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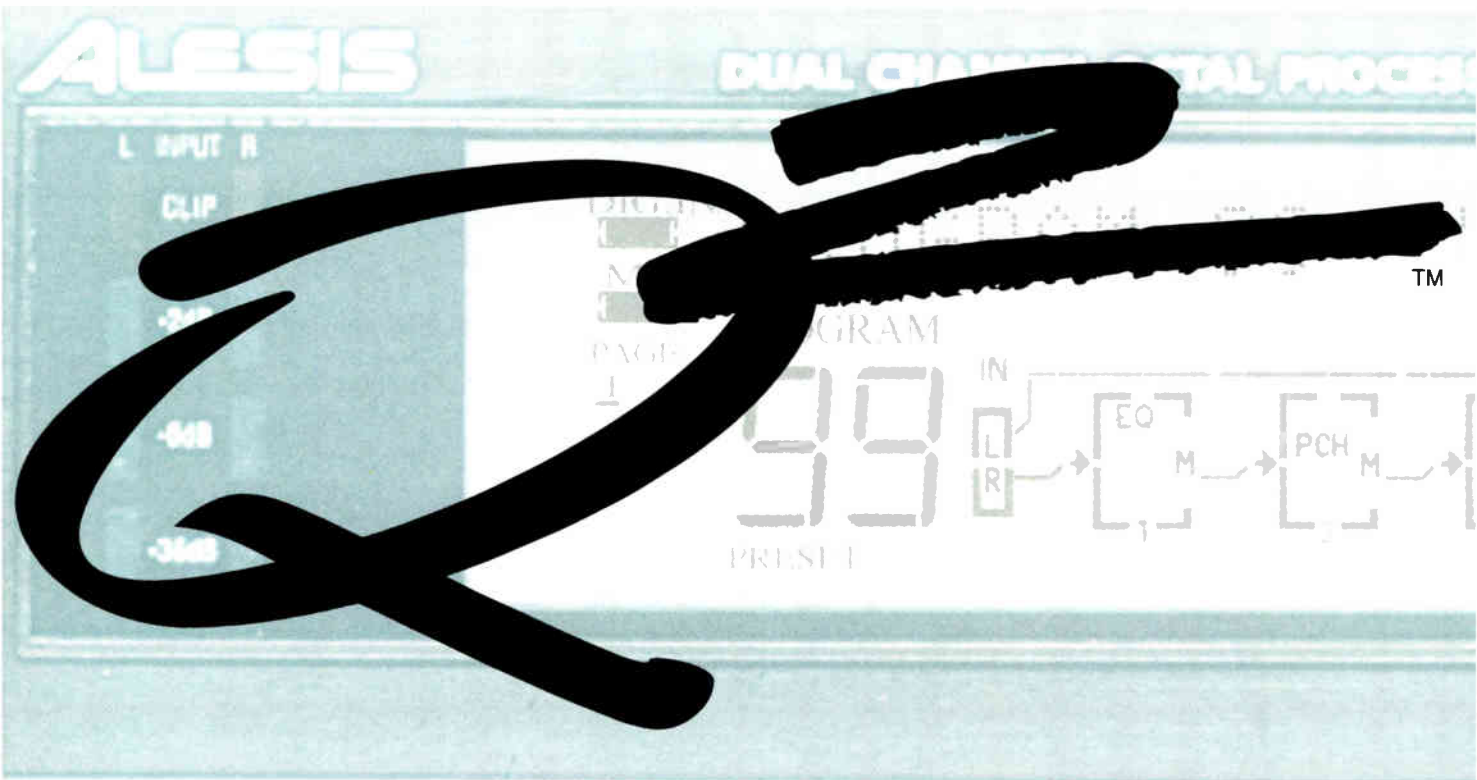

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The Best of Analog *AND* Digital
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The Euphonix sound represents the next step in professional audio quality. The revolutionary CS2000M audio electronics are remotely located from the electrical nightmare and acoustic vibrations of the control surface. And the reduced console size results in a dramatic improvement in control room acoustics.

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Euphonix has made every effort to preserve traditional console operation and is currently training professional engineers and producers on CS2000M systems around the world. Spend an hour on a Euphonix and you'll never go back.

No Obsolescence
Digital technology is here to stay and so is Euphonix with an architecture that's easily expanded and upgraded. A mix made on a Euphonix today can be recalled on an upgraded system well beyond the year 2000. Imagine what those other manufacturer's desks will look like then...

