Sound® microphone and equipment stand line. All models combine contemporary styling with an all-metal swivel clamp (patent pending) for greater user flexibility. Un que c-amp features Glide'n Position tubing, brake bushings for smooth horizontal adjustment, and an extra-strength steel T-bar for no-fall locking and simple one-hand adjustment. All versions include counterweights for optimum



**ATLAS/SOUNDOLIER**  
Atlas Sound® Performer Series Booms

microphone balance and stability. **Basic Specifications & Suggested List Price:** List prices range from \$55-\$85. Four models offer adjustable length tubing from 16 1/4" to 24 1/2", 25 1/4" to 38 1/2" and 32" to 51 1/2". Remaining models have a fixed-length tube of 34". Available in chrome or the video-preferred, nonreflective ebony as noted.



**ATLAS/SOUNDOLIER**  
Atlas Sound® Performer Series Tripods

### ATLAS/SOUNDOLIER

1859 Intertech Dr.; Fenton, MD 63026; (314) 349-3110. **Product Name:** Atlas Sound® Performer Series Tripods. **Contact:** Nora Steele, mkg. communication spec. **Date Product Introduced:** Summer/Fall 1993. **Product Description & Applications:** Atlas/Soundolier Introduces Performer Series Tripods to the Atlas Sound™ microphone and equipment stand line. Selection include low and full-height models, and easy-to-order tripod/boom combination, and two stands with unique tilt feature. Patent-pending tilt design allows upright or angled stand positioning with a single motion, awarding performers free movement. All stands feature instant set-up/tear-down without knobs or screws, all-metal housing, Glide'n Lock legs, and wearproof clutch. **Basic Specifications & Suggested List Price:** List prices range from \$100-\$135. Full-height models offer adjustable height tubing from 26'-63" and fold down to 23 3/4" for transport/storage. Low-height models adjust from 34'-63". Finished in nonreflective ebony.

### AUDIOLAB ELECTRONICS INC.

5831 Rosebud Ln., Bldg. C; Sacramento, CA 95841; (800) 624-1903. **Product Name:** CDS-2500 Continuous Degaussing System. **Contact:** Matt Hogsett, sales representative. **Date Product Introduced:** Fall 92. **Product Description & Applications:** The CDS-2500 is a continuous duty magnetic tape eraser, designed to thoroughly erase large volumes of audio cassettes, audio and data cartridges, 8 mm and VHS/Beta tapes. An adjustable speed conveyor belt provides a fast, one pass continuous operation, thus allowing the degausser to be closely matched with the operator and/or other machines input and output capabilities. Perfect for the audio/video duplicator and/or manufacturer. **Basic Specifications & Suggested List Price:** Effective gauss: 2500; gross weight: 120 lbs; dimensions: L 36", W 17", H 5". Price: \$4,495.

### BEC TECHNOLOGIES INC.

1101 N. Northlake Way, Ste. #3; Seattle, WA 98103; (206) 632-2431. **Product Name:** ProLine. **Contact:** Michael C. Creamer, VP sales/mktg. **Date Product Introduced:** 10/93. **Product Description & Applications:** New products: MP16/MX16. The MP16 functions both as an active 16-channel splitter and a premium-quality mic-to-line level preamplifier. Two discrete splits of line level outputs are provided for. The MP16 has two stage gain cont., for a total of 90dB of variable gain controlled by the MX16 remote. The MX16 remote gain control permits precise digital gain control of each of the 16 channels in .2dB steps from -30dB to +60dB of gain. **Basic Specifications & Suggested List Price:** AudioPlex AD16 input converter transmitter-16 channels of A/D \$2,995. AudioPlex DA16 output converter receiver/repeater 16 channels of D/A \$2,995. MP16 mic pre-amplifier/splitter \$3,995. MX16 remote gain controller with MIDI control \$795. FBI fiber-optic transceiver combines up to 4 AD16s, DA16s \$2,600. (for up to 64 channels of bidirectional audio and/or data control.)





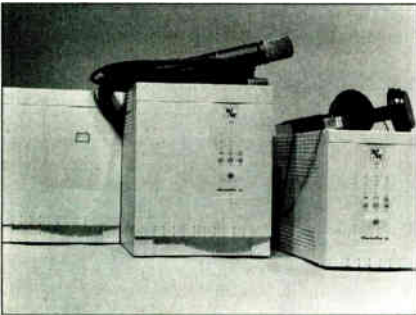


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mance. Our LCR-2400 automatically adjusts varying input voltages to provide full voltage support during low or high voltage conditions. In addition, isobar spike and line noise suppression is built in. **Basic Specifications & Suggested List Price:** LCR-2400 will maintain 120V±5% with input from 96V to 138V and comply with ANSI-C84.1 specification with input from 87V to 140V. Full 20 amp (2400 watts) voltage regulation. 12", 12 gauge, AC power cord (universal plug fits both 15 and 20 amp receptacles). 14 outlets, 2 isolated filter banks.

### KW CONTROL SYSTEMS INC.

RD 4 Box 194 S. Plank Rd., Middletown, NY 10940; (914) 355-5000. **Product Name:** Mini-Module. **Contact:** Bob DeGraw, assoc. engineer. **Date Product Introduced:** 1/93. **Product Description & Applications:** The new "Mini-Module" from KW Control Systems Inc. represents the latest in diesel generator technology. It features a top mounted diesel engine and a bottom mounted generator. Hence it's nick name "over-under." The unique design allows it to achieve a footprint of 60"x42". 40, 60, 80 and 100kW configurations are available. Ideal for backing up critical manufacturing, and audio/video facilities. Prices start at \$31,000. **Basic Specifications & Suggested List Price:** KW rating at 85°F at 300'; 40, 60, 80 and 100kW. Engine: 1800RPM Cummins diesel. Generator: Marathon. Horse power: 66, 102, 135 and 166. Voltage (standard): 208/120/3ø (other options available). Frequency: 60Hz. Fuel consumptions: 3.5, 4.4, 5.9, and 6.9 (gal/hour at full load).



KW CONTROL SYSTEMS INC.  
PowerPro

### KW CONTROL SYSTEMS INC.

RD 4 Box 194 S. Plank Rd., Middletown, NY 10940; (914) 355-5000. **Product Name:** PowerPro. **Contact:** Bob DeGraw, assoc. engineer. **Date Product Introduced:** 4/93. **Product Description & Applications:** KW Control System Inc., an industry leader in power systems for 25 years, recently introduced its new line of uninterruptible power supplies. UPSs provide superior line-conditioning and filtering, as well as uninterrupted backup during power transients, including blackouts. They are essential power protection for all computer-based audio and video applications. The PowerPro Series is available in sizes from 400VA to 18kVA, with backup times from 5 to 90 minutes. Prices start at \$449. **Basic Specifications & Suggested List Price:** Input voltage: 110, 120, 127VAC or 220, 230, 240VAC, nominal, user-selectable. Output power levels: 400VA-18kVA. Backup time: 5-90 minutes at full load. Front panel interface: ergonomic indicators including wiring fault, battery service, communication operation, system normal, bar graphs for input level, battery charge level, % load.

