

September 1991

Recording ■ Engineering ■ Production

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REP

The Pro Audio Applications Magazine

AES

SHOW PREVIEW

PRODUCT DIRECTORY
PRODUCT PREVIEW
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MEGAS STUDIO

Circle (4) on Rapid Facts Card

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September 1991

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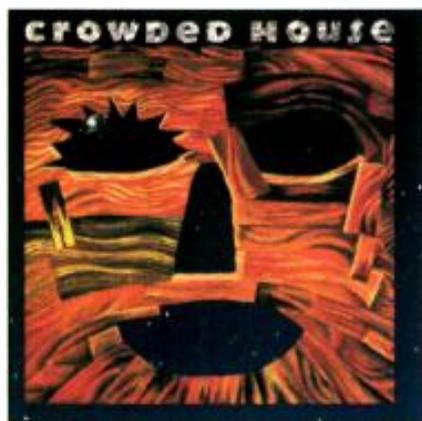
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A unique digital effects processor with analog and digital inputs and outputs, time code automation, and magnificent sound.

There may be digital effects processors that rival some of the 300's features, but you'll never find one with them all. The 300 delivers precise delay and stereo pitch shifting, as well as stunning



Connectivity redefined

The 300 redefines connectivity standards for digital signal processors. Unique analog and digital circuits accept analog signals or digital signals in the consumer SPDIF or professional

Total MIDI control

With the 300's real time MIDI automation you can record parameter changes on most any sequencer. The 300 also includes Lexicon's Dynamic MIDI[®] allowing you to control the 300's effects parameters from any MIDI controller.

And of course, the sound is superb. The 300 delivers nearly unmeasurable distortion and exceptional phase linearity through the use of state-of-the-art converters.

They're so advanced you can use their outputs as a system reference.

The 300 joins the Lexicon family of digital effects processors. From the economical LXP-1 to the world renowned 480L, they all share the Lexicon Sound.

For more information about the 300 or any of Lexicon's products, call (617) 736-0300, FAX (617) 891-0340, or write Lexicon, Inc., 100 Beaver St., Waltham, MA 02154.

reverb and ambience. It automates sound changes with SMPTE/EBU time code. And it inputs and outputs analog, as well as consumer and professional digital formats — in any combination. All with magnificent Lexicon Sound.

The 300 is a powerful tool in audio for video applications where time code synchronization is essential. And in digital video editing, the 300 ensures that scene changes are handled smoothly — in the digital domain. Because the 300 has digital inputs and outputs, it's the perfect choice for RDAT and CD mastering. And for music production there is an incomparable set of sounds, as you would expect from Lexicon.

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You can then select between analog and consumer or professional output formats, regardless of the input format.

Consumer in, professional out, analog in, digital out. The 300 handles them all. You can even mix analog and digital signals.

This kind of connectivity just isn't available anywhere else.



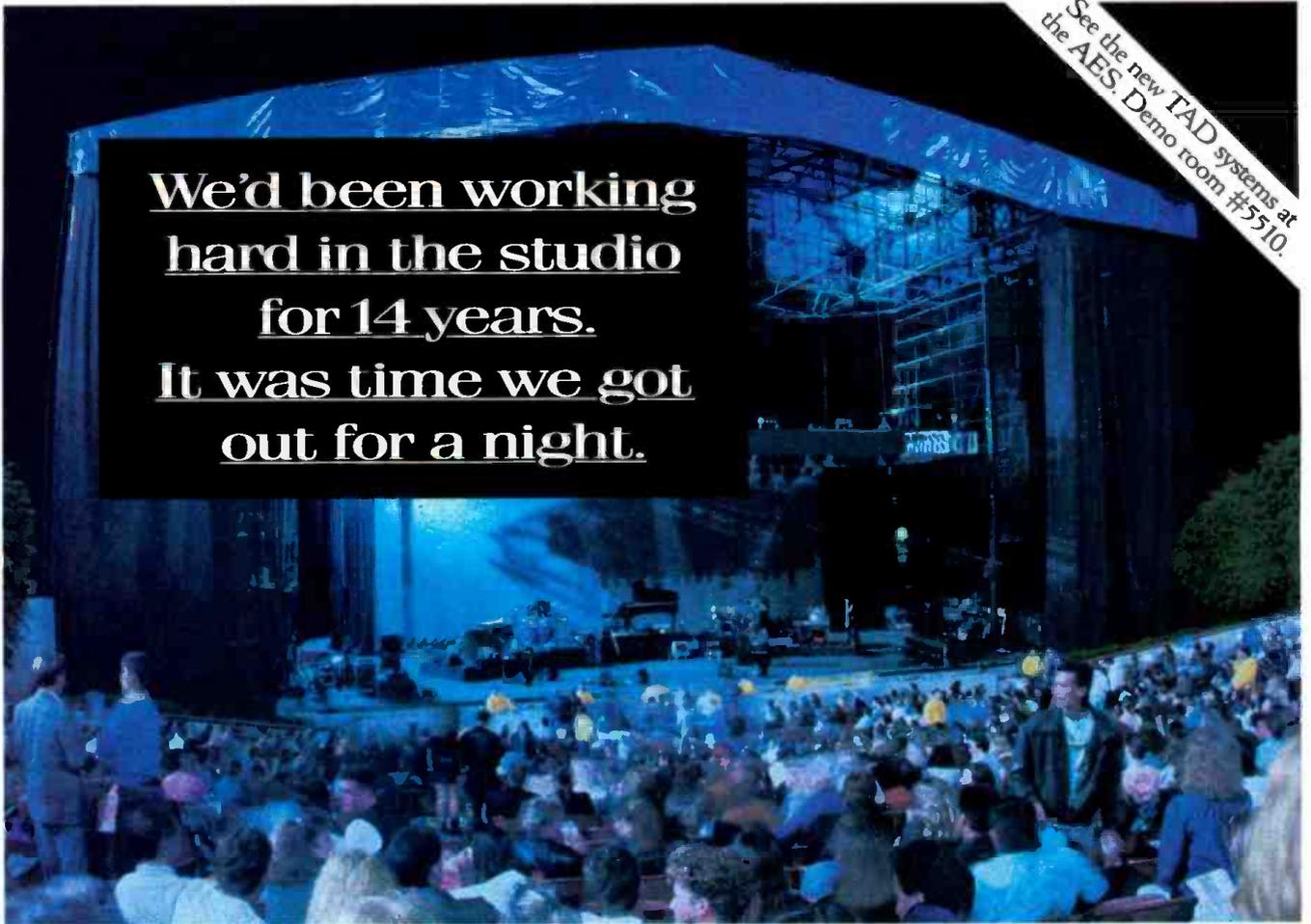
Lexicon
The Art and Science of Sound

See us at AES Show
Madison Suite 1316-1323

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See the new TAD systems at
the AES. Demo room #5510.

We'd been working
hard in the studio
for 14 years.
It was time we got
out for a night.



Spending years on end cooped up in small, dark rooms with a bunch of engineers takes certain special qualities. Durability, for one. We've always been known for that. Of course, clear, uncolored sound quality doesn't hurt, either. Or hand-assembled components, with gap precision to plus or minus one-millionth of an inch.

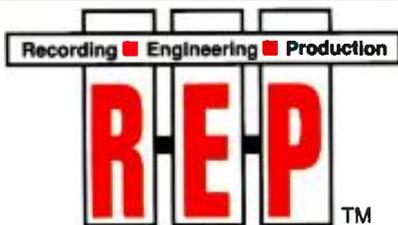
These features got TAD speakers into studios like Record Plant, NOMIS and Masterfonics. And the same features are now getting us out of them.

See, we had this funny idea that if TAD could make music sound terrific in a small room, we could make music sound terrific in a huge arena. And every outing we've had with Maryland Sound has proved us right.

Not that we won't still work our woofers off in studios from L.A. to London all day. But, at night, we'd like to get out and jam more often.

TAD Technical
Audio Devices®

Pioneer Professional Products Division



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R·E·P is an applications-based publication targeted at professional individuals and companies active in the commercial business of studio and field recording, audio for video, live sound production and related fields. Editorial content includes descriptions and demonstrations of audio production techniques, new products, equipment application, maintenance and audio environment design.

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From the Top

By Mike Joseph, Editor

How We Buy: Past Perfect/Present Tense

It's probably not something we think about very often - the process whereby we "discover" a piece of gear or software, locate a source for purchase and write out the check. It used to be a pretty easy thing. Any large community worth its demographic standing had several pro-audio shops where racks of processors could be punched-up and compared with real-live signal applied. Smaller towns had guitar/keyboard shops with pro-audio alcoves, where lower-priced to semi-expensive gear could be sampled and selected.

The big items — boards and digital multitracks — have more or less always been factory direct, with some outlet exceptions existing in a few selected larger coastal and land-locked markets. The majority of middle-priced audio gear in America comes through a dealer. Mics and consumable supplies come mail-order or through the auspices of a local dealer - any dealer, probably the one with this week's lowest price. That's been the traditional reality of the "sales channel."

How you buy and who you'll talk to will be quite different in the future.

But recently, along with the slowdown of the economy, the down-scaling of technology to smaller boxes that do more, and the stretching out of receivables on accounts-due, the sales channel has been in dire straits.

The reasons behind the situation are varied but easy to understand. Today's record buying public is smaller than yesterday's, with the largest "population bump" 30-something set out buying screen windows and baby's Adidas, not Rap CDs. On the video and film side, a lot of audio production has moved in-house, using tradi-

tional techniques and equipment. Also, today's gear does more per piece, performs better for less money, and is arguably easier to comprehend right out of the box. It needs less "hand holding" by dealer personnel, and you need fewer pieces. This all bodes ill for dealers.

In short, there isn't a manufacturer out there who won't confide the details behind the new Nineties reality: How you buy and who you'll talk to for information will (with a qualifier) be quite different in the future. The qualifier? Small inexpensive items and currently mail-ordered pieces will most likely maintain their existing avenues of distribution. So too will the really big items, with their level of direct factory tech support remaining intact. But everything in the middle. . . .

So what do you do if your normal purchasing outlet closes? The gear is still being made, but who's selling it? Is there a solution to this dilemma, maybe an alternative to the current audio industry reliance on dealers?

Let's look at the computer world. Analogous to equipment in pro-audio, it has four or so levels of activity: big mainframes and mini's (factory direct with technical sales support), personal computers (dealer and some factory outlet mail order), peripherals and software (dealer and mail order) and consumables, like paper, disks and toner cartridges (some dealer, but almost exclusively mail order).

We all understand how dealers and factory sales work. Someone gets in your face, you ask them questions, maybe poke at gear, make a choice and determine the means of payment. Mail order is simple too, as it mostly involves easy-to-understand gear or software programs. You either already know what you want, or there aren't that many questions to ask.

However, what happens when a complex piece of gear can't be sold, for whatever reasons, through a normal dealer structure, with its patient (one hopes), informative sales support structure?

In the computer industry, the dealer shakeout was so complete that manufacturers were forced to come up with innovative alternatives to product exposure and distribution. The result? If you get *PC World* or *MacUser* magazines, you know part of the answer. In these monthlies, mail order outlets spend tens of thousands of dollars every month inserting 20 page catalogs, detailing the performance capabilities of the products they hawk, in effect, publishing mini product reviews as

Continued on page 84

Letters

To All Our Friends

From: Laurel Cash and Fred Jones

In the very early hours of the 17th of April, our apartment in Las Vegas was broken into and we were shot with a .38 caliber hand gun at close range. The unknown assailant(s) have not been caught and there seems to be little chance that they ever will. As most of you know, this happened smack dab in the middle of the NAB convention.

We would like to take this opportunity to thank you all for the outpouring of love that reached us in those early days at the hospital. You'll never know how much it meant to us. What it meant to the hospital is another subject. Due to the nature of the attack, we were not supposed to have visitors or phone calls. But alas, they underestimated the professional audio industry!

Within the first 24 hours we received dozens of flowers and cards, as well as many good wishes from those who found a way of getting things through. There are too many of you out there to list all who sent flowers, cards, or just came by to visit. Be aware that we know who you are and you're always in our thoughts. We would, however, like to thank some of the individuals who have gone well beyond the call of duty. They are listed in no particular order:

Peter Chaiken and John Gatts of Yamaha; Anette Vlancich of Tony Silver Films; Marc Kunis, an independent film production accountant; Bob Burton of Audio Rents; Ken Lopez and Mark Gander of JBL; Cari Casteel-Stone of Western Audio; Erika Lopez of Audient Marketing; Bonnie Sills, an independent film location manager; Phil Proctor and Phil Austin of the Firesign Theatre; Barry Skolnick of Hollywood Recording Services; Larry and Elaine Zide of db Magazine; Mr. and Mrs. Kenneth Cash; Mr. and Mrs. Carl Jones; Ron and Judy Bennett of Cosmic Muffin Group; and Mr. and Mrs. Gunnar Lundstrom.

We know well that this doesn't cover the ground, but it's a start. There is just one more thing we would like to ask of you — please, please, please keep us in your thoughts and prayers. It's not over for us yet!

Send letters to R•E•P, Box 12901, Overland Park, KS 66212; fax 913-541-6697; or CompuServe mail 73477.2467. Letters must be signed and may be edited for length and clarity.

Howedoin?

From: Tony Madejczyk, director of creative services, WPTF-TV, Raleigh, NC.

In regards to "From The Top" in the June issue, I will be happy to take a few moments from writing and producing local spots to tell you what a great job R•E•P is doing. My favorite thing is that you do not have articles written by advertisers, or more specifically, ads written and laid out to look like editorial copy.

The video trade journals are notorious for that. I have found the one audio/video piece per month in R•E•P to be more informative, more reality-based and more applicable to my professional needs than many entire issues of *Millimeter* or *Post*. That's good for you, too bad for me.

The related articles on music production, live presentation, engineering, etc., are icing on the cake for me. I find it very entertaining to peek in on the world of hit record-making or home studios for indy labels. Often, with appropriate compensation to BMI or ASCAP, of course, some of this same music will end up on our air as a theme for a news piece. So it's all interconnected, really.

What can you do to improve? Articles on how to stretch a buck, obviously. The fat-goose days of broadcasting are over. This puts more pressure on capital investment in equipment; we even get questioned about how much tape stock we buy. Articles that help illustrate the economy or ease of use of a piece of gear can help us sell it to the owner(s).

The other thing I'd like to see more of, and not at the expense of what you're doing now, are tales from the front-line of video production sound — the techniques or recipes that pros have used to enhance or "save" a production from collapsing into crap. Too many of today's college graduates (why you need a college education for this business is still a mystery to me) think we just get this equipment out of the box, plug it in and use it. That would not be creative, nor would we get the most use out of something if we did that.

One more thing: Can you write an editorial to get engineers and equipment owners to keep the literature that comes with the equipment? Many times, I've wanted to check specs or bone up on application, and the manual's been thrown out!

From: Jake Brooks, Studio 80, Nashville.

Thanks for the invitation to critique. Reading each issue of R•E•P is like attending a good trade seminar; I find something I can use every time (which I highlight, cross-reference in my database and is why I *never* throw an issue away). Whether the subject is microphones, effects processors or digital multitrack recorders, it's how that tool is used by humans that intrigues me. It's nice to be reminded that there's a human behind the wheel at R•E•P.

From: Phil C. Mendelsohn, PCM Audio, Albuquerque, NM.

I find R•E•P to be one of the most interesting and informative magazines that I have encountered, and certainly *the* magazine to trust for pro audio. As for my response to your changes in the magazine's format and my wishes for the magazine's content, here goes:

I prefer to see articles like "Where's the Zero?" and "Audio Noise and AC Systems" in the June issue, or "Headphone Distribution Systems" and "Interfacing Monitor Amplifiers" in the May 1988 issue, rather than articles about why Studio X chose to move to a "smaller market" or why an industry trend will affect sales of International Widgets' new gadget.

I realize that these are of paramount importance to all of us in the relatively small and absolutely quirky audio industry. However, I would point to the slogan under the magazine's title and say that these issues are not directly related to applications. Put simply, there has been no "non-technical" article that has made me say, "This is a remarkable viewpoint that I could not have found in *Mix* or *Pro Sound News*, but this has happened quite frequently with technical topics.

In fact, on several occasions, an article in R•E•P has given me the background to go back and comprehend more fully an article in the *Journal of the Audio Engineering Society*, which I greatly appreciate.

Keep the focus on tools we might use to solve problems, rather than looking at things that may be interesting but not especially practical. While we all may not have to worry about whether it is more advantageous to buy or lease our new console, we all have to obey the laws of physics. ■

Musicians. A Microphone for Stage or Studio Applications.



Everywhere you find the most demanding musicians and recording engineers, you'll find AKG mics capturing the powerful dynamics and emotion of their music. Now, that clear, clean AKG studio quality sound is available in a rugged dual-pattern microphone—the C 1000—for stage or studio use.

The C1000 can be converted from a feedback-fighting hypercardioid vocal pattern to a broader cardioid instrument pattern—and back—in less than a minute. When your mixer doesn't have phantom power, the C1000's performance-balanced design hides a self-adjusting battery compartment to give you over 200 hours of full-headroom, self-powered operation from a standard 9V battery.

Try it for yourself.

The C1000 delivers world-standard performance at an affordable price.

Stage. Studio. Everywhere.



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Everywhere.



DIGITAL AGREEMENT MAKES HISTORY

There was no mistaking it: the agreement between hardware manufacturers and software suppliers concerning consumer digital audio recorders was a landmark event.

Years ago, when this controversy first erupted, there was but one technology in question, DAT. Now, there are a host of others, all of which will be affected by the agreement.

The compromise provides for a royalty of 2% of the wholesale price of machines (with a minimum of \$1 and maximum of \$8 per machine), and a 3% royalty on blank tapes and discs. A formula would determine how the revenue from these machines would be divided among record companies, songwriters, artists and publishers. (We're biased, but we'll ask anyway: What about engineers and producers?)

There will be no royalties on analog machines or tapes. All non-pro digital machines will have the SCMS system to limit home copying.

"The royalty which manufacturers will pay on new digital recording technologies will benefit consumers, assuring them full access to new product and an ever-increasing, diverse supply of prerecorded music," said Gary J. Shapiro of the Electronics Industries Association, which drafted the agreement with the Recording Industry Association of America and the Copyright Coalition,



Sony's Mini Disc will be one of several consumer digital formats to be affected by royalties on hardware and blank software.

representing songwriters and publishers.

The agreement is probably too late for DAT, which has stalled as a consumer format and is likely to be eclipsed by newer technologies. Philips has set a spring 1992 date for Digital Compact Cassette. Sony's Mini Disc is scheduled to bow in September 1992. ■

91st AES Convention Schedule of Events — October 4-8, 1991 As of 7-25-1991, Subject to change

MORNING - 9:00 AM

FRIDAY
SATURDAY
SUNDAY
MONDAY
TUESDAY

- SESSION: Digital Electronics I**
- SESSION: Architectural Acoustics I
- WORKSHOP: Forensic Audio

- SESSION: Digital Technology I
- Technical Committee on Signal Processing
- SESSION: Sound Reinforcement I
- WORKSHOP: Audio Cables

- SESSION: Measurements I
- SESSION: Listening Tests I
- WORKSHOP: Digital Audio Workstations I

- SESSION: Signal Processing
- SESSION: Loudspeakers I
- Technical Committee on Transducers
- WORKSHOP: Women in Audio

- SESSION: Recording I
- Technical Committee on Transmission
- WORKSHOP: Psychoacoustics
- Digital Audio Broadcasting

AFTERNOON - 2:00 PM

- SESSION: Digital Electronics I**1
- SESSION: Architectural Acoustics II
- Technical Committee on Acoustics and Sound Reinforcement
- WORKSHOP: Acoustics of Musical Instruments

- SESSION: Digital Technology II
- SESSION: Sound Reinforcement II
- WORKSHOP: Surround Sound I

- SESSION: Measurements II
- SESSION: Listening Tests II
- WORKSHOP: Digital Audio Workstations II

- SESSION: Transmission
- SESSION: Loudspeakers II
- Technical Committee on Transducers
- WORKSHOP: Recordable CDs

- SESSION: Recording II
- WORKSHOP: New Audio Media

* Auralization Session begins at 6:15 PM
**These 3 sessions take place at the Ormni Park Central Hotel, 870 Seventh Ave., NYC 10019-4399

EVENING - 7:00 PM

- SESSION: Electronic Music**
- SESSION: Auralization*
- WORKSHOP: Audio Restoration

- SESSION: Microphones
- SESSION: Music Sound Levels
- WORKSHOP: Surround Sound II

- SESSION: Audio Production
- WORKSHOP: Digital Audio Workstations III
- WORKSHOP: LowBit-Rate Encoding

AWARDS BANQUET

EDUCATION FAIR
Saturday, October 5th
Petit Trianon — Time: 11:00 AM to 5:00 PM

PEOPLE

Ron Remschel has been appointed marketing manager of professional audio products for Sony's Business and Professional Group ... **Dan Mockensturm** has been promoted to director of tapeless studio courses at Full Sail Center for the Recording Arts ... Digital Audio Research has restructured its sales team and has named **Ian C. Dodd** as director of sales. **Jonathan Redman** and **Mike Wood** have joined the sales team ... **Bill Thompson** has been named audio products marketing manager at Tektronix's television division ... QSC has promoted **Barry Ferrell** to eastern regional sales manager. **David DeLeon** has been named applications engineer ... **John Vitale** has been named sales manager at Bag End Loudspeakers ... **James M. Ruse** has been appointed product development and marketing manager at Audio Animation. **Jeff Berry** has been named customer service supervisor ... **Tony Balboa** is Lexicon's new Southern California sales representative ... Studer Revox America has promoted **Thorsteinn Thorsteinsson** to regional sales engineer, based at the company's New York office ... New England Digital has made two appointments at its Los Angeles office. **Ray Niznik** has been promoted to regional western manager; **Kerby D. Long** has joined the company as sales representative ... Solid State Logic has added two members to its New York sales team. **Clark Carr** will concentrate on ScreenSound sales and support. **Don Wershba** will concentrate on console and Ultimation sales and support ... **Jerry Burhans** has joined Tannoy to supervise the company's OEM sales of the ICT transducer. ■

TREND

w a t c h

Environment: A California state senate panel has approved legislation that would restrict the size of the CD longbox to no more than one inch longer or wider than the jewel box itself. If enacted into law, record companies would have until July 1993 to use alternative packaging.



Sampling: *Time* magazine discovered sampling in June, running a one-page article on the practice in the recording world. Mostly an overview, the article also talked about the copyright issues and the almost-standard practice of getting samples approved before release date. Sort of makes you wonder where *Time* was for most of the 1980s.



Economics: A new study predicts that consumer spending on recorded music and music video will grow this year to \$7.99 billion, an increase of 6% from last year. However, according to Veronis, Suhler & Associates, an investment banking firm that conducted the study, growth from 1990 to 1995 will be only 4.8%, compared to 11.4% from 1985 to 1990. ■



“

“Today's [record] companies record elements, not ensembles. The process is solitary and glamorous. The mysteries of high technology and its jargon have become instruments of intimidation and control over the traditional artist. The skilled musician or talented singer-composer who is not also a computer virtuoso is effectively disenfranchised from the electronic power structure of modern pop, where producers make records and remix engineers take them apart and put them together like garage mechanics. The result is music that has more in common with a \$40,000 Japanese car than an object of popular art.”

— John McDonough, writing in the *Wall Street Journal*.

”

Random Access

STUDIO UPDATE

Name/Location	Details
NORTHEAST	
Hip Pocket Recording Studios/ New York	Facility has appointed RPS Communications as its public relations and marketing consultant.
SOUTHEAST	
Virginia Arts/Charlottesville, VA	New equipment: TAC Magnum console; two channels of Dolby SR; Sennheiser and RCA microphones; and a Lexicon signal processor. Victor Benshoff has joined the facility as staff engineer/producer.
MIDWEST	
Disisound Recording Studios/ Omaha, NE	Facility has moved to a new location and added new equipment, including Genelec monitors; Lexicon, Drawmer and Eventide processors; a Soundcraft console; and Studer tape machines. Studios have been redesigned by D.A. Petersen and Steven Durr. Address: 206 S. 44th St., Omaha, NE 68131; 402-553-8523.
SOUTHERN CALIFORNIA	
Larson Sound Center/ Manhattan Beach	Vince R. Gutierrez has been named vice president and general manager.
Rumbo Recorders/Los Angeles	A third studio, Studio C, has been completed. Designed for long-term overdub work, the studio contains a Trident Series 80 console; an Otari MTR-90 tape machine; and a Sony 2-track. In Studio B, a Trident 80-C console has been installed.
Trax Recording/Hollywood	A DDA DMR-24 console has been installed in Studio A. A Soundcraft 2400 has been installed in Studio B. Studio C, a Mac-based MIDI room, is newly opened.
NORTHERN CALIFORNIA	
Music Annex/Menlo Park	Studio C, destroyed by fire in July 1990, is back on-line with a Soundcraft 3200 console with Discmix II automation; a Studer A827 recorder; an Otari MX-15 2-track; UREI 813 monitors; and a wide variety of outboard gear. Music Annex's San Francisco-based post-production facility has added a Sony BVW-70 Betacam SP VTR.
DESIGNERS	
Russ Berger Design Group/Dallas	Recent work includes schematic layout and design development for audio, video and A/V facilities for SAS Institute, a North Carolina-based software and applications developer.
Harris, Grant Associates/London	Firm has been awarded the contract for the acoustic and technical redesign of the Hit Factory, New York, scheduled to be completed in early 1992.

NEWS NOTES

The Hollywood Edge Sound Effects Library is offering a free CD containing over 80 full-range, production-ready sound effects to all post-pros currently working in the trade. For your free CD call 800-292-3755; in CA 213-466-6723.

JBL Professional has acquired the product lines of Audio/Digital and has incorporated it into the JBL Professional Systems Group, a new entity. Audio/Digital founder Gary Hardesty has been named director of the group, which will serve the large-scale contracting market.

It's back: Hollywood's **Record Plant** has been purchased by Rick Stevens, president of Summa Music, and will focus on music recording, with a special emphasis on service. Rose Mann will again handle booking, scheduling and client relations; Norm Dlugatch is the facility's chief technician.

Max Kay Public Relations has expanded its international clipping service to all companies in the MI and pro audio fields, in addition to its PR clients. In addition to clipping and mailing press items, the company will analyze coverage for trends. For more information, contact the company at 5 Addington Road, London N4 4RP; 44-81-340-4834; fax 44-81-348-0251.

The International Teleproduction Society has awarded **Sony** a Special Monitor Award for Excellence in Engineering Achievement for its Serial Digital Interface Chip Set.

SMPTE's 26th annual television conference will deal with the merging of television and computer technologies, and how it will affect video and audio. Titled "Collision or Convergence: Digital Video/Audio, Computers and Telecommunications," the conference will be Feb. 7-8 at the St. Francis Hotel in San Francisco. For more information, contact SMPTE at 595 W. Hartsdale Ave., White Plains, NY 10607; 914-761-1100; fax 914-761-3115.

Gand Music and Sound's third annual Mac Music Expo drew 350 people, and featured products from Apple, Articulate Systems, CMS, Coda, Digidesign, E-mu, Invasion, Opcode Systems, Passport, Radius, Raster Ops and Roland. ■

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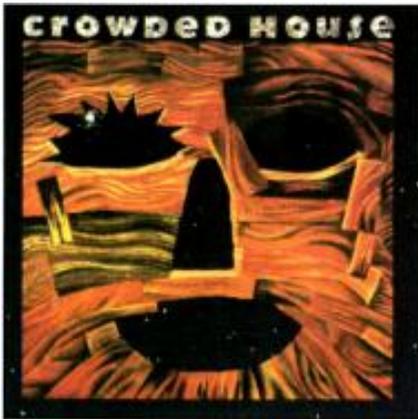
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Fresh Tracks

Crowded House: "Woodface"



Label: Capitol
Produced by: Mitchell Froom and Neil Finn
Recorded at: A&M, Platinum, Sunset Sound, Ocean Way, Periscope
Engineered by: Tchad Blake and Paul Ksoky
Assistant engineers: Rob Jaczko, Max Garcia and Andrew Horne
Mixed by: Bob Clearmountain at A&M and the Record Plant
Mastered by: Bob Ludwig at Masterdisk
SPARS Code: ADD

Comments: The latest from the Finn brothers (yep — they're back!) offers an exceptional selection of ditties filled with poignant messages and creative production techniques. Once you bypass the hit "Chocolate Cake" and delve further inside the superbly produced collection, you'll wonder what prompted Capitol to choose the first cut as the first single release.

Of special interest: Once again, Bob Clearmountain demonstrates why he is at the top of his field, with tracks mixed with great intelligibility (notice the "dry" nature of most of the vocals) and unique panning effects, which become part and parcel of some of the instrumental solos. ■

Mozart Sonatas for Piano & Violin: Pinchas Zukerman, Marc Neikrug

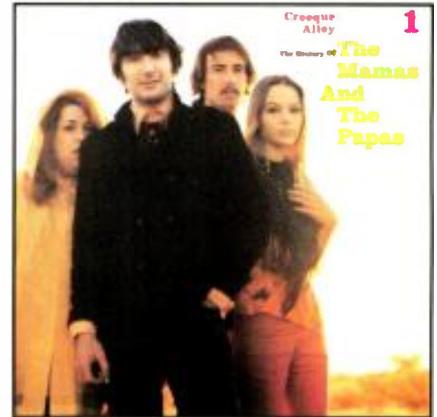
Label: RCA Victor
Produced by: Jay David Saks (Philip Traugott, associate producer)
Engineered by: James Nichols
Editing engineer: Tim Martyn
Recorded at: Manhattan Center
SPARS Code: DDD



Comments: Beautifully performed and recorded. The piano sounds dark and moody. The many subtle tone shadings of Zukerman's violin (Guarneri del Ges) come through with clarity.

Of special interest: We wondered whether the rich ambiances on the recording are natural or digital. James Nichols explains: "Some of the tracks were recorded in February and some in June. In February, the reverb in the room dried up, so when we were trying to match up the sound of the two recordings, we added a little digital reverb, 480L." The listener can try and figure out which is the digital and which is the natural reverb. Nichols used six mics: B&K 4006s on the piano, Schoeps omnis out in the hall and on Zukerman, and an MKH 40 behind him to focus the sound better. ■

The Mamas and the Papas: "Creeque Alley/The History of the Mamas and the Papas"



Label: MCA
Original producers: Lou Adler, Roy Silver, Alan Lorber, Lee Young, John Simon, Bill Szymczyk, Steve Barri, Jack Nitzche
Reissue produced by: Cary Mansfield, Andy McKaie
Digital transfer: Doug Schwartz
SPARS Code: AAD

Comments: Buying CD reissues is somewhat of a crap shoot, with many reissues sounding worse than their vinyl counterparts, often due to the deteriorating conditions of source tapes or (shudder) use of the *wrong* tapes for CD mastering. "Creeque Alley" is a great example of how to do it right. The sound quality is exceptional, as though the tapes were just made yesterday. Particularly when compared to the earlier Mamas and Papas greatest hits packages of several years ago, this edition is exceptional in its clarity and pellucidity.

Of special interest: Included in the 2-CD set are tracks from each of the group members as solo artists, cuts from earlier groups (the Mugwumps and the Big Three) and some unreleased tracks, also a great live version of "I Call Your Name" from the Monterey Pop Festival. The research was very carefully and expertly done; the packaging and liner notes are also excellent. This is one of the best reissue jobs we've ever encountered. A colleague called it "the reissue to end all reissues." More appropriate would be "the reissue to *begin* all reissues." They should all be this good. ■

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Steve Folsom, Sound Engineer for Melissa Etheridge and John Hiatt.



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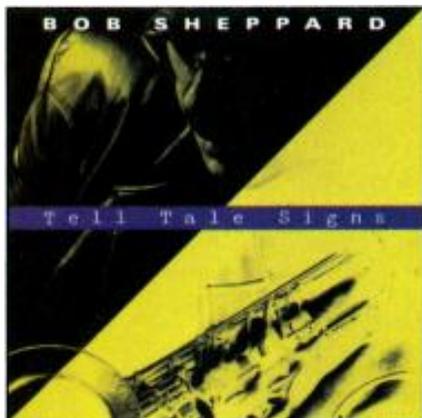
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Circle (9) on Rapid Facts Card

www.americanradiohistory.com

Bob Sheppard: "Tell Tale Signs"



Label: Windham Hill Jazz
Produced by: Walter Becker
Engineered by: Roger Nichols
Mixed by: Roger Nichols
Recorded at: Soundworks West (Los Angeles)
Mastered by: Glen Meadows at Masterfonics
SPARS Code: DDD

Comments: As near-perfect a recording as I have ever heard, and Becker and Nichols make it sound easy. It is not an elaborate recording: There are no swirling special effects, no amazing 3-D illusions or dizzying pan scans. It's been a long time since I heard an album that didn't have that. Because there are no flaws or artifacts of the recording, it's very easy to forget you are listening to a recording at all.

Sheppard plays alto, soprano and tenor, in what I would call modern traditional jazz (as opposed to modern modern jazz). He plays pleasingly inside the chord changes, and the music is based on consonance and melody. Sheppard is at his best on the title track, which he builds up with slow and graceful control. Beasley takes the first solo on the track, followed by Tom Warrington on fretless, and then Sheppard, who kicks the tune into high gear. Joining Sheppard on the album are John Beasley, piano (whose own Windham Hill solo record will be released early next year, also recorded by Becker and Nichols); Peter Erskine, drums; Larry Koonse, guitar, and other fine musicians. ■

FOCUS:

ROGER NICHOLS, Engineer, "Tell Tale Signs"

RN: The reason Walter and I started doing these albums is the fun. Real live musicians in the room, everybody playing at once, minimum of overdubs if any, and just put it out - you spend two or three days recording, two days mixing, and you're done! Everything stays fresh.

R•E•P: Does having everybody playing live in the room change your mic choices?

RN: Not really. Sometimes it changes whether we try another solo or not, because of the leakage involved, but that adds to the overall cohesiveness of the tracks.

R•E•P: When you go to stick up overheads on the Peter Erskine's drums, for example, you would choose the same mics as if he were playing alone?

RN: Yeah. I might reposition them or something, put baffles up to keep the leakage down a bit, but I don't go into overkill trying to get perfect isolation. My favorite mics for years now have been the Yamaha drum mics. They're real short and the connector comes out the side so you can get them underneath cymbals. They have a built-in high-frequency rise because of the resonance of the beryllium capsule, so you don't need to EQ like you normally would to brighten up a tom tom. I first used them on the Rickie Lee Jones album and I've been using them on everything since, including the new Donald Fagen stuff.

R•E•P: How did you mic Sheppard's sax?

RN: We used an RCA 44 ribbon mic — he likes the saxophone nice and warm, and ribbon mics are nice and warm. I put it six inches away from the bell, but sort of angled up so it was aiming at the keys, also.

R•E•P: What kind of piano did John Beasley play? He sounds great.

RN: It was a Blüthner, a really nice-sounding piano. I just put a pair of U87s about eight inches above the hammers, about a foot and a half apart, straddling middle C. The lid was up all the way, but not off.

R•E•P: The thing I like about Roy Hargrove's record [reviewed in August] is that it's traditional playing with some little touches of modern engineering, though not enough to blow the traditional vibe.

RN: We tried to do that too. In some of the mixes we have the drums over on one side, the piano is over on the other side, you know, keeping things a little smaller and more compact — maybe not as exaggerated as it was in those old recordings. We tried to keep the amount of reverb we had pretty low, so it was more intimate and living room sounding, as opposed to projecting the listener into the concert hall or something like that. I used the Sony MUR-201 'verb, an old EM1 250 and a little Lexicon 480 on the "Jazz Club" patch.

R•E•P: What digital machines did you use?

RN: The Sony 3348 48-track. I mixed to the Sony 3402, but I only use the machine for storage; I go through the Akai DD1000 or Yamaha outboard converters. Then I transfer it to 1630 myself so we can avoid mastering. ■

Dan Levitin is a contributing editor to R•E•P and a producer based in Stanford, CA.

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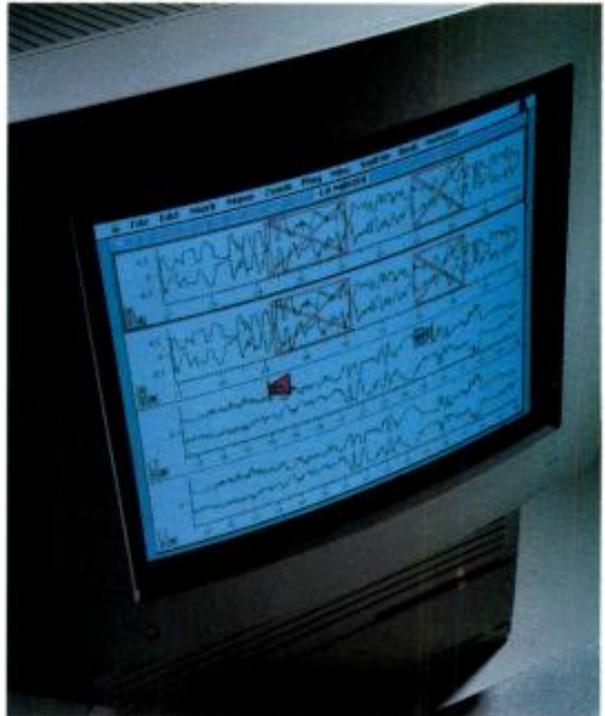


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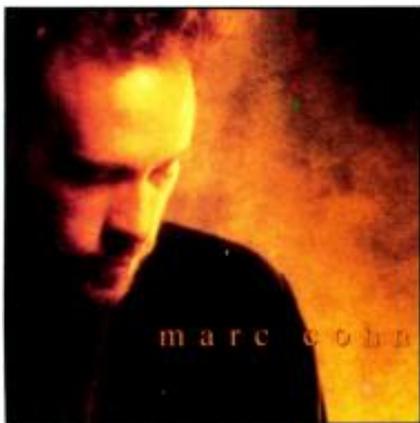


Circle (10) on Rapid Facts Card



Marc Cohn

Label: Atlantic
Produced by: Marc Cohn and Ben Wisch
Engineered by: Ben Wisch
Mixed by: Ben Wisch
Recorded at: Quad Recording (NYC)
Digital sequencing: Matt Knobel (using the Studer Editech Dyaxis)
Mastered by: Bob Ludwig at Masterdisk
SPARS Code: ADD



Comments: On this self-produced debut, Cohn shines equally as songwriter, singer and producer. "Marc Cohn" has the same understated elegance as David Kershbaum's production of Tracy Chapman. The album sounds eminently *real*, in the way that Bruce Springsteen's records do, or the records of Cohn's acknowledged inspirations, Van Morrison, Joni Mitchell and Jackson Browne. The production of the songs treats them as songs first and foremost: the centerpieces of each track are the confident, stately piano and vocals, supported by tasteful guitar, bass and drums.