Euphonix

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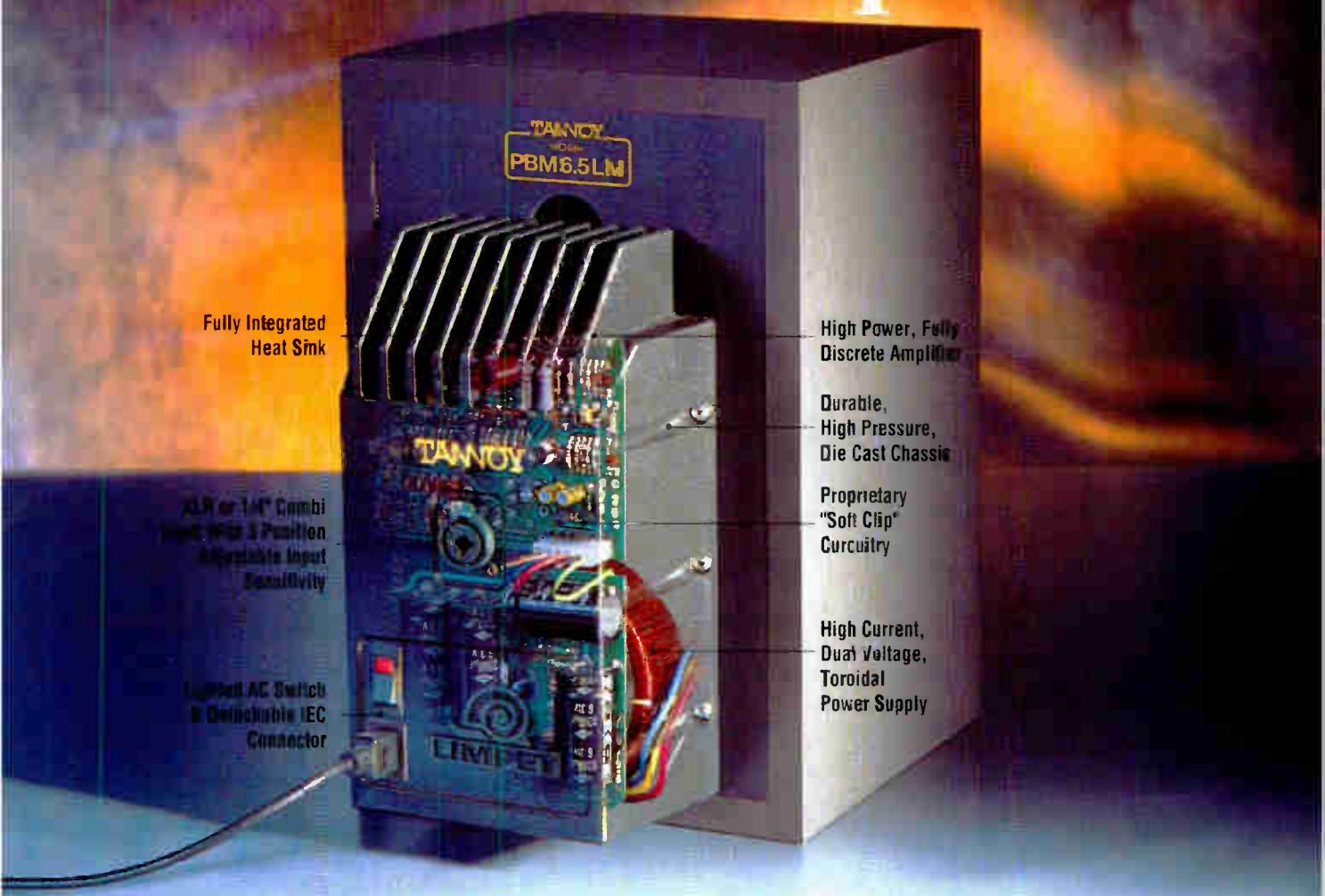

■ Every once in a while a product comes along which not only meets the ever increasing demands of the market, but one whose smooth commercial styling, ergonomics, durability and outstanding performance demands respect. Introducing MR. LIMPET. ■ The LIMPET is a unique, compact design that combines a very high current toroidal power supply, fully discrete amplification stages, and ultra wide (10 Hz to 80 kHz) bandwidth capabilities in a very affordable system. ■ Built using a one piece high pressure die-cast metal housing, the LIMPET is not only very rugged electrically and mechanically, its internal construction takes advantage of the industry's most advanced assembly techniques. ■ The LIMPET amplification system can be used with a wide range of TANNOY professional reference monitor systems, and provides the user with a number of improvements in both the performance of the loudspeaker system, and its flexibility. ■ Each single channel LIMPET system delivers an enhanced stereo image because the channels are fully separated - no power supply sagging due to inter-channel coupling, no crosstalk, no interference. Almost any kind of input level and connector can be used, since the LIMPET offers a balanced or unbalanced "combi" connector that can utilize either 1/4" or 3 pin jacks. ■ The ultra-low noise input section can accommodate either 0.775, 1.0, or 1.5 volt drive levels with no performance sacrifice. ■ The LIMPET's universal power supply, equipped with an industry standard IEC connector easily deals with almost any voltage, making the LIMPET a true global traveler. Finally, you can take your monitors wherever your work takes you, and not have to worry about cumbersome and troublesome adaptors, power converters, or strange electrical systems. ■ In addition, the unique and proprietary soft-clip circuitry and the significant reserves in the power supply ensure that no damage will occur to the drive units while providing the headroom needed for even the most demanding requirements. ■ The LIMPET is ideal for professional recording, broadcast/post production facilities, remote and live recording reinforcement applications, and finally gives the private/home recording studio truly reference quality performance unequaled at twice the price. ■ Instead of settling for the ordinary, get a LIMPET and get a real grip on your reference monitor performance.