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### LEITCH INCORPORATED

920 Corporate Ln., Chesapeake, VA 23320-3641; (804) 548-2300; (800) 231-9673; FAX: (804) 548-4088. **Product Name:** Mix Box Stand-Alone Audio Routing Switchers. **Contact:** Mike Gardner, regional sales mgr. **Date Product Introduced:** NAB 1993. **Product Description & Applications:** The ASM-4041MB and ASM-4044MB 4x1 and 4x4 audio switch module mix boxes are designed to route balanced stereo audio signals, while the ASM-4081MB routes 8x1 balanced mono. All provide excellent specifications for critical AM/FM/TV broadcast and production applications. Designed to fit in a stand-alone, self-powered Mix Box frame, these units may be controlled from the front panel, or from an optional remote panel via a single coaxial cable. **Basic Specifications & Suggested List Price:** Hi-Z (>20K  $\Omega$  nominal) input impedance and 66 $\Omega$  (33 $\Omega$  each leg) output impedance. <0.02% THD and IMD at 22dBu out. >80dB crosstalk isolation, >70dB CMRR, >80dB S/N ratio, and  $\pm$ 0.1db frequency response, all from 20Hz to 20kHz.

### LEITCH INCORPORATED

920 Corporate Ln., Chesapeake, VA 23320-3641; (804) 548-2300; (800) 231-9673; FAX: (804) 548-4088. **Product Name:** X plus Series AES/EBU Routing Switchers. **Contact:** Mike Gardner, regional sales mgr. **Date Product Introduced:** NAB 1993. **Product Description & Applications:** The ASR-16X1 and ASR-8X8 audio serial router modules will provide trouble-free switching of AES3-1992-type digital audio signals with sample rates of 32, 44.1, and 48 kilosamples per second. They require one rear slot of an X plus Series frame, and receive both computer control and power from the frame. They may be used as direct replacements for the analog ASM-16Xplus and ASM-8Xplus audio switch modules, or operated as additional router levels. **Basic Specifications & Suggested List Price:** Transformer-coupled, balanced inputs and outputs at 110 $\Omega$   $\pm$ 10% impedance. 200mV input circuit sensitivity. Selectable equalizer for cable runs greater than 300' (100 meter). DB-25 connectors, with optional provision for breakout to XLR-type connectors.

### LITTLITE/CAE INC.

10087 Industrial Dr., Hamburg, MI 48139; (313) 231-9373. **Product Name:** Littlite Raklite. **Contact:** Sharon Suffolk, sales & mktg. **Date Product Introduced:** 1/92. **Product Description & Applications:** The new Littlite RL-10 High Intensity Raklite comes complete with a 12" flexible gooseneck, bright 5 watt halogen bulb, dimmer rheostat, 6 ft. cord and transformer. When mounted at the top of your rack, the Littlite provides illumination for an entire rack of lighting or audio equipment. Littlite's flexibility allows you to adjust illumination for patching or general rack service. The light is recessed into a sturdy black metal E.I.A. standard 1.75" high rack panel. It is available in single (RL-10S) or dual (RL-10D) gooseneck versions. **Basic Specifications & Suggested List Price:** \$99 single gooseneck, \$149 double gooseneck lamp. 12V. 110 VAC, 220 VAC.

### LOGITEK

3320 Bering Dr., Houston, TX 77057; (713) 782-4592. **Product Name:** Super-VU. **Contact:** Tag Borland, pres. **Date Product Introduced:** 8/93. **Product Description & Applications:** LED bar graph audio meter. Simultaneous VU, PPM, peakhold display has adjustable sensitivity and 0dB point. Up to 3 stereo meters fit in an IRU enclosure. Digital or analog inputs are available. Special modes display stereo image and audio density. **Basic Specifications & Suggested List Price:** 40 tricolor LEDs in each display. Average response: 35mS attack, 300mS release. Peak response: 0mS attack, 300mS release. Analog input: balanced bridging. Digital input: AES/EBU or S/PDIF. Prices from \$895 to \$2,295.



LOWELL MANUFACTURING COMPANY  
L78-77 Gangable Rack Frame

### LOWELL MANUFACTURING COMPANY

100 Ingram Dr., PO Box 385; Pacific, MO 63069; (314) 257-3400; FAX: (314) 257-6606. **Product Name:** L78-77 Gangable Rack Frame. **Contact:** John J. Lowell, sales & mktg. mgr. **Date Product Introduced:** 4/93. **Product Description & Applications:** The Model L78-77 is a gangable rack frame featuring an open-sided design for convenient accessibility to 19" electronic equipment. Frame is fabricated of Mig-welded 16-gauge CRS, and provides 77-1/8" of vertical panel space. Unit consists of frame, flush locking rear door and one pair of 10-32 tapped mounting rails. Optional equipment: locking front door, removable side panels and additional mounting rails. Textured black powder coat finish. Also available in vertical panel spaces of 61-3/8" and 70-1/8". **Basic Specifications & Suggested**

List Price: Vertical panel space: 77-1/8" (44 rack units); height: 84-19/32"; width: 22-1/8"; depth: 30". Optional equipment: front door L150-77; pair of removable side panels L142-77; additional set of mounting rails L12-77. Suggested retail price: \$1,034.

### MIDDLE ATLANTIC PRODUCTS INC.

PO Box 29; Riverdale, NJ 07457; (201) 839-1011. **Product Name:** Model FWS. **Contact:** Jay Franetovich, inside sales mgr. **Date Product Introduced:** 4/93. **Product Description & Applications:** The FWS rack-mount fixed writing shelf is ideally suited for control rooms as a writing or work surface. The unit additionally works well with computer keyboards. **Basic Specifications & Suggested List Price:** The FWS occupies 2 rackspaces (3-1/2). Shelf size is 18" deep x 19" wide. Mounting hardware is included. Suggested retail price \$106.