Of special interest: Cohn's cover of Willie Dixon's "29 Ways," with Cohn's 4-part background vocals. James Taylor's BG Vox grace Cohn's beautiful ballad, "Perfect Love." John Leventhal gets a nice National or dobro sound out of his electric guitar on "Dig Down Deep." "Walking In Memphis," the first single off the album, establishes Cohn's unique style and is sort of a microcosm of the remainder of the record. ■

FOCUS:

MARC COHN, Co-Producer, "Marc Cohn"

R•E•P: Where did you learn to produce?

MC: I've been doing studio work for several years: I played piano on Tracy Chapman's "Crossroads," and I sang on some song demos for Jimmy Webb. I also worked on lots of less notable projects, too.

R•E•P: Did you woodshed a lot as a producer?

MC: I woodshedded a lot as a writer and as a performer. I tried to come to a certain kind of style that I felt was unique. I think that's an important thing to do as a writer if you want to produce your songs as well. If a song is there, it dictates the production, in that it lets you know what it wants and what it doesn't want. So I worked really hard on the songs themselves.

Ever since I was seven or eight, I was an avid music fan. I listened to albums under headphones trying to find out what made certain tracks work. Why was "The Boxer" magical? There were certain things for me — I knew they were great songs, but there was something beyond that. It was all those hours and years of listening and trying to familiarize myself with and understand what made the records I loved great.

R•E•P: What was your role as producer?

MC: It wasn't about finding the right drum sound, but finding the right chemistry to happen between the players. I saw the playwright Garson Kanin on TV talk about why he directs his own plays. It's not because he thinks he's the best director there is, but because nobody understands what the play is about more than he. I really felt I knew these songs better than anyone else. I didn't feel overly confident, just that Ben and I had something special to bring out in them.

R•E•P: How much hands-on recording experience did you have before this?

MC: I had experimented with lots of different ways to record over the years, with different players and engineers. I was exploring, trying to figure out the right way to do my songs. Then I spent a year and a half doing just piano and vocal demos, and that's all I gave to record companies. That's all Atlantic ever heard from me before I handed in my record — me at the piano singing.

R•E•P: Did you do lots of demos of the songs on this album?

MC: For some of them I did many versions, some of them none, some of them actually *are* the demos. "Strangers In A Car," "Walk On Water" and "Silver Thunderbird" were my original piano/vocal demos, and we just added stuff to it, after trying many versions that never worked as well as the demos had.

I did most of my demos with [co-producer] Ben Wisch for the past five years. He really fashioned the sound on my voice and on the piano, and he is a huge reason why the album sounds the way it sounds.

R•E•P: The album sounds very expensive. I'd guess about \$200,000.

MC: We spent a lot of time at an inexpensive studio, and that helped. We would work two or three days in a row, and then take about the same amount of time off to digest it. Working that way, it took nine months. ■

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Circle (11) on Rapid Facts Card

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Perfect Sound, Forever

By Rick Schwartz

At least that's what Philips said when they blessed the masses with digital audio almost ten years ago. Reviewers were so excited about the wonderful specs of the new CD players, they wrote that sound quality was no longer a key issue — features alone would differentiate competing players. In retrospect, early CD players were far from perfect. Audiophiles knew something was wrong with the sound, but they couldn't prove it.

With that thought in mind, it should come as no surprise that a piece of gear can measure well and sound bad. According to Richard Cabot, vice-president of Audio Precision Inc., conventional measurement techniques do not always predict the way a piece of gear will sound. Cabot has been experimenting with new measurement techniques based on the human hearing process. The results of these new techniques correlate well with actual listening tests. Their System One measuring package has made better measurements of digital gear possible.

The System One itself is a modular test system from Audio Precision which can measure audio in both the analog and digital domain. Audio Precision has replaced a whole bench-full of gear at a reasonable cost, using off-the-shelf PC technology. The System One exploits the capabilities of an IBM computer for storage, display, post-measurement processing, remote communications and printing. With its computer soft-panel, the unit can display data in any type of units. Because the System One makes amplitude measurements in both dB and bits, it's possible to see how so-called 16-bit DAT recorders measure up. It turns out that most DAT recorders have better dynamic range at mid-frequencies than at high frequencies. In fact, actual performance in the 14-bit area is pretty common. There appears to be at least one recorder that actually exhibits 9-bit performance. That may be why some manufacturers spec their gear

at 1kHz. By sweeping the entire bandwidth, the package will expose any performance flaws, if they exist.

The System One has a 2-channel professional (AES/EBU) interface as well as a consumer (S/PDIF-EIAJ) interface. It's therefore possible to compare performance response of the four signal paths: A/D, D/A, D/D or A/A. Digital testing allows a user to bypass errors in half of the device they are testing. For example, they can test the A/D section of a digital tape recorder separately from the D/A section. This lets the designer discover where problems are and avoid varying the performance in half of a device to compensate for errors in the other half. Have you ever made a digital recording on a DAT recorder that sounded fine until you played it on another machine? Now it is possible to find out why.

Today there are new techniques for characterizing nonlinearities, noise modulation and total distortion.

Although level linearity experiments were started many years ago, today there are new techniques for characterizing nonlinearities, noise modulation and total distortion. Dr. Cabot has been involved in recent studies of background noise modulation in digital audio gear. Errors can occur during quantization, especially at lower signal levels, because of the limited number of digital "steps" available there. An analog recorder normally has the most distortion at high levels, whereas a digital recorder exhibits its worst performance at low levels. If a low-level digital signal is smaller than one step, it's possible that all data will quantize to the next nearest step, creating a square wave output which looks horribly distorted. Noise modulation measurement techniques are well suited for finding the low-level defects in A/D and D/A converters, while the measurement of total distortion is useful for high-level non-linearities on analog systems. Both techniques are designed to assess the audibility of defects accurately.

A lot has happened on the bench in the last ten years. Performance measurements

of digital audio systems require greater care than their more familiar analog counterparts. The days of single or dual-tone sine wave tests are coming to a close. One way to speed up a complex set of measurements is to apply multiple test signals simultaneously. Audio Precision calls this "fast testing." Using FASTest, test signals can be transmitted and acquired in about one second, producing minimal disturbance in broadcast environments. On the System One, multitone test signals consisting of up to 60 different frequencies can be used. Various multitone test signals can be created by changing frequency, phase and shaping. Multitone test signals are more like program material than traditional test tones and yield results comparable to conventional measurement techniques.

Multitones are especially useful when testing the new bit-rate reduction schemes. Data compression requires a new set of test procedures because it's not entirely fair to say what the process does to simple sine waves. It's more important what compression does to complex program material such as music. One concept of bit-rate reduction-based compression is to eliminate what the ear allegedly will not miss due to the masking phenomenon. Audio Precision will be including test programs designed specifically for these kinds of tests in future releases.

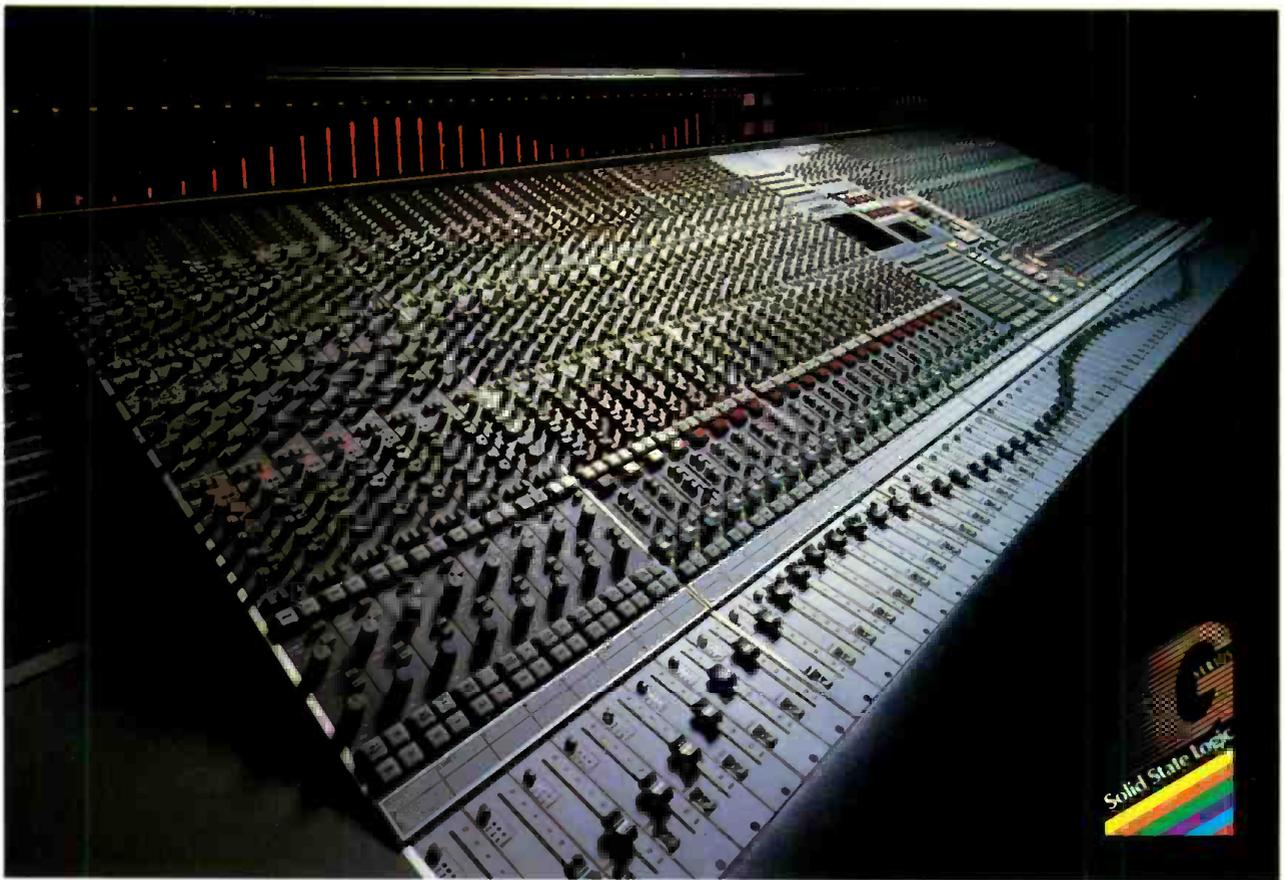
Instead of using multitones simulating program material, why not use the real thing? Bob Orban has performed tests of his compressors in actual broadcast environments, using music as a test signal. Using this technique, a radio station can see what their over-the-air frequency response really is. Although Cabot has found it difficult to get meaningful distortion measurements using program material, the System One can measure frequency response using actual program material with repeatability of 0.25dB, adequate for most purposes.

THE HIDDEN FILTER

Sometimes the System One uncovers very interesting things. Using digital-only measurements, Cabot found a popular DAT recorder with an in-line digital filter on both analog and digital inputs! It's interesting to speculate why a manufacturer would do this. Cabot assumes they added the 0.5Hz digital high-pass filter to stop dc. This digital filter didn't effect frequency response too badly because of its steep slope, but the real drawback was the distortion and noise modulation it intro-

Continued on page 85

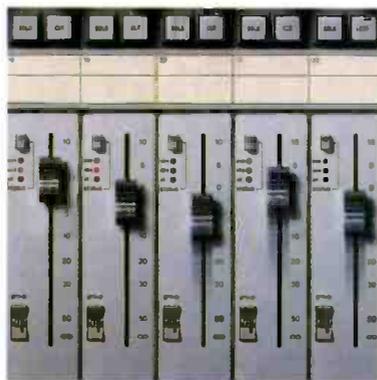
Rick Schwartz is a contributing editor to R•E•P and director of post-production for Music Animals, Los Angeles.



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The Politics of Cheese

By Pete Caldwell

It's reported that Charles DeGaulle once said, "It is impossible to govern a nation that makes over four hundred different kinds of cheese." I used to think that this was just a clever turn of phrase, but now I know what he meant. During my year as SPARS president I have encountered a lot of different kinds of cheese and, like French cheese, most of them are very good, but, boy are they ever different.

One year ago, upon my election to the SPARS presidency, I wrote an article for R•E•P entitled, "The Politics of Diversity." My belief was that the professional audio industry is in constant flux, and that we are experiencing ever-widening diversities of scale (larger, mega-studio complexes and smaller project/specialty/personal use operations), widening diversities of geography (a decentralization out into the hinterlands which still look back to the recording meccas of New York and Los Angeles for leadership), and increasing diversities of endeavor (specialization, niche marketing, audio-for-video post, film, MIDI, etc.). I still believe this, but my analysis and projections certainly created a stir.

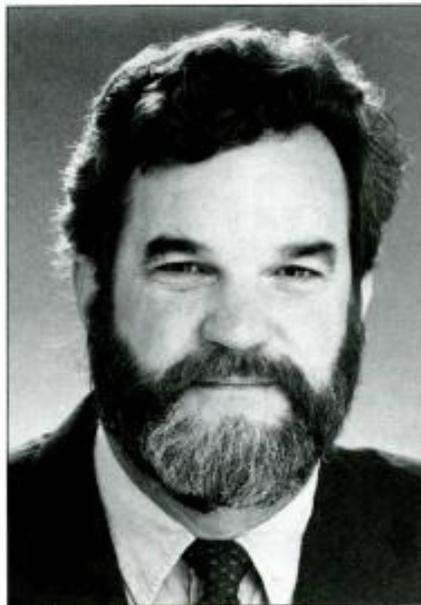
"... the professional audio industry is in constant flux, and we are experiencing ever widening diversities of scale."

Some people thought I intended SPARS to embrace every basement 2-track in America. Well, perhaps I did, as long as they were legal, ethical and engaged in sound technical practices. The SPARS

Pete Caldwell is the 1990-91 president of SPARS and president of Doppler Studios, Atlanta, GA.

bylaws are quite specific on all of these issues, but I didn't feel that SPARS should sit in judgement. My goal was to have SPARS create a forum for dialogue on local, national, and international levels.

To a large degree, I am proud to say, we are doing just that. I recently attended one of the regular meetings of New York City SPARS studio owners. It was not dull. The SPARS Digital Audio Workstation Conferences have been a great success, attracting audiences from across the nation and facilitating a productive relationship be-



1990-91 SPARS president, Pete Caldwell

tween the manufacturers and the recording community. Coverage in the trade press has been phenomenal and I'm sure everyone agrees that SPARS has had a pivotal effect on the direction of this newest of the audio technologies. Additionally, SPARS members recently participated in formal, full-day interfaces with major manufacturers in Tennessee and New Hampshire as part of our continuing interface workshops. For future reference to SPARS members and those who are considering joining, the upcoming SPARS Business Conference at UCLA promises to be a dilly.

A SPARS committee, headed by Chairman of the Board David Porter, is presently working with studio members and educators in an effort to create new guidelines for college-level curricula in audio and audio-for-video. SPARS is also instituting a brand new intern program, not only to place qualified students in studio intern-

ships, but to offer grants and funding to help students defray travel and per diem expenses incurred during internships, job interviews and attendance at educational conferences and conventions. At the AES show this year in New York City, SPARS will host meetings for educators, manufacturers and for the general membership. We are working to organize a strong Los Angeles chapter and to organize local SPARS chapters in Atlanta, Minneapolis, Nashville and elsewhere. We now have very good across-the-board membership, and we encourage more growth. We need everyone, large and small, from all over the country — studios, manufacturers, audio services, educators, vendors, freelancers — everybody involved in professional audio. If you are not yet a member of SPARS, now is the time to seriously consider participating in an organization which can provide immediate and valuable benefits. Then we will have a real dialogue. Then we can taste the real difference in the cheese.

When I wrote "The Politics of Diversity" last year, I didn't fully realize the concept I was exploring. At that time, I had not yet discovered the Politics of Patience. The truth is that the politics of diversity have to do with people and not with studio size, geographical location and specialization of endeavor. It is the people who are diverse, not the facilities. It is the people who are single-minded, stubborn, dedicated mavericks — men and women just crazy enough to choose this industry, to build the recording studios and to work in them. They are proud, vocal and often opinionated. They are as different as Roquefort and Camembert. You don't govern them any more than DeGaulle governed France. You just create opportunities for them to talk to each other. The rest is pure patience.

When I see a major facility owner from New York talking in earnest to a newcomer from Boise, I see a two-way learning experience. I see interest and awe, curiosity and camaraderie, ire and ego and awakening. The results are spectacular — fromage incroyable! ■

The Society of Professional Audio Recording Services is the industry's best source of business information. For details on membership or activities, contact SPARS at 4300 10th Ave. N., Suite 2, Lake Worth, FL 33461; 407-641-6648; fax 407-642-8263.

Hugh Padgham makes a career out of listening. But when it comes to our digital multitrack, he wants to do all the talking.

Grammy®-award winning producer and engineer, Hugh Padgham, is a man of few words. So when we asked him about Sony's PCM-3348 DASH 48-track recorder, we had no idea he'd have so many.

He spoke about its incredible

record, *Soul Cages*, I did a lot of multitrack editing from the original tracking sessions very simply. And I mean 'simply.' Edits that would be unbelievably difficult on another



"I was convinced that a recording engineer designed the thing. It's so easy to use, you never really notice

The PCM-3348's reliability and precise performance let you concentrate on what really matters—the music.

machine are actually very easy on the 3348. In fact, I don't think we could have

it's there. That's when you know a machine is good."

For even more words,



The PCM-3348's incredible transport works so quickly and accurately, the machine allows the engineer, or even the artist, to be more creative.

transport. "It's so fast and precise, I never have to wait for the machine. Neither does the artist. And that makes sessions run a lot smoother."

He went on about its easy

made that particular record in any other way."

He also mentioned its 48

tracks. "When I was recording Phil Collin's *Another Day in Paradise*, I got ahold of a 3348 halfway through the session. It completely eliminated the need for another slave. Which made overdubbing much, much easier."

And, he had a few words about its user-friendly design.

call the Sony Professional Audio Group at 1-800-635-SONY, ext. 903. But for now, we'll let Hugh have the last one: "Phenomenal."

digital editing. "For Sting's latest

The PCM-3348's built-in sampler lets you easily move around bits of a sax solo, for example, without changing anything else.



SONY®

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BUSINESS AND PROFESSIONAL GROUP

• 19 AES 91 •

After a roller coaster year in the pro audio industry, it's time for our annual summit meeting: a reckoning, to be sure — to see where we've been and to form a vision of where we're going. The 91st AES Convention Oct. 4-8 in New York, "Audio Fact and Fantasy — Reckoning with the Realities," is the upcoming arena for five days of discussion, workshops, papers and special events. It is the time to discover which innovations and advancements have helped us to progress and what products are in the works, poised to take us another step forward.

This year R•E•P's AES preview is the most comprehensive ever, designed to give everyone — whether you are attending the show or not — an overview of what's taking place in our industry and what we can look forward to in the future.

Please note that this information is current as of Aug. 29, 1991. Refer to on-site convention information for any changes. For more information, contact the AES at 212-661-8528; fax 212-682-0477.

EXHIBITOR LISTINGS

Separating fact from fantasy is not always easy; sometimes you need to crank the knobs and mercilessly test the equipment before you know it will stand up to real life, everyday use.

For this purpose, the AES exhibitors are putting their new equipment and reputations on the line for your inspection.

The following material has been assembled by the R•E•P staff from information supplied directly from the exhibitors. Each entry includes the model names, numbers, and a brief description of the products that will be shown, and in which booth that company will exhibit (all numbers listed with an asterik mean multiple booths). Also included are the product lines, overviewing the types of equipment each company manufactures. A red listing indicates that company has an advertisement in this issue. Please refer to the Advertisers Index for the appropriate page number.

If you are looking for a specific product, but need information on which companies manufacture it, refer to the Product Directory.

For more information on any of the companies or their products, circle the entry's number on the Rapid Facts Card in the back of this issue.

AB International Electronics (1605)

New products
1200C fully modular, 2-channel amp rated at 1,800W/ch, 2Ω; 200 single-rack, 2-channel amp rated at 75W/ch, 8Ω.

Product line
Amplifiers, equalizers.
Circle (200)

ACO Pacific (1723)

New products
PS9200G 2-channel microphone power supply with gain.

Product line

Mic pre-amps; studio and sound reinforcement microphones; measurement microphones; and miscellaneous equipment and services.

Circle (201)

Acoustical Physics Laboratories (1901)

New products
DCM-15 control room monitor loudspeaker system.

Product line
Acoustic design and construction; acoustic treatment materials; studio monitoring loudspeakers.

Circle (202)

Acoustical Supply International (3212*)

Product line
Cable and connectors; computer software, studio applications; crossovers and frequency dividers; component loudspeakers; sound reinforcement loudspeakers; studio monitoring loudspeakers.

Circle (203)

Adamson Acoustic Design (1611*)

New products
S-218 dual 18-inch, front-loaded bass enclosure; MH121 2-way, full-range, active enclosure; B118 single 18-inch, front-loaded bass enclosure; FR12 2-way, full-range passive enclosure; DM12 12-inch midrange loudspeaker; DB18 18-inch frequency loudspeaker.

Product line
Crossover and frequency dividers; digital audio workstations; electronically controlled loudspeaker systems; component loudspeakers; sound reinforcement loudspeakers; signal processors.

Circle (204)

See ad index

Adams-Smith (1024*)

New products

2600 E-A/V audio editor software.

Product line
Synchronizer systems; time code readers and generators.

Circle (205)

Akai Professional/IMC (5513)

New products
DL1000 and DL500 remote units for DD1000 optical recorder; S1000EX polyphonic expansion unit for S1100 stereo digital sampler; DD-FMac and Lightblade Macintosh software for DD1000; S-FMac Macintosh software for S1100; MPC60 II MIDI production center; ME80P MIDI patchbay.

Product line
Digital audio workstations; drum machines; MIDI hardware; sequencers; sound samplers; digital multitrack tape machines; time compression/expansion.

Circle (206)

AKG Acoustics (1348*)

Product line
Headphones and headsets; microphone booms, stands and accessories; studio and sound reinforcement microphones; wireless and RF microphones.

Circle (207)

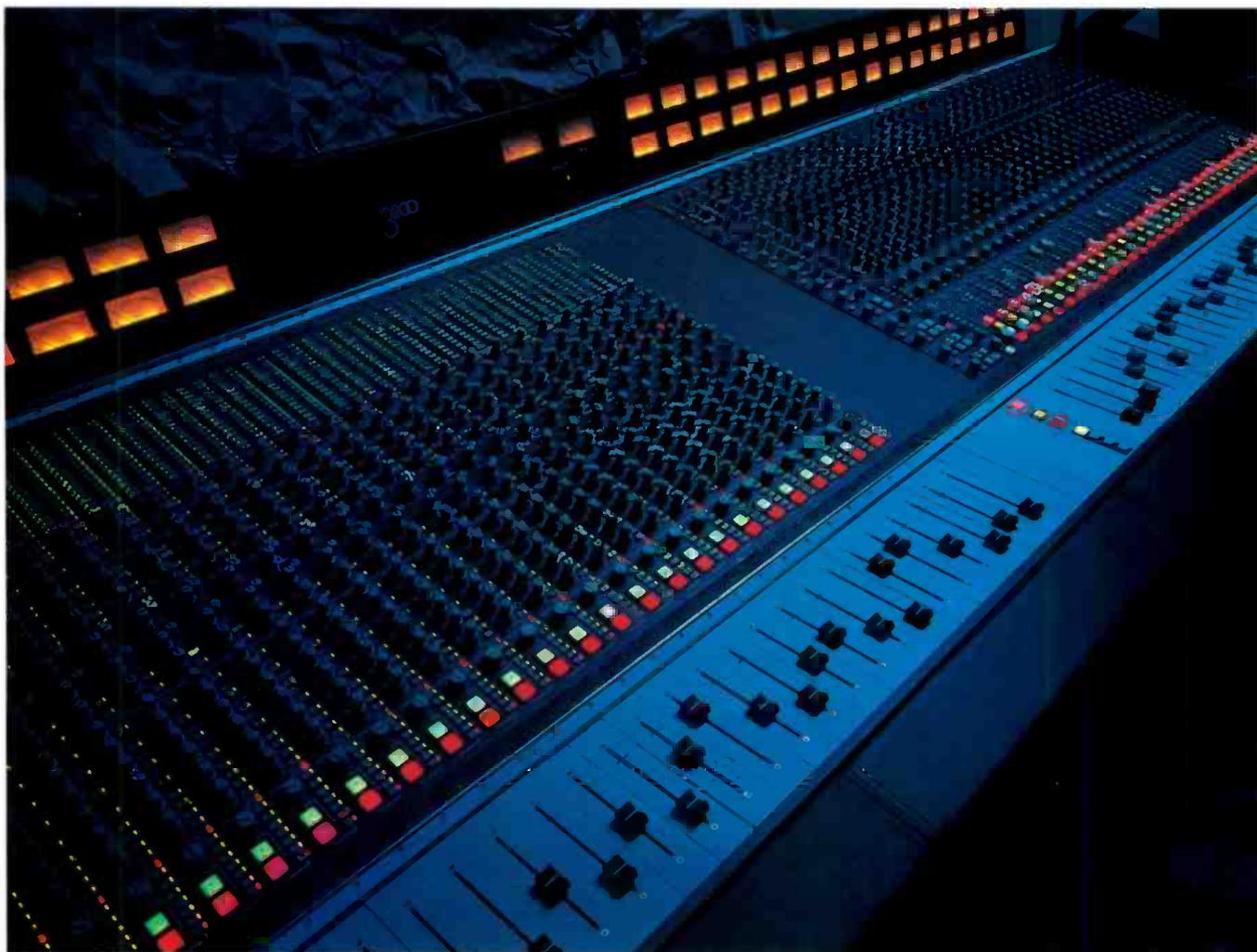
See ad index

Alesis (2407*)

Product line
Amplifiers; recording and production consoles; drum machines; equalizers; limiters/compressors; MIDI hardware; reverbs; sequencers; signal processors; digital multitrack tape machines.

Circle (208)

See ad index



Command Performance

The 3200. Your wish was our command. Introducing an analog console that dramatically refines performance while radically improving operational control and flexibility. Its design centers around the classic split configuration and successfully brings Soundcraft to a new milestone in console design.

The 3200, with full status illumination, offers up to 100 fader-controlled inputs and 20 auxiliary sends. With fully balanced 32 buss routing, global multitrack A/B switching and a noise gate on every channel, it delivers remarkable creative control. And, thanks to innovative electronics and advanced circuit design, the finest in sonic performance as well.

The 3200. It awaits your command.

See us at the AES Conference in New York,
Hilton Hotel, Clinton Suite

Soundcraft



Soundcraft USA/JBL Professional
8500 Balboa Boulevard, Northridge, CA 91329

H A Harman International Company

Alpha Audio/Acoustical Solutions (1007)*New products*

Pyramid acoustical materials for control room acoustics; portable audio isolation booth; vinyl sound barrick material.

Product line

Acoustic treatment materials; acoustic design and construction.

Circle (209)

Amek Systems & Controls (3815*)*New products*

Hendrix multipurpose, multitrack console; Mozart multitrack console; BCIII broadcast console; Media multiformat monitoring system; Medici equalizer designed by Rupert Neve; Classic broadcast console system.

Product line

Automation systems consoles; recording and production consoles; sound reinforcement consoles; equalizers.

Circle (210)

Ampex Recording Media (1102*)*Product line*

Audio and video recording tape.

Circle (211)

AMS Industries (2210*)*New products*

Logic 2 all-digital console; AudioFile PLUS 16-output hard disk digital audio editing and recording system.

Product line

Digital consoles; recording and production consoles; delays; digital audio workstations; editing systems; studio and sound reinforcement microphones; reverbs; signal processors; synchronizer systems; time compression/expansion.

Circle (212)

Analog Devices (1627*)*New products*

AD1879 dual 18-bit sigma-delta A/D converter; SSM-2142 balanced line driver IC; SSM-2018 voltage-controlled amplifier; SSM-2017 audio amplifier.

Product line

Stand-alone A/D and D/A converters; amplifiers; integrated circuits; microphone pre-amplifiers; audio routing switchers; sampling rate converters; signal processors; audio integrated circuits.

Circle (213)

Anchor Audio (4821)*New products*

AN1000X 50W monitor.

Product line

Amplifiers.

Circle (214)

Apex Machine Company (1426*)*New products*

RS-100 videocassette printing machine; RG-1000 videocassette printing machine; CA-20 on-cassette printer; Z-90 automatic insert machine; Z-100 overwrap machine.

Product line

Cassette and cartridge tape machines; DAT tape machines; audio and video on-cassette printing systems and related accessories; miscellaneous video equipment and services.

Circle (215)

Apex Systems (1130*)*New products*

9000 modular signal processing system; 9250 aural exciter module; 9301 compellor module, compressor/leveler; 9611 expander/gate module; 9651 expressor/compressor/limiter.

Product line

Limiters/compressors; signal processors; noise gates/expanders.

Circle (216)

See ad index

API (Audio Products Inc.) (3006*)*New products*

API Discrete series consoles with touch reset; 525B compressor; 550B equalizer; 512B microphone pre-amplifier; 550S Sony MXP3000 equalizer replacement; 212S Sony MXP3000 mic pre-amplifier replacement.

Product line

Amplifiers; automation systems consoles; recording and production consoles; sound reinforcement consoles; crossovers and frequency dividers; equalizers; limiters/compressors; metering devices; microphone mixers; microphone pre-amplifiers; noise gates/expanders; audio routing switchers; signal processors.

Circle (217)

Apogee Electronics (2600)*New products*

DA-1000-E portable reference standard D/A converter; AD-500 general purpose stereo A/D converter; C-768 low jitter clock; P818 power supply/dc-dc converter.

Product line

Stand-alone A/D and D/A converters; replacement filters.

Circle (218)

Apogee Sound (3223*)*New products*

Built-in amplifiers for the corresponding AE line of loudspeakers: PA-1, PA-2, PA-3, PA-4, PA-5 and PA-SSM.

Product line

Amplifiers; electronically controlled loudspeaker systems; sound reinforcement loudspeakers.

Circle (219)

See ad index

Apollo Masters (2108)*Product line*

Lacquer master disc; Lacquer cutting stylus.

Circle (220)

Applied Innovation America (4307*)*New products*

VHS program evaluator — NTSC, PAL, EP.

Product line

Test and measuring equipment; tape duplication/manufacturing systems; tape winding equipment; video test equipment.

Circle (221)

APRS (4921)*Product line*

Miscellaneous equipment and services. Trade association for the recording industry in the UK.

Circle (222)

The Archon Company (1517)*New products*

1800X52 on-cassette imprinter.

Product line

Direct on-cassette imprinting systems.

Circle (223)

Ariel Corporation (2308)*New products*

ISPW IRCAM music workstation; SYS id acoustics test and measurement system; PROPORT audio interface for Unix workstations, PCs and Macintosh; DATPORT digital audiotape interface for Unix workstations, PCs and Macintosh.

Product line

Stand-alone A/D and D/A converters; computer hardware; computer software, studio applications; digital audio workstations; editing systems; test and measuring equipment; signal processors; sound samplers.

Circle (224)

A.R.T. (2206*)*New products*

Multiverb Alpha digital signal processor; SGX-2000 and SGX-Nightbass preamplification and stereo digital effects systems.

Product line

Delays; equalizers; limiters/compressors; noise gates/expanders; pitch shifters; reverbs; time compression/expansion.

Circle (225)

ARX Systems (3909)*New products*

ARX Afterburner dual-channel compressor/limiter.

Product line

Amplifiers; crossovers and frequency dividers; equalizers; limiters/compressors; electronically controlled loudspeaker systems; component loudspeakers; sound reinforcement loudspeakers; noise gates/expanders; signal processors.

Circle (226)

Ashly Audio (1604)*Product line*

Amplifiers; crossovers and frequency dividers; equalizers; limiters/compressors; microphone mixers; microphone pre-amplifiers; noise gates/expanders; signal processors.

Circle (227)

Audio Accessories (1603)*Product line*

Cable and connectors; patchbays and jack panels; video equipment.

Circle (228)

Audio Action (1523)*New products*

File Effects sound effects library.

Product line

Music production libraries; sampled sounds libraries; sound effects libraries.

Circle (229)

Audio Animation (5521)*New products*

Paragon digital audio studio processor; Paragon transmission processor.

Product line

Equalizers; limiters/compressors; mastering systems; noise gates/expanders; signal processors.

Circle (230)

See ad index

In an age of disk and digital, why buy analog?

We know there are some applications where our 32-channel digital machine, the DTR-900, is the only answer. But if your business is such that you can do anything you want to do in the analog domain, and at the same time do less damage to your budget, then our brand new analog 24-channel MTR-100A may be the perfect machine for you.

When you consider that the MTR-100 will literally *change forever* the way engineers interface with audio machines, and

transport is pinchrollerless to give you the legendary tape handling ballistics of our MTR-90.

What's more, with its optional EC-103 chase synchronizer, the MTR-100 maintains frame-lock in forward and reverse from 0.2X to 2.5X play speed, and will typically park with zero frame error.

Then, there's the sound. New cylindrical-contour heads built by Otari especially for the MTR-100 result in remarkably low crosstalk and outstanding low-frequency performance. Pre-amps are located directly beneath the heads to further improve frequency response, and HX-Pro* is built-in for enhanced high frequency headroom. (An optional internal noise reduction package houses Dolby* SR/A.) Add all these features to gapless, seamless, punch-in, punch-out, which is also built-in, and your

MTR-100's sonic performance will rival, or beat any digital machine in the world.

So there you have it. With these powerful benefits available in analog, does it make sense to go digital? Sure, for some applications. But analyze your needs carefully before you buy. For many applications, a hot

analog tape machine like the

MTR-100 is the right choice.

And because we can see both sides of the question, put us to work. We have information that can help you make the right decision. Call Otari at (415) 341-5900 for the "Technology You Can Trust".



Reel motors that approach one horsepower are driven by pulse width modulation amplifiers to tape speeds up to 474 ips.



The MTR-100's auto-alignment saves you hours of time by eliminating constant tweaking and re-tweaking between sessions.

that this new way will save you hours spent in non-productive time, the analog choice begins to make even more sense. You see, the MTR-100 features full Auto-Alignment that allows total recalibration of the record and reproduce electronics. This means you can compensate for different tapes in a *fraction* of the time that it previously took, and your studio is not bogged down with constant tweaking and re-tweaking between sessions.

And if you think digital machines have a corner on high performance transports, think again! The MTR-100's new transport incorporates reel motors that approach one horsepower—you'll get fast wind speeds of up to 474 inches per second! Of course, the

OTARI



Trademark Dolby Laboratories Licensing Corporation

Circle (12) on Rapid Facts Card

www.americanradiohistory.com

AudioControl Industrial (3016)*New products*

SG-200 and SG-300 hand-held signal generators; PCA-200 phase coupled activator.

Product line

Test and measuring equipment; signal processors.

Circle (231) See ad index

Audio Digital (1332*)*Product line*

Crossovers and frequency dividers; delays.

Circle (232)

Audio Intervisual Design (2200*)*New products*

COS-II lavalier microphone.

Product line

Studio and sound reinforcement microphones; wireless and RF microphones.

Circle (233)

Audio Logic (1701*)*New products*

266 dual gate/compressor/limiter; 440 quad noise gate; X-23 stereo 2-way, mono 3-way crossover; X-34 stereo 3-way, mono 4-way crossover; X-22 stereo 2-way precision crossover; X-32 stereo 3-way precision crossover.

Product line

Crossovers and frequency dividers; delays; equalizers; limiters/compressors; microphone mixers; noise gates/expanders; signal processors.

Circle (234)

Audlomat Systems (1808)*New products*

Live console automation system; film console automation system; modules for EQ automation.

Product line

Automation systems consoles; MIDI hardware; miscellaneous equipment and services; audio routing switchers.

Circle (235)

Audio Precision (2616*)*New products*

FASTest multitone signal used in combination with FFT spectrum analysis.

Product line

Test and measuring equipment.

Circle (236) See ad index

Audio Services (1616)*Product line*

Acoustic treatment materials; amplifiers; cable and connectors; digital consoles; recording and production consoles; sound reinforcement consoles; equipment cases; equipment rental and leasing; headphones and headsets; intercom systems; electronically controlled loudspeaker systems; component loudspeakers; sound reinforcement loudspeakers; studio monitoring loudspeakers; test and measuring equipment; microphone booms, stands and accessories; microphone mixers; microphone pre-amplifiers; studio and sound reinforcement microphones; wireless and RF microphones; miscellaneous equipment and services; racks and stands; audio recording tape; audio routing switchers; signal processors; analog multitrack tape machines; DAT tape machines; digital multitrack tape machines; tape supplies and accessories.

Circle (237)

Audio-Technica U.S. (2408)*Product line*

Cable and connectors; headphones and headsets; microphone booms, stands and accessories; microphone mixers; studio and sound reinforcement microphones; wireless and RF microphones; MIDI hardware; phonograph cartridges and accessories.

Circle (238)

Audiotechniques (1727*)*New products*

Yamaha DMC digital recording console; Yamaha DMR8 digital recorder/mixer; Yamaha CD recorder; Sony time code DAT record/edit system; Sony audio and video systems; Sony 2700 DAT recorder; Audiotechniques parts and accessory department.

Product line

Amplifiers; digital audio workstations; equalizers; limiters/compressors; pre-amplifiers; record/CD manufacturing.