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PROFESSIONAL RECORDING • SOUND AND MUSIC PRODUCTION

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Cover: Soundtrack in New York City recently installed an SSL Scenar a in Studio H, the company's premier sound-for-picture suite in its 18-room, two-city facility. Studio H has access to mag dubbers, Sony 3348 digital multitracks, "on call" surround and a 20x16 voice/Foley booth. Main monitors are UREI 813C; BBSM-4 Westlakes are used for close-field monitoring. Jim Falconer designed the facility. **Photo:** Robert Lewis.

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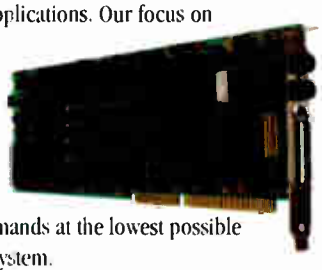

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FROM THE EDITOR

The New Regime

When I started working at *Mix* in 1981, I never imagined that I'd be taking over this space from the co-founder of the magazine, David Schwartz. Now, having written some 500 articles and a couple of books, I have a pretty good handle on *Mix* readers and what they want to see in the magazine.

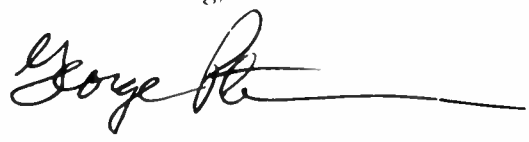
But who is this Petersen guy, anyway? Raised in San Francisco, I became interested in drums, guitar and electronics when my family moved to Italy, where I spent my formative years. When I wasn't building Knight or Heathkit projects, I split my time drumming in club gigs or doing sound and tech work for other groups. Working with 1960s-era Italian P.A. systems provided a crash course in thinking fast on the job.

I returned to America for college and worked in reinforcement, electronics repair, video production and operating/installing 35mm and 70mm projection systems as an IATSE journeyman. Later, I taught cinematography, film editing and sound design and ran an audio-visual production (back then we called it "multimedia") company, garnering several national film festival honors in the process. While working on a master's degree in film, I began writing for various publications, eventually winding up at *Mix*. These days, in between writing assignments, I run a small record label, an ASCAP publishing company and a 24-track recording studio. I never sleep.

So what's in store for the future of *Mix*? Those of you who've read my stuff over the years know what to expect: a down-to-earth approach from the pro user's viewpoint; increased product coverage with more reviews and technology spotlights; and perhaps most important, articles that focus on getting the most from the tools you already have.

The bottom line? *Mix* is *your* magazine. And your dedication and enthusiasm make *Mix* a special part of the professional audio community. So get involved. Drop us a line and let us know what's on your mind, whether you want to comment on some industry topic, suggest future articles or offer a production technique or tip to share.