### MIDDLE ATLANTIC PRODUCTS INC.

PO Box 29; Riverdale, NJ 07457; (201) 839-1011. **Product Name:** TD-5. **Contact:** Jay Franetovich, inside sales mgr. **Date Product Introduced:** 4/93. **Product Description & Applications:** The TD-5 is a 5-space (8-3/4") rack drawer available in a black textured powder coat or black brushed anodized finish. When used with model DVHSP, VHS partitions these drawers are perfect for bulk storage of VHS and ADAT tapes. **Basic Specifications & Suggested List Price:** Featuring rugged steel and aluminum construction, the TD-5 incorporates a fully enclosed top, full extension ball bearing slides, and a spring-loaded slam latch and optional keylock is available. Suggested retail price \$203.10 (includes VHS/partitions).

### THE NEW TUBE CO.

PO Box 790202; Middle Village, NY 11379; (718) 894-2131. **Product Name:** TNT. **Contact:** Joseph A. Sausa. **Date Product Introduced:** 1/93. **Product Description & Applications:** The New Tube Co. has released a line of ceramic tube sockets for both 8 pin & 9 pin chassis or PCB configuration. These sockets can be used in amplifiers and control board applications. Flammability rating is extremely low because of the ceramic content, and they are very durable.

### OMNIRAX

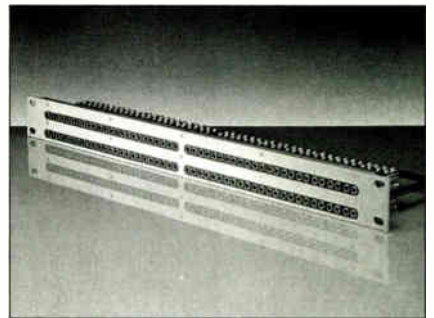
PO Box 1792; Sausalito, CA 94966; (800) 332-3393. **Product Name:** Mobi. **Contact:** Philip Zittell, VP sales & mktg. **Date Product Introduced:** 4/93. **Product Description & Applications:** Mobile Omnirax computer workstation designed to rackmount any digital recording system. **Basic Specifications & Suggested List Price:** \$399.95 suggested retail. Overall dimensions: 55.5"H x 28.75"D x 20.6"W. 115lbs. Desk surface: 19"x 28.5" for video monitor and worksurface. One lower bay 24"D w/16 rack spaces and a computer shelf. Sliding computer keyboard shelf. 4 rack space bridge for audio recording systems.

### OMNIRAX

PO Box 1792; Sausalito, CA 94966; (800) 332-3393. **Product Name:** Prostation Jr. **Contact:** Philip Zittell, VP sales & mktg. **Date Product Introduced:** 1/93. **Product Description & Applications:** A scaled down audio/video production workstation desk designed to create the perfect working environment for any multitrack hard disk recording system and associated peripherals. **Basic Specifications & Suggested List Price:** \$599.95 suggested retail. 42"H x 29.5"D x 60.5"W. 170 lbs. (overall dimensions.) Desk surface 29.5"H x 22"D x 60"W. One lower bay 22" D. w/8 rackspaces and a computer shelf. Vertically adjustable sliding keyboard shelf. 6-space bridge for more modules video monitor and nearfield monitors. Cable grommets. Heavy duty casters.

### RE AMERICA INC.

31029 Center Ridge Rd.; Westlake, OH 44145; (216) 871-7617. **Product Name:** RE d940 Digital Headphone Adapter. **Contact:** Jim Switzer, sales eng. **Date Product Introduced:** 4/93. **Product Description & Applications:** RE d940 digital headphone adapter allows direct monitoring of active AES/EBU or S/PDIF digital audio through analog headphones. RE d941 changing unit accepts up to 3 d940 digital headphone adapters. Great for trouble shooting digital audio chains or simple to use as a digital audio monitor. Automatic sample rate detection/lock to 32/44.1/48kHz. Auto muting. Belt clip package. **Basic Specifications & Suggested List Price:** RE d940 digital headphone adapter w/XLR cable \$485, RE d941 changing unit for three RE d940 units \$185.



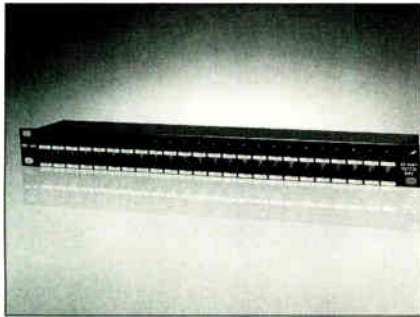
RE AMERICA INC.  
Rean Patch Bays

—SEE LISTING TOP OF NEXT COLUMN



**REAN PRODUCTS INC.**

16 Passaic Ave., Fairfield, NJ 07004; (201) 808-0063. **Product Name:** Rean Patch Bays. **Contact:** Joe Zunfrilli, pres. **Date Product Introduced:** 1/93. **Product Description & Applications:** Class 1 professional 96 point Bantam patch bay. Using Rean's cast frame Bantam jacks exclusively, which feature high grade palladium contacts welded to solid nickel silver spring contacts and plated nickel silver noses. The 'Class 1' chassis is made from precision die-cast aluminum. **Basic Specifications & Suggested List Price:** List price: \$469.



**REAN PRODUCTS INC.**  
Rean Patch Bays

**REAN PRODUCTS INC.**

16 Passaic Ave., Fairfield, NJ 07004; (201) 808-0063. **Product Name:** Rean Patch Bays. **Contact:** Joe Zunfrilli, pres. **Date Product Introduced:** 1/93. **Product Description & Applications:** 48 point, 1/4" patch bay. Modular system, no soldering or cutting wires to normalize, half-normalized, or to denormal, simply reverse connector module. **Basic Specifications & Suggested List Price:** Available configuration: mono jack/jack- List price: \$189. Mono jack/RCA-\$179. Stereo jack/jack-\$189.



**RTI-RESEARCH TECHNOLOGY INTERNATIONAL**  
M110 Tape Eraser with Steady-Drive™

**RTI-RESEARCH TECHNOLOGY INTL.**

4700 W. Chase, Lincolnwood, IL 60646; (708) 677-3000; FAX: (800) 323-7520. **Product Name:** M110 Tape Eraser with Steady-Drive™. **Contact:** T.A. Tisch, VP mktg. **Date Product Introduced:** 6/93. **Product Description & Applications:** High performance tape eraser. Versatile, erases all audio/video tape formats. -75dB metal, -90dB oxide erasure. Steady Drive™ cassette transport ensures that all tapes are erased at the proper speed. Convenient 115 VAC operation. Compact table top design. **Basic Specifications & Suggested List Price:** The compact, low-noise, easily operated unit sits neatly on table top. Its performance exceeds -75dB erasure of high-energy metal tapes, -90dB erasures of standard oxide tapes.