Circle (239)

Audio Teknology (4815*)*New products*

Leap 4.1 multiway loudspeaker design software for IBM PCs.

Product line

Computer software for studio applications; sound reinforcement consoles.

Circle (240)

Audra International (3909)*New products*

Afterburner dual-channel compressor/limiter; Emilar 2818X subwoofer; 2115SM spherical stage monitor.

Product line

Equalizers; electronically controlled loudspeaker systems; component loudspeakers; sound reinforcement loudspeakers; signal processors.

Circle (241)

Augan Instruments (1416)*New products*

408 OMX optical multitrack recorder/editor.

Product line

Removable computer media; recording and production consoles; delays; digital audio workstations; editing systems; music production libraries; sampled sounds libraries; sound effects libraries.

Circle (242)

Australian Monitor (1601*)*New products*

K7 2-channel, 400W amplifier; I-K2 2-channel, 600W amplifier; MOSFET amplifiers.

Product line

Amplifiers.

Circle (243)

Avalon Design (2200*)*New products*

M-2 stereo microphone pre-amplifier.

Product line

Microphone pre-amplifiers.

Circle (244)

BASF (1120*)*Product line*

Maintenance, test and measuring equipment; recording tape, audio; recording tape; video.

Circle (245)

Berklee College of Music (1626)*Product line*

Educational courses and programs.

Circle (246)

beyerdynamic (3811*)*New products*

S170H hand-held wireless microphone system featuring TG480 head; S170P pocket wireless lavalier microphone system; S170TE miniature camera-mount wireless system; M59 large diaphragm, high output voice microphone with internal shock mount; MCE50 series miniature condenser microphone systems; MC833 stereo field production microphone.

Product line

Cable and connectors; headphones and headsets; microphone booms, stands and accessories; studio and sound reinforcement microphones; wireless and RF microphones.

Circle (247)

BGW Systems (1103)*New products*

GTC compact grand touring amplifier.

Product line

Amplifiers; racks and stands; fabricated rack-mount metal products.

Circle (248)

Bose (5551)*Product line*

Sound reinforcement loudspeakers.

Circle (249)

Brainstorm Electronics (2306)*New products*

SR-2 time code refresher with frame rate reader; SR-15 time code distributor.

Product line

Miscellaneous equipment and services; synchronizer systems; time code equipment.

Circle (250)

Bruel & Kjaer (1711)*Product line*

Acoustic design and construction; educational courses and programs; microphones, studio and PA.

Circle (251)

BSS Audio/Div. of AKG (1348*)*New products*

FCS-960 dual mode graphic equalizer; DPR-901 dynamic equalizer.

Product line

Crossovers and frequency dividers; equalizers; limiters/compressors; electronically controlled loudspeaker systems; MIDI hardware; noise gates/expanders; signal processors.

Circle (252)

Cambridge Signal Technologies (1620)*New products*

AEC 1000 equalizer.

Product line

Equalizers; signal processors.

Circle (253)

Cipher Digital (2303*)*New products*

CDI-825 Sony serial to LTC converter.

If you want to know what an SV-3700 sounds like, listen to these people.

RECORDING PRODUCT OF THE YEAR
TEC
 1991
 NOMINEE
 OUTSTANDING TECHNICAL ACHIEVEMENT



You're hearing them already, but now listen carefully. Each recording listed here was produced (and often mastered) using the SV-3700 Pro DAT. **Aire LA Studios** *Chuckii* produced by Chuckii Booker; *Tuff* produced by Howard Benson; *Brian Wilson* produced by Brian Wilson & Eugene

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

Panasonic
 Professional Audio Systems

Circle (13) on Rapid Facts Card

Product line
Digital audio workstations; editing systems; synchronizer systems; time code generators/readers.
Circle (254)

Community Light & Sound (1000)

New products
RS660 compact trapezoidal flying loudspeaker system; VBS112 Micro Array trapezoidal flying subwoofer; VBS212 two 12-inch flying subwoofer; 660 system controller; CSV-8t transformer-coupled foreground loudspeaker for distributed sound systems.

Product line
Electronically controlled loudspeaker systems; component loudspeakers; sound reinforcement loudspeakers.
Circle (255)

Concept Design (1418*)

New products
DAAD R² digital audio analog duplication system.

Product line
Mastering systems; tape duplication/manufacturing systems; test and measuring equipment; QC equipment.
Circle (256)

Connectronics (1412)

New products
Range of audio and video adapter plugs.
Product line
Cable and connectors; patchbays and jack panels; cable reels.
Circle (257)

J.L. Cooper Electronics (3224)

Product line
Computer hardware; MIDI computer software; computer software, studio applications; automation systems consoles; digital consoles; sound reinforcement consoles; digital audio workstations; MIDI hardware; miscellaneous equipment and services; sampling rate converters; synchronizer systems.
Circle (258)

Countryman Associates (1023)

New products
EMW series lavalier microphones.
Product line
Studio and sound reinforcement microphones; wireless and RF microphones.
Circle (259)

Crest Audio (1519*)

Product line
Amplifiers; sound reinforcement consoles.
Circle (260)

Crown (1717*)

New products
SMX-6 automation mixer; Power Tech amplifier; LM 300-L podium microphone.
Product line
Amplifiers; studio and sound reinforcement microphones.
Circle (261) **See ad index**

Crystal Semiconductor (1800*)

New products
CS8411 AES/EBU interface receiver; CS5349 single supply A/D converter for audio.
Product line
Integrated circuits.
Circle (262)

CST Manufacturing & Sales (1606*)

New products
RHP 6000 audiocassette imprinter; RHP 7500 videocassette imprinter; OV 4000 overwrap packaging machine; O-7000 O card inserter.
Product line
Packaging equipment.
Circle (263)

Current Music Technology (1601*)

New products
Macintosh Mac-n-Rak rack-mount computer systems; IBM rack-mount computer systems.
Product line
Computer hardware.
Circle (264)

dbx/Div. of AKG (1348*)

New products
363X 2-channel noise gate.
Product line
Equalizers; limiters/compressors; noise gates/expanders; noise reduction systems.
Circle (265)

DDA (1417*)

New products
The Profile, a 56-module console with optional moving fader automation.
Product line
Automation systems consoles; recording and production consoles; sound reinforcement consoles; crossovers and frequency dividers.
Circle (266)

Developing Technologies Distributors (2200*)

New products
COS-II lavalier microphone.
Product line
Studio and sound reinforcement microphones; wireless and RF microphones.
Circle (267)

DIC Digital (2302*)

New products
15MQ, 30MQ, 48MQ, 62MQ, 92MQ, 122MQ professional master-quality DAT cassettes.
Product line
Tape supplies and accessories.
Circle (268) **See ad index**

Digidesign (4809*)

New products
Pro Tools multitrack audio production system; Pro Store magneto-optical hard drive; CD recorder for Pro Tools and Sound Tools.
Product line
Computer media, hard drive; removable computer media; computer hardware; MIDI computer software; studio applications computer software; digital audio workstations; music production libraries; sampled sounds libraries; MIDI hardware; sound samplers.
Circle (269)

Digital Audio Research (3704*)

New products
SoundStation SIGMA digital audio production system; DASS 100 digital audio interface, sampling frequency and format converter.
Product line
Digital audio workstations; sampling rate converters.
Circle (270)

DigiTech (1701*)

New products
The Vocalist, a harmony processor designed for human voices.
Product line
Delays; equalizers; limiters/compressors; microphone mixers; noise gates/expanders; pitch shifters; reverbs; signal processors; sound samplers.
Circle (271)

Dolby Laboratories (2610*)

New products
DP501/DP502 audio coding units; 430 background noise suppression system; DR5500 series digital studio-to-transmitter link.
Product line
Noise reduction systems; signal processors.
Circle (272) **See ad index**

Doremi Labs

New products
Enhancements for DAWN (Digital Audio Workstation Nucleus) system.
Product line
Digital audio workstations.
Circle (273)

Dorrrough Electronics (2508)

Product line
Limiters/compressors; metering devices; stereo signal test equipment.
Circle (274)

Drawmer (2402*)

New products
DS404 Quad Gate expander/gate unit.
Product line
Limiters/compressors; noise gates/expanders; noise reduction systems.
Circle (275) **See ad index**

Duplitronics (3103*)

New products
DHS-1 digital head end system for audiocassette, DAT and digital compact cassette reproduction; MM-100 mastering system.
Product line
Computers, hardware and peripherals; power conditioning/standby power systems; tape duplication, systems and accessories; tape machines, digital.
Circle (276)

East-West Communications (4920)

New products
Prosamples; CD-ROMs; optical disks; RAM; ROM cards.
Product line
Libraries, music production, sampled sounds.
Circle (277)

EAW (Eastern Acoustics Works) (1501*)

New products
KF300i/SB330 virtual array system; MX300i electronic signal processing unit; SM200 high-definition stage monitor.
Product line
Electronically controlled loudspeaker systems; sound reinforcement loudspeakers.
Circle (278) **See ad index**

Electro Sound (1020*)

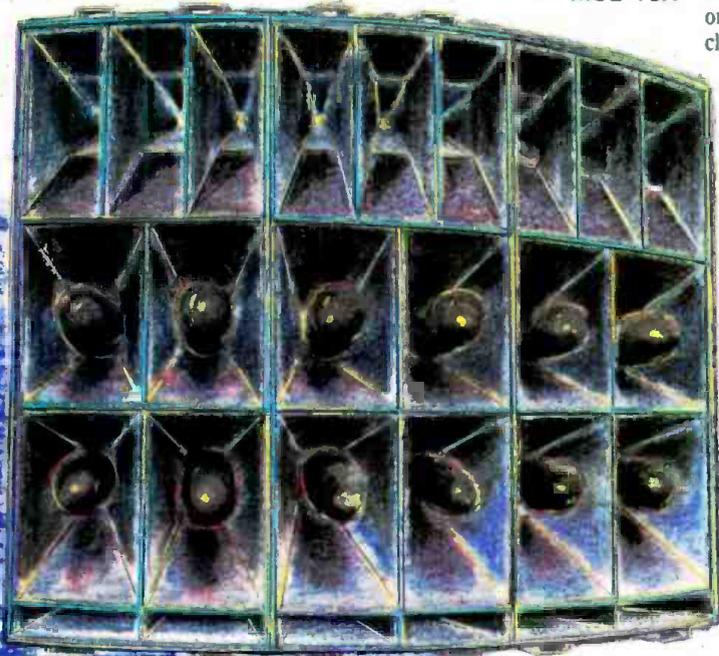
New products
9000 high-speed audio magnetic duplication system.

Meyer Sound Reinforcement Series

MSL-10A

"I've been using the MSL-10A for the biggest venues on our current tour. In terms of power, dynamics and clarity, nothing else even comes close."

*Chris Carlton
Audio Engineer
Julio Iglesias*



UPM-1

"I needed a speaker that was small and unobtrusive, yet produced the full musical range. I found what I was looking for in the UPM-1."

*Paul Schulz
Owner-Caffe SOMA*



UPA-1B

"For nine years Meyer has been our standard. Because we use MicroMonitors and have no onstage volume, we rely totally on the PA for our live sound. The quality of the UPA-1, especially supported with SIM® Equalization, far exceeds that of all its competitors."

*Tuck & Patti
Windham Hill Jazz
recording artists*



MSL-3

"We required a system that could reproduce the subtleties of a Broadway musical, yet reserve enough power for rock and roll. Our MSL-3/650-R2 system does exactly that!"

*Terry Smith
Technical Director
Opryland USA*

SIM® "Grand opera demands the ultimate in sonic realism. SIM® Equalization is my most important tool for satisfying the needs of conductors, artists and opera lovers."

Roger Gans, Sound Designer, San Francisco Opera



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Product line
Tape duplication/manufacturing systems.
Circle (279)

Electro-Voice (1725)
New products
RE27N-D and RE38N-D microphones.

Product line
Amplifiers; recording and production consoles; sound reinforcement consoles; crossover and frequency dividers; electronically controlled loudspeaker systems; component loudspeakers; sound reinforcement loudspeakers; studio monitoring loudspeakers; microphone mixers; studio and sound reinforcement microphones; wireless and RF microphones.
Circle (280)

E-mu Systems (6615)
New products

Emulator III digital audio workstation.
Product line
Digital audio workstations; synthesizers and keyboards.
Circle (281)

Enterprise Corporation of America

Product line
Test and measuring equipment.
Circle (282)

Euphonix (2403*)
New products

CSII digitally controlled analog audio mixing system.

Product line
Automation systems consoles; digital consoles; recording and production consoles; sound reinforcement consoles; noise gates/expanders.
Circle (283)

Eventide (1404*)
New products

VR240 digital logging recorder; BD980 talk show audio delay; BD1002 video delay; full line of Ultra-Harmonizer effects units.

Product line
Delays; pitch shifters; signal processors; sound samplers; time compression/expansion.
Circle (284) **See ad index**

Fairlight ESP Pty. Ltd. (5543)
New products

Upgrade to MFX digital audio workstation.
Product line
Digital audio workstations; digital video effects units; computer musical instruments.
Circle (285)

Ferrofluidics (1422)
New products

APG 027 and APG 017 ferrofluids for drivers, woofers and tweeters.

Product line
Audio grade ferrofluids; acoustic treatment materials; component loudspeakers; sound reinforcement loudspeakers.
Circle (286)

FM Acoustics (1515)
New products

FM 2001A precision monophonic high power amplifier, FM 801A precision high power stereo amplifier.

Product line
Amplifiers; cable and connectors; crossovers and frequency dividers; microphone pre-amplifiers.
Circle (287)

Fostex (5524*)

New products
X-28 multitrack digital recorder; PD2 portable DAT tape machine; 2412 studio console; SPA32 powered speaker system.

Product line
MIDI computer software; studio applications computer software; recording and production consoles; editing systems; headphones and headsets; sound reinforcement loudspeakers; studio monitoring loudspeakers; studio and sound reinforcement microphones; MIDI hardware; patchbays and jack panels; synchronizer systems; analog multitrack tape machines; cassette and cartridge tape machines; DAT tape machines; digital multitrack tape machines.
Circle (288)

Full Sail Recorders (1031*)

Product line
Educational courses and programs.
Circle (289)

Gauss (1020*)

New products
2400 high-speed audio magnetic tape duplicator; 1100 tape test system; 3588 coax speaker system.

Product line
Component loudspeakers; sound reinforcement loudspeakers; studio monitoring loudspeakers; tape duplication/manufacturing systems.
Circle (290) **See ad index**

Gefen Systems (1932)

New products
M&E Organizer music and SFX locator software; CDJ Classic and CD Sound Music background systems; BBC SFX library of 22 new CDs; Digifffects SFX library with 35 CDs.

Product line
Playback-only compact disk players; computer software for studio applications; music production libraries; sampled sounds libraries; sound effects libraries; automated background music systems for businesses, hotels, clubs and homes.
Circle (291) **See ad index**

Genelec Oy (5529)

Product line
Amplifiers, loudspeakers, studio monitoring.
Circle (292)

GML (3000*)

New products
HRT 9100 high-resolution, 10-input/4-output mixer; Series 2000 automation software update.

Product line
Automation systems consoles; recording and production consoles; equalizers; faders; limiters/compressors; microphone pre-amplifiers.
Circle (293)

Gold Line/Loft (1025)

New products
DSP-30 1/3-octave audio spectrum analyzer.

Product line
Crossover and frequency dividers; headphone mixing systems; test and measuring equipment; studio and sound reinforcement microphones; noise gates/expanders; real time analyzers.
Circle (294)

Gotham Audio (3801*)

New products
Microtech Gefell condenser microphones; DSP Audio Workbench FFT analyzer.

Product line
Stand-alone A/D and D/A converters; cable and connectors; playback-only and recordable compact disc players; computer software, studio applications; digital consoles; delays; digital audio workstations; equalizers; limiters/compressors; mastering systems; metering devices; microphone booms, stands and accessories; studio and sound reinforcement microphones; noise gates/expanders; noise reduction systems; phonograph cartridges and accessories; phonograph turntables; record/CD manufacturing systems; reverbs; audio routing switchers; sampling rate converters; synchronizer systems; DAT tape machines.
Circle (295)

The John Hardy Company (4004)

New products
LD-1 line driver.

Product line
Amplifiers; microphone pre-amplifiers; discrete op-amps; line drivers; transformer splitters.
Circle (296) **See ad index**

Harrison by GLW (1809*)

Product line
Automation systems consoles; sound reinforcement consoles; metering devices; audio routing switchers.
Circle (297)

HEDCO (4903*)

New products
16XPlus series routers; RCP-NXY numeric remote control panel.

Product line
Amplifiers; audio routing switchers; video equipment.
Circle (298)

Heino Ilseemann (1125*)

Product line
Tape duplication, systems and accessories.
Circle (299)

Hybrid Arts (5548)

New products
ADAPII and ADAPIV; portable digital recorder/editor.

Product line
Digital audio workstations; editing systems.
Circle (300)

Innovative Electronic Designs (1911)

New products
2000 universal digital audio processing system (UDAPS).

Product line
Amplifiers; audio routing switchers; signal processors; automatic microphone mixers; computerized audio systems; ambient analysis system.
Circle (301)

Intellex (2205)

New products
MIND-Net high-speed communications protocol for use with master controller or as a stand-alone unit.

Product line
Communications and control systems.
Circle (302)

NEW MQ™ SERIES. MASTER QUALITY DIC//DAT™ FOR THE ULTIMATE QUALITY MASTER.



DIC//DAT introduces its new MQ Series DAT tape. Master Quality media crafted with second-generation technical improvements based on extensive R&D and feedback from audio pros in the field. The one DIC//DAT perfected for professional use.

- ▶ **NEW MQ "Formulation Finish"** reduces friction and provides more efficient tape-to-head contact for superb performance even in the face of high search and rewind speeds.
- ▶ **NEW MQ proprietary DIC MicroFinity metal particle technology** creates a consistently high quality magnetic medium for uncompromising professional DAT recording.
- ▶ **NEW MQ exclusive DIC//DAT tape lengths** include an extra two minutes for tone recording, test signals and pre-roll identification—as well as the industry's only 15–30 minute DAT cassettes for small programs, demos and test tapes.
- ▶ **NEW MQ dust-busting cassette design** virtually eliminates recording errors and tape jamming due to environmental contamination.
- ▶ **NEW MQ unique window calibrations** for easier reading and more accurate time judgment.
- ▶ **NEW MQ extra-strong DIC//DAT cassette shell** made in the U.S., with new window ribs for increased stability, 100% anti-static plastic, and the industry's only fiber-filled slider for structural integrity, stands up to the most rigorous studio use.

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 © DIC DIGITAL SUPPLY CORPORATION, 1991 *DIC Digital*

Intersonics (4901)*New products*

Low frequency only switching amplifier for servo-drive loudspeakers; VANE speaker technology.

Product line

Amplifiers; electronically controlled loudspeaker systems; sound reinforcement loudspeakers; sonic boom simulators; acoustic levitation systems.

Circle (303)

JBL Professional (1332*)*New products*

MR series of sound reinforcement systems; Control Micro loudspeaker; Control SB Micro subwoofer.

Product line

Amplifiers; crossover and frequency dividers; delays; equalizers; limiters/compressors; electronically controlled loudspeaker systems; component loudspeakers; sound reinforcement loudspeakers; studio monitoring loudspeakers; signal processors.

Circle (304)

See ad index

Josephson Engineering (2500)*Product line*

Microphones, pre-amplifiers; microphones, studio and PA; miscellaneous equipment and services.

Circle (305)

JRF Magnetic Sciences (1011*)*New products*

PLX direct replacement magnetic heads; Otari MX5050 1/2-inch 8TK and MTR 10/12 1/2-inch 4TK; Teac 80-8 1/2-inch 8TK, Mod 38 1/2-inch 8TK and 85-16 1-inch 16TK.

Product line

Replacement recording heads; synchronizer systems; alignment tapes; time code retrofit kits.

Circle (306)

JVC Professional Products (1400*)*Product line*

Equalizers; mastering systems; noise gates/expanders; signal processors; DAT tape machines; video equipment.

Circle (307)

KABA (1824)*New products*

4-track realtime duplication decks operated direct-from-digital from Digidesign's new Pro Tools 4-track digital workstation.

Product line

Tape duplication, manufacturing systems and services; compact disc players, playback only; digital audio workstations; editing systems; cassette and cartridge tape machines; tape suppliers and accessories.

Circle (308)

See ad index

Kenwood USA (3703)*Product line*

Disc mastering systems; record/CD manufacturing.

Circle (309)

Klark-Teknik (1417*)*New products*

DN735 digital audio recorder; DN726V stereo digital audio delay.

Product line

Delays; equalizers; limiters/compressors; noise gates/expanders; reverbs; video equipment.

Circle (310)

See ad index

Klipsch (2603*)*New products*

Eight woofers (12-, 15- and 18-inch drivers); KP-480-SW subwoofer system vented via a 15-inch passive radiator; KP-101 2-way system with 8-inch woofer and horn-loaded 1-inch compression driver.

Product line

Component loudspeakers; sound reinforcement loudspeakers.

Circle (311)

See ad index

Korg USA (5534)*New products*

Wavestation EX expanded Wavestation keyboard; A1 signal processor; A2 multi-effects processor; WSAD rack-mount Wavestation module; Soundlink integrated audio production system; 01W and 01W/FD music workstation keyboards; SE100 Marshall speaker emulation unit.

Product line

Amplifiers; digital audio workstations; editing systems; pitch shifters; reverbs; signal processors; synthesizers and keyboards.

Circle (312)

KRK Monitoring Systems (2200*)*Product line*

Studio monitoring loudspeakers.

Circle (313)

Leitch (4903*)*New products*

VGE-3210 and VGD-3200 Viewguard scrambler/descramblers.

Product line

Amplifiers; audio routing switchers; video equipment.

Circle (314)

See ad index

Lester Audio Laboratories (4922)*Product line*

DAS-2000 digital audio transmission and routing system, with fiber-optic cable.

Circle (315)

Lexicon (1316*)*New products*

LFI-10 digital audio format interface, which converts between AES/EBU, S/PDIF and SDIF-2; LARES (Lexicon Acoustic Reverberance Enhancement System) 18-bit, MIDI-controlled DSP.

Product line

Hard drive computer media; recording and production consoles; delays; digital audio workstations; editing systems; MIDI hardware; pitch shifters; reverbs; signal processors; time compression/expansion.

Circle (316)

See ad index

Magnifax International (1804)*New products*

7801 4-track cassette duplicator.

Product line

Cassette duplicators; continuous belt tape degaussers.

Circle (317)

Mag-Zon (1617)*Product line*

Tape supplies and accessories.

Circle (318)

Mark of the Unicorn (2300)*New products*

Digital Performer, combines Macintosh-based random access digital audio recording and Performer's sequencing capabilities.

Product line

MIDI computer software; MIDI hardware; video equipment.

Circle (319)

Marshall Electronic (2504*)*New products*

Symetrix DPR workstation: multitrack, direct-to-disk recording studio.

Product line

Computer hardware; computer software, studio applications; automation systems consoles; digital consoles; delays; digital audio workstations; equalizers; limiters/compressors; noise gates/expanders; noise reduction systems; pitch shifters; reverbs; signal processors; time compression/expansion.

Circle (320)

Marshall Electronics Inc. (2509)*New products*

PJM-XX (five colors and six length variances, plus customized) high-definition Pantam patchcords and pigtailed; RW-XX high-definition stereo interconnects.

Product line

Patchbays and jack panels; cable and connectors.

Circle (321)

Media Technologies Ltd. (3103*)*New products*

Tachos 90/Kronos 4 automatic cassette loader line; P-2600/P-4400 Lyrec audiocassette duplicating system with speed ratio 80:1/100:1; quality control deck.

Product line

Tape duplication/manufacturing systems; cassette loading equipment; quality control decks.

Circle (322)

Meyer Sound Laboratories (1803*)*New products*

SIM second-generation integrated source independent equalization system; DS-2/02 mid-bass loudspeaker system; stage monitor with 15-inch, low frequency and 2-inch, high-frequency compression driver.

Product line

Equalizers; electronically controlled loudspeaker systems; sound reinforcement loudspeakers; studio monitoring loudspeakers.

Circle (323)

See ad index

Midas (1417*)*Product line*

Sound reinforcement consoles; XL88 line level matrix mixer.

Circle (324)

Milab (1417*)*Product line*

Studio and sound reinforcement microphones.

Circle (325)

Minim Electronics (2309)

Not available at press time.

Circle (326)

Monster Cable Products (2502)*Product line*

Cable and connectors; fiber-optic communication systems/snakes.

Circle (327)

Have your cake

You can have it both ways with System One.

Most audio test sets fall into one of two categories...

There are the specialty testers, like tape recorder test sets, video/audio monitors or pricey short interval test systems. Then there are conventional general purpose audio testers, which can do basic testing but lack the capability to fill today's specialized testing needs.

Investing large amounts in specialty systems that don't also meet your day-to-day audio testing needs is both expensive and frustrating.

SYSTEM ONE solves the problem by providing both high performance general purpose audio testing and innovative specialty testing functions. Basic SYSTEM ONE configurations are priced competitively, yet can grow with your needs to include these advanced functions:

FASTest – Test any audio channel in 2 seconds or less

MLS – Quasi-anechoic measurements of loudspeakers

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TV BTSC – Automated Stereo Proofs

DUAL DOMAIN TESTING – Direct digital domain testing of digital audio and interfaces.

TAPE TESTING – Complete magnetic tape recorder and media testing.

SPECTRUM ANALYSIS – Audio FFT analysis

EBU 0.33 – Short interval testing

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Motorola (2209)

Product line
Computer hardware; computer software, business; integrated circuits; signal processors.
Circle (328)

Nady Systems (1812)

New products
750 VHF dual discrete channel wireless system.
Product line
Amplifiers; headphones and headsets; intercom systems; electronically controlled loudspeaker systems; microphone mixers; wireless and RF microphones; noise reduction systems; signal processors; video equipment; transceivers, UHF and VHF.
Circle (329)

Nagra/Phi Technologies (4305)

Not available at press time.
Circle (330)

Neotek (1831*)

New products
Broadcast Elite production console.
Product line
Automation systems consoles; recording and production consoles; sound reinforcement consoles.
Circle (331)

Neutrik, U.S.A. (1509*)

New products
A-1 audio test and service system with optional phase and RS-232 boards/software.
Product line
Cable and connectors; component loudspeakers; patchbays and jack panels; audio transformers; audio test and measurement equipment; digital message repeater.
Circle (332)

Neve (2210*)

New products
44 series of compact audio consoles for broadcast and video post editing; Orion 2000 and 2000E series consoles for TV broadcast, production, remote and video post; HRC-1 digital stereo A/D and D/A converter; Mitsubishi X-86E "Razor Edit" 2-channel digital audio recorder for stereo master recording.
Product line
Stand-alone A/D and D/A converters; automation systems consoles; recording and production consoles; equalizers; signal processors; digital multitrack tape machines; time compression/expansion.
Circle (333)

NVision (3921)

New products
NV3512 digital audio routing switch; NV4448 digital audio sampling rate converter; NV1000 terminal equipment system.
Product line
Stand-alone A/D and D/A converters; audio routing switchers; sampling rate converters; audio multiplexers.
Circle (334)

New England Digital (1308*)

New products
DSP Option for the PostPro, PostPro SD and Direct-to-Disk workstations.
Product line
Digital audio workstations; MIDI hardware; sequencers.
Circle (335)

Opcode Systems (3915*)

Product line
Computer hardware; MIDI computer software; computer software, studio applications; digital audio workstations; music production libraries; MIDI hardware; sequencers; video equipment.
Circle (336)

Optical Disc (4202*)

New products
538 ODC/PQ Generator/Editor address information generator for CD recording and mastering.
Product line
Compact disc and laser disc mastering systems.
Circle (337)

OD & ME b.v. (3501*)

New products
Integrated manufacturing system; Monoliner MK II; Videoliner VMK I; masking systems; electroforming equipment; packaging line; test equipment.
Product line
Mastering systems; record/CD manufacturing systems; video equipment; electroforming equipment.
Circle (338)

Optim Audio (4911)

New products
Wharfedale loudspeakers; Whiteley amplifiers.
Product line
Amplifiers; sound reinforcement, loudspeakers and microphones; signal processors.
Circle (339)

OptoDigital Design (2502)

Product line
Cable and connectors; fiber-optic communications systems/snakes.
Circle (340)

Orban/Div. of AKG (1348*)

Product line
Recording and production mixing consoles; equalizers; replacement filters; digital signal processors; miscellaneous broadcast equipment.
Circle (341)

Otari (1814*)

Product line
Automation system consoles; recording and production consoles; sound reinforcement consoles; digital audio workstations; manufacturing services and systems tape duplication; analog multitrack tape machines; cassette and cartridge tape machines; DAT tape machines; digital multitrack tape machines.
Circle (342) See ad index

Oxmoor (2303*)

Product line
Equalizers; audio routing switchers; programmable equalizers; mixing matrices; digital volume controls; distribution amplifiers; room combining systems; buffer amplifiers.
Circle (343) See ad index

Panasonic Pro Audio/Ramsa (5537*)

Product line
Amplifiers; computer software, studio applications; automation systems consoles; recording and production consoles; sound reinforcement consoles; crossovers and frequency dividers; delays; sound reinforcement loudspeakers; studio monitoring loudspeakers; microphone mixers; studio and sound reinforcement microphones;

audio recording tape; DAT tape machines; audio transformers.

Circle (344) See ad index

Peavey Electronics (2218*)

New products
Production series 1600PB and 2400PB consoles.

Product line
Amplifiers; cable and connectors; computer software, studio applications; automation systems consoles; digital consoles; recording and production consoles; sound reinforcement consoles; crossovers and frequency dividers; delays; equalizers; sampled sounds libraries; electronically controlled loudspeaker systems; component loudspeakers; sound reinforcement loudspeakers; studio monitoring loudspeakers; microphone mixers; microphone pre-amplifiers; studio and sound reinforcement microphones; wireless and RF microphones; MIDI hardware; miscellaneous equipment and services; noise gates/expanders; noise reduction systems; patchbays and jack panels; reverbs; sequencers; signal processors; sound samplers; synchronizer systems; synthesizers and keyboards; audio transformers.

Circle (345) See ad index

Penny & Giles (1707*)

Product line
Faders; patchbays and jack panels.
Circle (346)

PINC LINK (4005)

New products
PincSound Editor 2-channel to 4-channel, direct-to-disk, editor master/CD/DAT dialogue editor; Pinc Edit System 486kHz to 66MHz PC for audio/video applications; 4-place removable hard drive; Pinc Real Time Video displays real time in VGA monitor; Pinc Tape Caster outputs VGA/video to tape.

Product line
Hard drive computer media; removable computer media; computer hardware; digital audio workstations; editing systems; educational courses and programs; equipment cases; equipment rental and leasing; miscellaneous equipment and services; noise reduction services; racks and stands; reverbs; signal processors; synthesizers and keyboards; video equipment; real time video.

Circle (347)

Plitron Manufacturing (1513)

New products
PLA5100 modular audio amplifier.
Product line
Amplifiers; audio transformers; power transformers.
Circle (348)

Professional Audio Systems (1622*)

New products
Target Series trapezoidal reinforcement loudspeakers; SM-2 studio monitors.
Product line
Electronically controlled loudspeaker systems; component loudspeakers; sound reinforcement loudspeakers; studio monitoring loudspeakers.
Circle (349)

Pygmy Computer Systems (4907)

New products
AD-1 outboard A/D converter.
Product line
Stand-alone A/D and D/A converters.
Circle (350)

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From the beginning we wanted it all: massive power, high efficiency and performance combined with unmatched flexibility and reliability. Together they represented the ultimate statement — amplifiers far more sophisticated than any available today. Our engineers accepted the challenge. **The result is the EX Series.**

MASSIVE OUTPUT POWER. The EX 4000 supplies 1,100 watts per channel at 4 ohms, enough power to drive today's most demanding speaker systems. No duty cycle lightweights, each model will deliver massive output power under high duty cycle conditions.

HIGH EFFICIENCY. QSC engineers developed an advanced high efficiency stepped linear output circuit to dramatically lower waste heat and AC current consumption. As a result, the EX 4000 can operate on a normal 15 amp AC plug. It's the only amplifier in its power class to do so!

CLOSED LOOP PROTECTION. A sophisticated closed loop thermal management and protection system measures actual operation and smoothly and progressively intervenes

only to the degree necessary. This eliminates harsh clipping, false triggering chatter, shut down, and other forms of protection distortion.

OPEN INPUT ARCHITECTURE.™

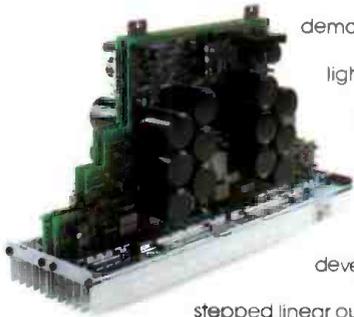
Open Input Architecture provides the ability to interface with computers, digital audio, and



fiber optic systems. It also allows you to incorporate signal processing capabilities within the amp. No matter what your needs will be, an EX Series amp has the flexibility to meet your requirements.

YOU CAN HAVE IT ALL. At QSC, our high standards of quality and value have remained the same for over two decades. We have also earned a legendary reputation for reliability. And we've done it the hard way, by performing flawlessly in the world's most demanding sound systems. Now, with the EX Series, we have raised the standard for engineering sophistication. It will change what you think a power amplifier should be.

QSC
A U D I O



To learn more about the EX Series, contact an authorized QSC dealer for the EX Series White Paper.

Circle (17) on Rapid Facts Card

QSC Audio Products, Inc., 1926 Placentia Avenue, Costa Mesa, CA 92627 (714) 645-2540

www.americanradiohistory.com

QSC Audio Products (1012*)
New products
Computer control system.
Product line
Amplifiers.
Circle (351) See ad index

Radian Audio Engineering
New products
MM8C compact 8-inch coaxial studio monitor; M58C 8-inch coaxial studio monitor; 500/2 series coaxial loudspeakers; MS12 12-inch coaxial studio monitor.
Product line
Component loudspeakers; sound reinforcement loudspeakers; studio monitoring loudspeakers.
Circle (352)

Rane (3903)
Product line
Amplifiers; crossovers and frequency dividers; equalizers; headphone mixing systems; limiters/compressors; microphone mixers; microphone pre-amplifiers; noise gates/expanders; signal processors.
Circle (353) See ad index

R•E•P (1927*)
Stop by to meet R•E•P's sales and editorial staff, including Dennis Milan, publisher; Mike Joseph, editor; Sue Edwards, Associate Editor; Stan Kashine, East Coast sales rep; David Ruttenberg, Midwest sales rep; Jason Perlman, West Coast sales rep; Richard Woolley, international sales rep; and Renée Hambleton, classified sales rep.

The sales and editorial staffs of *Sound & Video Contractor* and *Broadcast Engineering* will also be at booths 1927 and 1929. All three magazines are Intertec publications.

Renkus-Heinz (1003*)
New products
EASE, Version 1.1 electroacoustic simulator for engineers software program; EARSS electronically auralized room simulation system; C-2 coaxial 3-way loudspeaker system; SSD180T high-frequency titanium diaphragm driver; COAX40 coaxial 40°x20° horn; WR (Weather Resistant) Option for all Renkus-Heinz loudspeakers.
Product line
Acoustic design and construction; computer software, studio applications; electronically controlled loudspeaker systems; component loudspeakers; sound reinforcement loudspeakers; studio monitoring loudspeakers; signal processors.
Circle (354)

Roland Pro Audio/Video Group (6620*)
New products
DM-80 multitrack hard disk recording system; DM-80R remote controller; RSS Roland Sound Space localization system.
Product line
Stand-alone A/D and D/A converters; MIDI computer software; delays; digital audio workstations; editing systems; equalizers; sampled sounds libraries; MIDI hardware; noise reduction systems; reverbs; sequencers; signal processors; sound samplers; synchronizer systems; 3-d audio processors.
Circle (355)

Roldex Industries (3111*)
Product line
Tape duplication, manufacturing systems; video equipment.
Circle (356)

Rolls Corporation (1614)
New products
RA 2100 stereo amplifier.
Product line
Amplifiers; equalizers; microphone mixers; microphone pre-amplifiers.
Circle (357)

RPG Diffusor Systems (2722)
New products
VAMPS acoustical shell for recording studios, location recording, performing arts facilities, and schools; NDC Almute sound-absorbing panel; Studio-in-a-Box kit for home studios, small post-production facilities and edit suites; Kydex vacuum-formed diffusor for ceiling and wall systems.
Product line
Acoustic design and construction; acoustic treatment materials; miscellaneous equipment and services.
Circle (358)

Saki Magnetics (1009)
Product line
Replacement recording heads.
Circle (359)

Samson Technology (1110*)
New products
Concert Series II wireless system.
Product line
Wireless and RF microphones.
Circle (360)

Sanken (Developing Technologies Distributors) (2200*)
New products
COS-II lavalier microphone.
Product line
Studio and sound reinforcement microphones; wireless and RF microphones.
Circle (361)

Schoeps/Posthorn Recordings (1220*)
New products
KFM 6U sphere stereo microphone.
Product line
Stand-alone A/D and D/A converters; recording and production consoles; equalizers; equipment rental and leasing; metering devices; microphone booms, stands and accessories; microphone mixers; microphone pre-amplifiers; studio and sound reinforcement microphones; wireless and RF microphones; signal processors.
Circle (362)

Sellmark Electronics (1808*)
New products
Omitrac linear motor fader; Slimline TKD motor fader; additional conductive plastic faders.
Product line
Automation systems consoles; faders; component loudspeakers; reverbs; rotary potentiometers; switches; sockets.
Circle (363)

Sennheiser Electronics (1401*)
New products
BF 530 hand-held, supercardioid, dynamic vocal microphone; MD 422 cardioid, dynamic, studio, touring and broadcast microphone; MKE300 electret short shotgun microphone; HD 490 low impedance, digitally compatible headphone.
Product line
Cable and connectors; computer hardware; computer software, business; headphones and headsets; microphone booms, stands and accessories; studio and sound reinforcement microphones; wireless and RF microphones; miscellaneous equipment and services; test and measurement equipment; infrared sound distribution.
Circle (364) See ad index

Seacom (1724)
New products
ASG-2 low distortion audio generator; THD-2 distortion analyzer; OSC-1 flat oscilloscope; SFG-1 sweep function generator; AT-1 portable audio tester; FM-1 portable frequency meter; AVM-2 portable audio voltmeter; LSI-1 loudspeaker impedance checker. All units are hand-held.
Product line
Amplifiers; crossover and frequency dividers; equalizers; limiters/compressors; microphone mixers; microphone pre-amplifiers; miscellaneous equipment and services; noise gates/expanders; audio transformers.
Circle (365)

Shure (1825*)
New products
VP 64 omnidirectional, hand-held interview microphone; FP 410 portable automatic mixer, featuring Shure Intellimix.
Product line
Microphone mixers; microphone pre-amplifiers; studio and sound reinforcement microphones; wireless and RF microphones.
Circle (366) See ad index

Shure HTS (1823*)
New products
HTS 400 SPA signal processing amplifier; HTS 640 LRS and HTS 680 CF monitor loudspeaker systems; HTS 650 SW subwoofer system.
Product line
Amplifiers; studio monitoring loudspeakers.
Circle (367)

Solid State Logic (3005*)
New Products
Ultimation G Series console automation system; Screensound digital audio-for-video editing/mixing system; Soundnet digital audio network; SL4000, SL5000, SL6000 G Series consoles; Logic F/X G384 stereo compressor and G383 dual mic amplifier.
Product line
Consoles, automation systems; consoles, recording and production; digital audio workstations; equalizers.
Circle (368) See ad index

Sonex/Div. of illbruck (1409*)
New products
PSP-1 ProSPEC acoustical foam; PSP-5 ProSPEC composite; PSP-7 ProSPEC barrier material.