We'll be listening,



George Petersen,
Editor

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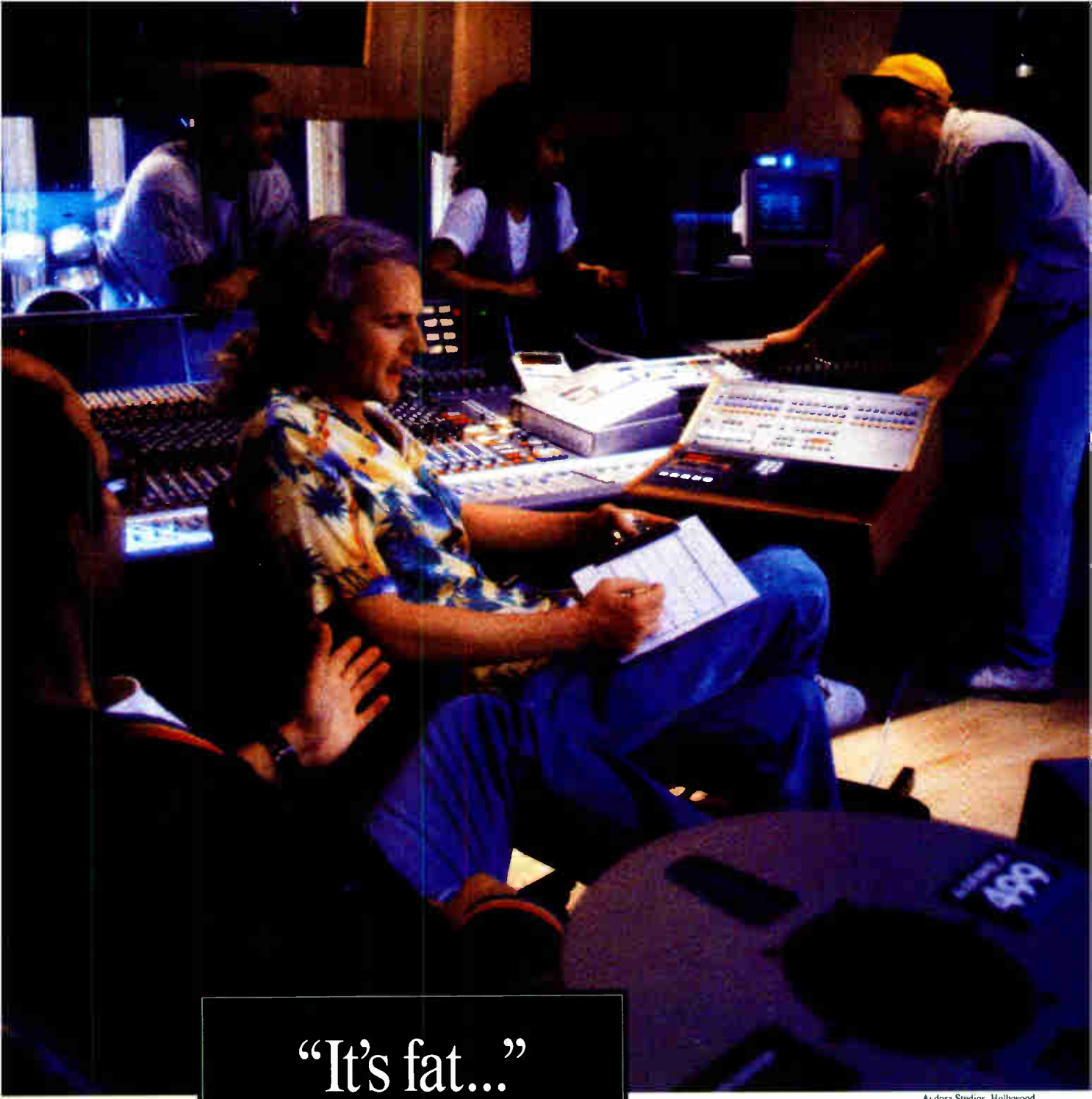

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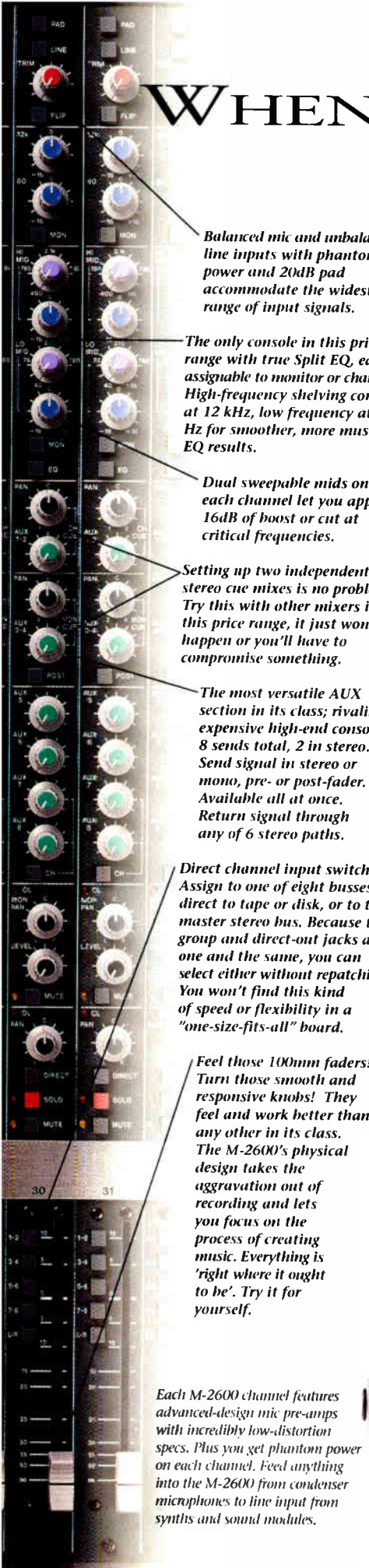

Balanced mic and unbalanced line inputs with phantom power and 20dB pad accommodate the widest range of input signals.