**SILTON COMPANY**  
The "Survivor" Shipping Case

**SILTON COMPANY**

3224 W. Saginaw Wy., Fresno, CA 93722; (209) 222-8121. **Product Name:** The "Survivor" Shipping Case. **Contact:** Bryan Neel, VP

mtg. **Date Product Introduced:** 10/92. **Product Description & Applications:** Silton's extra-heavy-duty shipping case. The Survivor style case is designed to survive the most rugged environment. The Survivor, with all recessed hardware has reinforced corners and edges giving your equipment maximum protection against the roughest handling. **Basic Specifications & Suggested List Price:** Silton cases are custom-designed to customer specifications. The interior of each case can include drop protection foam levels which will protect sensitive equipment in drops up to 30'. With Silton cases you're getting proper protection at manufacture direct savings.

**TAPE STORAGE SYSTEMS**

PO Box 5267; Walnut Creek, CA 94596; (510) 256-6006. **Product Name:** T.S.S. **Contact:** Ted Tripp, president. **Date Product Introduced:** 4/93. **Product Description & Applications:** High-density storage cabinet for all CDs and video cassettes. Made with built-in unbreakable aluminum dividers providing an individual slot or "mail-box" for each CD or cassette. Cabinets are for maximum efficiency of library control and CD or cassette access. Ideal for bar code library control systems. CD cabinets store between 560-800 CDs. Video cassette cabinets are available for VHS, Beta D2, D3, MII and U-matic static and mobile. **Basic Specifications & Suggested List Price:** High-density storage cabinet with built-in aluminum dividers providing individual storage space for each unit-CD or video cassette.

**VANS EVERS**

5815 6th St., Tampa, FL 33611; (813) 837-1224. **Product Name:** Clean Line. **Contact:** Mike VansEvers, owner/chief eng. **Date Product Introduced:** 7/93. **Product Description & Applications:** Very few modern power supplies are capable of filtering out the high-tech garbage deposited on the power lines by today's high-tech equipment. This garbage breezes through power transformers and regulated supplies and interferes with the low-level resolving power of your audio equipment. The Clean Line power conditioner is a highly effective power cleaner and spike protector. **Basic Specifications & Suggested List Price:** The 2Ru Clean Line power conditioner comes with 2 front panel On/Off switches, a 15A circuit breaker, and 14 rear-panel outlets. Three levels of noise filtration and 6 MOVs provide exceptional protection. The retail price is \$795.

**VCA ASSOCIATES**

7131 Owensmouth St., Suite B-87; Canoga Park, CA 91309-7961; (818) 704-9202. **Product Name:** VCA 2020. **Contact:** Harvey Rubens, pres. **Date Product Introduced:** 10/93. **Product Description & Applications:** The VCA 2020 utilizes surface-mount technology to realize a high performance Class A VCA which is functionally pin-compatible with the dbx 202 family of VCA modules. The VCA 2020 incorporates a pair of VCA Associates MTA 1537 Voltage Controlled Attenuator IC's in a proprietary new circuit to form a true, exponentially controlled (db/volt) VCA capable of gain and loss and free of crossover distortion. **Basic Specifications & Suggested List Price:** Price: to be announced. ≥112 dB dynamic range, ≥130 dB control range, ≥100kHz full power bandwidth at +20dB gain. THD at full output: ≤0.003 typical (unity gain), ≤0.015 max (any gain).

**VEGA**

9900 Baldwin Pl., El Monte, CA 91731-2294; (800) 877-1771. **Product Name:** Q600 UHF Wireless Intercom System. **Contact:** Robert Bell, mktg. mgr. **Date Product Introduced:** 3/93. **Product Description & Applications:** The Vega Q600 UHF Q+ Wireless intercom system is ideal for use in areas where VHF band saturation is a problem. The system features base station transmission in the VHF band with portable belt pack units transmitting in the UHF band. The Q600 provides continuous full duplex hands-off communications between up to 6 people, making it ideal for film, television, and broadcast crews. **Basic Specifications & Suggested List Price:** UHF belt pack transmitter provides 150 mW of power frequency stability of ±0.005%, beltpack receiver SNL-84dB; receiver distortion >1%; will interface with all popular intercoms; receiver frequency response: 70 Hz-7.5 kHz. Range- 1000 ft. Price: Q600 base w/1 transmitter-\$5199; Q600 w/6 transmitters-\$14,207.

**VEGA**

9900 Baldwin Pl., El Monte, CA 91731-2294; (800) 877-1771. **Product Name:** RMT-14 Wireless IFB Transmitter. **Contact:** Robert Bell, mktg. mgr. **Date Product Introduced:** 4/93. **Product Description & Applications:** The RMT-14 is a 4-channel private-line wireless IFB transmitter for use with Vega PL-2 dual-channel miniature receivers. It can be expanded to as many as four individual transmitters by adding internal modules. It includes audio processing that reduces noise and interference, in addition to expanding system range. The unit's XLR inputs accept line-level or can be compatible with most wired intercoms. **Basic Specifications & Suggested List Price:** Full 50 mW power output; operates 169-216 MHz; frequency stability- ±0.005%; audio frequency response: 70 Hz-8kHz; THD- better than 1%; SNL ratio- better than 80db. Price: RMT- 14/1- \$1497, RMT-14/4- \$3702.

Pro audio dictionaries and technical reference guides are available through the Mix Bookshelf catalog. Call toll-free (800) 233-9604 for your free copy.

**ONE STEP AHEAD**

**Coming in Mix:**  
**November 1993**

# Recording Consoles

- **TECHNICAL FEATURES**

Developments in Console Technology  
Consoles for Project Studios  
Commercial Production in Small Studios

- **AUDIO FOR FILM**

Sound for *Even Cowgirls Get the Blues*  
Digital Sound on Film Formats

- **INTERNATIONAL UPDATE**

Vancouver's Booming Post-Production Industry

- **LIVE SOUND**

Fall Tour Updates

- **BYTE BEAT**

Multimedia Authoring Systems

- **PRODUCER'S DESK**

Ministry's Al Jourgensen

- **DIRECTORIES**

North Central U.S. and Canadian Recording Studios

- **PLUS!**

Bonzai Lunches with Jackson Browne

**ATTENTION ADVERTISERS:**

Deadline for ad placement is the seventh of the month, two months prior to publication. Call (510) 653-3307 for a 1994 Mix Editorial Calendar, space reservations and complete advertising information.

# MIX



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# MIX READER SERVICE

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**1.** See the opposite page for a listing of Reader Service numbers for advertisers in this issue.

**2.** Circle the Reader Service numbers that correspond to each advertisement or editorial item in which you are interested. (Maximum of 20 numbers.)

**3.** Complete all information on the card below. Please check ONE answer for each question unless otherwise indicated.

**4.** Mail card postage-free!

**Important Notice to Readers:** Reader Service inquiries are mailed directly to the advertiser, who is solely responsible for sending product information. *Mix* does not guarantee advertiser response.