A ROOM EQUALIZED TO PERFECTION

MULTITRACK TO MIXDOWN

STUDIO MONITORS REVEAL

THE ENTIRE SOUND SPECTRUM



Now the excellence of sound experienced by engineers and producers
can be duplicated on Sunkyong Pure Chrome Tape.

What the producer hears, chrome remembers.

UCR Pure Chrome Professional Duplicating Tape from Sunkyong.

Because the time has come for the world to share the excitement of studio sound.

SUNKYONG
Professional Products

Sunkyong Magnetic/America, Inc., 4041 Via Oro Avenue, Long Beach, CA 90810 1-800-331-5729 Outside CA 1-800-237-8372

Circle (18) on Rapid Facts Card

www.americanradiohistory.com

Product line.
Acoustic design and construction; acoustic treatment materials.
Circle (369)

Sonic Solutions (2400*)
Product line.

Recordable compact disc players; computer software, studio applications; digital audio workstations; noise reduction systems; record/CD manufacturing systems.

Circle (370) See ad index

Sony (2510*)
New products.

DABK-3341 update kit for the PCM-3348 DASH recorder; DABK-3005 interface for the DAE-3000 to work with the PCM-7000 series DAT recorders.

Product line.

Stand-alone A/D and D/A converters; playback-only compact disc players; automation systems consoles; recording and production consoles; delays; equalizers; headphones and headsets; limiters/compressors; mastering systems; metering devices; studio and sound reinforcement microphones; wireless and RF microphones; reverbs; sampling rate converters; analog multitrack tape machines; cassette and cartridge tape machines; DAT tape machines; digital multitrack tape machines; video equipment.

Circle (371) See ad index

Soundcraft Electronics (1339*)
New products.

Europa live reinforcement console; Sapphire in-line recording and post-production console; Spirit STUDIO for multitrack recording and Spirit LIVE for sound reinforcement; Delta Monitor with 12-bus stage monitor mixer and up to 40 inputs.

Product line.

Automation systems consoles; recording and production consoles; sound reinforcement consoles.

Circle (372) See ad index

Sound Ideas (1930)
New products.

Series 5000 "Wheels" sound effects library.

Product line.

Music production libraries; sampled sounds libraries; sound effects libraries.

Circle (373)

Sound Technology (2507)

Product line.

Acoustic design and construction; audio distortion analyzers; audio spectrum analyzers.

Circle (374)

Soundtracs plc (1110*)
New products.

Megas Mix 4-bus sound reinforcement; Megas Stage 8-bus sound reinforcement; Megas Studio 16- or 24-bus recording console; Megas Monitor 10-bus monitor console; IL4832 32-bus production/recording console; Quartz 4800 24-bus, in-line recording console; Sequel 4000 8-bus large/medium venue sound reinforcement.

Product line.

Automation systems consoles; recording and production consoles; sound reinforcement consoles.

Circle (375) See ad index

Soundtracker Pty. Ltd. (2307)

New products.

ST08 8-output digital workstation for film and video post-production.

Product line.

Digital audio workstations; editing systems.

Circle (376)

Society of Professional Audio Recording Services (SPARS) (4921)

Product line.

SPARS is a non-profit professional trade organization who members include prominent studios, manufacturers of professional equipment, recording schools and colleges, small personal home-use studios, individual engineers and producers. The goal of SPARS is to promote worldwide communication among all of those who make and use professional audio equipment, to foster high-quality educational programs for future engineers and producers, and to promote the economic well-being of the recording service industry as a whole.

Circle (377)

Spectral Synthesis (2622*)

New products.

Audio Engine Series digital audio workstations up to 16 tracks; Audio Scape digital effects processing software; Studio Tracks version 1.3 multitrack recording/editing software.

Product line.

Stand-alone A/D and D/A converters; computer hardware; studio applications computer software; digital audio workstations; editing systems; mastering systems; sound samplers; time compression/expansion.

Circle (378)

Stellevox (2203)

Product line.

Tape machines, analog; tape machines, DAT.

Circle (379)

Stewart Electronics (1900)

New products.

PA-800 2x150W, 8Ω power amplifier.

Product line.

Amplifiers; microphone mixers; microphone pre-amplifiers; direct boxes; phantom power.

Circle (380)

Studer Revox America (1300*)

New products.

D740 CD recorder; D820 48-track DASH digital recorder; Dyaxis magneto-optical drive; Dyaxis MacMix 3.2 software with enhanced graphics and snapshot EQ.

Product line.

Playback-only compact disc players; recordable compact disc players; computer media, hard drive; removable computer media; recording and production consoles; digital audio workstations; studio monitoring loudspeakers; analog multitrack tape machines; digital multitrack tape machines.

Circle (381)

Success Specialty Sales (1802)

New products.

A219 1/4-inch acetate splicing tape; P219 1/2-inch polyester splicing tape; full line of leader tapes, hold-down, console, gaffers, duct and other tapes.

Product line.

Tape supplies and accessories.

Circle (382)

Summit Audio (3905)

New products.

DCL-200 dual limiter/compressor.

Product line.

Equalizers; limiters/compressors; metering devices; microphone pre-amplifiers.

Circle (383)

Sunkyong Magnetic/America (3601*)

New products.

MCX modified ferric cobalt tape designed for duplication from tapeless digital bins or similar sources.

Product line.

Audio recording tape; tape duplication/manufacturing services.

Circle (384) See ad index

Swire Magnetics (2207)

Product line.

Tape supplies and accessories; complete line of audio/video C-O's, V-O's and Norelco boxes.

Circle (385)

Symetrix (2504*)

New products.

564 quad expander gate; 524 multimode crossover; SX208 stereo limiter/compressor.

Product line.

Amplifiers; crossover and frequency dividers; digital audio workstations; editing systems; equalizers; headphone mixing systems; limiters/compressors; metering devices; microphone pre-amplifiers; noise gates/expanders; noise reduction systems.

Circle (386)

Tannoy/TGI North America (1030*)

New products.

CPA-5 point source, full-bandwidth, inductively coupled, 5-inch loudspeaker; CPA-12 and CPA-15 main loudspeakers; CPA-15 FM floor monitor; CPA-10.1 high powered constant directivity horn.

Product line.

Component loudspeakers; sound reinforcement loudspeakers; studio monitoring loudspeakers.

Circle (387) See ad index

Tape Automation (4307*)

Product line.

Maintenance, test and measuring equipment; tape duplication, systems and accessories; tape machines, cassette and cartridge.

Circle (388)

Tapematic USA (3807*)

Not available at press time.

Circle (389)

Tascam (2010*)

New products.

MFA-700 automated/moving fader 40x40 in-line mixing console; M7-MFA moving fader automation retrofit package for M700 series consoles.

Product line.

Playback-only compact disc players; automation systems consoles; recording and production consoles; sound reinforcement consoles; patchbays and jack panels; synchronizer systems; tape duplication/manufacturing systems; analog multitrack tape machines; cassette and cartridge tape machines; DAT tape machines; digital multitrack tape machines.

Circle (390) See ad index

T.O.T.A.L. R.E.C.A.L.L.



The DPM[®] **SP** SAMPLE PLAYER

Expand your horizons. Don't limit your creativity by limiting your memory capacity. With the new DPM[®] SP sample playback synthesizer from Peavey Electronics, the creative possibilities are endless. The Peavey DPM SP can be whatever you want it to be. A nine foot grand piano, an orchestral string section, background vocal harmonies, a brass section, sound effects, or a combination of multiple instruments. The SP has the memory capacity (up to 32 Megabytes) to be anything you need without compromise. 16-bit sample resolution and 44.1 kHz playback rate means the sonic quality of the SP is also uncompromised. Samples can be loaded from the on-board 3.5" high density disk drive, CD ROM, hard disk, or MIDI sample dump standard. With hundreds of Megabytes of professional samples available from Peavey, as well as many independent companies, the capabilities of the SP are limitless. If you want to record your own samples for the SP, just add the DPM[®] SX Sampling Expander module and you've got an incredibly affordable full blown 16-bit sampling system. Both the DPM SP and the DPM SX are expandable using standard SIMM memory upgrades. Peavey has brought 16-bit sampling to a new level of flexibility. And, at about **HALF THE PRICE OF COMPARABLE UNITS** by other manufacturers, the SP makes sampling an affordable reality for just about anybody. Check out the DPM SP and DPM SX at an authorized Peavey dealer near you.

**LIMITLESS
PERFORMANCE**

Circle (19) on Rapid Facts Card



T.C. Electronic (2102)*New products*

M5000 digital audio mainframe true stereo digital audio processor.

Product line

MIDI computer software; MIDI hardware; delays; equalizers; pitch shifters; reverbs; signal processors; sound samplers; test equipment.

Circle (391) See ad index

TDK Electronics Corporation (2121*)*Product line*

Cable and connectors; audio recording tape; video recording tape; tape supplies and accessories.

Circle (392)

Technical Audio Devices (5510*)*New products*

TD-4002 2-inch throat compression driver with neodymium magnetic circuit and 4-inch beryllium diaphragm; TL-1801 18-inch LF transducer rated at 800W, for studio monitor and sound reinforcement applications; TCM series sound reinforcement systems for front-of-house touring applications.

Product line

Component loudspeakers; sound reinforcement loudspeakers; studio monitoring loudspeakers.

Circle (393) See ad index

Techron/Div. Crown Intl. (1715)*New products*

TEF 20HI System 20 with high-speed port, which allows software packages to use TEF's DSP.

Product line

Test and measuring equipment.

Circle (394)

Telex Communications (1408*)*Product line*

Tape duplication/manufacturing systems.

Circle (395)

THAT Corporation (1931)*Product line*

Amplifiers; integrated circuits; miscellaneous equipment and services; noise reduction systems; voltage-controlled amplifiers; RMS-level detectors.

Circle (396)

Theatre Crafts (1527)

Not available at press time.

Circle (397)

3M Profesional (1100*)*New products*

3M275 improved digital audiotape; 3M DAT hanger/shipper allows DAT cassettes to be shipped and stored.

Product line

Recording audiotape; tape supplies and accessories.

Circle (398) See ad index

TimeLine Vista (2522*)*New products*

Lynx Console Control Unit; Lynx System Supervisor with Neve Flying Faders interface; Lynx 500 universal software.

Product line

Synchronizer systems; audio editing for post-production.

Circle (399)

TOA Electronics (1505*)*New products*

1x-9000 digital mixing system; SAORI expansions; computer control software, two SAORI subframe models and long delay modules; P-1090D, P-1060D and P-1030D modular power amplifiers; LE series medium- and large-format CD horns; HFD series 2-inch compression drivers; SB series low-frequency enclosures.

Product line

Amplifiers; digital consoles; crossovers and frequency dividers; electronically controlled loudspeaker systems; component loudspeakers; sound reinforcement loudspeakers; microphone mixers; signal processors.

Circle (400)

Total Audio Concepts (TAC) Ltd. (3815*)*New products*

SR6000 sound reinforcement console; Bullet compact mixing system; Magnum 24-bus in-line recording console; M.I.C.E. (Multiple Interface Control Element); B2 compact mixing console.

Product line

Automation systems consoles; digital consoles; recording and production consoles; sound reinforcement consoles.

Circle (401)

Trident Audio USA (1411*)*New products*

Vector audio mixing console for music, post-production and broadcast applications; Trident multiple machine control system for master, slave and MIDI transports.

Product line

Computer software, studio applications; automation systems consoles; recording and production consoles; equalizers; equipment rental and leasing; limiters/compressors; microphone mixers; microphone pre-amplifiers; noise gates/expanders; patchbays and jack panels.

Circle (402)

Tube Tech (1727)*New products*

Clib compressor; PE1IC equalizer; ME1A equalizer; MP1A microphone pre-amplifier.

Product line

Equalizers; limiters/compressors; microphone pre-amplifiers.

Circle (403)

Turbosound/Div. of AKG (1348*)*New products*

TFS-3 long throw add-on for TMS-3; Flashlight system.

Product line

Electronically controlled loudspeaker system; sound reinforcement loudspeakers.

Circle (404)

Turtle Beach Systems (1909)*New products*

MultiSound multimedia 16-bit sound output board; version 1.2 of the SoundStage 2-track editing software for the 56K digital recording system.

Product line

Digital audio workstations; MIDI hardware.

Circle (405)

UltraAnalog (2607)*New products*

ADC 20048-A 20-bit audio A/D converter; DAC D20400 dual 20-bit audio D/A converter; DEMO-1 audio converter evaluation board.

Product line

Stand-alone A/D and D/A converters; integrated circuits.

Circle (406)

UREI (6608*)*Product line*

Limiters/compressors; monitors.

Circle (407)

U.S. Audio (1027)*New products*

PressPower 2-channel press mixer with XCR and 1/8 phone outputs for press conferencing; P-12 headphone power amplifier for studio use with 12W per side; P-45 amplifier with 45W per side.

Product line

Amplifiers; headphone mixing systems; microphone mixers; active press box.

Circle (408)

Valentino (3901)*New products*

Valentino Production Sound Effects Library; Production Music Library.

Product line

Music production libraries; sampled sounds libraries; sound effects libraries.

Circle (409)

Vega Wireless (1725)*New products*

VX-20 portable miniature production wireless microphone system; 600 series UHF frequency selective professional wireless microphone system; T-680 series UHF hand-held transmitters.

Product line

Intercom systems; wireless and RF microphones.

Circle (410)

WaveFrame Corporation (4005*)*New products*

CyberFrame 3.0 software based on Microsoft Windows, supports removable optical disc drives; AudioFrame 5.0, also based on Windows, supports multichannel digital interface module, time compression/expansion and real-time, punch-on-the-fly recording.

Product line

Automation systems consoles; digital audio workstations; MIDI hardware; sampling rate converters; sound samplers; time compression/expansion.

Circle (411)

Westlake Audio (5507)*New products*

BBPM-4 biamplified system incorporates precision level control, active crossover, fully protected amplifiers and power supply in compact design. Eliminates variable of power amplifier/cable/speaker interface.

Product line

Cable and connectors; loudspeakers, studio monitoring.

Circle (412)

Whirlwind (1027*)

New products

W 56 PR — 56 PR audio snake cable; Hot Box transformerless direct box, phantom powerable.

Product line

Cable and connectors; miscellaneous equipment and services; patchbays and jack panels; audio transformers.

Circle (413)

Wireworks Corporation (4000*)

New products

New literature for designing audio and audio/video cabling systems, including microphone cables, cable testers, data cables and coax.

Product line

Cable and connectors; patchbays and jack panels; audio and audio/video cabling assemblies; microphone cables and cable testers; microphone splitting systems.

Circle (414)

Yamaha (1004*)

New products

PM4000 live sound reinforcement mixing console; YPDR 601 professional compact disc recording system.

Product line

Stand-alone A/D and D/A converters; amplifiers; recordable compact disc players; automation systems consoles; digital consoles; sound reinforcement consoles; crossovers and frequency dividers; delays; digital audio workstations; drum machines; equalizers; headphones and headsets; limiters/compressors; electronically controlled loudspeaker systems; sound reinforcement loudspeakers; studio monitoring loudspeakers; microphone mixers; microphone pre-amplifiers; studio and sound reinforcement microphones; reverbs; audio routing switchers; signal processors; sound samplers; synthesizers and keyboards; cassette and cartridge tape machines; DAT tape machines; digital multitrack tape machines.

Circle (415)

Zoom (1905*)

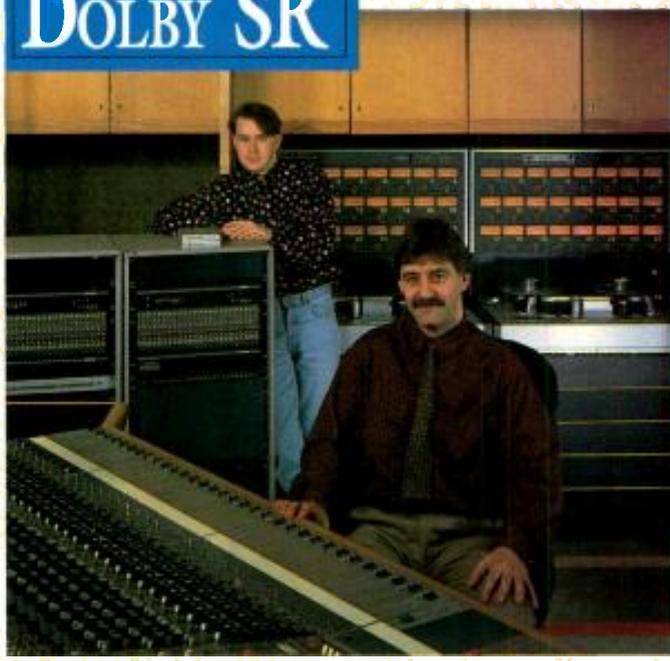
New products

9030 advanced instrument effects processor; 8050 multifunction foot controller.

Product line

Signal processors.

Circle (416)



Nik Milner

Our clients insist on Dolby SR.

“We provide our clients with the very best as a matter of course. That’s why we offer Dolby SR on our analogue tracks.”

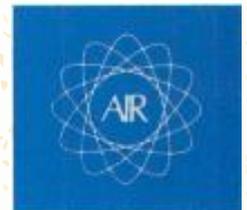
“I was startled by the absence of tape modulation noise. From the looks on their faces, so were my engineers!”

“Dolby SR allows analog recording to compete with digital without a cost penalty.”

Malcolm Atkin, Studio Manager

“With Dolby SR, you hear what you should hear: good warm low end, no muddiness in the top end, and no noises. Analogue with Dolby SR is definitely my preferred mastering format.”

Lance Phillips, Chief Engineer



Built by the legendary George Martin, most of the famous names in music have worked at AIR Studios, London

Circle (20) on Rapid Facts Card

Contact Dolby or your Dolby professional audio dealer for more information.

Dolby SR: over 50,000 channels worldwide

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• 19 AES 91 •

PRODUCT DIRECTORY

The following listing presents 77 categories of services and products offered by exhibiting companies. The categories are listed in alphabetical order, as are the companies within each specific category. Red listings denote companies advertising in this issue. Please refer to the Advertisers Index for the appropriate page number.

For general information on exhibiting categories and booth numbers, refer to the Exhibitor Listings. Detailed information on individual new products is included in Product Preview.

Because of press deadlines, any changes made after Aug. 29 are not included. If you are attending the show, please check your convention program for updated information.

Acoustic design and construction

Acoustical Physics Laboratories
Alpha Audio Acoustics
Renkus-Heinz
RPG Diffusor Systems
Sonex
Sound Technology
Techron/Div. of Crown

Acoustic treatment materials

Acoustical Physics Laboratories
Alpha Audio Acoustics
Audio Services Corp.
Ferrofluidics
RPG Diffusor Systems
Sonex

A/D and D/A converters, stand-alone

Analog Devices
Apogee Electronics
Ariel Corporation
Neve
NVision
Pygmy Computer Systems
Roland
Schoeps/Posthorn Recordings
Sony
Spectral Synthesis
UltraAnalog
Yamaha

Amplifiers

AB International Electronics
Alesis
Analog Devices
Anchor Audio
A.P.I. (Audio Products Inc.)
Apogee Sound

ARX Systems
Ashly Audio
Audio Services Corp.
Audra
Australian Monitor
BGW Systems
Crest Audio
Crown
FM Acoustics
Gotham Audio
The John Hardy Company
HEDCO
Innovative Electronic Designs
Interonics
JBL Professional
Korg U.S.A.
Leitch
Optim Audio
Panasonic Professional Audio Systems
Peavey Electronics
Plitron Manufacturing
QSC
Rane
Rolls Corp.
Sescom
Shure HTS
Solid State Logic
Stewart Electronics
Symetrix
THAT Corp.
TOA Electronics
U.S. Audio
Yamaha

Cable and connectors

Acoustical Supply International
Audio Accessories
Audio Services Corp.
Audio-Technica U.S.
beyerdynamic
Connectronics
FM Acoustics
Marshall Electronics
Neutrik U.S.A.
OptoDigital Design
Peavey Electronics
Sennheiser
TDK Electronics
Westlake Audio
Whirlwind
Wireworks

Compact disc players, playback-only

Gefen Systems
KABA

Sony

Studer Revox America
Tascam

Compact disc players, recordable

Gotham Audio
Sonic Solutions
Studer Revox America
Yamaha

Computer media, hard drive

Digidesign
Lexicon
PINC LINK
Studer Revox America

Computer media, removable

Augan Instruments B.V.
Digidesign
PINC LINK
Studer Revox America

Computer hardware

Ariel Corporation
Current Music Technology
Digidesign
J.L. Cooper
Marshall Electronic
Motorola
Opcode
PINC LINK
Sennheiser
Spectral Synthesis

Computer software, business

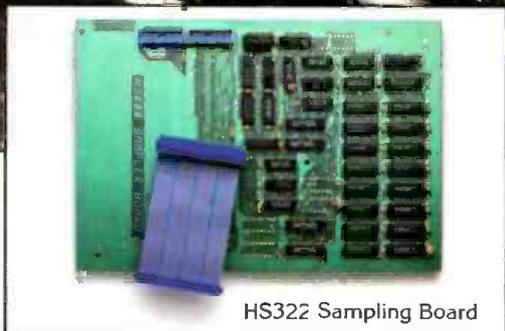
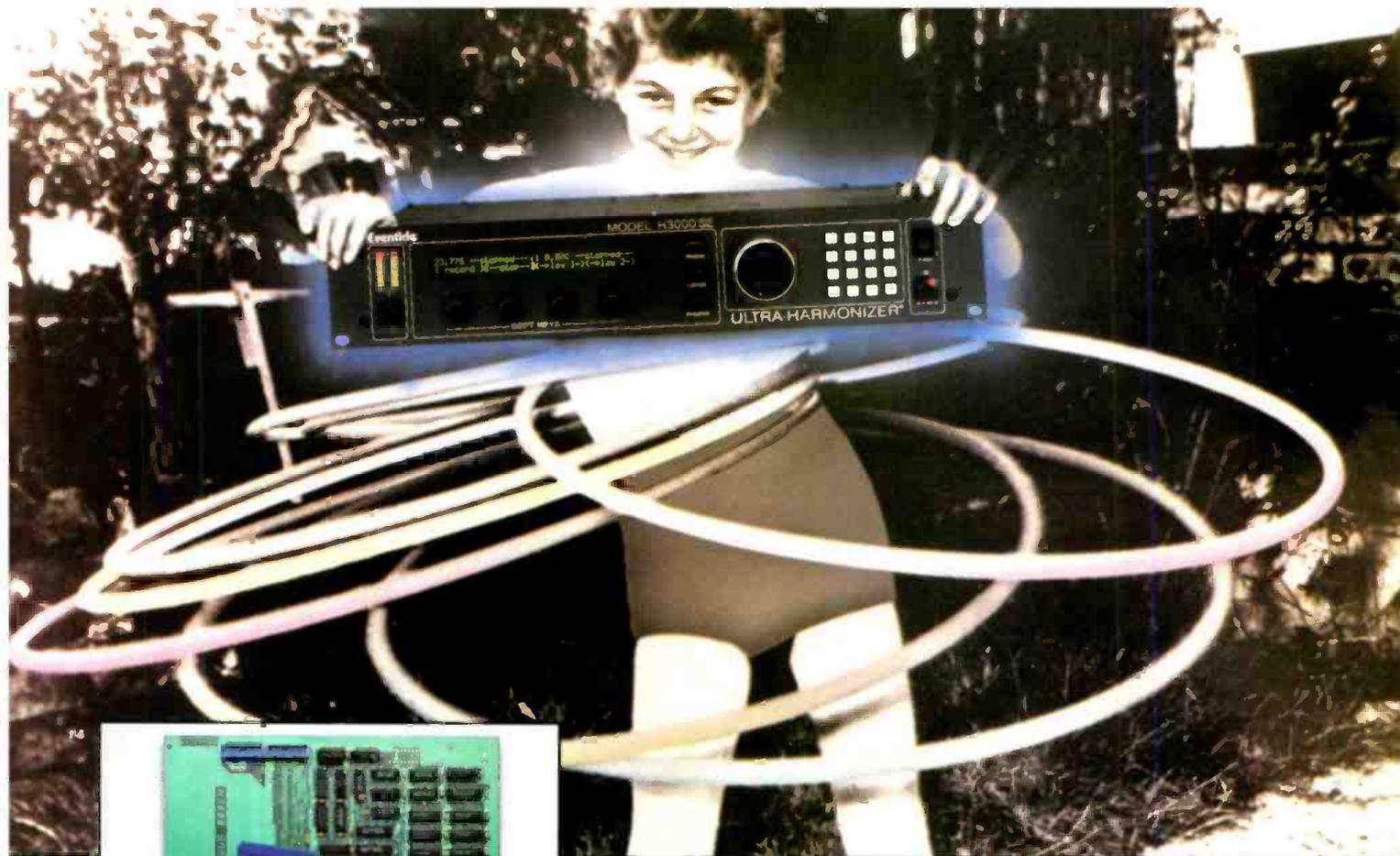
Motorola
Sennheiser

Computer software, MIDI

Digidesign
Fostex
J.L. Cooper
Mark of the Unicorn
Opcode
Roland
T.C. Electronic

Computer software, studio applications

Acoustical Supply International
Ariel Corporation
Audio Teknology Inc.
Digidesign
Fostex
Gefen Systems
Gotham Audio



HS322 Sampling Board

Looping Is Only Our Newest Trick.

Eventide engineers just can't stop teaching the Ultra-Harmonizer® new tricks. First the eight new algorithms and 200 new presets in our SE ConKit. Now, 11.8 seconds of stereo or 23.7 seconds of mono sampling with the HS322 Internal Sampling Board option.

For \$995, the HS322 adds 16 bit, 44.1 kHz sampling to any H3000 Ultra-Harmonizer's audio processing capabilities. And Eventide's unique pitch change technology makes it easy to do things no ordinary sampler can. Change playback length on the fly without changing the pitch, to make rhythm loops that groove perfectly at any tempo. Or change playback pitch (from the front panel or any MIDI keyboard) without changing length, to transpose parts or tweak timbres without EQ-ing. The HS322 can also work like an ordinary sampler if you do want to change pitch and length simultaneously.

The HS322 board records two stereo or mono sounds, with the flawless audio quality that's

made the H3000 a studio favorite. You also get fast, flexible, precise control. Start recording and playback manually, via MIDI or audio trigger. Edit Start, Stop and Loop points using the famous Eventide Knob to "rock" audio, or enter locations on the keypad.

Impressed? Ultra-sampling is just part of the H3000's best trick—the way it keeps your original investment growing in power and performance, without making you buy a whole new box. If you're ready for the digital audio processor that's more than just another "fad box," it's time to visit your Eventide dealer. And sample the future.

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J.L. Cooper
Marshall Electronic
Opcode

Panasonic Professional Audio Systems

Peavey Electronics
Renkus-Heinz
Sonic Solutions
Spectral Synthesis
Trident

Consoles, automation systems

Amek/TAC U.S.
A.P.I. (Audio Products Inc.)
Automation Systems Ltd.
DDA
Euphonix
GML
Harrison by GLW
J.L. Cooper
Marshall Electronic
Neotek
Neve
Otari

Panasonic Professional Audio Systems

Peavey Electronics
Sellmark Electronics
Solid State Logic
Sony
Soundcraft Electronics
Soundtracs P.L.C.
Tascam
Total Audio Concepts
Trident
Wave Frame
Yamaha

Consoles, digital

AMS Industries
Audio Services Corp.
Euphonix
Gotham Audio
J.L. Cooper
Marshall Electronic
Peavey Electronics
Solid State Logic
TOA Electronics
Total Audio Concepts
Yamaha

Consoles, recording and production

Alesis
Amek/TAC U.S.
AMS Industries
A.P.I. (Audio Products Inc.)
Audio Services Corp.
Audiotechniques
Augan Instruments BV.
DDA
Euphonix
Fostex
GML
Harrison by GLW
Lexicon
Nady
Neve
Orban/Div. of AKG
Otari

Panasonic Professional Audio Systems

Peavey Electronics
Schoeps/Posthorn Recordings
Solid State Logic
Sony
Soundcraft Electronics
Soundtracs P.L.C.
Studer Revox America

Tascam

Total Audio Concepts
Trident

Consoles, sound reinforcement

Amek/TAC U.S.
Audio Services Corp.
Audio Teknology Inc.
Crest Audio
DDA
Euphonix
J.L. Cooper
Midas
Nady
Otari

Panasonic Professional Audio Systems

Peavey Electronics
Soundcraft Electronics
Soundtracs P.L.C.
Tascam
Total Audio Concepts
Yamaha

Crossovers and frequency dividers

Adamson Acoustic Design
Acoustical Supply International
ARX Systems
Ashly Audio
Audio Digital
Audio Logic
BSS Audio/Div. of AKG
DDA
FM Acoustics
Gold Line
JBL Professional
Panasonic Professional Audio Systems
Peavey Electronics
Rane
Sescom
Symetrix
TOA Electronics
Yamaha

Delays

AMS Industries
A.R.T.
Audio Digital
Audio Logic
DigiTech
Eventide
JBL Professional
Klark-Teknik
Lexicon
Marshall Electronic
Panasonic Professional Audio Systems
Peavey Electronics
Roland
Sony
T.C. Electronic
Yamaha

Digital audio workstations

Adamson Acoustic Design
Akai Professional/IMC
AMS Industries
Ariel Corporation
Augan Instruments BV.
Cipher Digital
Digidesign
Digital Audio Research
Doremi Labs
E-mu Systems
Fairlight ESP
Gotham Audio
Hybrid Arts
J.L. Cooper

KABA

Korg U.S.A.
Lexicon
Marshall Electronic
New England Digital
Opcode
Otari
PINC LINK
Roland
Sonic Solutions
Soundtracker Pty. Ltd.
Spectral Synthesis
Studer Revox America
Symetrix
Turtle Beach
Wave Frame
Yamaha

Drum machines

Akai Professional/IMC
Alesis
Yamaha

Editing systems

AMS Industries
Ariel Corporation
Augan Instruments BV.
Cipher Digital
Fostex
Hybrid Arts
KABA
Korg U.S.A.
Lexicon
PINC LINK
Roland
Soundtracker Pty. Ltd.
Spectral Synthesis
Symetrix

Educational courses and programs

Berklee College of Music
PINC LINK

Equalizers

AB International Electronics
Alesis
Amek/TAC U.S.
A.P.I. (Audio Products Inc.)
A.R.T.
ARX Systems
Ashly Audio
Audio Animation
Audio Logic
Audra
BSS Audio/Div. of AKG
Cambridge Signal Technologies
dbx/Div. of AKG
DigiTech
GML
Gotham Audio
JBL Professional
JVC Professional
Klark-Teknik
Marshall Electronic
Meyer Sound Laboratories
Neve
Orban/Div. of AKG
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Peavey Electronics
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Roland
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Equalizers

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 PINC LINK

Equipment rental and leasing

Audio Services Corp.
 PINC LINK
 Schoeps/Posthorn Recordings
 Trident

Faders

GML
 Penny & Giles
 Sellmark Electronics

Filters, replacement

Apogee Electronics
 Orban/Div. of AKG

Headphone mixing systems

Gold Line
Rane
 Symetrix
 U.S. Audio

Headphones and headsets

AKG Acoustics
 Audio Services Corp.
 Audio-Technica U.S.
 beyerdynamic
 Fostex
Sennheiser
Sony
 Yamaha

Integrated circuits

Analog Devices
 Crystal Semiconductor
 Motorola
 THAT Corp.
 UltraAnalog

Intercom systems

Audio Services Corp.
 Vega Wireless

Libraries, music production

Audio Action
 Augan Instruments BV.
 East West Communications
Gefen Systems
 Opcode
 Sound Ideas
 Valentino

Libraries, sampled sounds

Audio Action
 Augan Instruments BV.
 East West Communications
Gefen Systems
Peavey Electronics
 Roland
 Sound Ideas
 Valentino

Libraries, sound effects

Audio Action
 Augan Instruments BV.
Gefen Systems
 Sound Ideas
 Valentino

(cont.)

Limiters/compressors

Alesis
Aphex Systems
 A.P.I. (Audio Products Inc.)
 A.R.T.
 ARX Systems
 Ashly Audio
 Audio Animation
 Audio Logic
 BSS Audio/Div. of AKG
 dbx/Div. of AKG
 DigiTech
 Dorrrough Electronics
Drawmer
 GML
 Gotham Audio
JBL Professional
Klark-Teknik
 Marshall Electronic
Rane
 Sescom
Sony
 Summit Audio
 Symetrix
 Trident
 UREI
 Yamaha

Loudspeaker systems, electronically controlled

Adamson Acoustic Design
Apogee Sound
 ARX Systems
 Audio Services Corp.
 BSS Audio/Div. of AKG
 Community Light & Sound
Eastern Acoustic Works
 Intersonics
JBL Professional
Meyer Sound Laboratories
Peavey Electronics
 Professional Audio Systems
 Renkus-Heinz
 TOA Electronics
 Yamaha

Loudspeakers, component

Adamson Acoustic Design
 Acoustical Supply International
 ARX Systems
 Audio Services Corp.
 Community Light & Sound
 Ferrofluidics
Gauss
JBL Professional
Klipsch
 Neutrik U.S.A.
 Peavey Electronics
 Professional Audio Systems
 Radian Audio Engineering
 Renkus-Heinz
 Sellmark Electronics
TAD/Pioneer
 TOA Electronics

Loudspeakers, sound reinforcement

Adamson Acoustic Design
 Acoustical Supply International
Apogee Sound
 ARX Systems
 Audio Services Corp.
 Bose
 Community Light & Sound
Eastern Acoustic Works

Ferrofluidics

Fostex
Gauss
 Intersonics
JBL Professional
Klipsch
Meyer Sound Laboratories
 Optim Audio
Panasonic Professional Audio Systems
Peavey Electronics
 Professional Audio Systems
 Radian Audio Engineering
 Renkus-Heinz
Tannoy
TAD/Pioneer
 TOA Electronics
 Yamaha

Loudspeakers, studio monitoring

Acoustical Physics Laboratories
 Audio Services Corp.
 Fostex
Gauss
JBL Professional
 KRK Monitoring Systems
Meyer Sound Laboratories
Panasonic Professional Audio Systems
Peavey Electronics
 Professional Audio Systems
 Radian Audio Engineering
 Renkus-Heinz
Shure HTS
 Studer Revox America
Tannoy
TAD/Pioneer
 Westlake Audio
 Yamaha

Maintenance, test and measuring equipment

Acoustical Supply International
 Applied Innovation America
 Ariel Corporation
AudioControl Industrial
Audio Precision
 Audio Services Corp.
 Enterprise Corp. of America
 Gold Line
 Techron/Div. of Crown

Mastering systems

Concept Design
 Duplitronics
 Gotham Audio
 JVC Professional
 OD & ME b.v.
Sony
 Spectral Synthesis

Metering devices

A.P.I. (Audio Products Inc.)
 Dorrrough Electronics
 Gotham Audio
 Harrison by GLW
 Schoeps/Posthorn Recordings
Sony
 Summit Audio
 Symetrix

Microphone booms, stands and accessories

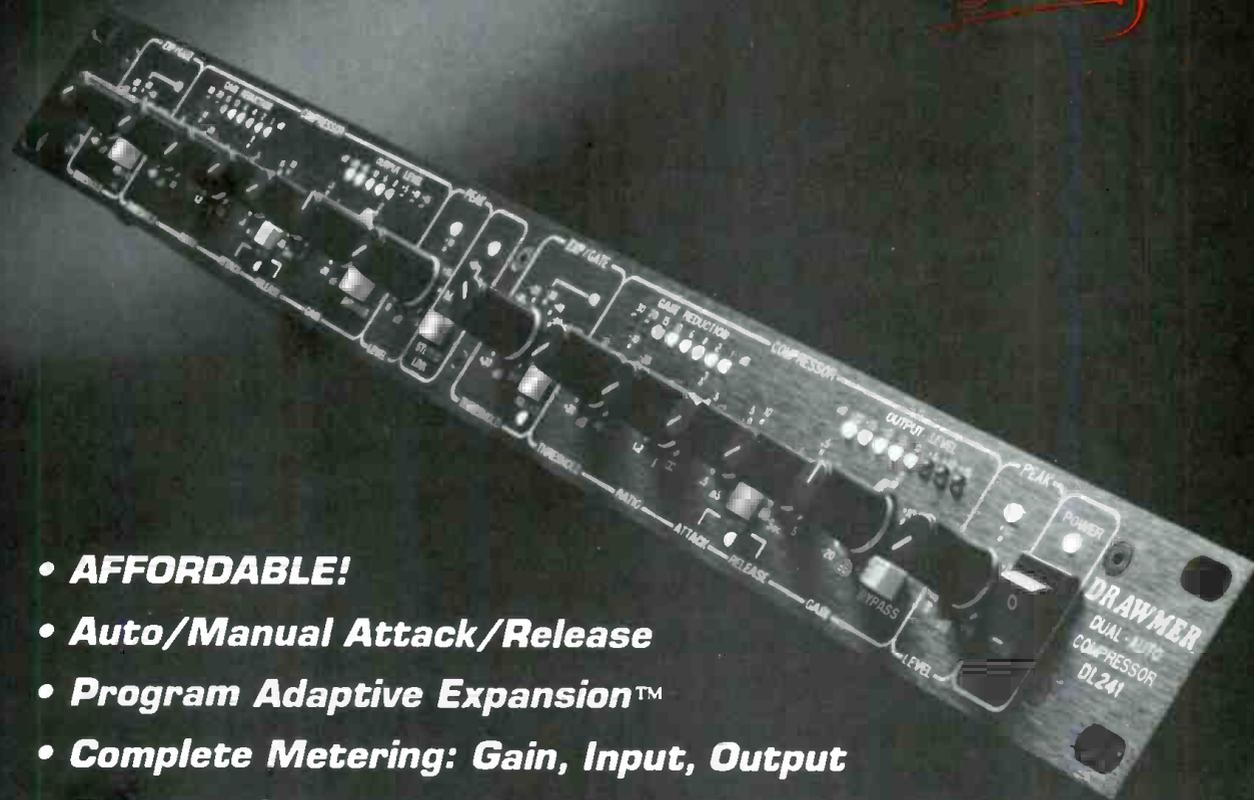
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 Ashly Audio
 Audio Logic
 Audio Services Corp.
 Audio-Technica U.S.
 DigiTech
 Electro Voice
Panasonic Professional Audio Systems
Peavey Electronics
Rane
 Rolls Corp.
 Schoeps/Posthorn Recordings
 Sescom
Shure
 Stewart Electronics
 TOA Electronics
 Trident
 U.S. Audio
 Yamaha

Microphone pre-amplifiers

ACO Pacific
 Analog Devices
 A.P.I. (Audio Products Inc.)
 Ashly Audio
 Audio Services Corp.
 Avalon Design
 FM Acoustics
 GML
The John Hardy Company
Peavey Electronics
Rane
 Rolls Corp.
 Schoeps/Posthorn Recordings
 Sescom
Shure
 Stewart Electronics
 Summit Audio
 Symetrix
 Trident
 Tube Tech
 Yamaha

Microphones, studio and sound reinforcement

ACO Pacific
AKG Acoustics
 AMS Industries
 Audio Intervisual Design
 Audio Services Corp.
 Audio-Technica U.S.
 beyerdynamic
 Countryman Associates
Crown
 Developing Technologies Distributors
 Electro Voice
 Fostex
 Gold Line
 Gotham Audio
 Milab
Panasonic Professional Audio Systems
Peavey Electronics
 Sanken
 Schoeps/Posthorn Recordings
Sennheiser
Shure
Sony
 Yamaha

Microphones, wireless and R.F.