The only console in this price range with true Split EQ, each assignable to monitor or channel. High-frequency shelving control at 12 kHz, low frequency at 80 Hz for smoother, more musical EQ results.

Dual sweepable mids on each channel let you apply 16dB of boost or cut at critical frequencies.

Setting up two independent stereo cue mixes is no problem. Try this with other mixers in this price range, it just won't happen or you'll have to compromise something.

The most versatile AUX section in its class; rivaling expensive high-end consoles. 8 sends total, 2 in stereo. Send signal in stereo or mono, pre- or post-fader. Available all at once. Return signal through any of 6 stereo paths.

Direct channel input switching. Assign to one of eight busses, or direct to tape or disk, or to the master stereo bus. Because the group and direct-out jacks are one and the same, you can select either without repatching. You won't find this kind of speed or flexibility in a "one-size-fits-all" board.

Feel those 100mm faders! Turn those smooth and responsive knobs! They feel and work better than any other in its class. The M-2600's physical design takes the aggravation out of recording and lets you focus on the process of creating music. Everything is 'right where it ought to be'. Try it for yourself.

Each M-2600 channel features advanced-design mic pre-amps with incredibly low-distortion specs. Plus you get phantom power on each channel. Feed anything into the M-2600 from condenser microphones to line input from synths and sound modules.

For your personal or project studio, don't settle for anything less than a dedicated recording console. Some may try to convince you that a "multi-purpose mixer" works fine for multitrack recording. But don't take their word for it. The compromises, hassles and workarounds just aren't worth it.

Want proof? Ask your salesman how a multipurpose mixer handles these common recording situations. But listen carefully for workarounds, repatching schemes and other compromises. Then compare it to how easily the M-2600, a *true* recording console, sets up and does things.

SITUATION Separate headphone mixes for the talent and the producer. The talent wants a reverb-wet mix, but the producer wants it dry. Everyone wants it in stereo.

Compromise: Multi-purpose mixers require you to sacrifice 4 AUX sends and tape returns to get 2 stereo headphone mixes; but you need those sends/returns for outboard effects! What a dilemma.

M-2600 Solution: With a few buttons, assign up to two, independent stereo AUXs to be used as headphone mixes. Everyone hears the mix they want — and you've still got four AUX sends and returns free for signal processing gear.

SITUATION You're EQing tape tracks to get just the right sound. You're using the shelving EQ for the monitor mix, and the sweepable mids for the channel buss. Still, the drummer wants a certain frequency out of his mix — a job for the sweepable mids.

Available with 16, 24 or 32 inputs, the M-2600 is optimized for digital recording. Don't wait till your first session to discover the compromises and hassles other boards will put you through.

Compromise: Few multi-purpose mixers have EQ assignment. You're stuck with the shelving EQ on the monitor mix, and the sweepable mids on the channels *(if they even have split EQ)*. You've got no choice. Good luck trying to explain this to the drummer.

M-2600 Solution: Assign the shelving EQ, the sweepable EQ, or both to either the monitor or channel buss as necessary. The entire EQ section is splittable and assignable and can work in tandem.

SITUATION Mixdown. You're sending tracks to effects units for added studio polish. You want to take advantage of true stereo effects. How do you do it?

Compromise: Most multi-purpose mixers have fewer AUX sends than the M-2600's eight. Usually only in mono. And, some sends are linked, so you can't send them to different signal paths. So you settle for only a few effects, or forego stereo effects altogether.

M-2600 Solution: Pick one: 8 mono sends or 1 stereo and 6 mono sends or 2 stereo and 4 mono sends. Each with its own level control and separate output jack. So you can use true stereo effects and still have sends left over for effects. Send the effects signals back via 6 stereo returns.

That's not all! The M-2600 doesn't compromise sound, either. You'll appreciate the new TASCAM sound — low-noise circuitry and Absolute Sound Transparency™. It all adds up to the perfect console for any personal or project studio — combining great sound with recording-specific features you'll need when recording, overdubbing and mixing down. Features you can get your hands on for as little as $2,999 *(suggested retail price for the 16-input model)*.

So forget compromises. Invest in a true recording console. The TASCAM M-2600.