## MIX Reader Service

P.O. Box 5069, Pittsfield, MA 01203-9856

Issue: *Mix*, October 1993 Card Expires: February 1, 1994

Name \_\_\_\_\_ Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ Zip \_\_\_\_\_

Phone (\_\_\_\_) \_\_\_\_\_

**1) Your company's primary business activity (check ONE):**

- 01.  Recording studio (including remote trucks)
- 02.  Independent audio recording or production
- 03.  Sound reinforcement
- 04.  Video/film production
- 05.  Video/film post-production
- 06.  Broadcast/radio/television
- 07.  Record company
- 08.  Record/tape/CD mastering/manufacturing
- 09.  Equipment manufacturing (incl. rep firm)
- 10.  Equipment retail/rental
- 11.  Contractor/installer
- 12.  Facility design/acoustics
- 13.  Educational
- 14.  Institutional/other (please specify) \_\_\_\_\_

**2) Your job title or position (check ONE):**

- 15.  Management—President, owner, other manager
- 16.  Technical & Engineering—Engineer, editor, design engineer, etc.
- 17.  Production & Direction—Producer, director, etc.
- 18.  Sales & Administration—Sales rep, account executive, etc.
- 19.  Artist/Performer—Recording artist, musician, composer, other creative
- 20.  Other (please specify) \_\_\_\_\_

**3) Your role in purchasing equipment, supplies and services (check ONE):**

- 21.  Recommend the purchasing of a product or service
- 22.  Specify makes, models or services to be purchased

- 23.  Make the final decision or give approval for purchase
- 24.  Have no involvement in purchasing decisions

**4) Your company's annual budget for equipment, supplies and services:**

- 25.  Less than \$50,000
- 26.  \$50,000 to \$149,999
- 27.  \$150,000 to \$249,999
- 28.  \$250,000 to \$499,999
- 29.  \$500,000 or more

**5) Purpose of Inquiry:**

- 30.  Immediate purchase
- 31.  Files/future purchases

**6) Where you got this copy of *Mix*:**

- 32.  Personal subscription
- 33.  Recording studio/production facility
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**7) Where your audio-related work takes place (check all that apply):**

- 37.  Commercial (public) production facility
- 38.  Private (personal) production facility
- 39.  Corporate or institutional facility
- 40.  Remote or variable locations

Circle number 250 and we will send you a subscription application, or use subscription form in this issue of *Mix*

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## MIX Reader Service

P.O. Box 5069, Pittsfield, MA 01203-9856

Issue: *Mix*, October 1993 Card Expires: February 1, 1994

Name \_\_\_\_\_ Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

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Phone (\_\_\_\_) \_\_\_\_\_

**1) Your company's primary business activity (check ONE):**

- 01.  Recording studio (including remote trucks)
- 02.  Independent audio recording or production
- 03.  Sound reinforcement
- 04.  Video/film production
- 05.  Video/film post-production
- 06.  Broadcast/radio/television
- 07.  Record company
- 08.  Record/tape/CD mastering/manufacturing
- 09.  Equipment manufacturing (incl. rep firm)
- 10.  Equipment retail/rental
- 11.  Contractor/installer
- 12.  Facility design/acoustics
- 13.  Educational
- 14.  Institutional/other (please specify) \_\_\_\_\_

**2) Your job title or position (check ONE):**

- 15.  Management—President, owner, other manager
- 16.  Technical & Engineering—Engineer, editor, design engineer, etc.
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—FROM PAGE 99, AL SCHMITT

both Roger and I. I mixed it and did most of the overdubs. It was a funny record, because we did a demo with Gary Katz, the producer, for the motion picture company, and they loved it. Then we went into the studio to do the real record, and they could never capture the same feeling. So they ended up taking everything off the demo except the basics and starting again. And that's what we used. **Bonzai:** Steely Dan were notorious for taking a long time on records. Did this work help you to refine your abilities to take different sessions and combine them so that they sound seamless?

**Schmitt:** They do sound great, and the amazing thing is that we didn't have computers. I had never mixed a record that took *ten bouts* to mix, ever in my life. And I don't use a lot of limiters. When we were starting to mix the tunes I mixed, they must have brought in 15 limiters! But working with Gary Katz was great. They left me alone to get my thing together, then they sat down and did their refinements, and it worked out great. But I had never worked on any record that long. I would get a mix and think it was great, and they'd want the guitar up in one spot. We'd get that, and then they would want something else. It went on and on, but it did get better and better. It was hard work, and frustrating, and the concentration you need is amazing when you're doing it all at one time, but when finished, we had great records.

And I did a record with Dave Mason, *Alone Together*, with Bruce Botnick, which is one of my favorites, and it still holds up. This was around 1970, and I hadn't been engineering for a while, because as a staff producer, you weren't allowed to touch the board.

**Bonzai:** How times have changed...

**Schmitt:** They sure have. It was Tommy LiPuma who asked if I would mix the Dave Mason record. I told him I didn't think I could do it anymore. He said I had to do it, so I said I would if he would let me know if anything was sounding bad with no hard feelings. I didn't want to scuffle around and embarrass him, or myself. Anyway, it turned out well, and that was the start of me getting back into engineering. After that, I realized engineering was my first love. I en-

joy producing records, but engineering is where I feel the best.

**Bonzai:** Speaking of producing, didn't you do the Jefferson Airplane?

**Schmitt:** Four albums: *After Bathing at Baxter's*, *Crown of Creation*, *Bless Its Pointed Little Head* and *Volunteers*. **Bonzai:** How did you work, taking all that LSD?

**Schmitt:** [Laughs] I didn't take it every day! Although they did try to spike us every day. I got spiked when we were doing the first Hot Tuna album. I was nailed. The engineer was Allen Zentz, and I thought I was drinking apple juice. I was working in a remote truck, and I had my pad out, ready to go, and all of a sudden the sides of the truck started to breathe. I looked at Allen and said, "Buddy, you are on your own tonight." I rarely did any drugs while I was working. Some engineers could smoke joints and keep working, but I couldn't. I didn't drink on the job either, but afterward we all got into it pretty hot and heavy.

You know, working with them really changed my life. I had to rethink where my priorities were. Before that, I was a company guy, and I never asked why. Then I started to question authority and ask why we couldn't do certain things. I found that in a lot of cases they didn't really have any answers. It was just policy, and my life changed.

**Bonzai:** Let's move on to your fifth Grammy—for *Toto IV*, which included "Africa" and "Rosanna." These guys were children of studio cats you had worked with. Did this help?