AKG Acoustics
 Audio Intervisual Design
 Audio Services Corp.
 Audio-Technica U.S.
 beyerdynamic
 Countryman Associates

Developing Technologies Distributors

Electro Voice
 Nady
Peavey Electronics
 Samson Technology
 Sanken
 Schoeps/Posthorn Recordings
Sennheiser
Shure
Sony
 Vega Wireless

MIDI hardware

Akai Professional/IMC
Alesis
 Audiomatic Systems Ltd.
 Audio-Technica U.S.
 BSS Audio/Div. of AKG
 Fostex
 J.L. Cooper
Lexicon
 Mark of the Unicorn
 New England Digital
 Opcode
Peavey Electronics
 Roland
T.C. Electronic
 Turtle Beach
 Wave Frame

Miscellaneous equipment and services

ACO Pacific
 Adams-Smith
 Apex Machine Company
 Apollo Masters
 Applied Innovation America
 APRS
 The Archon Company
 Audiomatic Systems Ltd.
 Audio Services Corp.
 BGW Systems
 Brainstorm Electronics
 Cipher Digital
 Concept Design
 Connectronics
 CST Manufacturing & Sales
 Dorrough Electronics
 Fairlight ESP
 Ferrofluidics
 Gold Line
The John Hardy Company
 Innovative Electronic Designs
 Intelix
 J.L. Cooper
 JRF Magnetic Sciences
 Lester Audio
 Media Technologies, Ltd.
Meyer Sound Laboratories
 Nady
 Neutrik U.S.A.
 Optical Disc Corp.
Oxmoor
Peavey Electronics
 PINC LINK
 RPG Diffusor Systems
Sennheiser
 Sescom
 SPARS
 THAT Corp.
 Whirlwind

Noise gates/expanders
Aphex Systems
 A.P.I. (Audio Products Inc.)
 A.R.T.

ARX Systems
 Ashly Audio
 Audio Animation
 Audio Logic
 BSS Audio/Div. of AKG
 dbx/Div. of AKG
 DigiTech
Drawmer
 Euphonix
 Gold Line
 Gotham Audio
 JVC Professional
Klark-Teknik
 Marshall Electronic
Peavey Electronics
Rane
 Sescom
 Symetrix
 Trident

Noise reduction systems

dbx/Div. of AKG
Dolby Laboratories
Drawmer
 Gotham Audio
 Marshall Electronic
Peavey Electronics
 PINC LINK
 Roland
Sonic Solutions
 Symetrix
 THAT Corp.

Patchbays and jack panels

Audio Accessories
 Connectronics
 Fostex
 Marshall Electronics
 Neutrik U.S.A.
Peavey Electronics
 Penny & Giles
 Plasmec
Tascam
 Trident
 Whirlwind
 Wireworks

Phonograph cartridges and accessories

Audio-Technica U.S.

Pitch shifters

A.R.T.
 DigiTech
Eventide
 Korg U.S.A.
Lexicon
 Marshall Electronic
T.C. Electronic

Racks and stands

Audio Services Corp.
 BGW Systems
 PINC LINK

Record/CD manufacturing systems

Audiotechniques
 Duplitratics
 Gotham Audio
 OD & ME b.v.
Sonic Solutions

Recording heads, replacement

JRF Magnetic Sciences
 Saki Magnetics



There's no faster, easier or better way to record incredible stereo.

When you compare Crown's new Stereo Ambient Sampling System™ (SASS™) and a DAT recorder with traditional recording methods you'll discover there's no faster or better way to record natural, beautifully imaged stereo.

Lightweight, durable and extremely easy to set up, the SASS microphone is an exciting improvement in stereo recording. Combined with a DAT machine, it becomes a high-quality, no-compromise recording system that goes everywhere.

Crown's SASS eliminates traditional stereo recording compromises in sound quality, ease-of-use, and cost. No longer do you have to settle for weak low-end or off-axis coloration common to Midside, X-Y and near-coincident pair mics. Assembly and positioning time is also reduced

significantly compared with conventional stereo micing techniques.

The SASS is available in two versions: the SASS-P, with switchable battery or phantom power and Crown's finest studio-grade PZM®



capsules; or the SASS-B, which uses the famed Bruel & Kjaer 4003 and 4006 studio mics (not supplied).

Regardless of which you choose, you'll enjoy full ambience without coloration, excellent sum to mono,

and extraordinary broad frequency response. With SASS's superb imaging capabilities, every sound is audibly reproduced in its precise position resulting in a stereo experience of uncanny realism.

Readily adaptable to all common stands, the SASS includes a carrying case and accessories.

No matter what your stereo recording requirements are—from sampling to electronic news gathering to remote recording of live events—you'll find Crown's SASS family the simple choice. See your Crown representative or call toll-free for information: 1-800-535-6289.



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Elkhart, Indiana 46515-1000 • 219/294-8000

Circle (24) on Rapid Facts Card

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Recording tape, audio

Ampex Recording Media
 Audio Services Corp.
Panasonic Professional Audio Systems
Sunkyong Magnetic/America
 TDK Electronics
3M Company

Recording tape, video

Ampex Recording Media
 TDK Electronics

Reverbs

Alesis
 AMS Industries
 A.R.T.
 DigiTech
Eventide
Klark-Teknik
 Korg U.S.A.
Lexicon
 Marshall Electronic
Peavey Electronics
 PINC LINK
 Roland
 Sellmark Electronics
Sony
T.C. Electronic
 Yamaha

Routing switchers, audio

Analog Devices
 A.P.I. (Audio Products Inc.)
 Audiomation Systems Ltd.
 Audio Services Corp.
 Harrison by GLW
 HEDCO
 Innovative Electronic Designs
Leitch
 NVision
Oxmoor
 Yamaha

Sampling rate converters

Analog Devices
 Digital Audio Research
 Gotham Audio
 J.L. Cooper
 NVision
Sony
 Wave Frame

Sequencers

Akai Professional/IMC
Alesis
 New England Digital
 Opcode
Peavey Electronics
 Roland

Signal processors, other

Adamson Acoustic Design
Alesis
 AMS Industries
 Analog Devices
Aphex Systems
 A.P.I. (Audio Products Inc.)
 Ariel Corporation
 ARX Systems
 Ashly Audio
 Audio Animation
AudioControl Industrial
 Audio Logic
 Audio Services Corp.
 Audra
 BSS Audio/Div. of AKG
 Cambridge Signal Technologies
 DigiTech

Dolby Laboratories
Eventide

Innovative Electronic Designs
JBL Professional
 JVC Professional
 Korg U.S.A.
Lexicon
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 Motorola
 Neve
 Optim Audio
 Orban/Div. of AKG
Peavey Electronics
 PINC LINK
Rane
 Renkus-Heinz
 Roland
T.C. Electronic
 TOA Electronics
 Yamaha
 Zoom

Sound samplers

Akai Professional/IMC
 Ariel Corporation
 DigiTech
Eventide
Peavey Electronics
 PINC LINK
 Roland
 Spectral Synthesis
T.C. Electronic
 Wave Frame
 Yamaha

Synchronizer systems

Adams-Smith
 AMS Industries
 Brainstorm Electronics
 Cipher Digital
 Fostex
 J.L. Cooper
 JRF Magnetic Sciences
Peavey Electronics
 Roland
Tascam
 TimeLine Vista

Synthesizers and keyboards

E-mu Systems
 Korg U.S.A.
Peavey Electronics
 PINC LINK
 Yamaha

Tape duplication/manufacturing services

KABA
Otari

Tape duplication/manufacturing systems

Applied Innovation America
 Concept Design
 Electro Sound
Gauss
 Magnefax
 Media Technologies, Ltd.
Otari
 Roldex
Tascam
 Telex Communications

Tape machines, analog multitrack

Audio Services Corp.
 Fostex
Otari
Sony
 Studer Revox America
Tascam

Tape machines, cassette and cartridge

Apex Machine Company
 Fostex
KABA
Otari
Sony
Tascam
 Yamaha

Tape machines, DAT

Apex Machine Company
 Audio Services Corp.
 Audiotechniques
 Fostex
 JVC Professional
Otari
Panasonic Professional Audio Systems
Sony
Tascam
 Yamaha

Tape machines, digital multitrack

Akai Professional/IMC
Alesis
 Audio Services Corp.
 Audiotechniques
 Fostex
 Neve
Otari
Sony
 Studer Revox America
Tascam
 Yamaha

Tape supplies and accessories

Audio Services Corp.
DIC Digital
KABA
 Mag-Zon
 Success Specialty Sales Corp.
 Swire Magnetics
 TDK Electronics
3M Company

Three-dimensional audio processors

Roland

Time compression/expansion

Akai Professional/IMC
 AMS Industries
 A.R.T.
Eventide
Lexicon
 Marshall Electronic
 Neve
 Spectral Synthesis
 Wave Frame

Transformers, audio

Neutrik U.S.A.
Panasonic Professional Audio Systems
Peavey Electronics
 Plitron Manufacturing
 Sescom
 Whirlwind

Video equipment, all

Apex Machine Company
 Audio Accessories
 HEDCO
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Leitch
 Mark of the Unicorn
 OD & ME b.v.
 Opcode
 PINC LINK
 Roldex
Sony

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Our extensive line of equalizers is a pretty impressive sight. But let's face it: all equalizers are pretty similar in appearance. It's what's BEHIND a product that makes the real difference. Rane offers many unique qualities that you should be aware of when considering your next equalizer purchase.

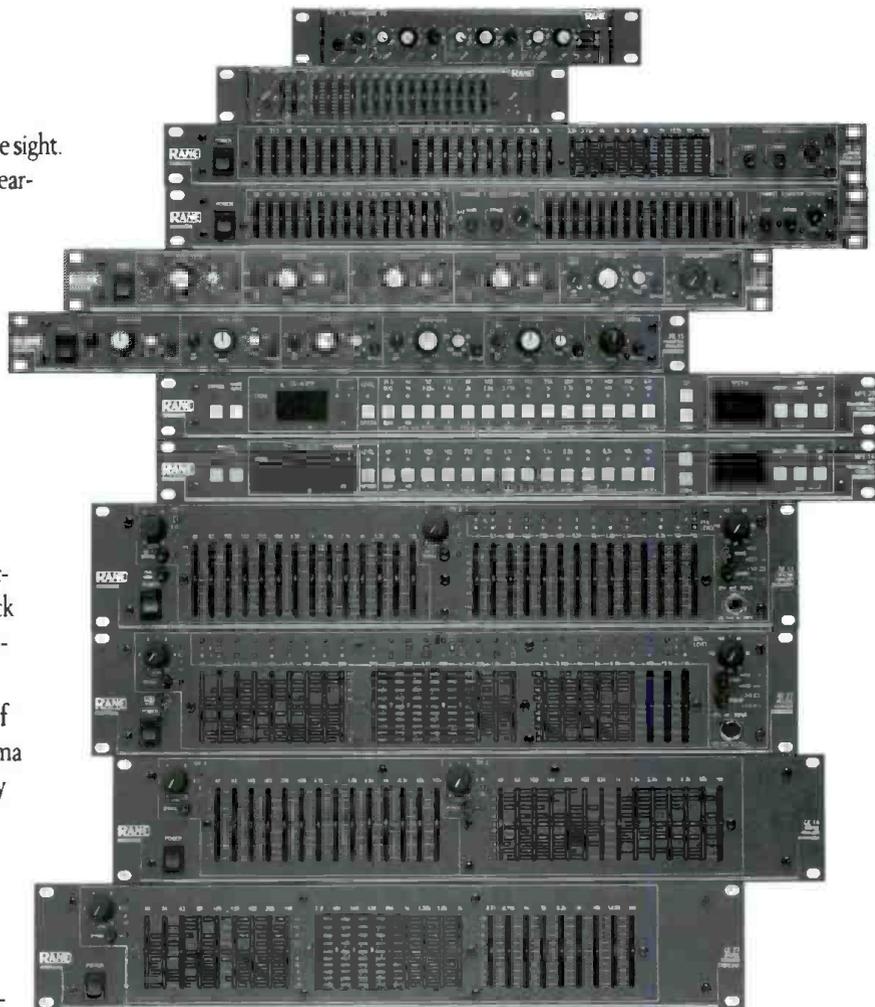
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AN EXTENSIVE VARIETY of formats lets you choose just the right configuration for your particular need. Instrument or voice, sweetening or feedback elimination, analog or digital control—all with studio-grade performance quality.

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Circle (25) on Rapid Facts Card

Something Old, Something New

By Laurel Cash-Jones and Fred Jones

First: the tape copy protection battle is over. And you are the winner/loser, depending on which side you are on. But if you work for certain companies, you are both. Either way, it's guaranteed that more accountants will be employed in this development than anyone else. Here's how:

As you have no-doubt heard, record companies and equipment manufacturers have finally come to a preliminary agreement to pay royalties for blank tape and DAT recording equipment, amounting to approximately 6 to 8 cents per tape and 6 to 8 dollars per machine sold. This is designed to balance-out alleged losses which so-called "perfect copy" DAT, DCC and MD recording systems can make. It is also an attempt to put to rest any future use of technology to regulate this part of the music industry, such as the ill-fated notch-filter copy protection from now-defunct CBS Labs, or the SCMS system currently on DAT machines.

However, with all of the recent purchases of record companies by foreign equipment manufacturers, it will be an interesting accounting problem as to who is writing checks to whom. You don't suppose that these mergers have had anything to do with the agreement?

SOMETHING NEW FOR YOUR TOOLBOX

It's the latest bit (pun intended) of digital wizardry from those folks at Digidesign. It's called Pro Tools, and it combines multitrack disk-based recording and editing, digital signal processing, MIDI sequencing and automated digital mixing into an integrated system for the Macintosh computer.

Laurel Cash-Jones is R•E•P's editorial consultant and a Los Angeles-based free-lance writer. Fred Jones is an audio industry observer and a Los Angeles-based free-lance writer.

Depending on the configuration you choose, Pro Tools has from four to 16 balanced analog channels (think of them as I/Os to the outside world), an almost unlimited number of on-screen virtual recording tracks, and over-sampling digital I/Os with support for both AES/EBU and S/PDIF formats. Non-destructive editing and assembling of multiple tracks can be accomplished for both the audio and MIDI information. You can also record, edit and playback MIDI sequences without eating up any of the digital audio tracks, along with DSP functions like track slipping, region trimming and crossfades, all at no extra charge!

Pro Tools includes complete digital mixing capabilities featuring both dynamic and state-based (snapshot) automation with automatic updates. For those of you who like to make lots of tiny changes within your mix, event-level editing of the automation is available to you, the engineer, should you decide to get that picky. SMPTE synchronization and resolving is also standard, as is real-time multi-band parametric EQ and digital effects (such as chorusing and delay), all completely automatable for each channel.

But wait, there's more! Each 4-channel Pro Tools system comes with two software packages: ProDeck for recording and mixing, and ProEdit, for graphic editing of both MIDI and digital audio tracks. The two hardware components you get with Pro Tools are the Audio Interface (which includes both analog and digital ins and outs), and the Audio Card (which resides in any Macintosh II series and provides DSP capabilities). All you have to do is plug them into the computer, install the software, and you're off and running.

Digidesign will also be offering a System Accelerator card, which will interface with up to six SCSI storage devices. The card speeds up the audio processing and screen redraw time to resemble what it would be like if someone plugged your disk drive directly into a nuclear power plant.

They are also addressing the sticky problem of "what do I do now that I have all my tracks in this thing and need to back them up so I don't lose everything?" First of all, the package works with *any* Mac-compatible back-up system, so if you already have that covered, you're set. Secondly, Digidesign is making available their DATa software package, which allows you to back-up to a standard DAT cassette.

Available as an option will be high capacity hard disks, with 660Mbyte or one Gbyte capabilities, fast access times and

in a rack-mountable package. The Pro Store optical drive will also be available, useful for 2-channel recording and playback, or the archiving of multi-channel data. If you are using the System Accelerator card, you can connect a 3Gbyte or 5Gbyte Exabyte tape drive, which will allow you to upload or backup audio files in the background while Pro Tools is being used for something more interesting.

Already several other manufacturers have jumped on the Pro Tools bandwagon (some even before the wagon hit the road), offering products designed to augment or enhance the basic package. Among these are Opcode's Studio Vision, Mark of the Unicorn's Digital Performer and JL Cooper's CS-10 and CS-1 Control Stations for external control of Pro Tools' faders, features and transports.

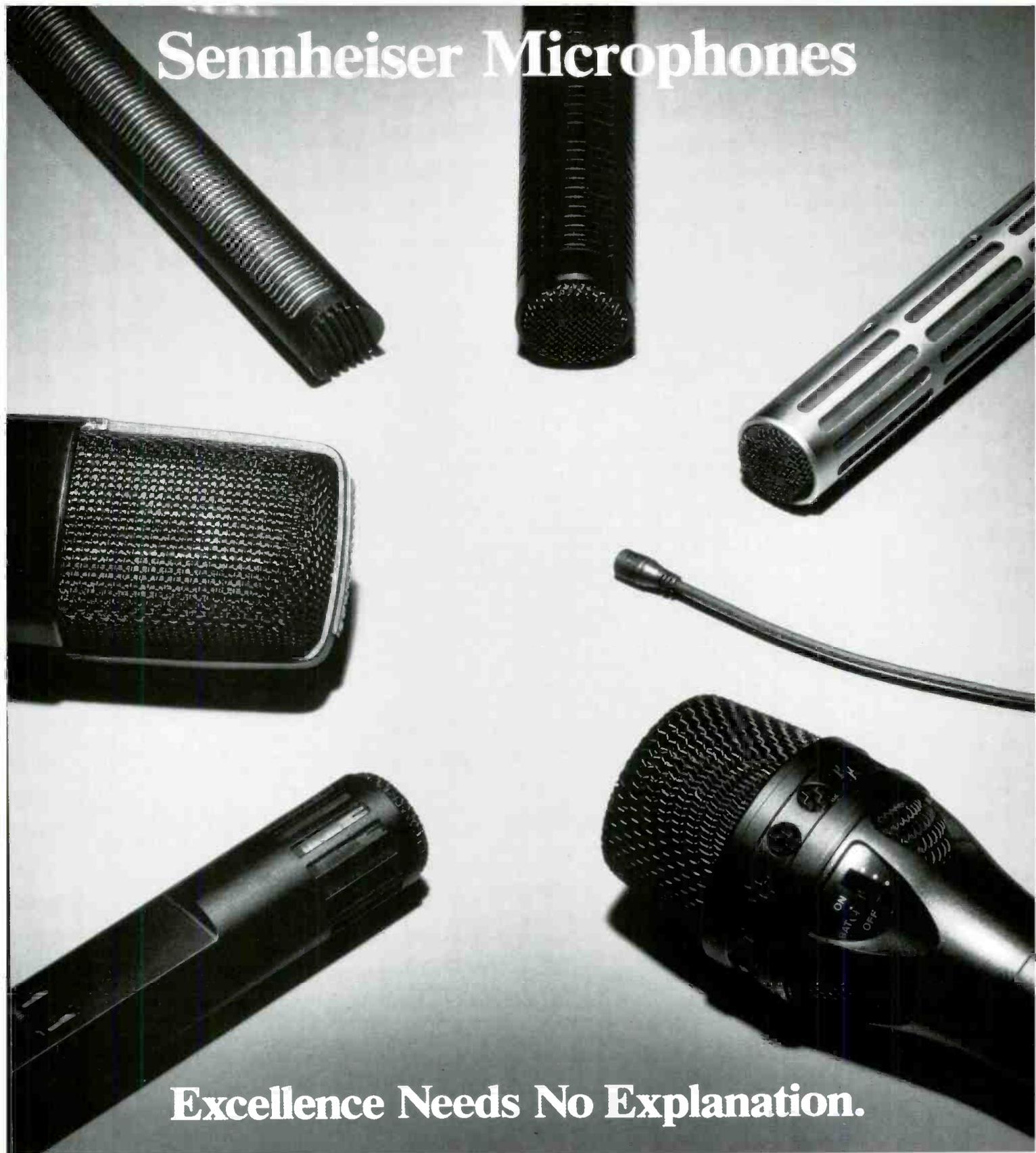
Also available as an option or stand alone product is Sample Cell, which (in case you may not be familiar with it) is a RAM-based sample playback card which offers 16 voices, eight outputs and up to 8Mbytes of RAM. Included are 630Mbytes of already sampled instruments and sound effects. Additionally, over 2Gbytes of other unique sounds and effects are available from third party vendors.

Complete 4-channel I/O (with unlimited number of virtual tracks) Pro Tools systems have a suggested list price of \$5,995 U.S. The 8-channel version is \$14,495 U.S. (which includes the System Accelerator card); 12 channels are \$19,495, and the maximum of 16 input/output channels are \$24,495. You provide the Macintosh and hard drives.

For those of you who are reading this and saying "Darn! I just bought a WHATCHAMAHOOGI workstation and I really want one of these instead," well, don't be disappointed. Digidesign is offering an upgrade/trade-in program. If you have any one of a number of competing hard disk recording systems, you can receive up to \$2,000 toward the purchase of a Pro Tools package. If you already own a Digidesign Sound Tools system (a 2-track package which is not being discontinued and will still be strongly supported in the future), an upgrade program allows up to \$2,000 in rebates toward Pro Tools. Sorry, WHATCHAMAHOOGI workstations aren't covered.

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PRODUCT PREVIEW

Product Preview provides a quick preview of some of the equipment at this year's show. Some of it may be new; some may have new and/or updated features, or they may be faster, smarter and perform more functions than before. If something really grabs your attention, find the company's booth number in the Exhibitor Listings and go check it out. That's what the exhibition is all about.

The entries are listed alphabetically by company name, and each has a Rapid Facts Number. For more information on a particular product, circle the appropriate number on the Rapid Facts Card in the back of this issue. In future issues, Cutting Edge will showcase additional products from the show.

ACO PACIFIC PS9200G

The PS9200 is a 2-channel precision mic that has an optional power supply with gain feature (G option), which overcomes sensitivity limitations of audio analyzer boards. The mic provides 0-, 10-, 20-, 30- or 40dB gain with a bandwidth of 2Hz to 200kHz, features low noise and is capable of driving 3,000 pF of line capacitance.

Circle (500) on Rapid Facts Card

ACOUSTICAL PHYSICS LABS DCM-15

The dome/coaxial DCM-15 is a tri-amplified loudspeaker system designed for control room monitoring accuracy. A coaxially mounted dome tweeter is matched to a 9-inch midrange cone driver for phase accurate transitions and coincident time arrivals for accurate spatial imaging and a lobe-free crossover transition over a large listening area. The system features two 15-inch drivers, a frequency response of 24Hz to 24kHz (3dB), and a maximum SPL of 125dB at 12 feet.

Circle (501) on Rapid Facts Card

ALPHA AUDIO ACOUSTIC MATERIALS

Pyramid Acoustical Materials comprise 2' x 2' panels to control room acoustics. Vinyl Sound Barrier Material has a limp mass of one pound per square foot. The Portable Audio Isolation Booth is 4' x 4' x 6' x 8" for recording and is available in custom sizes.

Circle (502) on Rapid Facts Card

AMEK HENDRIX

The standard configuration of the Hendrix multipurpose multitrack console is 40-line, dual-path input channels with eight stereo returns. Inputs feature 4-band parametric EQ with swept pass filters, 24 bus routing, 12 auxiliary buses, and multimode panning. A 3-channel routing matrix is provided for film monitoring speaker systems.

Circle (503) on Rapid Facts Card

AMEK MOZART

The Mozart console has two formats: All-Input in which input modules function as mic, line, DI, bus or tape inputs; and In-Line in which inputs use the dual-path in-line monitoring system that allows simultaneous acceptance of two signals. The units are configured for 40, 56, and 80 inputs, and all-input, in-line and stereo modules can be mixed. The console has 32 buses, 16 auxiliary buses, a comprehensive and 4-band EQ. The onboard grouping computer allows record/mix, bus/tape/EQ in/out, aux sends on/off and mute groups. A software controlled compressor/limiter/gate is optional.

Circle (504) on Rapid Facts Card

AMEK MEDICI

The Medici EQ has low separate control paths, each containing a 4-band parametric EQ with high and low pass filters. Bands may be switched between paths allowing an 8-band EQ to be created. The unit can be operated by MIDI or Timecode control. Features include variable "warmth" for added presence in low frequencies and "Sheen" for added air and space to high frequencies. Individual bands may be switched into the Sidechain, and a sidechain listen switch is provided. A Pink Noise Generator card is optional.

Circle (505) on Rapid Facts Card

ANALOG DEVICES PRE-AMP

The SSM-2017 mic I.C. pre-amp offers low input noise, saves space with its 8-pin mini-DIP housing, and requires only one external gain-set resistor. Applications include audio mix consoles, intercom/paging systems, digital audio systems, and sonar equipment.

Circle (506) on Rapid Facts Card

ANALOG DEVICES SSM-2018

The SSM-2018 is a monolithic VCA that has a maximum total harmonic distortion of 0.025% in Class A mode and 0.04% in AB mode with gains of ± 20 dB at 1kHz.

Circle (507) on Rapid Facts Card

ANALOG DEVICES SSM-2142

The monolithic SSM-2142 driver system for audio, telecommunications and industrial applications replaces larger, more expensive transformer-based solutions. The system can transmit 10Vrms signals into impedance loads at 600 Ω over 500-foot cable lengths. Total harmonic distortion plus noise from 20Hz to 20kHz is 0.006%.

Circle (508) on Rapid Facts Card

ANCHOR AUDIO AN1000X

The AN1000X is a 50W powered monitor that has RCA and 1/4-inch unbalanced line inputs and a selectable 3-pin XLR connector for balanced line, mic or mic with phantom power. Volume, bass and treble controls are on the front panel. The tuned enclosure is injection-molded polycarbonate ABS.

Circle (509) on Rapid Facts Card

APEX PRINTING MACHINES

The RS-100 video cassette printing machine can feed, print and ultravioletly dry more than 80 cassettes per minute using Rotoscreening. Designed for high production, the RG-1000 can feed, print using rotary gravure and dry up to 200 cassettes per minute. For audiocassette printing the CA-20 is capable of feeding, printing in one color on both sides, ultraviolet drying and restacking up to 150 cassettes per minute using a dry offset technique. Rotary gravure offset print heads have also been interfaced on many other existing Apex cassette printers.

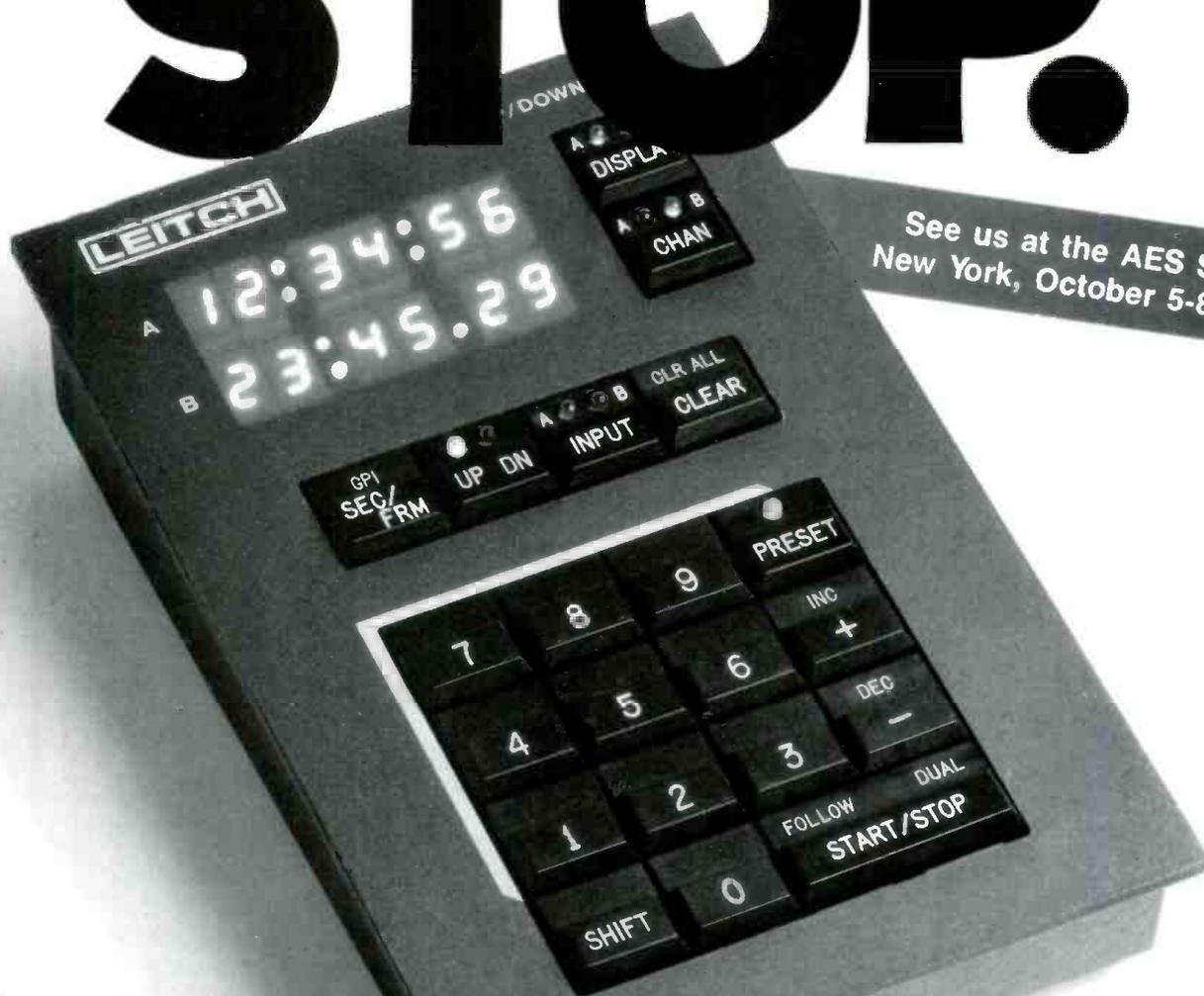
Circle (510) on Rapid Facts Card

APOGEE SOUND POWER AMPS

Apogee processor/amps feature factory calibrated transducer protection for maximum performance and fidelity. Both the processor amp and the stereo amp are designed for stability and reliability in a durable package for touring and fixed installations.

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ARCHON 1800X52

The 1800X52 is a 2-sided direct on-cassette imprinter with variable speed control. The small, affordable, user-friendly unit has an output capacity of 3,600 imprints per hour.

Circle (512) on Rapid Facts Card

A.R.T. MULTIVERB ALPHA

The Multiverb Alpha from ART is an ASIC that can mix four of an available 50 reverbs, chorusing and flanging effects. Among the 24 reverb algorithms are halls, rooms, plates, chambers and cathedrals. There are also 12 gated and reverse algorithms and 18 tap delay effects for chorusing and doubling. The pitch transposer provides more than two octaves of pitch shift for artificial harmonies, and a wide range of stereo chorus and flange algorithms are available.

Circle (513) on Rapid Facts Card

A.R.T. SGX-2000

The SGX-2000 comprises a comprehensive EQ, a second 5-band EQ on the front panel, a tube pre-amp, a solid-state pre-amp, internal routing, each of which are independently controllable, and a digital effects system for 12 effects and eight real-time functions simultaneously. The 70 effects include harmonic exciter, noise gate, programmable EQ, expander, peak limiter and reverse reverbs.

Circle (514) on Rapid Facts Card

A.R.T. SGX NIGHTBASS

The SGX Nightbass is an integrated pre-amp and digital effects system designed specifically for bass guitar. The unit features a tube pre-amp, a solid-state pre-amp, internal routing (each of which are independently programmable), and an effects system providing 12 audio and eight real-time functions simultaneously. Features include an expander and a noise gate that can be set to eliminate background noise or gating. The sections are separately controllable.

Circle (515) on Rapid Facts Card

ARX COMPRESSOR/LIMITER

The Afterburner is a dual-channel compressor/limiter that features balanced inputs and outputs on unbalanced jacks and XLRs, with a detector loop insert. An enhance feature allows for frequency correction to preserve spectral balance and to compensate for limited low- and high-frequency response of loudspeaker systems. Front panel controls include variable threshold, ratio, output gain, hardwire bypass, enhance in/out, stereo link switch and dual channel/mono 2-band mode. Maximum input/output level is -22dB. The unit can be configured as a mono dual band to allow separate dynamics control of low and high frequencies.

Circle (516) on Rapid Facts Card

AUDIO ANIMATION PROCESSOR

The Paragon 4-channel digital audio studio processor combines dynamics control (compression, expansion, limiting and gating) with 5-band parametric and 1/3-octave graphic EQ modes. The studio processor allows users to combine processors to gain dynamics control within a user-specified frequency range. The Paragon transmission processor will also be displayed.

Circle (517) on Rapid Facts Card

AUDIO CONTROL SG2000

The SG200 hand-held signal generator features sine and square wave signals at discrete frequencies from 10kHz to 100kHz, balanced and unbalanced outputs, and runs on a 9V battery. The unit's Pink Noise section uses a discrete digital noise source with an 8-pole filter. Output frequencies are set by a 10-position switch with a 4-position multiplier.

Circle (518) on Rapid Facts Card

AUDIO CONTROL SG300

The SG300 hand-held signal generator features sine, swept sine, 1/3-octave warble tone and pink noise outputs. In sweep mode, the unit makes a single sweep from the setting of the main frequency knob to the setting of the stop-frequency knob. In warble mode, the unit's output varies from 1/6-octave above and 1/6-octave below the setting of the main frequency. The unit runs on a 9V battery.

Circle (519) on Rapid Facts Card

AUDIO CONTROL PCA-200

The PCA-200 phase coupled activator is a bass enhancement/restoration system designed for live sound, recording or DJ applications. Features include balanced I/Os (-4dBu, TRS), unbalanced I/Os (-10dBu, RCA), output band-limiting controls, mix control and clip LED.

Circle (520) on Rapid Facts Card

AUDIO LOGIC PROCESSORS

Audio Logic is releasing six new signal processors: 266 dual gate/compressor/limiter, the 440 quad noise gate, the X 23 stereo 2-way, mono 3-way crossover, the X 34 stereo 3-way, mono 4-way crossover, the X 22 stereo 2-way precision crossover and the X 32 stereo 3-way precision crossover. Each includes four new crossovers, a 4-channel noise gate and a gate/compressor/limiter.

Circle (521) on Rapid Facts Card

AUDIO PRECISION FASTEST

FASTest is a software package using a multi-tone signal, when used in combination with FFT spectrum analysis, provides response, distortion and noise analysis of any audio channel in less than two seconds. Audio Precision System One — DSP and System One Dual Domain both feature FASTest.