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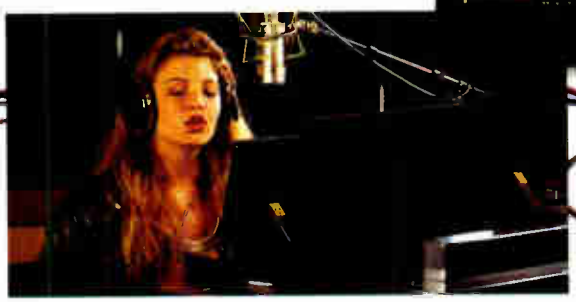
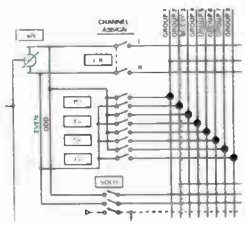
DING, MOST OTHER CONSOLES OMPROMISING SITUATION.

Only the M-2600 provides two independent stereo cue systems. Demanding performers can hear the submix or scratch tracks the way they want, so they'll perform better. Meanwhile, the control room or producer's mix is unaffected. You can accommodate everyone involved in the production — without interrupting the creative flow. Best of all, using the cue mixes doesn't involve tying up your valuable AUX sends.

Use more effects/signal processing gear on more tracks with the M-2600. Use two (count 'em) true stereo send/returns to support stereo effects units. Plus, you still have 4 fully-assignable AUX sends left over for other gear. A total of 8 AUX sends — more than nearly any other console — anywhere. Better yet, you can use them all at once. No compromises. At mixdown, you can actually double your inputs so you can mix in all those virtual tracks. Just press the "Flip" switch. No repatching. No need to buy expensive and space-eating expansion modules.*



The incredibly flexible design of the M-2600 means signal routing is versatile and accomplished by the touch of a button, instead of a tangle of wire. Our decades of mixer experience has resulted in an ergonomic design that's exactly what you need: a board that speeds and facilitates recording and mixdown. Everything is where you intuitively think it should be. Dedicated solo and mute indicator lights on every channel, on master AUX sends, stereo returns, and each of the 8 busses so you always know exactly what you're monitoring. Plus, SmartSwitches™ protect you against redundant or canceling operations.



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CURRENT

SUMMER NAMM 1994: GOOD TIMES RETURN IN MUSIC CITY

After years of decline, it appears the Summer NAMM show has finally returned to health. A great location at the Nashville Convention Center combined with modest, reasonably priced booths and equally modest expectations to make the 1994 edition the most successful in recent memory.

As with last year's initial outing in Music City, the primary focus was on musical instruments, especially strings. But two innovative electronic percussion products garnered considerable attention. Korg led the way with its revolutionary Wavedrum physical modeling MIDI synthesizer ($2,500), expected to ship in late September. The percussion instrument uses a 10-inch drum head mounted in a solid wooden body. The head and rim can be struck with a stick, fingers, brushes or the hand. The acoustic waveform of the vibrating head is picked up by the piezo pickups and sent to a DSP-based sound generator. Most of the sounds were percussive, but several synth effects were included.

Zendrum Corporation, a new Atlanta-based firm, was a big hit with its Zendrum Z-Series MIDI percussion controller ($1,250). The strap-on instrument has 24 independent, velocity-sensitive triggers that are struck with the fingertip, much like drumming on a tabletop. The triggers can be mapped to user-selectable MIDI notes, so the Zendrum is compatible with virtually any MIDI sound source.

On the synth front, Roland's JV-1080 Super JV synth module ($1,695) features 64-voice polyphony and a 32-bit RISC-based CPU. The new synth comes with 8 MB of samples and accepts up to four SR-JV80 series, 8MB wave-expansion boards and a 2MB wave card, for a total of up to 42 MB of wave memory.

Several new signal processors also made the scene. Zoom's 1U rack-mount 1202 Studio Reverb ($249.99) offers 512 editable programs (two banks of 16 effects, each with 16 variations), many derived from the company's much pricier Model 9200 reverb. One bank contains reverbs, while the other produces modulation effects, including 2-octave pitch shifting and flanging, chorusing and noise reduction. The unit offers true stereo or dual mono operation.

Yamaha checked in with the D5000 Professional Digital Delay ($1,499), which features 20-bit A/D and D/A conversion, a 50kHz sampling frequency, MIDI control and sampling. The unit has three stereo delay lines, each with up to 5.2 seconds of delay, or six independent, mono delays that provide up to 10.4 seconds each. Delay time can be displayed in seconds, distance, musical tempo or SMPTE frames. The sampling modes include Capture, which is constantly recording, and Sample and Hold, which records according to predetermined start and stop parameters. Both XLR and balanced phone connectors are provided.