**Schmitt:** Actually, it did help quite a bit. I had worked with Marty Paich for years, and his son David used to come by the studio when he was a little kid of 8 years old. He would sit around and watch while we were recording, like with Sammy Davis, Jesse Belvin, Ray Charles and Betty Carter, with Marty as arranger. And I had done a lot of work with Jeff Porcaro, and it was he who asked if I would work with Toto. He was the easiest guy to

get a drum sound on and one of the nicest guys you could imagine: He gave both of my sons drum kits. He made everyone feel comfortable and at home. I loved him dearly and miss him a lot. I had done about a dozen albums in a row, and he was the drummer on all of them.

I knew them all, good studio musicians, and we did that record over at Sunset Sound, one of my favorite studios. We set up the rhythm section, with Lenny Castro on percussion, David Hungate on bass, David Paich, Jeff and Steve Porcaro, and Steve Lukather. Second take was "Rosanna," and that was it. Everything just fell into place, and we knew we had a winner. I had that same feeling working with Natalie on "Unforgettable." There is a special signature on the session, a unique quality.

I had a rough tape of "Unforgettable" with both Nat and Natalie singing all the way through. I was off to Hawaii to do a record with George Benson. I played it for him, and his mouth just dropped open. He instantly recognized it as a hit. David Foster produced that record, and it was a lot of fun working with him and Dave Reitzas.

**Bonzai:** Didn't you work with Bing Crosby?

**Schmitt:** Yes, I did two sides with him when I first came to RCA out here in California. We started at nine in the morning. He came in early, was smoking his pipe and reading the paper. He would sing, and during the eight-bar instrumental passage, he turned his head and continued reading—might have been the racing form—and when it came time to sing again he just turned his head and started right where he was supposed to come in. Amazing.

Singers like Bing Crosby, Rosemary Clooney, these old-time singers had microphone technique. They knew when to lean in and when to back off. I didn't use limiters; it was all hand limiting. I once did a record with Rosemary Clooney, and

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when to  
back off.**

Perez Prado and this roaring Latin band, with no isolation booth. I would set a level for her, and that was it; I never worried about it. Such a pleasure. Like working with Frank on these sessions.

Now we have all this gear, and a lot of the artists really never had to learn about microphone techniques. You hear some records, and it's obvious that they got too loud and the limiters had to come in—sometimes the vocals almost disappear.

**Bonzai:** Can you think of anything about your style as an engineer that is unique to you?

**Schmitt:** Basically, I am an acoustical engineer. I like working with orchestras, and the more players there are, the happier I am. My big thing is microphone technique. I still use the old 67s, 47s, 49s, M-50s, with very little EQ. The assistants look at me and wonder sometimes. I use very little limiting. Maybe a little on the bass, sometimes on the vocal. I try to be in the studio, listen to what it sounds like there and try to capture that. I don't have that Al Schmitt identifiable drum sound. It's the sound of the drummer I am working with.

**Bonzai:** Did you ever really screw up, erase a track?

**Schmitt:** [Laughs] Oh yeah, I did it one time bad with Tommy Dowd. We were joking around and running some tapes, which were mono at that time. I said, "What would you do if I went like this?" and reached over like I was going to hit the Record button, and I actually did it and erased a section of the tape. We spent about eight hours going through all the outtakes to piece it back together.

Another time, we were doing a Gillette commercial, with a huge orchestra. We had a mute switch on the console where you could hear everything, but it would mute what was going to the tape machine. At the end of a take, I would throw that switch, and it would keep all the extraneous stuff off the tape. One time, I forgot to throw it back, and I missed a 30-second commercial. The band had left, and I was rewinding the tape and realized we had a big blank section. I panicked and ran to get the producer. The band was outside grabbing cabs, but we got everybody back in and got the spot.

Yeah, I've screwed up. We all do at one time or another. I try to explain to the guys I am working with, the second engineers, that we are

human and we screw up. But if you do screw up, just let me know, and I will take care of it. And then just forget about it. I've seen so many guys make a mistake, and it stays on their mind, and they keep screwing up. They fall apart. I tell them to come to me first, and I try not to get too crazy with my assistants. I depend on them a lot more than most engineers. I ask for ideas, and I can't keep up with all the new outboard gear. I rely on good people, like Charlie Paakkari and Peter Doell here at Capitol for this Sinatra project. Jim Giddens is out there in the room running around. This has really been a big team effort.

**Bonzai:** Who has helped you the most in your career?

**Schmitt:** Well, I can't give enough credit to Tommy LiPuma. He gives me the freedom I like. Stu Levine is a producer I really enjoy working with. Great sense of humor, keeps the session light—one of the great guys who don't become overly impressed with their own importance. David Foster is a good musician, knows how to handle people, very pleasant to work with. But if I was

given the ultimatum that I could only work with one guy for the rest of my life, it would be Tommy LiPuma.

**Bonzai:** Who are some engineers you admire?

**Schmitt:** Engineers who consistently do good work: Bruce Swedien, Bill Schnee, Elliot Scheiner, George Massenburg, Lee Herschberg, Kevin Killen, Allen Sides, Niko Bolas, Joe Ferla, Don Murray, Ed Cherney... I'm sure there are a lot of great ones I didn't mention.

**Bonzai:** You go all the way back to an era when engineers didn't get much credit. It must feel nice today...

**Schmitt:** Well, there was a time when your name never went on the album. Then there came the time when you were listed. Later on, the engineer got prominent listing, but now, they are starting to put your name behind the programmer. So I think you gotta demand some good position, assuming that you have done some good work. ■

*It's a little-known fact that in his youth roving editor Mr. Bonzai ran with the Rat Pack: He was the one who always picked up the tab.*

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## PRODUCER'S DESK

—FROM PAGE 109, TONY VISCONTI

house in Philadelphia so he can  
make *Young Americans II*."

*I've seen Bowie refer to the period  
when Heroes was made in Berlin as  
sort of a haze to him. I guess it was  
one of his more decadent periods.  
What sort of responsibility did you  
have to keep sessions going in a co-  
herent fashion?*

I'll be perfectly honest with you, be-  
cause David is honest about it. I wit-  
nessed David taking a lot of drugs  
around *Young Americans*, and I was  
no angel myself, though I'd usually  
limit my drug taking until after the  
session in a very recreational way.  
And I must go down on record as  
saying I haven't taken any drugs at  
all for about ten years now. But with  
*Low* and *Heroes*, he was actually  
nowhere near drugs. Those were re-  
habilitation albums for him. On *Low*,  
there was nothing available except  
French wine. And we specifically  
went to Berlin because drugs were  
difficult to get there. *Scary Monsters*,  
on the other hand, was another  
story. [Laughs] We had a little slide  
back to decadence.