Circle (522) on Rapid Facts Card

AUDRA DISPLAYS ARX AND EMILAR

Audra International is displaying the ARX Afterburner and the Emilar 2828X subwoofer and 2115SM spherical stage monitor. The Afterburner is a dual-channel enhanced compressor/limiter that features balanced inputs and outputs on 1/4-inch jacks and XLRs, with a detector loop insert. An enhance feature allows for frequency correction to preserve spectral balance and to compensate for sagging low- and high-frequency response of loudspeaker systems. Front panel controls include variable threshold, ratio, output gain, hardwire bypass, enhance in/out, stereo link switch and dual channel/mono 2-band mode. Maximum input/output level is -22dB. The unit can be configured as a mono dual band to allow separate dynamics control of low- and high-frequencies.

Circle (523) on Rapid Facts Card

AID SHOWS AVALON M-2 MIC PRE-AMP

Audio Intervisual Design, the U.S. distributor of Australian-based Avalon Design, is showing the Avalon M2 mic pre-amp. The M2 uses the Avalon 2022 hybrid-cell, a thermally conductive cell that incorporates two discrete, high-voltage, symmetrical class A signal amps. Features include discrete circuitry, low noise, internal phantom powering of -48V, input polarity reversal mode, sealed gold contact relays and switches, and hard-wired circuit boards.

Circle (524) on Rapid Facts Card

BERKLEE COLLEGE OF MUSIC

The Berklee College of Music has material relating to careers in music, including information on admission requirements, career majors, scholarship opportunities, financial assistance and special summer programs for students, educators and professionals.

Circle (525) on Rapid Facts Card

BGW GRAND TOURING AMP

The Grand Touring Amp (GTA) has been redesigned to fit into a 2-rack space package. A large toroidal power transformer replaces two conventional transformers, and back-to-front forced air cooling allows hot air to be blown out the front. Two large LEDs provide signal presence and true clip indication for each channel; a third LED indicates input power. Features include looping XLR input connectors, delayed turn-on, instant turn-off, thermal protection, input polarity reversal inside the amp, a ground lift switch, and two Neutrik NL4MP connectors. A third connector is provided for bridged mono output.

Circle (526) on Rapid Facts Card

BRAINSTORM SR-2

The SR-2 time code refresher is identical to the SR-1, but has a new 4-digit counter on its front panel. The counter reads the incoming time code's frame rate which helps to identify the code's format and verify its stability. The unit can be used with balanced or unbalanced signal and is available with XLR connectors or 1/4 inch jacks.

Circle (527) on Rapid Facts Card

BROADCAST ELECTRONICS AUDIOVAULT

AudioVAULT Digital audio storage/retrieval system offers digital recording, storage and playback of short duration audio material, including commercials, jingles, liners, IDs and promos. Able to accommodate up to 28 hours of stereo audio, the system can replace all cart machines, instacarts and carousels in Program Automation Systems. Its fully programmable playlist holds a full day of short duration audio material.

Circle (528) on Rapid Facts Card

BROADCAST ELECTRONICS AIR TRAK 90

The Air Trak 90 linear audio console delivers versatile input mixing, independent metering, BCA audio controls and P&G faders. The console is available in 6-, 12-, 18- and 24-channel models.

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BROADCAST ELECTRONICS CORE 2000

The Core 2000 Program Control System offers complete control of Sony Jukebox, RDAT and AudioVAULT. It also provides control of conventional sources (reel-to-reel, carousels, go-carts). The unit incorporates those features specifically required by satellite formats, including automatic announcer, liner changes and commercial underprogramming protection.

Circle (530) on Rapid Facts Card

CAMBRIDGE SIGNAL AEC 1000

Cambridge Signal Technologies AEC 1000 delivers accurate tonal balance and stereo imaging. The unit automatically measures direct sound and room reflections using precise FIR digital filters, compensates separately for early response time and delayed reflections, and makes up to 100 corrections within an octave band.

Circle (531) on Rapid Facts Card

DAR DASS 100

The DASS 100 is digital audio interface, sampling frequency and format converter and signal processor that includes phase reversal and stereo fader capabilities. Also featured are digital audio sample synchronization, gain adjustment, bit flag display and set, mixing and test signal generation.

Circle (532) on Rapid Facts Card

DAR SIGMA

Sigma is a digital audio production soundstation that allows the user to assign or copy 4-band parametric equalization, gain and pan settings. Features include eight or 16 analog or digital recording/playback channels, rewritable optical disk storage, all sound Station edit functions and a high-speed CPU. Included are 18-bit analog I/Os and eight channels of AES/EBU digital I/O.

Circle (533) on Rapid Facts Card

DBX 363XDUAL GATE

The 363x Dual Gate is a 2-channel noise gate that features separate threshold, hold and release controls per channel. The unit also provides individual hardware bypass, key monitor and key enable switches per channel, in addition to a stereo couple switch. Enclosed in a 1/2-rack package, the 363x provides the user with four gates in one rack space.

Circle (534) on Rapid Facts Card

DDA PROFILE

The Profile from DDA is a 56-module console that incorporates a combined in-line and split design configuration, giving it a 32/24 format. Features include 4-band parametric EQs on all modules, 10 auxiliary buses with direct out facility, and an aux return function on every module, making 136 inputs available in mix mode. Options include moving fader automation with MIDI and tape machine control, eight automated switch functions per channel, mic patching lines, VU or bar graph metering. The console is available with the moving fader automation.

Circle (535) on Rapid Facts Card

DIGITECH VOCALIST

The Vocalist from DigiTech is a harmony processor designed exclusively for the human voice. The processor generates up to 5-part harmonies and features a pitch correction function and a Vocoder mode. Additionally, it offers 128 user-definable programs and 128 factory presets with four variations each; a built-in one-octave keyboard; full MIDI implementation; on-board sync for cue-in tone and harmony editing; key/chord change memorization ability; XLR mic input with built-in pre-amp; line in jack; stereo output; headphone jack; and a 2-line 40-character LCD.

Circle (536) on Rapid Facts Card

DOLBY CODING UNITS

The DP501/DP502 audio coding units are 2-channel digital encoder/decoder units that provide professional-quality audio at 128Kbits/second per channel. They can be used for transmission systems that require high audio signal transparency and low, spectrum-efficient data rates. Applications include satellite subcarriers, band edge and SCPC schemes and terrestrial microwave and telecommunications links.

Circle (537) on Rapid Facts Card

DOLBY 430

The 430 is a background noise suppression system based on a modified version of Dolby SR, designed to assist film and video-post-production users in reducing background noises in field recordings. The modular system can be configured to provide from one to six channels of background noise suppression.

Circle (538) on Rapid Facts Card

DOLBY DSTL

The 950MHz Digital Studio-to-Transmitter Link has two audio channels and two auxiliary channels in less than 300kHz of RF spectrum. The unit features Dolby AC-2 audio coding.

Circle (539) on Rapid Facts Card

DOREMI DAWN SYSTEMS

The Macintosh-based Digital Audio Workstation Nucleus (DAWN) offers eight analog I/Os and eight tracks of hard-disk recording. CMX-format EDLs can be imported or generated by the system, and executed to conform audio to time-code events. Direct remote control is available via Transport Control Window, TimeLine system Supervisor, Motionworks ports, Panasonic SV-3900 Pro-DATs. DSP functions such as EQ, compression and resynthesis.

Circle (540) on Rapid Facts Card

DRAWMER DS404 QUAD GATE

The DS404 Quad Gate is a 4-channel expander/gate that is switchable for hard or soft gating. All four channels can be linked if necessary, and each is equipped with variable release, key filters, external key input, a choice of 20dB or 90dB attenuation and balanced XLR inputs and outputs.

Circle (541) on Rapid Facts Card

DUPLITRONICS DHS-1

The DHS-1 from Duplitrronics is a digital head-end system for audiocassette, DAT and digital compact cassette reproduction. The system includes high-speed load at 25:1, and a SRTM system that allows users to listen to a program while it is duplicating without interrupting the duplication process. Self-diagnostic hardware and software allow immediate pin-pointing of failed chips and components, and boards can be changed in less than five minutes.

Circle (542) on Rapid Facts Card

DUPLITRONICS MM-100

The MM-100 mastering system is a dedicated system for larger duplicators who need to increase their daily production levels. A high-speed load system that uses a standard S-VHS cassette for archive purposes is included. Information such as program ID, mastering engineer, program notes and other information may be stored on the VHS for recall at the duplication line.

Circle (543) on Rapid Facts Card

E-MU EMULATOR III EXPANDER

Designed as an Emulator Three expander or as a stand-alone EIII playback system, EIIIx is designed to reproduce sound with a dynamic range and lack of noise and distortion approaching the limits of the 16-bit format. 8Mbytes of memory can be expanded up to 32Mbytes. The unit can be configured as 16-channel stereo voices or 24-channel monophonic voices, and offers true 16-bit digital signal processing functions, including cut and paste editing, gain change, digital sample rate conversion, digital pitch conversion, digital delay, and dynamic digital filter. An SCSI port is standard.

Circle (544) on Rapid Facts Card

EUPHONIX CSII

The CSII analog audio mixing system is a full function refinement of the Cresendo system. Features have been added to enhance flexibility, and all audio circuits have undergone revision to improve overall system performance. All control and switches may be reset within 30ms and can also be dynamically automated to time code.

Circle (545) on Rapid Facts Card

FAIRLIGHT ESP MFX UPGRADE

An upgrade to Fairlight ESP's MFX digital audio workstation features continuous 16-track operation from one to six 1.2Gbyte disk drives using a "Turbo SCSI" bus. The file backup/restore function uses a double-speed 5Gbyte 8mm tape drive. The upgrade also includes double resolution screen graphics, featuring clip, track names, waveforms, fades, track level and status indication.

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FERROFLUIDICS FOR LOUDSPEAKERS

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RV (Road Version) designed for portable use with input and output connections on the front panel (pictured above).

PV (Permanent Version) with inputs and outputs on the rear panel designed specifically for permanent installations.

SA-Series ("Straight" Amplifier) designed for use where a processor is not required.

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previously available ferrofluids; APG 017 for full range speakers is a premium ferrofluid designed to provide heat transfer and the necessary damping of the resonance peak. The magnetization and viscosity values of APG 027 eliminate the splash and thermal restrictions in woofer applications while ensuring negligible loss in efficiency.

Circle (547) on Rapid Facts Card

FOSTEX DAT RECORDER

The PD2 is a portable 4-head time code DAT recorder for stereo TV and film location recording. The unit offers a built-in time code generator, off-tape monitoring and synchronization, a 2-channel input for mic/line switching, two phantom power option, 3-stage low-cut filters, mic input limiter and right channel phase reverse.

Circle (548) on Rapid Facts Card

FOSTEX SPA32 SPEAKER SYSTEM

The SPA32 portable powered speaker system features 250W RMS amp, 30cm woofers, constant directivity horns and a limiter circuit to prevent coil overheating, and a variety of optional mountings. Applications include temporary sound reinforcement, AV presentation and public address systems.

Circle (549) on Rapid Facts Card

FOSTEX MULTITRACK CASSETTES

Fostex multitrack cassettes feature repeat-loop playback, footswitch controlled punch I/Os, synch I/O jacks, 99 memory location programmable mixer routing, sync out for slaving MIDI sequence, selectable mixer configurations, external capstan control, 16 mixdown channels, auto-punch and optional ac adaptor.

Circle (550) on Rapid Facts Card

GOLD LINE DSP-30

The DSP-30 is a portable 1/3-octave audio spectrum analyzer that has the ability to measure in 1/4dB increments up to 5dB per step. A 90dB window allows the user to view the dynamic characteristics of a hall or studio and to monitor distortion levels. The unit has selectable filter slopes which can be set for either IEC type 0 or type 1 filters. Applications include machine alignment, live music, equalization and feedback elimination.

Circle (551) on Rapid Facts Card

INNOVATIVE UDAPS 2000

The Universal Digital Audio Processing System (UDAPS) from Innovative Electronic Designs provides the user with the flexibility and versatility to perform many sophisticated functions. The system is a modular, rack-mountable system with plug-in cards, which allows the user to design and construct a system that is properly integrated for each application. The total integral architecture eliminates the wiring among devices. Only the input and output connections of the audio and controls are necessary, eliminating the problem of ground loops, hum and EMI.

Circle (552) on Rapid Facts Card

INTELIX MINDNET

The Mindnet is a low-cost, high-speed communications protocol that allows many products in the audio industry to communicate with each other. It can be used with a master controller or as a stand-alone communications system that provides stimulus, feedback and status indication.

Circle (553) on Rapid Facts Card

JBL MR SERIES

The MR series sound reinforcement loudspeaker systems from JBL include 10 separate models that feature selective harmonic geometry and thermoset composite voice coil transducer technology. The designs also use bi-radial horns with improved titanium diaphragm compression drivers. Other features include strong comfort grip handles, glass reinforced Lexan locking corner protectors and 18 gauge perforated steel grills.

Circle (554) on Rapid Facts Card

JBL CONTROL MICRO, SB MICRO

JBL has expanded the Control Series line of loudspeaker systems with the Control Micro loudspeaker and Control SB Micro subwoofer. The Control Micro and SB Micro are suited to on-console placement in recording studios, fixed installations or wherever space is limited.

Circle (555) on Rapid Facts Card

KLIPSCH WOOFERS

Klipsch introduces a new line of eight high efficiency woofers, including a 12-inch, five 15-inch and two 18-inch drivers with various performance parameters. All eight drivers include symmetric field magnetic structures with vented pole pieces for improved power handling.

Circle (556) on Rapid Facts Card

KLIPSCH 480 SW

The KP-480-SW is a subwoofer system that uses an 18-inch woofer that is vented via a 15-inch passive radiator. Frequency response is 44Hz to 700Hz \pm 4dB, 110dB at 34Hz. The subwoofer's sensitivity at 2.83 V/1m is 104dB. Options include a metal reinforced grill, handles, trim, a stand socket cup and a passive crossover that has the crossover point at 150Hz.

Circle (557) on Rapid Facts Card

KLIPSCH-101

The KP-101 is a compact, high-output, low-distortion, 2-way system with an 8-inch woofer and a horn-loaded 1-inch compression driver. Applications include side fill, foreground and nearfield monitoring. Frequency response is 75kHz to 20kHz \pm 4dB, and -10dB at 51Hz. Sensitivity is 95dB at 2.83 V/1M. Options include 700/25V line matching transformer and a mounting bracket.

Circle (558) on Rapid Facts Card

KORG SOUNDLINK

The Korg SoundLink is an integrated audio production system that 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 audio signals. The system operation is from a hardware-type console. Applications include production and post-production sweetening for television, radio, corporate and industrial productions, music production and mastering.

Circle (559) on Rapid Facts Card

KORG WAVESTATION A/D RACK

The Wavestation A/D is a rack-mountable version of the Wavestation keyboard. The unit is a compact 2RU module that features 32 digital oscillators, 32 digital filters and 64 envelope generators and LFOs. The wave sequencing function allows each oscillator to play up to 255 sounds in sequence. Four different sounds can be accessed through each patch, and eight patches can be layered together in complex keyboard and velocity zones. Additional features include two vocoders and a combined compressor/limiter/EQ/gate, digital waveforms, time slices, component-synthesis sounds, attack transients, a vector joystick, a graphic LCD, balanced stereo outputs and a MIDI implementation, PCM and program card slots.

Circle (560) on Rapid Facts Card

KORG PROCESSORS

The Korg single-rack A2 processor offers stereo in/out and 102 internal effects with 97 effect chains. Additionally, the A2 features Spatial Reverb, an effect designed for applications where discrete inputs for separate instruments or stereo mixdown is necessary. The Korg A1 2-rack space unit features DSP architecture, more than 50 effects and user programmable effect chains, which allows the selection of different effect variations and order in a chain. Stereo inputs/outputs and chains can be configured for stereo and independent dual serial or parallel processing. The A1 was designed as a guitar-effects and multi-effects processor.

Circle (561) on Rapid Facts Card

LEXICON LARES

The Lexicon Acoustic Reverberance Enhancement System (LARES) uses mics, digital electronics and loudspeakers to enhance the direct and reflected energy of indoor environments.

Circle (562) on Rapid Facts Card

LEXICON LFI-10

The LFI-10 is a digital audio format interface that converts between any of the following digital standards: AES/EBU, S/PDIF, and SDIF-2. The unit allows viewing and edition of all auxiliary data, including 24bytes of channel status, user blocks in the AES/EBU-S/PDIF data stream, and emphasis and dub prohibit bits in the SDIF-2 datastream.

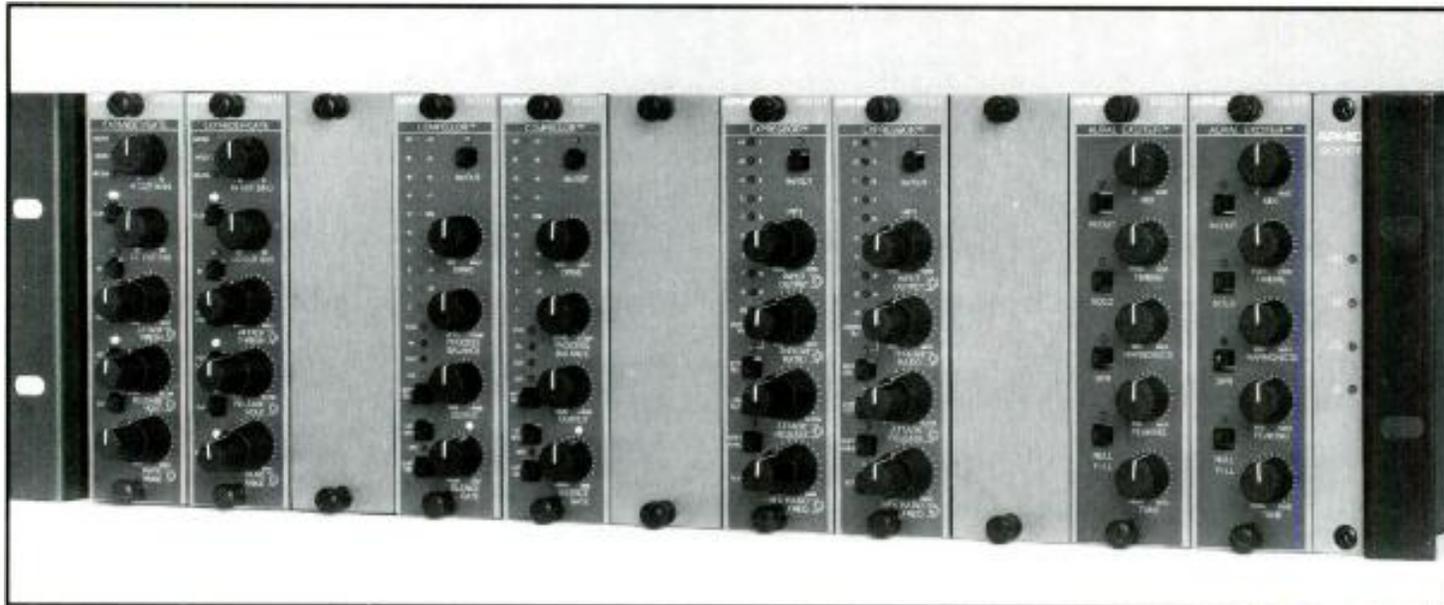
Circle (563) on Rapid Facts Card

MARK OF THE UNICORN PERFORMER

The Digital Performer offers Macintosh-based random access, 16 recording and playback channels, unlimited audio and MIDI tracks, simultaneous playback and editing of audio and MIDI data, SMPTE synchronization, waveform display and data management, including sound file compacting.

Circle (564) on Rapid Facts Card

Space Saver...



Aphex Modular System

Once hooked on Aphex signal processing, people have an insatiable appetite for more and more. Space then may become a problem. That is why we shrank four of our best ... the Aural Exciter[®], Compellor[®], Expressor[™] and Expander/Gate.

These modules feature all the processing power and performance of their standalone counterparts including our servo-balanced inputs and outputs. You can fit 11 modules in our 3RU Model 9000 rack* (or nine in the compatible dbx 900 Series rack).

Here's a brief rundown on these powerful tools:

- ❖ Aural Exciter- the signal enhancer that increases intelligibility, presence, clarity, and detail.
- ❖ Compellor - the "intelligent" compressor/leveler that controls levels as if a mixer were riding faders.
- ❖ Expressor - a full featured compressor/limiter that lets you tailor the sound your way.
- ❖ Expander/Gate - simply the world's finest gate, no one ever met our \$10,000 challenge to find a better one!
- ❖ And, more to come.

See your nearest professional audio dealer to rack up more processing power per inch than ever before.

Circle (30) on Rapid Facts Card

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Aphex is proudly American ... 100% owned, engineered and manufactured in the U.S.A.

* Unpowered, separate power supply available

MARSHALL SE100

The SE100 rack-mount speaker emulation unit from Marshall Amplification uses inductive loading to make an amp perform as if it is plugged into a speaker cabinet. As a power attenuator, the unit provides up to 18dB of cut in 6dB increments and features a headphone jack with separate level control. As a speaker emulation device, the unit can be hooked to either a PA or run direct through a studio console for recording. A line-in jack is provided so a -4dB line signal, such as a pre-amp output, can be run through the SE100's tone-shaping circuitry. A second uncompensated output allows the unit to be installed as a reactive load in live racks that use guitar speaker cabinets.

Circle (565) on Rapid Facts Card

MEYER SOUND MID-BASS

The DS-2 mid-bass loudspeaker is a horn-loaded unit that operates with the DS-2 Control Electronics Unit. The DS-2 uses two 15-inch cone drivers in a folded horn enclosure that has vertical steel reinforcing rods. The horn features a hyperbolic flare for maximum energy transfer and minimum response ripple with small enclosure dimensions. The balanced compression chamber presents a symmetrical load to the drivers for high power handling and low distortion.

Circle (566) on Rapid Facts Card

MOSSES AND MITCHELL JACKS

The Flexipatch jackfields, built with Mosses and Mitchell jacks, use PCB technology to provide reliable and consistent wiring between jacks and connectors at a lower cost than conventional wiring. The company also offers "pop-on" pod for rapid configuration. Jackfields and pods can be manufactured to custom requirements.

Circle (567) on Rapid Facts Card

NADY 750

The Nady 750 VHF Dual Discrete Channel wireless system consists of a compact, rack-mount unit featuring two true diversity receivers operating on two different VHF high-band frequencies and a choice of two transmitters — lavalier, hand-held mic or musical instrument bodypacks. The 750 receiver features balanced and unbalanced outputs with adjustable gating for each channel; a pair of 5-level LED bar graph displays for signal strength and audio level for each channel; 110Vac, 220Vac and 12Vdc power options; a single antenna assembly that serves both channels; and a squelch control for each channel. Standard frequencies are from 171MHz to 216MHz. The bodypack transmitters and HT10 wireless hand-held mic are standard with the 750 VHF.

Circle (568) on Rapid Facts Card

NED DSP OPTION

New England Digital features the DSP Option for its PostPro, PostPro SD and Direct-to-Disk workstations, providing real-time, channel multitrack digital signal processing capabilities. Based on multiple 68020/56000 processors and incorporating 32-bit databases, the DSP Option

offers on-board mixing capabilities, including 5-band parametric EQ with switchable shelving, panning, summing, gain control and digital crossfades. Macintosh-based AudioMation mixing software may be controlled from any MIDI fader module.

Circle (569) on Rapid Facts Card

PEAVEY CONSOLES

The Production series 1600PB and 2400PB consoles are available in 28x16 and 32x24 standard split configurations, each with a built-in 240 point miniature TT type patchbay. Inputs, master and subs will use "Delta Vu" simultaneous peak and VU responding LED metering.

Circle (570) on Rapid Facts Card

RENKUS-HEINZ EARSS

The Electro-Acoustic Room Simulation System from Renkus-Heinz, using data from post processing files in EASE, enables acoustical consultants, engineers, system designers, contractors and their clients to determine how a room and its sound reinforcement system will sound before it is built. The simulation software and DSP card are available separately.

Circle (571) on Rapid Facts Card

ROLAND DM-80

Available in 4- or 8-track configurations, the DM-80 digital multitrack hard disk recording system from Roland Pro Audio/Video Group includes a 24-bit internal digital mixer, analog and digital I/Os and a built-in SCSI interface for the connection of external hard disks or magnetic optical disks to extend recording time. The remote controller DM-80R or Track Manager software for the Macintosh offers a wide variety of editing modes and fast operation. The Roland Sound Space is a sound localization system that enables the reproduction of an enhanced aural environment when played back over a conventional stereo system.

Circle (572) on Rapid Facts Card

ROLDEX IMPRINTER

The Imprinter is a 2-color per pass dry offset printer. The STF-2C automatic cassette imprinter has a new inking unit and drying system for a higher capacity impression on the cassette.

Circle (573) on Rapid Facts Card

RPG DIFFUSORS

The VAMPS is a 6' x 11' variable acoustics shell that can be adjusted to different formats by changing the 12 inserts. The inserts include thermoformed or hardwood QRD diffusor, Ab-fusor, NDC Almute sintered aluminum absorbers and reflectors.

Circle (574) on Rapid Facts Card

RPG STUDIO-IN-A-BOX

The Studio-In-A-Box kit includes a combination of melamine QRD diffusors, fabric upholstered absorbers, and NDC Almute, made of porous sintered aluminum. Also available are the thermoplastic Kydex diffusor or the ABS units.

Circle (575) on Rapid Facts Card

SAMPSON CONCERT SERIES II

The Concert Series II wireless microphone system offers all of the features of a professional package at a cost-effective price. The 19-inch rack-mountable receiver has removable antennas, XLR balanced output, true diversity and dbx noise reduction. The transmitter offers a wide variety of mic elements and a newly designed hand mic.

Circle (576) on Rapid Facts Card

SCHOEPS KFM 6U MIC

The KFM 6U sphere stereo mic combines the warmth and natural sound of pressure (omni) capsules with the localization of coincident miking to achieve integration of the stereo soundfield in a 2-channel pickup.

Circle (577) on Rapid Facts Card

SESCOM HAND-HELD INSTRUMENTS

Sescom will display its line of hand-held audio test instruments including, the ASG-2 low-distortion audio generator, THD-2 distortion analyzer, OSC-1 flat oscilloscope, SFG-1 sweep function generator, AT-1 portable audio tester, FM-1 portable frequency meter, AVM-2 portable audio voltmeter and LS-1 loudspeaker impedance checker. These devices are battery-powered and are designed for field use.

Circle (578) on Rapid Facts Card

SHURE PORTABLE MIXER

The FP410 is a portable automatic mic mixer designed for use in a wide variety of multimic applications. By keeping unused mics turned down, the unit improves audio quality and provides a seamless mix automatically. Primary applications include corporate television, broadcast and field production environments. Features include the noise-adaptive threshold that activates mics for speech but not for constant room noise, such as air conditioning; max bus circuitry limits the number of activated mics to one per talker; and last microphone lock-on keeps the most recently activated mic open until a newly activated one replaces it.

Circle (579) on Rapid Facts Card

SHURE VP64 MIC

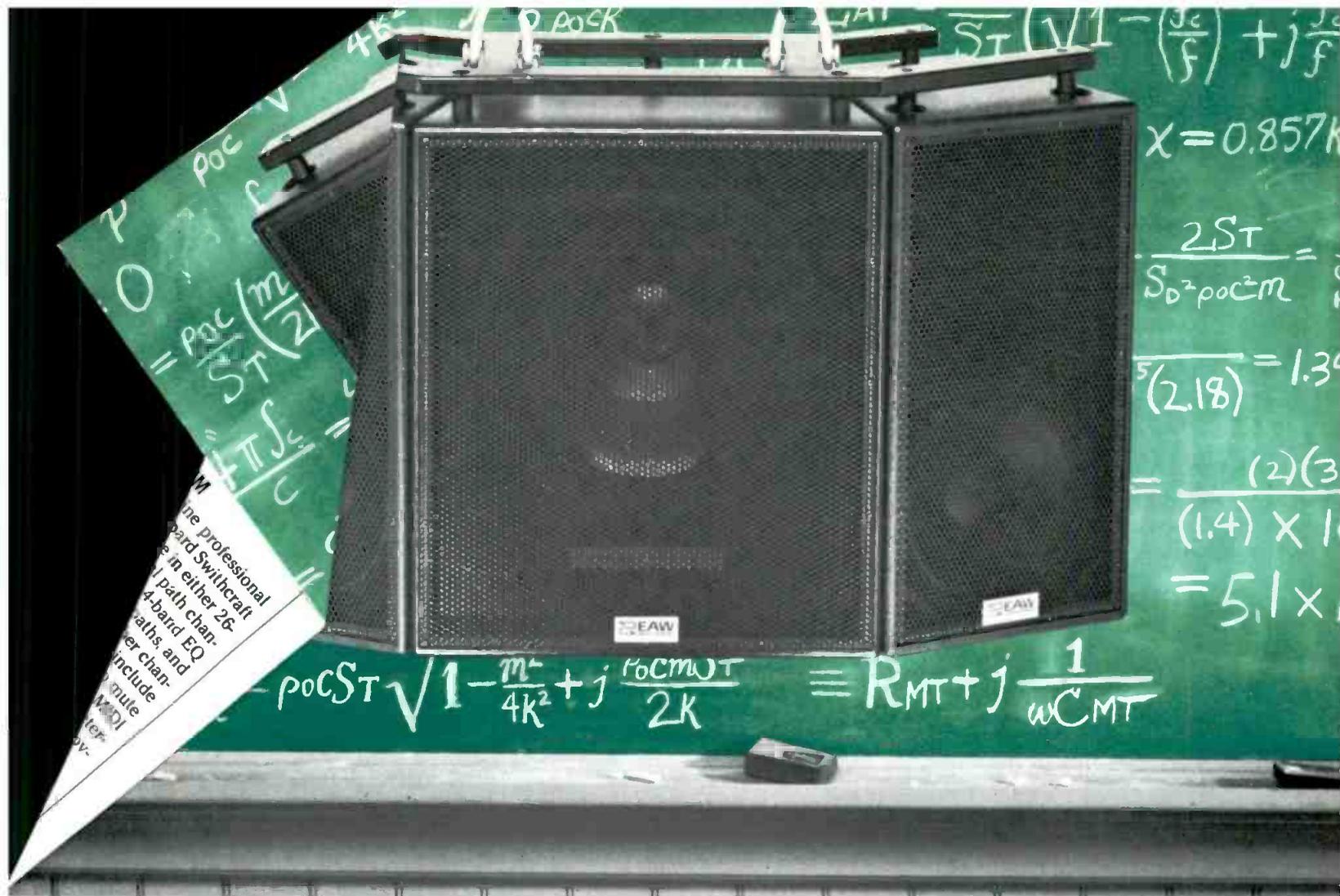
The VP64 omnidirectional hand-held mic is designed primarily for field interviewing. It incorporates sleek styling, a neodymium magnet, internal shock mounting, scratch- and chip-resistant polyurethane finish and rugged construction.

Circle (580) on Rapid Facts Card

SHURE HTS400SPA

The HTS400SPA 2-channel signal processing power amp is designed for a variety of playback and control room monitoring applications, including stereo surround encoded material in music, TV or film production environments. The amp is designed so that the signal is corrected for loudspeaker crossover interaction and excursion capabilities. An excursion limiting circuit in the amplifier continuously monitors the audio signal and modifies the low-frequency response when necessary to prevent overexcursion.

Circle (581) on Rapid Facts Card



We're making the laws of physics work harder than ever.

If you think it's easy to develop full performance from an enclosure this size (3.4 ft.³), just listen to any other ultra-compact system.

If you already have, you've probably decided it's impossible for anything this small to combine high output with high definition. In that case, you really should hear our new KF300 Series.

These are true 3-way designs—unheard of in this size class, but a fundamental principle in all EAW full-range systems. An advanced midbass horn and ultra-rigid carbon-fiber cone driver cover the entire midband, producing over 130 dB SPL with lower distortion than comparable two-way systems. The custom-designed woofer uses a flat wire wound voice coil and massive, optimally aligned magnet structure to achieve exceptional efficiency and surprisingly impressive bass.

True 3-way design also makes the KF300 Series a genuine Virtual Array™ system. Horizontal coverage is uniform from 400 Hz all the way to 18 kHz, and precisely matched to the enclosure angles of two KF300i's arrayed with our new SB330 subwoofer. The result is consistent, predictable coverage without comb filtering, lobing or hot spots.

The KF300 Series includes a variety of hardware configurations and powering options, such as the horizontal AS300 enclosure, designed for distributed systems. Each version delivers coherent output, controlled directivity and wide full power bandwidth in concert sound fill coverage, theatrical systems, dance clubs, corporate theater and other demanding applications.



The MX300i CCEP™ (Closely Coupled Electronic Processing™) unit provides overload protection, LF excursion control, phase compensation and idealized crossover characteristics for the KF300i.

It was no small task to make so little do so much. But at EAW, we insist that even our smaller systems embody big ideas.



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 Circle (31) on Rapid Facts Card

SHURE HTS640LRS and HTS680CF

The HTS640LRS and HTS680CF loudspeakers are designed for professional production and small theater playback systems, and can be coupled with the HTS400 SPA OR HTS50SPA signal processing amps. Both amps electronically control response and power handling characteristics of the loudspeaker system. All HTS amp speaker system combinations employ extended dynamic range techniques in circuitry, suiting the CF speaker to the demand of cinema, TV and music audio programs.

Circle (582) on Rapid Facts Card

SOLID STATE ULTIMATION G

The Ultimatum console automation system operates as either a dedicated VCA system, a dedicated moving fader system, or as a combination of both. The unit is an extension of the G Series Automation and is available as an option on all new G series consoles or as a retrofit to any console using the G Series computer.

Circle (583) on Rapid Facts Card

SOLID STATE SCREENSOUND

The ScreenSound digital audio-for-video editing/mixing system is hard-disk based and provides soundtrack assembly with music, dialogue and effects from a pen and tablet controller.

Circle (584) on Rapid Facts Card

SOLID STATE SOUNDNET

Sound digital audio network is designed to work in conjunction with ScreenSound allowing up to seven operators to share and copy work without downloading or uploading. It also provides central mass storage of audio and a database of sound clips.

Circle (585) on Rapid Facts Card

SOUNDCRAFT EUROPA

The Europa is Soundcraft's newest live reinforcement console. Frame sizes range up to 40 inputs. Each is standard with 4-band parametric EQ, an integrated noise gate, eight VCA subgroups and eight mute groups. Each of the 12 auxiliary sends has an on/off switch. Full metering inputs and groups are included. All inputs and outputs are balanced along with differential balanced bussing.

Circle (586) on Rapid Facts Card

SOUNDCRAFT SAPPHYRE

The Sapphyre is an in-line recording and post-production console available in 20, 28, 36 or 44 frame sizes, each with six stereo effect returns. Each I/O module incorporates individual noise gains with an advanced 4-band EQ design, splittable between the two signal paths. A combined I/O module gives access to dual signal paths with sub-grouping and routing architecture that allows different modes to be easily configured and controlled.

Circle (587) on Rapid Facts Card

SOUNDCRAFT SPIRIT

The Spirit range of consoles are available in Studio models for multitrack recording and Live for sound reinforcement. The Live is offered in three frame sizes: 8x3 feet, 16x3 feet, and 24x3 feet. An optional 8-channel expander is available for the Live. The Studio is available in 16x8x2 or 24x8x2 configurations. The console features a 4-band EQ and 6 auxiliary buses. The Live features a 3-band EQ, four auxiliary sends, four stereo effects returns and dedicated left/right and mono outputs.

Circle (588) on Rapid Facts Card

SOUND IDEAS EFFECTS LIBRARY

The sound effects library for Sound Ideas offers eight series: the General series 1000, a collection of more than 3,000 effects; the General series 2000, an additional expansion of more than 2,000 general effects; the Ambience series, which includes rural to urban atmospheres and various degrees of traffic; the Hollywood series, featuring boinks, zips and pops, horror effects and gunfire; the Wheels series of car sounds; the Lucasfilm library, comprising industry, jungle animals and earth's elements; Production music library for audio visuals, film, industrial, broadcast and commercial presentations; and a sampler library of 135 instruments and selected special effects.

Circle (589) on Rapid Facts Card

STUDER 48-TRACK

The D820-48 offers low noise A/D converters, passive filters and 4x sampling D/A converters. The headblock is equipped with two record heads and one ferrite reproduce head. The head configuration is write-read-write. Features include a 40-second, 4-channel built-in internal sound memory that can be used for track slipping, editing and re-editing, and digital ping-pong.

Circle (590) on Rapid Facts Card

SUMMIT DCL-200

The DCL-200 2-channel compressor/limiter features an input, ADJ attack, release, slope, ac threshold controls, two meters with clip indicators, stereo linking, side chain insert, dual mono mode, individual channel output gain and vacuum tube gain stages with 990 balanced outputs.

Circle (591) on Rapid Facts Card

TAC SR6000

The SR6000 is a sound reinforcement console that incorporates a VCA output group and split auxiliaries within a conventional analog desk. The console is fully balanced throughout and incorporates parametric EQ, input metering, stereo effects, returns, 8x VCA/mute groups and a 10x8 output matrix. 40-, 32-, and 24-input chassis are available.

Circle (592) on Rapid Facts Card

The B2 is signed for video post-production and include electronic and outputs, 4 discrete auxiliary returns. Video is available in both 8x2 and 8x4 faces. 8x 2-track provided. An optional panel on the 8x

Circle (593) on R

TAC MAGNUM

The Magnum is a 24-bus, in-line recording console with an on-board jackfield. The console is available in 32- or 32-input chassis sizes, with dual panels for either 52 or 72 inputs. Aux may be split between the two signal paths. The eight aux sends can be used on either channel or monitor. Routing capabilities include auxes to multitrack plus in-place solo, two groups, eight effects returns and optional muting and fader automation systems. Metering is either 30-segment LED ramps or metering coil VUs.

Circle (594) on Rapid Facts Card

TAD TCM SERIES

The TD-4002 from Technical Audio Devices is a 2-inch throat compression driver with neodymium magnetic circuitry and a 4-inch beryllium diaphragm. The TL-1801 LF transducer is rated at 800W and is suitable for studio monitor and sound reinforcement applications. The TCM series sound reinforcement systems are engineered for front-of-house touring applications, as well as fixed installations where sound quality and intelligibility are of premium consideration.