Also new in the true stereo/dual mono effects-processor world is the Alesis Midiverb 4. The unit uses 18-bit converters, sampling at 48 kHz. It offers 128 factory and 128 user programs, including a variety of reverb, delay and modulation effects.

In this era of digital recording, tube processing has become increasingly popular. Drawmer has addressed this market with the dual-channel Model 1961 tube EQ. Each channel of the 2U rack-mount unit provides an individually switchable, variable highpass filter, lowpass filter and four fully parametric bands.

Nearly hidden near the rear of an aisle, Island Digital (from MR Engineering of Chicago) showed the Touch-Pro 16 ($8,995), a standalone, 16-channel, hard disk recorder. The system features a unique, detachable touch-screen user interface with pop-up, circular graphics for channel controls such as pan and trim. Once your finger touches a control (such as a fader),

—CONTINUED ON PAGE 16

MIX-ED UP?

In June of this year, a British publishing company (Music Maker Publications) launched a new magazine in the United Kingdom titled "The Mix." As longtime readers of *Mix* know, our magazine was originally called *The Mix*, and we still hold a U.S. trademark on that name. In fact, many people still refer to *Mix* as *The Mix*. We are very concerned about confusion in the minds of readers, advertisers and others between our magazine and the new British publication, and a legal action has been initiated in both the UK and the U.S. to require Music Maker to cease its appropriation of the *Mix* trademark.

As part of our efforts, we are requesting readers, especially in the UK, to let us know whether they have seen "The Mix" on newsstands or elsewhere and whether they have wondered about any connection between "The Mix" and *Mix* magazine. Please write *Mix* at 6400 Hollis St., Suite 12, Emeryville, CA 94608; fax (510) 653-5142, Attn: Hillel Resner. The *real Mix* appreciates your assistance.

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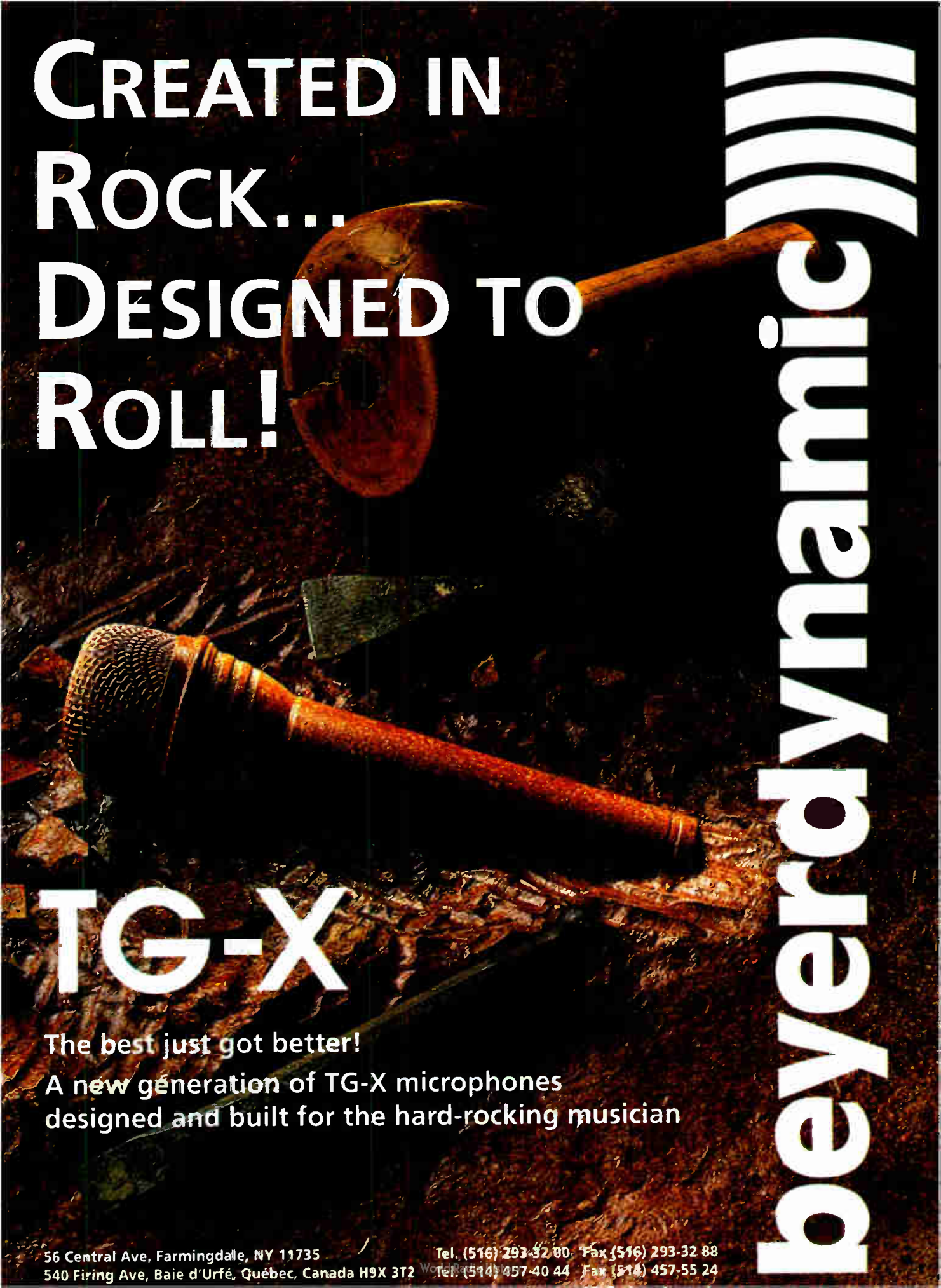
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Introducing the Roland S-760 Digital Sampler, a professional sampler for the kind of cash mere mortals actually have. A single rack space digital powerhouse that does virtually everything kazillion dollar units do and more. Including 48kHz stereo sampling, built-in digital EQ, multi-mode filters, extensive wave editing and everything else you would expect from a Roland sampler.