*What do you gain from working  
with the same artist for six albums  
in a row?*

Well, obviously there's real teamwork  
going on. We were a damn good  
team. You pick up where you left off,  
and hopefully it gets better, as long  
as the artist is making a commitment  
to improving and going forward, like  
David used to be—I find most of  
what he's done the last ten years is  
pretty retro; nothing very adventurous.

*Have you ever had artists rebel  
against your inclination toward  
meticulous recording?*

All the time. It's a constant battle for  
quality. [Laughs] It started with Marc  
Bolan. He never saw the point in  
getting a good drum sound—except  
on the mix; *then* he wanted the big  
thumping kick drum. So with him, I  
started to use more tracks for drums.

*What was your experience with the  
Boomtown Rats like?*

Oh, it was a nightmare. It was like a  
Stephen King novel—it starts out in  
an innocent little village somewhere.  
Then there's that little touch of evil  
that starts to grow...

*You're not going to tell me that "St. Bob" Geldof is difficult to work with...* [Sarcastically] *Not at all.* [Laughs] He's difficult, and he knows it. He's a good performer, a great songwriter, but you have to keep him out of the mixing room. Apparently, he wants everything to sound very sizzle-y and treble-y, so I used to mix a really fizzy top just for him. I used to put this glistening sound on the cymbals, and he loves to hear his sibilance, which was hard to get on a vinyl record. Then I said, "Bob, there's a limit. We can't put too much of this on tape." His drummer told me, "You think that's bad, he goes home with the mixes, and he takes all the bass off his hi-fi set, and he adds more treble!" It was then I realized I must be dealing with a deaf person! [Laughs]

It's usually that artists get wacky about 80 percent into the album, or even earlier, and then they go absolutely nuts. They think it's going all wrong, and then it hits the fan when they try to take control. They usually don't know how to do certain things, so they'll come up with wild guesses and all that. The two Boomtown Rats albums I did sort of went in that direction. Sonically, I'm not very proud of them, because they sort of slipped out of my control.

*Were you comfortable wearing both the producer and engineer hats on so many projects?*

Usually, I wear both hats comfortably. Lately, I'm not too fond of mixing, whereas that used to be my favorite thing. It's only because, over the past five years, virtually everything I've mixed has gone over to another mixer anyway.

*Who's making that decision?*

Sometimes it's the artist. They want the benefit of all the worlds possible. They keep remixing with people; they might even edit your mix into someone else's mix. Or some A&R person might think it's cool to have someone else mix the album. A lot of times, it's not the best decision to get someone on the outside to remix the album. They don't know why you put a certain track in a certain place, they don't know what level it should be at, and the whole original concept is being placed in the hands of a third party who doesn't know what went into that concept.

*I've interviewed remixers who say*

*the same thing, except they view it as this good thing: "I don't have to worry about what the producer intended."*

That's right. They're doing it for bucks, and there's no heart in it most of the time. They're bypassing the months of blood, sweat and tears that went into making those sounds, and that's

**The technical tricks might make the music sound good sometimes, but they don't make the music.**

what music is about—not technical tricks. The technical tricks might make the music sound good sometimes, but they don't make the music. We—the musicians and the producer—make the music.

In the '70s, the vision of the producers and artists was always respected—you would *never* tamper with a Led Zeppelin album or an Elton John album or a Queen album. You'd get your balls cut off. The manager would have your guts for garters if you went near it. Now there's no protection from it. If someone told me they got their 6-year-old son to remix someone's album, I'd believe them. It's lawless.

*Is that because the record companies have reasserted control over their product?*

I think so. The people at the top are not that experienced. There are very few musical people in the business now—you might as well be selling soap or cereal. It's reduced music to a commodity, and quite a disposable one, too.

*Have your budgets shrunk?*

Of course. Now the video is more important in some companies' eyes. Two videos cost more than my entire album budget.

But it'll work out. There's rebellion in the air again. You see young groups coming up, and they're feeling very strongly about their music, and now people have 8-track digital machines that allow them to make great-sounding music in their own houses at a leisurely pace instead of paying big bucks for a studio. This is

going to change everything.

I can see an end of producers eventually, because it's no longer a great mystery of how to make a record. There are zillions of books on the subject, whereas when I started 25 years ago, there were none whatsoever. Now, the information is available to anyone.

*At this point, does being "Tony Visconti, world-renowned record producer" help or hurt in getting jobs? Are some people as intimidated by your track record as they are attracted by it?*

I've found that it's 50-50. Sometimes I like a group, they like my work, and then I go into a room and they start trembling. I realize at that time that it's not going to work out, because their fear factor is so high. That's happened to me several times in recent years. It can be discouraging, but I try to keep my eyes and ears open. I listen to demo tapes. I'm not so successful that I don't have to listen to anything anymore. I love music, and I think rock is the best genre we have. You can do anything in it, and it's still called rock. ■

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# FEEDBACK

## SOME MORE HISTORY

Only recently was I shown the article in the September '92 *Mix* about the life of film sound pioneer James G. Stewart. It is heartening that, in the pace of today's technology, you find space to report on the history of sound recording. Unfortunately, Larry Blake's "Very Short History of Film Sound Techniques," which accompanied the Stewart article, contained several historical inaccuracies.

The sound-on-disc system used to record *The Jazz Singer* was not, as Mr. Blake reports, "the most mature and highest-quality format." The disc system was actually cursed by projectionists across the country, was studio-bound and could not be used for location recording; it was not used by any studio other than Warner Bros. because of its many inherent problems, and it was little more than a complicated, convoluted combination of two existing technologies. Alone, these facts don't negate Mr. Blake's assertions, but the fact that there was a competing sound system available that suffered none of the above problems does.

The Case Research Lab's sound-on-film system was used publically and had entertained thousands of theater-goers for three years prior to the release of the often-misrepresented WB "milestone." The Case system was used for all of the de Forest Phonofilms from 1923 until the end of 1925, and by Fox from 1926-32. Fox Movietone News continued using the system until 1937. It could do all the things the disc system could not. Due to the abilities of this system, in 1927 Fox had the only talking newsreel.

The subsequent Western Electric system that replaced the Case system was developed, in part, by

E.I. Sponable at the Fox Movietone studios in New York. The Case system was later abandoned, not because it wasn't the best, but because further developments of the W.E. system were at no cost to Fox films.

In short, sound films were a success, but sound-on-disc was a mistake.

*Peter L. Jones*

Director, Case Research  
Lab Museum  
Auburn, NY

## BEFORE SONY

I was very interested to read your "N.Y. Metro Report" piece on Sony's lavish new audio/video facility in Manhattan. I thought your readers might appreciate some of the earlier, lesser-known history of the building. My grandfather, Theodore W. Case, renovated the structure in 1926 to house his new ventures, the Fox-Case Corporation and Movietone News. The purpose of the partnership with William Fox was to exploit my grandfather's new technology, talking pictures.