Circle (595) on Rapid Facts Card

TANNOY CPA 5

The CPA 5 loudspeaker features a 5-inch dual concentric driver, based on TGI's Inductive Coupling Technology (ICT), and employs a high-frequency passive radiator — a 1-inch Duralumin HF dome. Time delays and phase anomalies are eliminated by the unit's point-source, crossover-free architecture. The HF unit is impossible to blow up because ICT transducers do not use a coil or windings. Dimensions of 8 1/2" x 6" x 5" allow it to be used by keyboard players and MIDI workstation operators.

Circle (596) on Rapid Facts Card

T.C. ELECTRONIC M5000

The M5000 digital audio mainframe is a 2U that features reverb, sampling, pitchshift, chorus and flanging. I/O ports include AES/EBU, S/PDIF, optical, MIDI, serial remote and SMPTE. I/O options include SCSI, LAN, RamCard and floppy disk. The M5000 can be configured for recording, broadcast and sound reinforcement.

Circle (597) on Rapid Facts Card

TECHRON TEF20HI

The TEF20HI is a high-speed interface port that allows software packages, such as Hypersignal, to use the TEF's DSP. The unit is primarily used for acoustic simulation.

Circle (598) on Rapid Facts Card

3M 275 AND SHIPPER

The 275 improved digital audiotape offers better performance and improved packaging than previous models. The DAT hanger/shipper allows DAT cassettes to be stored and shipped.

Circle (599) on Rapid Facts Card

TIMELINE SOFTWARE UPGRADES

New features of the Lynx module software include a unified SAL/VSI operation that uses the same software chip; the ability to run VSO mode with the Lynx System Supervisor; new interfaces; and the ability to read VITC from video decks through serial ports. The Keyboard Control Unit software features a film mode that displays in feet/frames and a single key cue list for capture into memory. TimeLine's CMX EDL download software for the Lynx system supervisor allows the user to up/download the CMX format EDLs to the Lynx system for editing under the Keyboard Control Unit.

Circle (600) on Rapid Facts Card

TIMELINE CCU

The Console Control Unit from TimeLine is a miniature keypad that mounts directly into

standard Neve, SSL and other consoles. The unit operates the TimeLine System Supervisor multiple machine controller, which interfaces to standard console automation software. The CCU controls up to six analog or DAT recorders, VTRs or sprocketed film transports. Features include a 16-character alphanumeric display; readout of machine time code locations and offsets; status lights for each machine indicating lock, code, record, busy and aux; group and solo functions.

Circle (601) on Rapid Facts Card

TRIDENT VECTOR 432

The Trident Vector 432 is an in-line post-production, film, music console that has 32 multitrack, four stereo, and eight auxiliary outputs. Features include a high/low pass filter, 4-band parametric equalizer, 12 automated switches per input, optional stereo input/dynamics modules, an integral/remote patchbay, VCA/moving fader automation/machine control.

Circle (602) on Rapid Facts Card

TRIDENT MACHINE CONTROL SYSTEM

The PC-based machine control for music and post-production offers master, slave and MIDI transport control via SMPTE. The system features a sophisticated cue list, multiple cycles, automated drop-in and off-line functions. A Vector on-board QWERTY keyboard integrates ma-

chine control and fader automation. Synchronizer and computer are included.

Circle (603) on Rapid Facts Card

TRIDENT SERIES 80C

The Series 80C is a 32- to 48-input music/post-production console with 24 multitrack/5 auxiliary outputs, and a 4-band EQ. The console's 24-track dual monitor has full equalizer/auxiliary sends and is 48-track capable. The unit offers 60 inputs on a 32 frame, and an integral patchbay of 28/36 frames.

Circle (604) on Rapid Facts Card

TURTLE BEACH SOUNDSTAGE 1.2

Turtle Beach has released Version 1.2 of SoundStage, the 2-track editing software for the 56K digital recording system. New features include sample rate conversion, time compression/expansion, a scrubbing window, separate mono left/right control, pitch shifting, SMPTE chase-lock, invert, reverse, 3-D real-time frequency analysis, and record undersampling support. Updates include real-time playlist scrolling, the ability to name markers and name display on waveform screen, user assignable looping functions, a speed enhancement to DSP tools, the ability to drop markers during real-time playback, and tape mode. Version 1.2 is free to all registered users of the 56K system.

Circle (605) on Rapid Facts Card



Chameleon

POWER AMPLIFIER



Expanding upon the successful DX Series Power Amplifiers, we have created an amplifier which produces a full 2000 watts of sonically transparent audio power in a housing only one unit high.

Like its namesake, Chameleon can instinctively adapt to an altered environment, optimising its power to suit the workload.

A new era in professional audio amplification has dawned — the parameters have all changed. **THERE IS NO GOING BACK!**

TOTAL PROGRAM POWER* (RMS 10ms/100ms):	8Ω dual channel	1200W
	4Ω dual channel	2000W
	8Ω bridge mono	2000W
SINEWAVE POWER PER CHANNEL (RMS):	8Ω single channel	500W
	4Ω single channel	800W
	8Ω both chs. driven	400W
	4Ω both chs. driven	600W

DX 1000A

DX 2000

DX 3000



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Circle (32) on Rapid Facts Card

TURTLE BEACH MULTISOUND

The MultiSound multimedia sound output board is a 16-bit full-size output card for PC multimedia. The card can play and record stereo compact disc-quality sound. The unit's Motorola DSP560001 processing chip is a DSP capable of 10.5 million instructions per second. The system supports 8- or 16-bit recording with 44.1kHz, 22kHz and 11kHz sampling rates. Mono recording is also provided. The system offers 32 voices of MIDI playback.

Circle (606) on Rapid Facts Card

21st CENTURY LIGHTWORKS EDITOR

The Lightworks Editor is a portable, self-contained unit that can store and randomly access from 90 minutes to 20 hours of picture and sound. The unit can work simultaneously with two pictures and three soundtracks, and it allows variable-speed playback (forward or backward) with real-time dissolves. Scripts can be read into the system and used directly.

Circle (607) on Rapid Facts Card

ULTRAANALOG ADC 20048-A

This 20-bit audio A/D converter is a redesigned

version of the ADC 20048. The converter offers improved electrical performance and pin compatibility with the ADC 20048 at a lower cost.

Circle (608) on Rapid Facts Card

ULTRAANALOG 20400

The 20400 is a dual 20-bit audio D/A converter that offers a dynamic range greater than 110dB, which is higher than any other D/A converter, according to the company.

Circle (609) on Rapid Facts Card

U.S. AUDIO PRESSPOWER

The Presspower is a 2-channel mixer with XLR and 78 phone outputs for press conferencing.

Circle (610) on Rapid Facts Card

U.S. AUDIO P-12

The P-12 is a headphone for amps and studio use. It offers 12W per side.

Circle (611) on Rapid Facts Card

U.S. AUDIO P-45

The P-45 is an amp with 45W per side.

Circle (612) on Rapid Facts Card

VEGA UHF T-680

The T-680 hand-held UHF transmitter is designed for the R-662 wireless receiver and delivers 150mW of RF output, giving it a range of up to 1,700 feet. The unit features an internal dipole antenna, Dynex III audio processing, a 108dB signal-to-noise ratio. Three mic elements can be used with the T-680. Also available is the T677 bodypack transmitter, which has 150mW output.

Circle (613) on Rapid Facts Card

VEGA VX-20

The VX-20 portable wireless system includes the R-27 camera-mounted receiver and a choice of bodypack or handheld transmitters. The T-27 receiver features a GaAsFET front end, helical-resonator RF circuitry, ten poles of IF filtering, XLR audio output and a front-panel audio monitor output with independent gain control. The T-28 handheld transmitter has an EV BK-1 condenser mic element, and the T-29 handheld has a Vega K4 cardioid condenser element. The T-25 bodypack has a miniature XLR audio input that can accept most lapel mics. All transmitters offer 50mW of power and a range of up to 1,000 feet.

Circle (614) on Rapid Facts Card

WAVE FRAME CYBER FRAME 3.0

Based on Microsoft Windows 3.0 environment, the Cyber Frame 3.0 supports removable optical disk drives and SDPX digital mixer and I/O module.

Circle (615) on Rapid Facts Card

WAVE FRAME AUDIO FRAME 5.0

The Audio Frame 5.0 supports the multi-channel digital interface module. The software offers time compression/expansion and real-time punch-on-the-fly recording.

Circle (616) on Rapid Facts Card

DIGITAL PROOF!

The demands of digital monitoring have driven many "old standby" coaxial speakers to bits. Instead of singing the blues, more and more studios are replacing their blues with Gauss coaxials.

The Gauss coaxials were designed neutral so they wouldn't color the music. The cosh horn and time coherent design eliminate the need for time correction and greatly reduce fatigue. The carefully matched drivers require little or no EQ, provide the widest possible frequency response and 200 watts of power handling (400 peak) without self-destructing.

For more information on how you can bring your old coax systems up to the digital 90's, see your authorized Gauss dealer, or call us today.

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WESTLAKE AUDIO BBPM-4

The BBPM-4 eliminates the variable of power amp/cable/speaker interface. The bi-amped system incorporates precision level control, active crossover, fully protected amps and power supply into a compact design. The unit can be used as a portable personal reference and can be connected directly to a console or editing station output.

Circle (617) on Rapid Facts Card

WHIRLWIND W56 PR

The 56PR audio snake cable offers flexibility and OD less than 0.90 total isolation between pairs. It is CM rated.

Circle (618) on Rapid Facts Card

WHIRLWIND HOT BOX

The Hot Box is a transformerless direct box phantom-powerable DI.

Circle (619) on Rapid Facts Card

WIREWORKS LITERATURE

Wireworks has designed and printed more than 25 individual product cut sheets that can assist in designing audio and audio/video cabling systems. These sheets provide profiles and detailed specification on Wireworks cabling assemblies. The literature contains information on Wireworks mic cables, cable testers, data cables, coax, and audio video assemblies. Cut sheets detailing multipin disconnect products include those on multiboxes and racks, multi-tail fan-outs, multitrunk main and extension cables and Jensen transformer isolated mic splitters.

Circle (620) on Rapid Facts Card

ZOOM 9030 EFFECT PROCESSOR

The 9030 Advanced Instrument Effects Processor designed for guitar, bass, keyboards, vocals and recording contains 47 sophisticated effect programs that can be used up to seven at a time. Also featured are 99 user-definable patches and stereo digital effects, such as a harmonized pitch shifter, phaser, chorus, tremolo and reverb. A MIDI in/out and remote foot-switch jacks are offered for comprehensive external control.

Circle (621) on Rapid Facts Card

ZOOM 8050

The Zoom 8050 multifunction foot controller features five different patch pedals and two bank pedals for control over a wide variety of effects and MIDI devices. Also included are a control and bypass pedal.

Circle (622) on Rapid Facts Card

ADDITIONS

API CONSOLE

The fourth in a series of discrete consoles can be configured with up to 128 inputs and 48 buses and has an automated send module that can assign individual send to pre- or post-on large or small fader. The sends are available in 8-, 10-, or 12 per module. Also featured is the Touch Reset that allows knobs and faders to be automatically reset through an optional nulling system. All program loading and computer interfacing is done from a touchscreen.

Circle (623) on Rapid Facts Card

FM 2001A

The FM 2001A high-power precision amp supplies continuous power levels in excess of 2000W RMS and maximum output 180V pp. The unit employs a new grounding system, a temperature/air flow measuring circuit that recognizes blocked or dirty fan filters and protects the amp, a refined multi-sensor temperature control, automatic working hour counter, a low noise fan, and spike suppressors. The units are hand-crafted in Switzerland to MIL, DIN, and IEC standards.

Circle (624) on Rapid Facts Card

OPTIM AUDIO SYSTEMS

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Live & Direct

Linking-Up The Amps

By David Scheirman

Just when the sound reinforcement industry is finally starting to accept that a computer might actually have a place in the scheme of things ... perhaps to keep track of and do MIDI-switching of effects programs, handle complex pre-set cue "scene" changes or complex signal routing via matrix switchers, or as part of a sophisticated system performance analysis and audio measurement package ... somebody comes along and wants you to hook up your power amplifiers to a computer.

"What on earth for?" is not an unreasonable response, particularly from a touring sound system owner/user who has already seen the number and complexity of consoles, signal processing tools and other items needed for a sound system recently increase in number, complexity and expense.

David Scheirman is R-E-P's live sound consulting editor and president of Concert Sound Consultants, Julian, CA.

Possible answers to that question include: all power amps can be turned on or off, or muted, at the same time; the system operator can remotely scan temperature, power levels, etc.; level changes can be made to amp channels from the mix position; and all input levels, front panel settings, etc., can be seen and changed.

Power amplifiers are a much-needed part of every sound system; yet, they are almost invisible. System operators have little interaction with them ... they don't live at the mix position in a typical portable or fixed-installation system. Few people see them. They have to be reliable, quiet, and should be a transparent part of the audio signal path. It is because the power amps are often out of the way that helps lead to the development of computer-linking systems that enable the sound system operator to engage in digital dialogue with the amplifiers ... wherever they may be located in the building.

Such information and control networking systems are primarily finding their ways into complex, fixed-installation sound systems that are installed for long-term use where both consistency and flexibility must be considered. If a power amp is located high above the

proscenium in a small closet (as in a casino showroom theater, or two stories, three flights of stairs and 300 feet away from the mix position in a sports arena, or down a long service corridor in a nameless, faceless locked room at a convention center), it is a prime candidate for being hooked up to a computer-addressable network.

Computer control of amps is not really news. I.E.D. (Innovative Electronic Designs of Louisville, KY) has offered a PC-based computer-controlled modular card-frame system (including dual-channel, signal processing amps, monitor amps and single-channel telephone and zone-paging amps) for nearly a decade. In Europe, Stage Accompany of Holland has offered an integrated sound system including computer-linked power amp/loudspeaker modules since the mid-1980s.

What's news, perhaps, is that power amplifier companies known to the pro audio community have recently been developing and improving computer-controlled system software and hardware for their own products, so that names commonly seen in the pro sound reinforcement industry like Crest, Crown and QSC are now being linked to this technology.

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Crown International offered such a system more than two years ago. That company's software and amplifier modules for computer-linking have found their way into a variety of installed systems. Crest Audio has completed the development of a computer-networking system for its power amplifiers, and the first major system installation is under way this month. QSC continues to work on a system for data collection and remote-control functions that will support an open standard, including the controlling software. Looking at these three competitive firms alphabetically, let's examine each in greater detail.

CREST'S NEXSYS

Crest Audio's new computer-control system, first demonstrated to the sound industry at the NSCA meeting in May 1991, is able to monitor and/or control up to 2,400 channels of amplification. At present, only Crest amps can be supported by the system, but this is only because a small interface card must be installed within each amp for it to be included in the computer-linked network.

The system is DOS-based, and will run on IBM-format PCs. The RS-232 signal that

originates with the computer is converted to the RS-485 protocol, and communication between computer and amp is possible for up to 3,000 feet using standard twisted-pair wire. Remote boxes called "supervisors" are located within 30 feet of the power amp, and each supervisor supports up to 24 dual-channel amps. NexSys software uses pull-down menus to access most system functions. A handy feature gives the operator the ability to create macro functions that speed up any series of repetitive instructions for a multiple number of amp channels.

In addition to offering a wide variety of control functions (mute, VU meter ballistics, input attenuation, etc.), NexSys can also monitor heat sink temperature, clipping, and perform other sophisticated diagnostics, including shorted voice coils, or woofer fatigue in speaker systems can be detected.

CROWN'S IQ SYSTEM 2000

Available for either the Apple Macintosh or IBMs and compatibles, Crown's computer-control system uses special IQ-P.I.P. cards that can be installed in the company's Macro-Tech or Com-Tech series of power amps. This card

sends and receives information down a serial line from the host computer via a system interface using a RS-232/423 or RS-422 port. As many as eight "serial loops," each holding up to 250 amplifier channels, can be linked, giving the system the ability to monitor and/or control up to 2,000 units per system.

System operators have the ability to remotely control many functions (including on/off, input level attenuation in 1dB steps, audio signal muting and polarity, amplifier rail voltage presence, etc.) and the special DSPI (Data Signal Presence Indicator) enables the swift isolation of problems, such as improper wiring or disconnected IQ-P.I.P. cards in the power amps. An auxiliary control feature allows linkage to other related devices, such as supplemental cooling fans or auxiliary rack lighting.

With this system, simple user do-only commands at the computer keyboard enable the system operator to perform a variety of functions quickly. (For instance, AMPION gives the instruction "turn on amp channel No. 1," or INV2 means "invert the signal of channel No. 2.")

Continued on page 86



Roadwork

By Mark Herman

Guns N' Riots

A riot at a Guns N' Roses show inflicts over \$300,000 worth of damage to sound reinforcement company Electrotec Productions and \$200,000 to the venue!

Electrotec Productions (Canoga Park, CA) has been providing audio for this summer's concert tour with the controversial and trouble-plagued band Guns N' Roses. On July 2nd, an estimated 2,500 angry and music-crazed concert goers — out of an audience of 15,000 — exploded and rushed the stage at the Riverport Performing Arts Center near St. Louis. They proceeded to commit one of the most violent and senseless displays of pro audio equipment destruction in the history of concert touring.

A full-scale riot broke out after Guns N' Roses vocalist Axl Rose dove off of the stage 90 minutes into the show to fight with a fan who was video-taping the performance. Supposedly, Rose had requested security guards to stop the illicit taping but apparently the guards did not act fast enough for Rose. After he was pulled back onstage, he then reportedly struck one of the security guards, yelled at the crowd, threw down his wireless microphone in a fit of rage and abruptly left the stage.

Mass confusion ensued, and the crowd got increasingly agitated as time passed with no band. The house lights were put on but the crowd refused to dissipate and instead got angrier before finally storming the stage, a full 15 minutes after Axl Rose's departure. The police estimated that 2500 rioters swarmed onstage, grabbed microphone stands and began smashing everything in sight, including hurling equipment off of the stage. Some even tried climbing the cabling that hung down from the flying PA and attempted to disconnect speaker cabinets from the rigging points. Making matters even worse, several got hold of the venue's emergency fire hoses and fire axes. They proceeded to spray water on the audio equipment, and used the axes to cut the lighting, audio and electrical cabling to shreds. Fortunately, the system's power had already been shut down.

Mark Herman is a contributing editor to R•E•P and the president of Hi-Tech Audio Systems, a sound reinforcement equipment rental company based in South San Francisco.

The entire monitor system — with the exception of the brand new Gamble EX48 monitor console — was completely thrashed. When the crowd first rushed the stage, crew members saw the Gamble monitor console being pulled into the audience by the multi-pair house snake. Heroically they grabbed the console case cover, unlatched the AMP multi-pair connector and fought off rioting concert goers. Several of the crew were hospitalized with lacerations, concussions, bruises and broken ribs.

The Gamble console survived with minor damage to the rear panel, but the adjoining Soundcraft Series 4 was not so lucky, suffering massive terminal destruction. It was utterly destroyed. One audio engineer eyewitness to the Series 4 devastation said, "It looks like the entire World Wrestling Federation jumped up and down on top of it. Just imagine five big guys with jack boots literally kicking, smashing and jumping on a console."

"It was scary. You don't want to put your life in jeopardy to save a 1/3-octave equalizer."

One of the event's other miracles was that the FOH engineer and system engineer, along with several security guards, were able to protect the house mixing console and all FOH electronics (and themselves) from the maniacs in the crowd. They did this by covering the gear and then applying psychology with a dose or two of muscle to dissuade the hotheads around the FOH mixing position. At one time when a rioter was approaching the FOH position with a water hose, just about to turn it on, one of the security crew wrestled the hose away and turned it on the crowd and drove the attack off.

Along with the Soundcraft console, all the microphones, monitor wedges, monitor amps and stage processing racks were obliterated. Two of the racks contained 18 Klark-Teknik DN360 equalizers and BSS crossovers. The main P.A. amplifier racks, although just off stage and harder to get

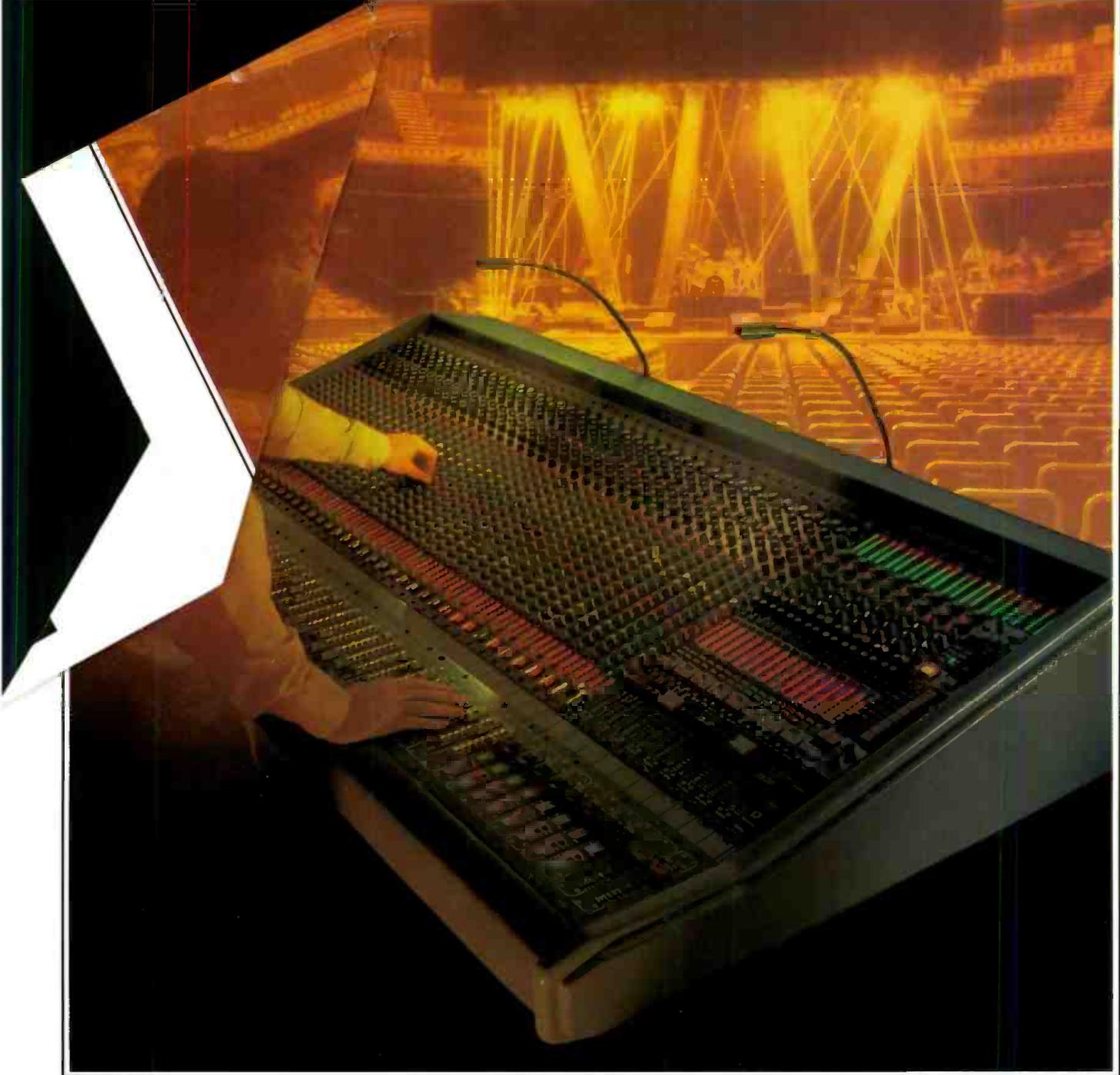
to, were also rudely pushed off the stage. Amazingly, most of these amplifiers survived the impact, only to be hosed down later. No significant damage was reported for the main FOH P.A. system that was flying overhead. The 24 subwoofers on the floor were not so fortunate. All-in-all Electrotec sustained over \$300,000 worth of damage to their equipment.

"These people were bent on destruction. It was war, basically."

The security forces and police were overwhelmed; hundreds of police officers were eventually called in and used nightsticks and hoses to quell the destructive crowd. Many rioters were arrested and over 60 people were injured. The Riverport Performing Arts Center's shed had been only open two weeks before the July 2nd disaster. The stage floor suffered severe damage; 1800 broken chairs were replaced, chain link fences were torn down, 24 portable toilets were knocked over and both video screens were ruined. Damage to the facility was reported to be around \$200,000.

After the disaster, sound reinforcement company Tascos picked up the monitor system rental for several weeks until Electrotec could put together a completely new replacement system. Electrotec's subsequent new monitor system was on the road July 29th and featured a 16-mix T.C. Electronic 6032 system with a remote controller, 1128 programmable equalizers and an IBM PC compatible computer as the control unit. The new system's electronics stage rack also includes (10) BSS FDS 360 crossovers, (3) TDM 24CX-4 crossovers, (2) BSS FD402, (6) Aphex 612, (2) Yamaha SPX90 and (4) Klark Teknik DN300 equalizers.

Lawsuits have already been filed against Axl Rose and the band's corporation for damage inflicted upon the facility and several people. The lawyers will have a field-day with this one. Maybe the band should just change their name to Guns N' Riots. ■



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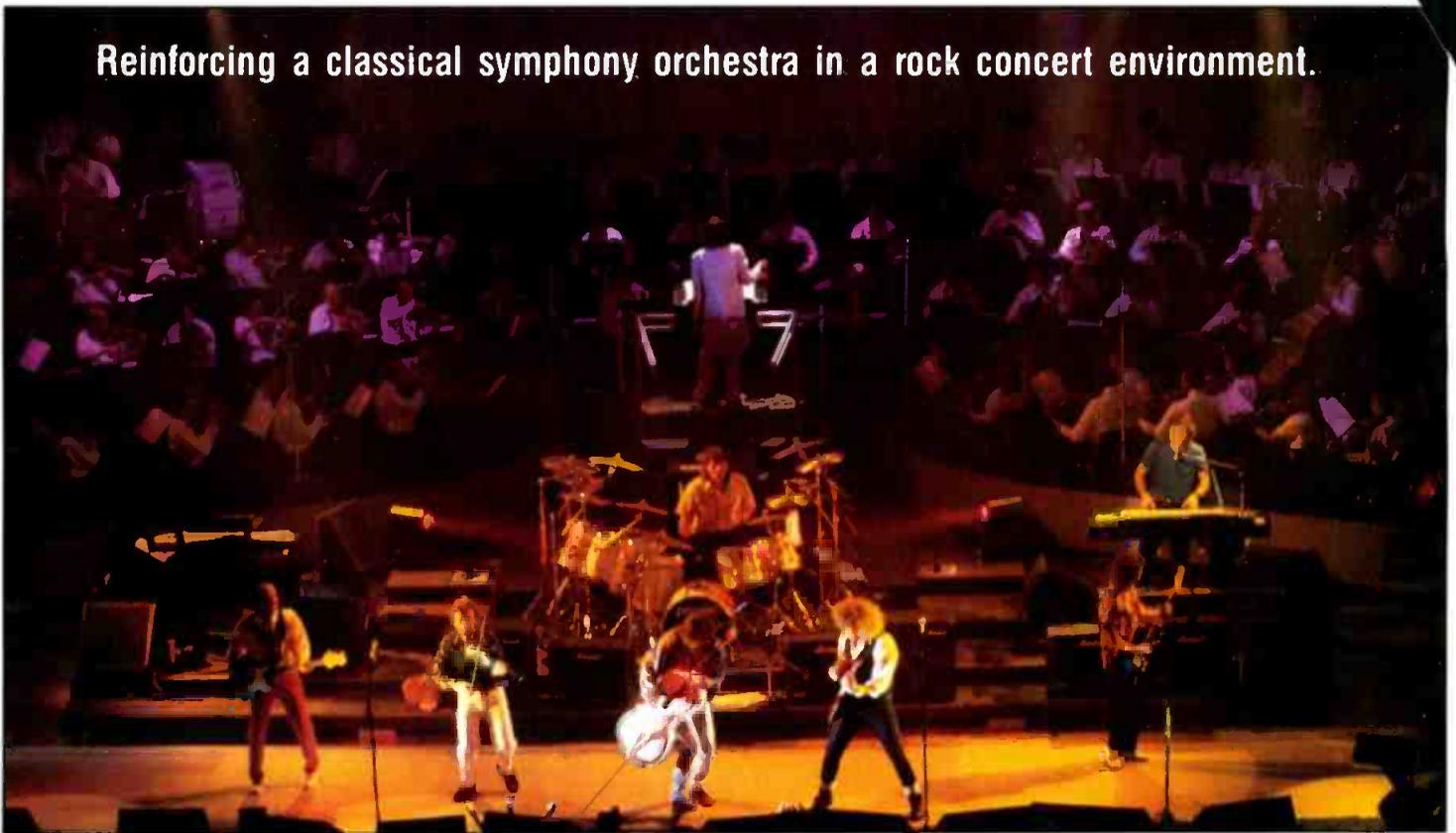
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PART ONE:

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Reinforcing a classical symphony orchestra in a rock concert environment.



By David Scheirman

Attempts to team a full symphonic ensemble with a rock group have met with varying degrees of success or failure in the past. English groups like Deep Purple, Emerson Lake & Palmer, and Procol Harum began doing special "concept" record album projects circa 1968-1978, accompanied by performances of the same material in a

David Scheirman is R•E•P's live performance consulting editor and president of Concert Sound Consultants, Julian, CA.

live concert setting using symphony orchestras. Many such projects in the past resorted to tape playback for the symphony, even if an orchestra was onstage, due to the technical difficulties involved in amplification and monitoring. However, today's sound reinforcement technology can allow the rock group and symphony to perform together in concert.

The 1991 World Tour by England's Electric Light Orchestra Part II with the 78-piece Moscow Symphony Orchestra was presented by Rockview Promotions, in conjunction with Stas Namin. This project offered an opportunity to seek out and implement the most effective technique to

achieve the goal of the tour producers: present the public a full-blown rock concert with maximum production values while showcasing one of the world's top symphonies to rock 'n' roll audiences ... without compromising sound, style or musical integrity of either.

Electric Light Orchestra has been known for its creative use of electronically-amplified violin and cello for a string of pop hit recordings starting in the early 1970's. In 1991, the re-formed rock group (E.L.O. Part II) attempts to take that familiar style and add a full symphony orchestra to the brand-new album and to the live show.

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The new 8-piece band features original members Bev Bevan (drums), Kelly Groucutt (bass), Hugh McDowell (cello) and Mik Kaminski (violin), joined by Louis Clark (keyboards), ex-Climax Blues Band member Pete Haycock (lead guitar & vocals), Eric Troyer (keyboards & vocals), and Neil Lockwood (guitar & vocals).

The results are spectacular. From the 52-foot wide lighting truss that lifts off like a flying saucer (courtesy of Lighting & Sound Design, following a design by Chas Harrington), to the multi-colored lasers flashing throughout the arena (courtesy of Lasermedia, coordinated by Ed Auswacks), to the large-screen projected images of Big Ben, the Kremlin, and such (courtesy of Production Arts Lighting), to the symphony stage risers incorporated into a clever, effective set design (courtesy of Tait Towers, designed by Tom McPhillips), the production is a sonic and visual extravaganza. Conceived by Don Arden of Rockview, personal management for E.L.O. Part II, the concert event created a host of challenges for veteran production manager Chris Lamb of GLS Productions, Inc.

Focusing on the live audio, the sound crew felt a level had been reached at the first few shows that could be fine-tuned and improved, but the media critics seemed to have loved it right out of the gate: "... a quite spectacular impact ... super sounds and great music ... the unique combination of orchestras, contemporary and classic, can only be described as a modern day masterpiece," Bournemouth Register, England, May 25, 1991. "The sound is tight and explosive ... the twinning of orchestra and rock music was stunningly effective," Daily Express, London, May 27, 1991. "C.D.-quality sound ... a £3.5 million production that also boasted an integral 30-minute classical concert ... one of the best shows of my life," Birmingham Mail, England, May 29, 1991.

In this feature some of the "tricks" that made the sound of this show work so well will be exposed, and the various aspects of concert sound on this project and how they were handled will be examined.

INITIAL PROJECT DESIGN STAGE

Starting in October, 1990 (seven months prior to the first concert), meetings were held to determine how to best convert the live-show concepts into production reality on the large concert stage. Engaged as the sound consultant to the project, I immediately stressed three important points to the tour producers regarding past attempts to use a symphony orchestra with rock concerts: 1) Feedback is a primary problem, and soundmixers will have difficulty achieving gain before feedback when attempting to bring the symphony

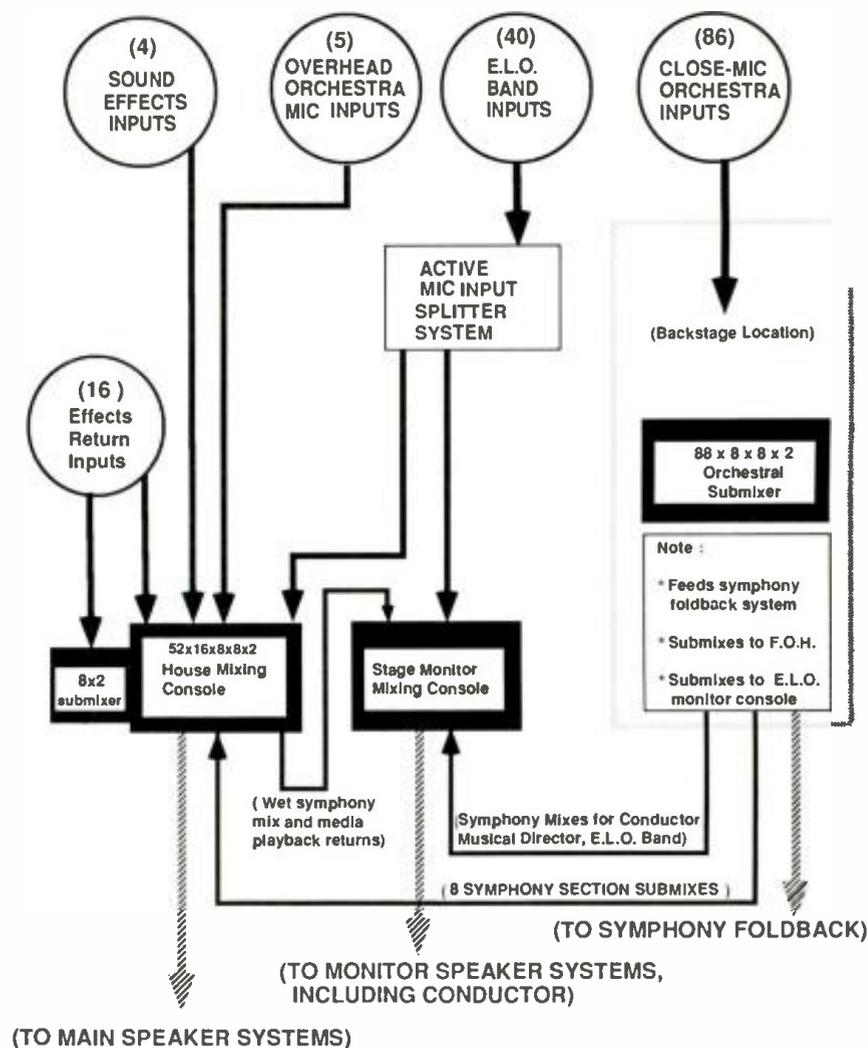


Figure 1. Input and mixing console signal routing for all three mixing locations: FOH, on-stage monitor and backstage orchestra.

into the full mix. 2) Achieving some sense of acoustical isolation for the symphony from the rock group will be critical, both as regards the symphonic musicians' efforts to hear each other as they play, and in terms of achieving appropriate input signals for the mix. 3) There must be a well-coordinated equipment package and operating plan in the symphony area with adequate manpower to get things up on time and keep them in order, for the show to be able to tour.

These points were taken into consideration by the tour producers, and a working budget was established to address these issues and implement the solutions into the show when it came time to play live. In working on the sound design for the project, I decided to focus on several primary working directives for dealing with the audio for the entire show: we must have some acoustical isolation of the

symphony from the rock band, neither group's sound or musical style must be compromised, and the sound team and equipment package must be very carefully selected and optimized for one-nighter touring.

With these precepts in mind, we looked for the best possible solutions. There were a great many factors to consider that made this more than "just another tour." 78 symphony musicians had to fit into the smallest possible area, and the stage would include moving set pieces, meaning that many things would be affected whenever a single monitor speaker placement, cable run or mic stand position was altered.

SOUND SYSTEM SELECTION

In March of 1991, the sound system design specifications and working blueprints were complete, and requests for bid

proposals were sent to the world's major concert sound companies. During the selection process, priority was given to those firms best able to meet certain requirements related to industry accomplishment with both rock and symphonic concert productions, and those firms best able to meet the sound design specifications in their proposals. A close look was taken at firms offering available inventory in the United Kingdom, where the tour production rehearsals and first shows were to be held.

After an examination of all the above factors, the firm chosen by the tour producers was Showco, Inc. of Dallas, TX. Showco supplied a Prism arena sound system with Harrison consoles, the new Prism digital drive system and Crown power amplifiers. Special signal processing gear, microphone systems, custom cabling and other unique items were supplied as specified in the sound design.

Showco's crew offering met the specification's requested 6-man team approach, and that gave us a 7-person audio team for the first leg of the world tour which included the following individuals: sound consultant and house soundmixer, David Scheirman (E.L.O./M.S.O.); soundmixer &



Photo 1. Konstantin Krimets conducting the Moscow Symphony Orchestra from the scissors lift podium.

Moving?

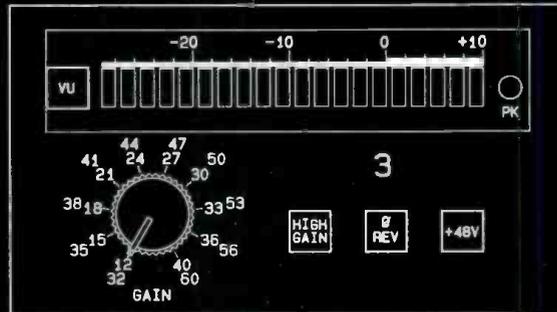
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sound crew chief, Mike "Dr. Funk" Ponczek (Showco); stage monitor mixer for E.L.O., Chris Wade-Evans (Showco); symphony soundmixer/audio tech, Jeff Cohen (Showco); electronic tech/audio tech, Mark Hergenrader (Showco); Rigging/A.C. power/stage setup, Kevin McCarthy (Showco).

With the sound system design complete, the sound contractor chosen, and the crew selected and approved, a scant two weeks remained to assemble and prep the system, order any specialty items and build custom devices, as well as prepare any gear not already based in the U.K. for shipment to Birmingham, England from Showco's Dallas headquarters. Band rehearsals with Electric Light Orchestra Part II started in mid-April with a stage monitor system. Load-in for production rehearsals at the National Exhibition Centre Forum building in Birmingham began on April 29th, and the Moscow Symphony Orchestra arrived in England from the Soviet Union on May 13th. One week later a showcase was staged for promoters and the press, and the first concert of the tour began on May 22nd.

SYMPHONY MIXING TECHNOLOGIES

In deciding how to best mic and mix the symphony, it became apparent to me that

a combination of two different technologies would work best: traditional overhead area mic systems for picking up the full ensemble sound, and close-mic systems for every individual instrument in the symphony. This would mean over 90 mic lines coming from the symphony riser area.

I knew that we had to have the maximum amount of control over the sound of the symphony possible, yet we also had to have a clean, uncluttered stage set. The system also had to be designed for quick setups and takedowns for the one-nighters. There was the problem of physical space to consider. More consoles and equipment racks meant more stage or audience area consumed.

My decision was to make use of a symphony pre-mixing station for all close-mic inputs, with its own board operator in a backstage location. Orchestra section mix-downs would be made there and line-level signals fed to the house. This strategy gave us several advantages. It allowed one soundmixer to become intimately familiar with only the symphony, including playing habits and the sounds of individual players in the ensemble. It kept the mic-level cable runs as short as possible, routing them under the risers and directly to

the dedicated symphony console backstage. And, it let us concentrate on mixing the "sound of the show" out in the audience area, without getting drawn into the intricacies, multiple cues and mix troubleshooting that would inevitably be a part of reinforcing the symphony (See Figure 1).

The console specified for the symphony mix position was the Ramsa WR-S840. This piece of equipment is unique among consoles in that the manufacturer offers a special submix module with eight discrete mic pre-amps that route to a single fader and EQ section. Eight of these were installed, thus enabling us to have up to 88 separate mic inputs on one console frame, in addition to the unit's versatile output scheme. Dual power supplies were placed online for the console to ensure adequate, consistent voltage levels to the input modules, with special consideration given to the fact that nearly all of the input devices to the console's 88 inputs would require 48V phantom power (See Figure 2).

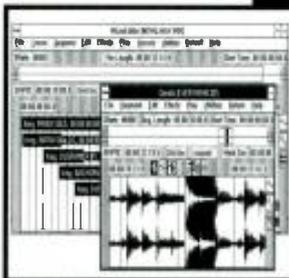
Using the Ramsa console with its clean mic pre-amps and EQ sections, very little outboard signal processing was required. The percussion section needed special attention. Since it was relatively well-

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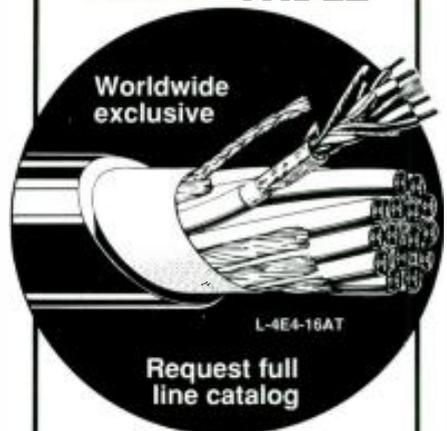
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isolated at the upper rear area of the symphony risers and located nearly seven feet higher than the rock band's stage level, we were able to use a variety of traditional dynamic and condenser mics with success. Symphony pre-mixer Jeff Cohen found that channel-inserted noise gates (Brooke-Siren Systems DPR-504's) helped to clean things up considerably here. Klark-Teknik DN-504 compressor/limiters were inserted on the bass drum and tympani inputs.

THE SYMPHONIC ENSEMBLE

The Moscow Symphony Orchestra, under the direction of conductor Konstantin Krimets, arrived in Birmingham with their own instruments, a great deal of enthusiasm, and much curiosity. The group of 78 players, both male and female, ranged in age from about 30 to 60 years. They had never seen a major rock concert production before, much less played in one. Mr. Krimets is a gregarious personality and a natural showman, and instantly made the best advantage of such staging tricks as a "glow in the dark" fiber-optic laser baton, a Darth Vader-like spaceship helmet and a platform set on a scissors lift that took him 10 feet in the air (See Photo 1).

Classically trained and known around the world, the 78 member ensemble was set up in a traditional European format, with all elements necessary to perform pieces by such composers as Wagner, Grieg and Beethoven.

In tests conducted two months before the tour, I had determined that some types of microphones and/or pickups would work better than others for specific instruments. Sample products were obtained for testing from a wide variety of microphone manufacturers. Microphone systems of five different types were obtained and tested with symphonic musicians in a high-noise environment: custom-developed diaphragmatic transducers for woodwinds, internal mini-mic systems with optimized pre-amps for strings, miniature condenser mics (cardioid, hyper-cardioid, and omni), piezo-type "spot" pickups and strip-type capacitive tape pickups.

Wherever possible, miniature clip-on condenser mics were used to minimize the amount of "clutter" from stands, cables and such in the symphony area.

In practice, we confirmed many things that most professional sound engineers have realized from experience or intuition. For example, the very low frequency wind, horn and percussion instruments (contrabassoon, tuba and bass drum) sounded best with a large-diaphragm, high-quality condenser mic such as the Neumann U-87. Miniature microphones or piezo-type pickups did not accurately re-

produce the natural sound of the instruments at rock concert sound levels in the lower register. Proper pickup pattern selection and careful mic placement minimized the amount of stage leakage at these instrument positions.

SYMPHONY MICROPHONE SYSTEMS FOR STRINGS

Symphony soundmixer Jeff Cohen worked with full-orchestral music scores for each piece performed by the Moscow

Symphony, and received valuable assistance in the early stages of the project from Lothar Strunk-Fenner. Lothar, a technician from Soundlab Electronics in Germany, was present at production rehearsals to assist with familiarization on the firm's "Wings for Strings" SMS (Symphony Microphone System) product group that we used for all violin, viola, cello and bass instruments.

Comprising a specially-built Sennheiser miniature mic element that is located in-



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Symphony Console Signal Flow
(Custom-configured RAMSA WR-S840 console)

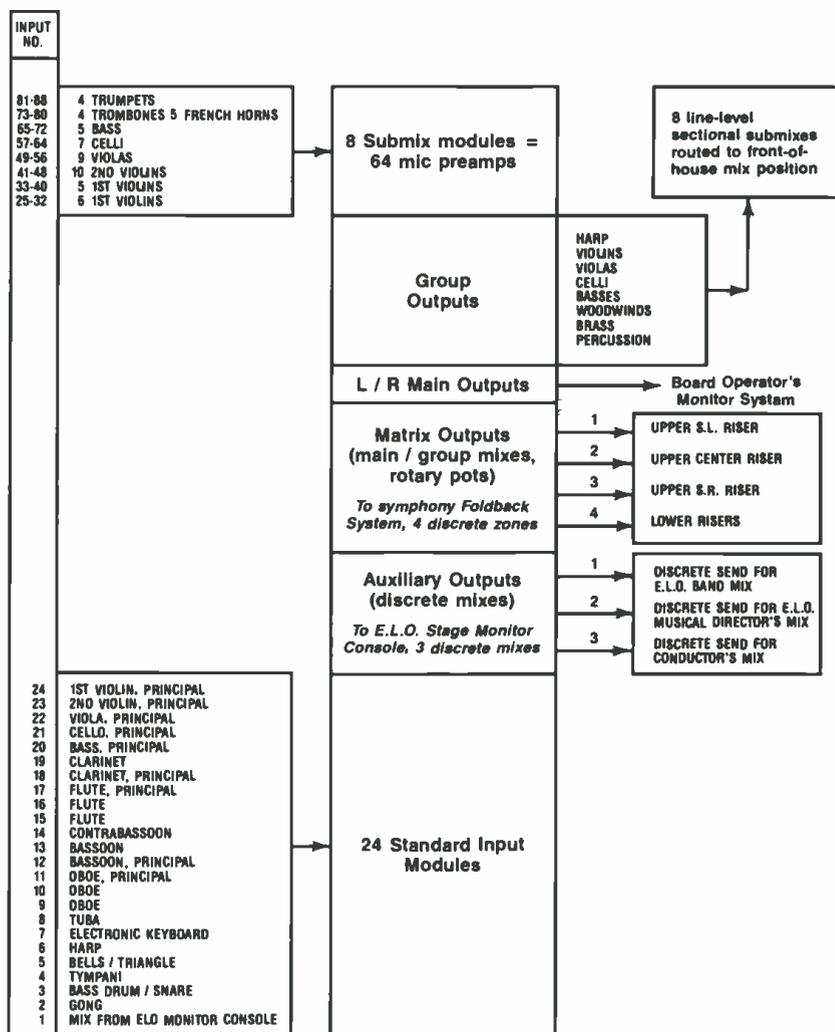


Figure 2. Input and output assignments for the backstage symphony Ramsa WR-S840 mixing console.

side the wooden body of each string instrument, the SMS units are the result of several years of meticulous research and development.

"Many people don't realize that sound pressure levels of up to 135dB can be measured inside the violin body near the soundpost," says Soundlab's Chief Engineer Klaus Kaetel. "This is obviously the best place to get acoustic gain on the instrument. Locating the exact mic position for optimum sound and then creating a shock-mounted mini-mic element and the installation and cable systems to support it was only the first step. We then designed a compact, 48V pre-amplifier with four active filters that could be tailored for use

in any of the four primary string instrument groups" (See Photo 2).

For violins and violas, the end pin of the instrument is removed and replaced with a hollow aluminum sleeve. The mic element mounts through this sleeve. On cello and bass violi, the existing end-pin is replaced with a high-quality precision-machined unit manufactured for Soundlab Electronics by Stalhammer in Sweden. The microphone unit then mounts into a threaded fitting, and can be easily removed or re-installed.

Musicians for the Moscow Symphony were a bit hesitant at first to have their valuable instruments modified, but the on-site presence of master luthier Martin

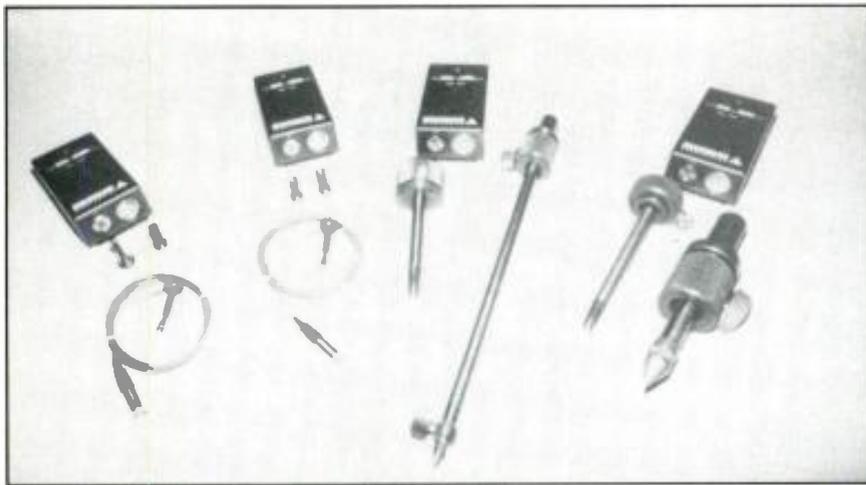


Photo 2. SMS "Wings for Strings" pickup systems including custom mics, instrument mounting hardware and optimized pre-amps.

Lawrence (Birmingham, England) eased their fears. During two days of work sessions and personal attention with the Russians, Mr. Lawrence capably fitted each of the 47 string instruments with the appropriate hardware. Acting on his advice, we also had each of the six bass viols outfitted with new, high-quality string sets. This improved the sound of these instru-

ments tremendously.

On a daily basis, the SMS units were left installed in each violin, viola, cello and bass. The musicians would merely wrap up the compact cable and store it in a soft fabric pouch in the case with their instrument. Setup each day required only that the musician plug into the pre-amp waiting at his or her chair. ■

This concludes Part One of the feature "The Moscow Symphony with Electric Light Orchestra Part II." Next month, Part Two will examine the high-gain overhead mic system, the acoustical treatment system for the symphony risers, the specialty monitoring systems for the conductor and the symphony area and the main concert sound system format used in large venues.

The author would like to offer thanks for advice, consulting and/or technical assistance on this project to Mark Gander, JBL Professional; Steve Woolley, RAMSA Professional Audio; Michael McDonald, Yamaha Pro Audio; Art Noxon, Acoustic Sciences Corp.; Joseph Magee, Audio Engineering; Klaus Kaetel and Christian Thiele, Soundlab Electronics; Craig Hannabury, Crest Audio; and Michael Adams of Sound Image. Many thanks for efforts above and beyond the call of duty by Robin Magruder, Clay Powers and the entire staff of Showco, Inc.

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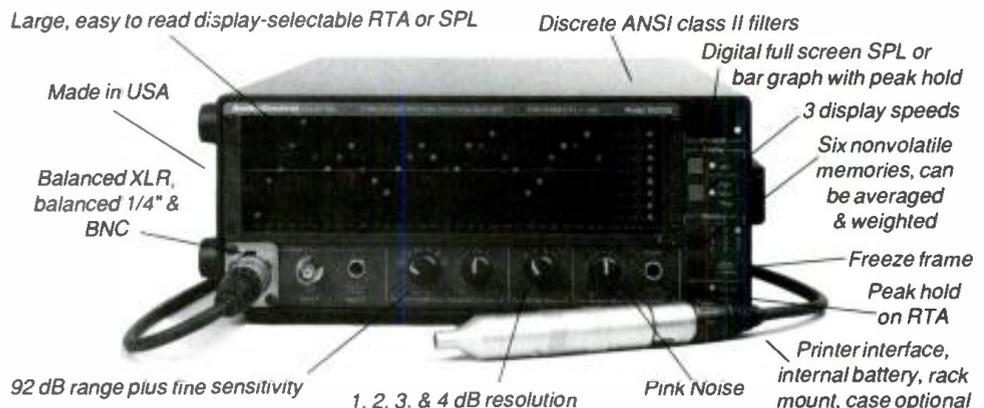
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September 1991 R•E•P 79



THE SPOTLIGHT IS ON!

Engineer Spotlight: David Morgan

By Mark Herman

Name: David Morgan
Age: 41
Years of experience: 16
Home: Los Angeles
Now employed by: Paul Simon

CONSOLES

Favorite live mixing console: Crest Gamble Series EX 56-channel FOH

VOCAL MICROPHONES

Favorite standard: Shure Beta 58
Favorite wireless: Sennheiser UHF, Beyers VHF condenser

SIGNAL PROCESSORS

Favorite equalizers: API 550, GML, T.C. Electronic 2240
Favorite gates: Drawmer 201, Aphex 612
Favorite compressor/limiters: UREI 7110, dbx 165
Favorite delays: T.C. Electronic 2290, Lexicon PCM 70 version 2.0 (for drums)
Favorite reverb: AMS rmx 16
Favorite multi-FX: Lexicon 480, Eventide H-3000 Harmonizer

VENUES

Favorite indoor: The Palace (Auburn Hills, MI); The Orlando Arena (Orlando, FL); Brendan Byrne (East Rutherford, NJ)
Favorite outdoor: Waldbühne Theater (Berlin); Shoreline Amphitheater (Mountain View, CA); Irvine Amphitheater (Irvine, CA); Red Rocks (Red Rocks, CO)

MEMORABLE TOURS

Doobie Bros., 1979 "Minute By Minute;" Barry Manilow, 1980; Doobie Bros., 1982 farewell; Whitney Houston, 1986, 1987, 1988; Paul Simon, 1987 "Graceland"

CAREER HIGH POINT

A 1987 "Graceland" show in Zimbabwe: "It was amazing to see blacks and whites celebrating music together in a country that had gone through a bloody civil war ending white rule just a few years before."

"If you had dreams in 1976 that things would be like they are today, people would have said you were crazy."

CAREER LOW POINT

A Barry Manilow show at the Rosemont Horizon (before the room's 13-second RT60 was modified): "When we turned on the P.A. for the show, it sounded so bad that it was my worst moment ever. There was so little I could do in that room that I just wanted to leave the building and quit."

HOBBIES

Golf, basketball, skiing, gardening

BACKGROUND

Originally, Morgan was a guitar player and singer in various bands around Boston. But he had a technical side: "I was the first guy I knew that had a Teac 3340. I used it to do demos for all my buddies. While living in the Berkshires, my next door neighbor, Jack Malken, got me interested in audio and taught me about the fundamentals of mixing and audio engineering."

Later, Morgan moved to Woodstock, NY, and opened a demo studio. He continued to split time between playing and recording music. The company then moved to Los Angeles in 1975, where Morgan landed the job as El Chicano's engineer — his first opportunity to mix a headline band. He also spent some time as a studio engineer with Alan Zentz Recording and ABC.

Soon, he was working for sound reinforcement company A-1 Audio (Hollywood) and gained valuable experience and connections during the next few years. He managed to independently hook on as the FOH mixer for Barry Manilow's 1980 tour. After finishing the tour, Morgan got a call to use his touring knowledge to help out a sound company in trouble.

"In the winter of 1981 I agreed to help out a major sound company, Innovative Audio, that was struggling; I soon became the general manager at age 30. It seemed like a good way to get off the road. Running an entire company was very challenging and quite a learning experience. At the time we were doing Toto, Willie Nelson, the Doobie Bros., Starship and the Tubes. I was still managing to mix live with the Doobies but mainly found myself running the business. What a headache!

"In 1983 Dirk and Roy Schubert and myself bought out Innovative Audio and expanded Schubert Systems Group into a full service audio company. I was the managing partner of SSG until the end of 1985 when Dirk and Roy bought me out."

With his days running a sound company thankfully over, Morgan worked as an audio consultant and landed several freelance tours as the FOH mixer. Maryland Sound Industries had Morgan mix Whitney Houston tours in 1986, 1987 and 1988. He has been busy ever since — Paul Simon's 1987 "Graceland" tour, Debbie Gibson in 1989, the 1989 reprise of

Mark Herman is president of Hi-Tech Audio Systems, a sound reinforcement equipment rental company based in South San Francisco.

"Graceland" and the current Paul Simon tour (see March 1991 All Access).

CAREER MOTIVATION

"The reason I do this is because it is fun. It is an unusual business but it is certainly a gratifying one. Of course, getting paid is always a reason, but personal commitment and comradery is what this business is all about."

ADVICE FOR ASPIRING ENGINEERS

"The best thing to do is to find yourself a small local sound company that needs help and bodies. If it means working free for awhile, do it. Work your way up from the bottom and get yourself known around town. Los Angeles, San Francisco, New York, Boston and Chicago offer the most possibilities. Do any work that is offered to you.

"A lot of it is being in the right place at the right time. The most important thing is if someone says 'Can you do this?' say yes. If necessary, learn how to do it as you go along. Go to school if you want, but there is no real school for live sound reinforcement. Each building and each day is different. If you do take audio courses, don't overlook the music side. Learn ar-

rangements, get ear training and take the music side as seriously as electronics."

SETTING UP THE DAILY MIX

"I don't use the soundcheck to make sure my mix is right. The mix for the most part is pretty much set during rehearsals; I make very few EQ modifications on the individual instruments during the show. At soundcheck, I'm mainly listening to the main vocals, the marriage between the monitors and the house system and which amplifiers need to be attenuated. I make sure radio systems are working perfectly in every position on the stage and I try to fix immediate lobes that can be remedied by creative attenuation.

"I try to make the P.A. sound the same in every situation and I do it mainly through system equalization and turning amplifiers up and down. The mix exists on the board and in my mind. For a point of reference I throw on a CD I know well; then I work on making the P.A. sound like what I am hearing in the cans. That is the art of this business."

FUTURE DEVELOPMENTS

"I'm really hoping that live audio consoles catch up to lighting consoles. I would

love to have programmable scenes that would include patchpoint in/out, effect sends and muting. I would also like to see a MIDI keypad built into a console in order to make it more responsive to the demands of a large 100-plus input show."

CLOSING COMMENTS

"I have watched the industry evolve so much that many of my pet peeves have pretty much been assuaged. The buses are more comfortable, people are building better facilities, the systems fly faster, the gear sounds better and is much more compact and reliable. If you had dreams in 1976 that things would be like they are today, with specialized loudspeaker boxes, remote programmable equalization, seamless cross-overs and great mixing consoles, people would have said you were crazy.

"I do wish vending production companies still got the slice of the pie they got in the 1970s. The money scene is the only place where things are worse than before." ■

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By Mark Herman



PERSONNEL

House Mixer (Scorpions): Joachim Schulze

Monitor Mixer (Scorpions): Horst Hartmann

House Mixer (Great White): Fred Micera
Monitor Mixer (Great White): Rick Semerjian

House Mixer (Trixter): Doug Cook

Monitor Mixer (Trixter): Tom Pfaeffle

Technicians: Bobby De Luca, Uwe Friedrichs, Tom Pfaeffle, Doug Cook

Riggers: John DeLong, Paul Ingwersen, Rocko Reedy

CONSOLES

House (Scorpions): Midas Pro40 36x12x2, Midas Pro40 24x12x2

House (Great White): ATI Paragon 40x16x12

House (Trixter): Yamaha PM1800 40x8x2

Monitor (Scorpions): TAC SR9000 42x16

Monitor (Great White): Ramsa WR-S840 40x18

Mark Herman is president of Hi-Tech Audio Systems, a sound reinforcement equipment rental company based in South San Francisco.

Monitor (Trixter): Midas Pro40 30x10

AMPLIFIERS

Main FOH: Carver PM1200, BGW 750C, BGW 250D, Camco LA801

Lows/Subs: Carver PM1200, Camco LA801

Monitors: Camco LA801, BGW 750C, Crown PSA2

Sidefills: D&B Audiotechnik BI, F2

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Manufacturer/Model: (24) Rocksound CM4 (4x10" JBL, 2x JBL2380, 4x JBL bullets)

Manufacturer/Model: (12) Rocksound CM4 (2x12" EV, 2x JBL2380, 4x JBL bullets)

LOW END CABINET/SUBWOOFER

Manufacturer/Model: (24) Rocksound CM4 (4x15" JBL) direct radiating

Manufacturer/Model: (12) Rocksound CM4 (2x15" Gauss) ported folded horn

ONSTAGE MONITOR WEDGES

Manufacturer/Model: (10) Rocksound 2x12 JBL

Manufacturer/Model: (10) Rocksound 1x15 JBL

Manufacturer/Model: (2) Rocksound 4x12 EV

Manufacturer/Model (Great White only): (2) Crystal Taylor Systems Personal Ear monitors

Crossovers: BSS FDS 360, FDS 340

ONSTAGE SIDEFILLS

Manufacturer/Model: (8) Rocksound 2x12" EV

Manufacturer/Model: (8) Rocksound 2x15" JBL

Crossover: D&B Audiotechnik BI

HOUSE SIGNAL PROCESSING - Scorpions

Equalizers: (4) Klark-Teknik DN 27A

Crossover: BSS MCS 200, (2) BSS FDS 340

Effects: Lexicon 224X, Roland SRE 555, Yamaha SPX 90, SPX 90-II and SPX 900, Eventide H3000S, Lexicon Super Prime-Time, Eventide H910, Lexicon 200

Gates: Drawmer DS201

Compressor/Limiters: dbx 903, dbx 160XT

Intercom system: ClearCom CS 200K

DAT Machine: Sharp RX100

Cassette Machine: Pioneer CT-W900R

CD Player: JVC XL-Z444

Line Conditioner: Furman PL8E

Analyzer: Klark-Teknik DN60 RTA

Cue System: JBL Control 1, Crown DC300A, (2) Korg SDD 2000 DDL

HOUSE SIGNAL PROCESSING - Great White

Equalizers: Klark-Teknik DN 410

Effects: Lexicon 480L, T.C. Electronic 2290, Eventide H3000SE, dbx 500, Lexicon PCM70, Yamaha REV-5, Korg A3

Gates: (40) ATI Paragon mixing console

Compressor/Limiters: (40) ATI Paragon mixing console, BSS DPR 402

Intercom system: HME RP732

DAT Machine: Sony TCD D3

CD Player: dbx DX5

Headphones: Sony MDR V6

Line Conditioner: Furman ARI17J & PL8E

Analyzer: AudioControl Industrial SA3050 RTA

HOUSE SIGNAL PROCESSING - Trixter

Equalizers: Peavey EQ 215

Effects: Alesis Midiverb III, Lexicon PCM42, (2) Yamaha SPX 90

Gates: Audio Logic MT44

Compressor/Limiters: Alesis Micro Limiter, dbx 160x

Cassette Machine: Carver PST-12

CD Player: Tascam CD301

Headphones: Radio Shack Nova

Line Conditioner: Furman PL8E

ONSTAGE SIGNAL PROCESSING - Scorpions

Equalizers: Yamaha Q1027

Effects: (3) Yamaha SPX 900

Gates: dbx 904, Drawmer DS201

Compressor/Limiters: dbx 166

Misc: Stage Accompany PPE 2410 (programmable stereo parametric EQ)

Analyzer: Gold Line RTA

ONSTAGE SIGNAL PROCESSING - Great White

Equalizers: Valley International Maxi-Q

Crossovers: BSS FDS 360

Effects: Alesis Quadriverb, Yamaha SPX 90-II

Gates: Valley International Keyplex II

Compressor/Limiters: Valley International Gain Brain II, Aphex Dominator II, Valley International DSP

Headphones: Sony M DR V4

Misc: D-Drum 2

ONSTAGE SIGNAL PROCESSING - Trixter

Equalizers: Klark-Teknik DN300

Compressor/Limiters: dbx 166

MICROPHONES - Scorpions:

Main Vocals: Shure Beta 58, Sennheiser BF 530

Wireless Vocals: Sennheiser 4031
Background Vocals: Sennheiser BF 530
Kick: Sennheiser BF 541
Rack Toms: Sennheiser BF 541
Floor Toms: Sennheiser BF 541
Overheads: Sennheiser MKH 50
Snare Top: Shure SM57
High Hat: Shure SM81
Guitar No. 1: Sennheiser BF509
Guitar No. 2: Shure SM57
Keyboards: Rocksound Active DI
Bass: Sennheiser 422, Rocksound Active DI

MICROPHONES - Great White
Main Vocals: Electro-Voice ND 757 on Samson BH3
Background Vocals: Electro-Voice ND 757A
Kick - inside: Beyer M88
Kick - outside: Electro-Voice RE20
Rack Toms: Electro-Voice ND 408
Floor Toms: Electro-Voice ND 408

Overheads: Zildjian ZMC 1
Snare Top: Shure SM57
Snare Bottom: AKG 451
High Hat: AKG 451
Guitar No. 1: Electro-Voice ND 408, Sennheiser 409
Guitar No. 2: Electro-Voice ND 408
Keyboards: BSS AR116 DI
Bass: BSS AR116 DI

MICROPHONES - Trixter
Main Vocals: EV 757 on Samson
Background Vocals: EV 757, Sennheiser 535
Kick: Sennheiser 422
Rack Toms: Sennheiser 409
Floor Toms: Sennheiser 409
Overheads: Sennheiser MKH 50
Snare Top: Shure SM57
High Hat: Shure SM 81
Guitar No. 1: SM57
Guitar No. 2: SM57
Keyboards: Pro Co DI
Bass: Pro Co DI

CABLING - Scorpions
House snake: (2) 24-pair
Multi-pair connectors: Amphenol, Tuchel D64
Stageboxes: Rocksound Custom
Splitter: 3-way, passive, with transformers

CABLING - Great White
House snake: 52-pair
Multi-pair connectors: Cannon Mass
Stageboxes: Whirlwind-Elco
Splitter: 2-way, passive

CABLING - Trixter
House snake: (2) 27-pair
Multi-pair connectors: Amphenol, Tuchel
Stageboxes: Rocksound Custom
Splitter: 3-way, passive, with transformers

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FROM THE TOP

Continued from page 5

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still being made, but
who's selling it?***

The reality of fewer knowledgeable sales people, bad receivables, general uncertainty about the changing technology, lower-priced gear being available everywhere, etc., has definitely sent the sales/distribution channel into a tailspin. Maybe pro-audio manufacturers ought to take a good look at the way the computer world is doing it. It may just make the future audio sales situation a little less tense. ■

On a separate subject, material in this issue of R•E•P will mark the last contributions by Dan Torchia, our managing editor, as he is leaving our production helm. After six years of magazine navigation, Dan is moving on to subjects dear to his heart - music composition and freelance (read: other industry) creative writing. Dan's contributions to the magazine over the years has been immeasurable, and all of us at R•E•P wish him the best. Keep an eye on the masthead for new exciting developments! ■

Mike Joseph
Editor

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DIGITAL DOMAIN

Continued from page 20

duced. On this particular machine the background noise changed over time, cycling at every two seconds with a 3dB shift in level. According to Louis Feider of Dolby Labs, noise modulation greater than 2dB is audible by a critical listener.

Another very well known manufacturer decided to put a low cost compressor/limiter on the analog input that kicks in at about -6VU. Although there is no mention of the hidden signal processor in the DAT machine's user manual, the linearity program on the System One confirmed audible suspicions. Undocumented features are nice, but so are bypass controls.

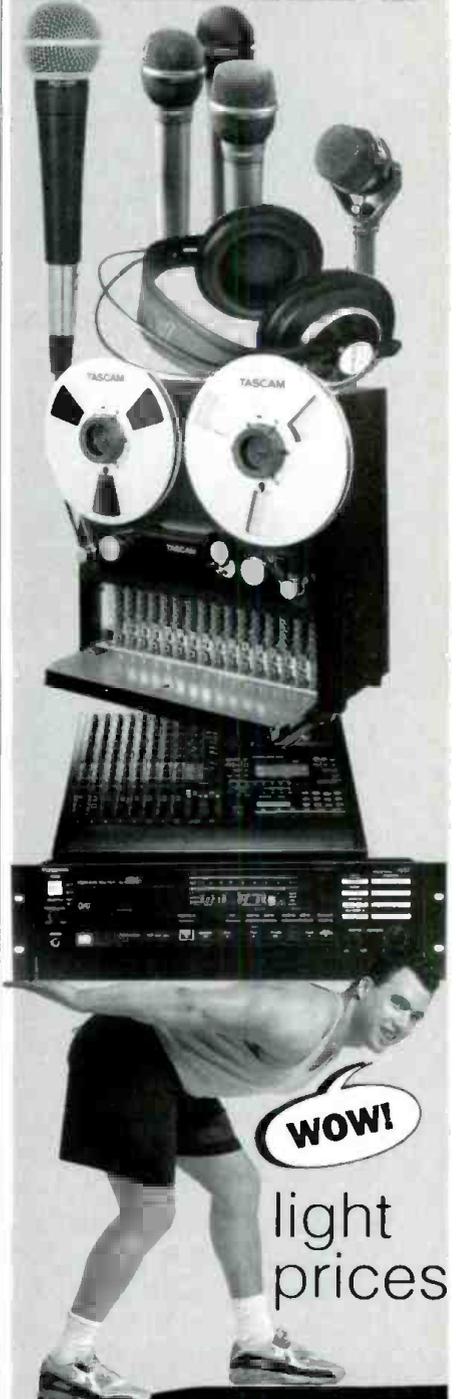
According to Cabot, there is only a loose correlation between price and performance of digital recorders. "I've seen very expensive machines that didn't measure well at all. Although most digital recorders have been on the market for a short number of years, their initial designs were done long before that," says Cabot. As a result, there is a large demand for after-market filters.

Cabot feels items like the Apogee filters measure quite well. He says, "There are still a significant number of machines using inexpensive analog reconstruction or anti-aliasing filters. There are also a fair number of machines where the over-sampling converter attenuates signals at half the sampling rate by only a few dB, creating alias products."

Many digital recorders that claim to conform to the AES-EBU digital standard have additional serious problems with clock jitter. One of the best selling DAT recorders on the market right now has problems locking to the stable clock on the System One.

We spoke with several designers of digital recorders that swear by the System One. They felt it allowed them to bring better-sounding products to market faster than previously. Although Audio Precision is understandably reluctant to put manufacturers on the spot, they find it keeps them on their toes. Quality test gear won't always tell you whether a piece of gear will sound good, but they almost always tell you when it will sound bad. ■

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LIVE & DIRECT

Continued from page 69

QSC

This Southern California manufacturer is hoping to break new ground by presenting an open-architecture system able to offer a high degree of compatibility with not only other brands of power amps, but other production and mechanical systems (perhaps lighting, curtain controls, ventilation, etc.).

"We have developed and tested our hardware, and are continuing to work on compiling the software that it will take to integrate a power amplifier into a whole computer-linked production package," says Barry Andrews, CEO for QSC Audio Products. "We'd really like to see a single, technically sufficient standard ... one that allows designers, installers and operators to quickly and easily tune, operate, modify and troubleshoot an entire audio system. This system should be able to easily integrate with other mechanical control systems."

To make such diverse things work together, a number of things will be required ... foremost is a powerful communication protocol and networking system. Also important is third-party controlling software and the ability to install diverse products in the controlling software for operation on the system network.

"One company [Lone Wolf] is working on a powerful communication engine called MediaLink that offers tremendous potential [in this area]," says Andrews. He also mentions Intelix (Madison, WI) and Echelon (San Francisco Bay area) as two companies actively working on computer-control protocol that can be applied to audio systems.

QSC has chosen a computer control system that will operate on either PA-422 or RS-485. "PA-422 offers some hope of becoming an industry standard," says Andrews. "If another standard emerges, we'll back it. We don't think a control scheme should be used just to sell one brand of amplifier. As we see it, there are three types of firms working on this technology; those that have a technically sufficient standard but are choosing to take a proprietary stance; those that are backing an open but technically insufficient standard; and those that are waiting until a clear trend emerges. It's our belief that an open standard, including control software, is essential to meet the industry's needs in the '90s."

FUTURE DIRECTIONS

There is no doubt that power amps in many more future sound systems will be linked together for control and status monitoring by computers. There are already many sophisticated systems using such technology from companies like Crown and I.E.D., and Crest's first NexSys installation (linking 80 amplifiers in one of the world's most famous government buildings) should cause quite a stir.

The crux of the matter is neatly summed up by Andrews when he points out that current, competitive systems don't communicate with each other, that a standard is needed, and that an "open-architecture" integrated hardware/software approach would best serve the industry. Many manufacturers of amps and other audio gear that have been or are working on proprietary, "closed" systems might not agree. Most sound system designers, consultants, sound rental companies, and system operators (read that, "customers") probably would. ■

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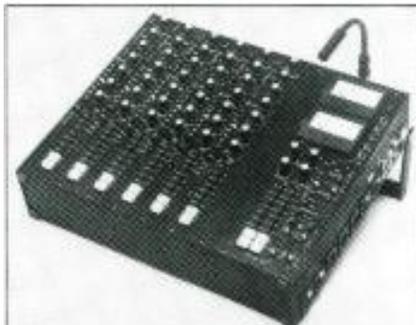
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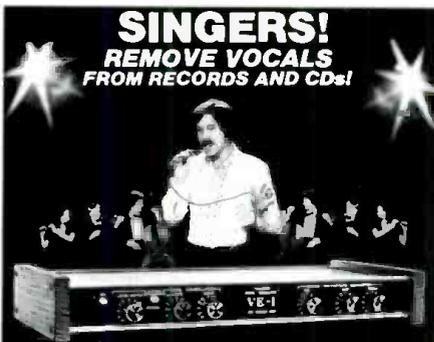
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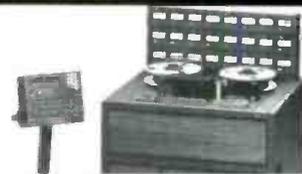
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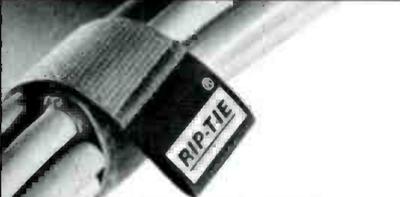
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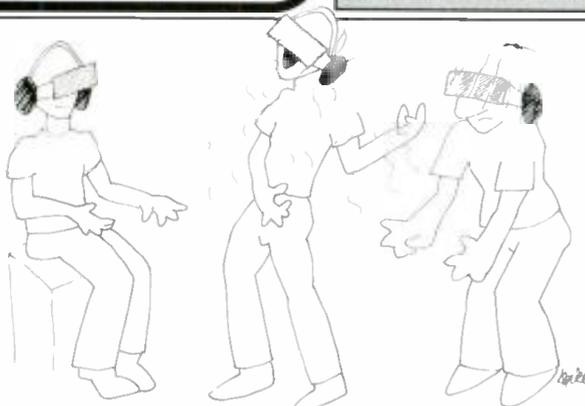
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Ocean Audio	91	72	213-459-2743
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Oxmoor	77	48	205-985-7040
Ramsa/Panasonic	27	13	714-373-7478
Peavey Electronics Corp.	IBC,39	2,19	601-483-5365
QSC Audio Products	35	17	714-645-2540
Rane Corporation	51	25	206-355-6000
Seam Tech	91	76	415-861-6011
Sennheiser Electronics Corp.	53	26	203-434-9190
Shure Brothers, Inc.	13	9	800-25-SHURE
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Soundcraft U.S.A.	23		818-893-8411
Soundtracs Div Samson Tech	1	4	516-932-3810
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