460 West 54th Street served as both research lab and studio for the duration of their association. It was the world's first "purpose-built" soundstage (i.e., a structure designed and constructed specifically for recording sound and picture). Sony's new home is the site of several other important firsts, including the production of the first sound newsreels. Among the most dramatic of these was sound footage of Lindbergh's transatlantic takeoff. The film was rushed by truck to West 54th St. for processing and caused a sensation when it played that very evening to standing-room-only crowds at the Roxy Theater in Times Square.

After my grandfather retired, his assistant, E.I. Sponable, continued to work in the 54th St. facility and was awarded an Oscar in 1953 for his role in the invention of Cinemascope. Sponable subsequently developed an opaque screen, which was transparent to sound, allowing for the placement of speakers "behind" the action, for heightened realism, as well as the first system for recording stereo sound film. All of these technologies were invented and perfected at the West 54th St. lab.

And kudos to the people at Sony for their impressive new start.

*Michael Case Kissel*

New York City

## ANALOG RULES!

I enjoy your publication very much, but as an analog enthusiast I often feel that *Mix* is turning all-digital. I think readers would really enjoy a "Special Analog Issue," presenting the views of successful producers, engineers and artists who have found that they prefer the sound of analog recorders. There is a lot to be said for the format, and I think it is only fair that you present both sides and let the readers decide for themselves. I would hate to see your subtitle change from "Professional Recording..." to "Digital Recording..."

*Tucker Martine*

Seattle, WA

P.S. Loved the Eno interview!

## MEMO FROM STUTTGART

I wish to comment on two items in the June *Mix*:

First, with regard to your article on miking acoustic guitar, I'd like to point out that one of your interviewees, Bob Norberg, is, in addition to being an exceptional engineer, the designer and manufacturer

er of one of the finest lines of studio monitors available. Unfortunately, Norberg monitors are only in the hands of a few hundred people, because Mr. Norberg does not have a major distributor. But I'll put my Norbergs up against anything else on the market.

Second, with regard to your piece on Jed Leiber [in "Recording Notes"]: Don't get me wrong; I think Jed is a very talented individual (as is his brother Oliver), and I don't begrudge either one of them their success. But frankly, it's nothing short of ludicrous for your writer to suggest that, in the music business today, their career successes were accomplished "without benefit of their father's [songwriting legend Jerry Leiber] connections." Get real, folks! Anyone who's worked in this industry for more than an hour knows that it's a business of connections and relationships.

Do you honestly believe Jed and Ollie Leiber simply "hit the streets" on their own, without ever getting a stray phone number or two from dad? In all those years of growing up in a household immersed in the biz, do you really purport that neither son ever made a powerful friend/acquaintance or three? Is it a coincidence that both are now successful writer/producers in these highly competitive days? Talent is only part of what it takes to make it in this business. Having an inside line to the biz is a decided advantage, and I doubt if either Leiber would argue the point.

*Daniel Keller*

Listen Productions  
Stuttgart, Germany

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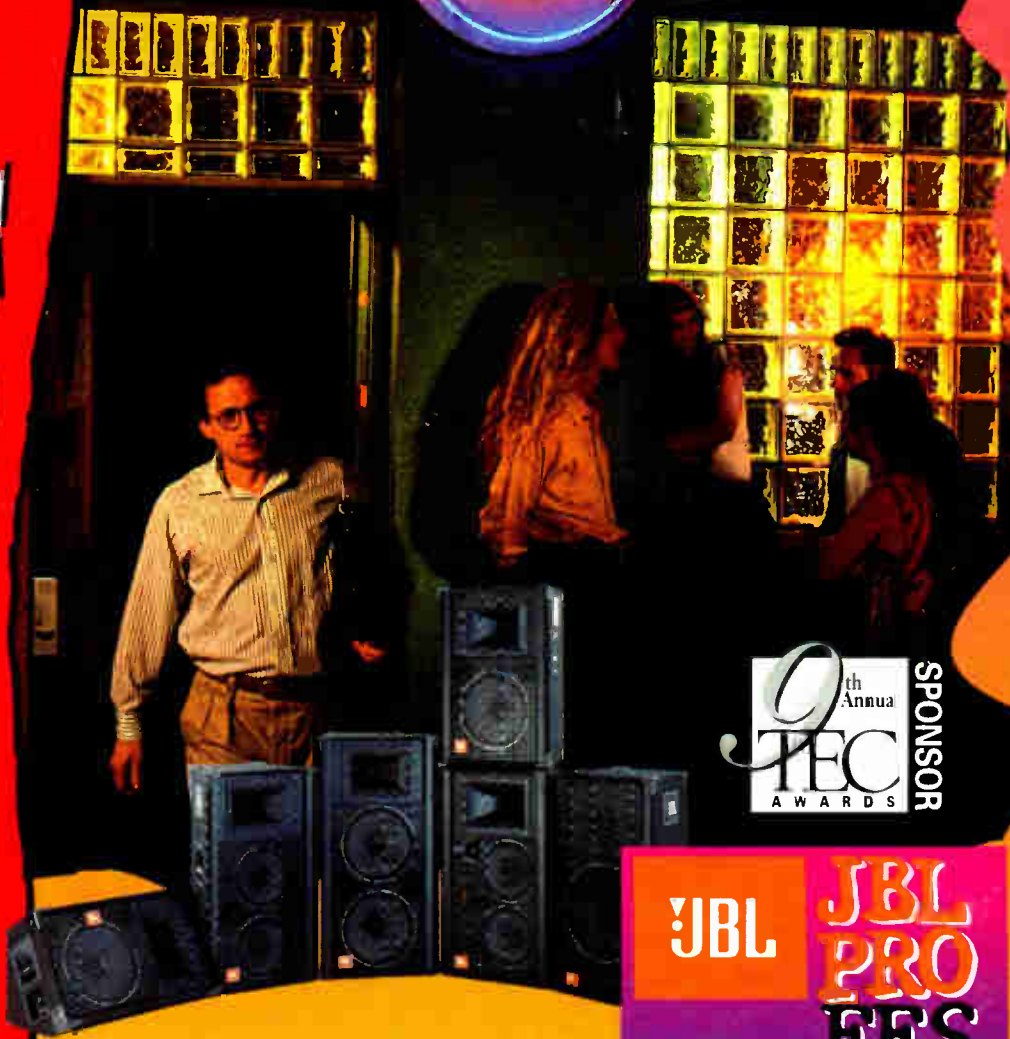
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