And right out of the box it's ready to use as a 32-part multitimbral musical instrument or a full-fledged studio production tool. With its diversity of sounds and infinite sonic possibilities, unsurpassed fidelity and sound manipulation capabilities, the S-760 will open up new worlds of sound, even if you already have a full rack of synths.

We should also mention that the S-760 can be expanded to 32 megabytes of memory, providing a total of more than three minutes of stereo sampling time at full bandwidth.

And the built-in SCSI interface lets you plug in virtually any storage device, including CD-ROM drives, hard disks and removable optical disk drives.

Edit your sounds with monitor and mouse.

Our large high-res LCD makes it easy on the eyes when you're editing without an external monitor. And with the optional OP-760-01 Board,

If you don't think you're quite ready for a sampler, think again.

World Radio History

you can connect the S-760 to either a dedicated monitor or your ordinary color TV, and use a mouse for point, click and drag editing. View and access all editing operations such as loop, time stretch and cut/splice functions in an intuitive, easy-to-use graphic environment without having to use an external computer with dedicated software.

The Option Board expands the S-760 with lots of advanced functions like S-video, RGB and composite video output plus digital I/O, transforming the S-760 into the ultimate high-end sampler.

All the sound in the world at your fingertips.

The S-760 gives you immediate access to the vast Roland 700 Series CD-ROM library, the fastest-growing sound library in the world. And it comes with a 600 Mbyte CD ROM Preview Disk that'll get you started right away. Its standard SCSI port accepts up to seven SCSI devices, letting you play thousands upon thousands of meticulously recorded CD-ROM samples from around the world. Like Roland's Sample Archives, Project Series, Composer Series and numerous third party sources. The S-760 can even load data from the S-550 as well as convert programs from Akai® S-1000/1100 data.

Five bucks says you're ready for a sampler. Put down this magazine, pick up your phone and call (800) 386-7575. Ask for our $5 *Sample Archives Demo Disk II* audio CD and our new CD-ROM catalog of Roland and 3rd party sounds. Better yet, put down this magazine and get to your nearest Roland dealer for a real-time demo of the S-760 Digital Sampler. Then you'll know what we've known all along. You're ready.

TEC 1994 NOMINEE

Roland

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INDUSTRY NOTES

Audio-Technica (Stow, OH) made several personnel changes: **Marc Lee Shannon** joined the pro products division, filling one of three new regional sales manager positions. **Tony O'Keefe** and **Kal Mullens** were promoted to the other two regional slots, while **Kim Wallace** and **Sally Fish** were appointed pro division sales coordinators...International staff additions at Paramus, NJ-based **Crest Audio**: The company appointed **Tim Chapman** to the position of international director of marketing, and **Andy Simmons** is the new professional markets manager for Crest Europe out of its office in Hove, England. Also, **Wolfgang Garcon** joined the sales staff of Crest GmbH in Langenfeld, Germany, and in related news, **Craig Hannabury** returned to the U.S. from Crest Europe and is working on developing new market potential for the company...**Passport Designs** (Half Moon Bay, CA) named **Barry Rosenbaum** president and CEO and made company founder **David Kusek** chairman and chief technical officer. **Paul Bader**, formerly in sales at Compton's NewMedia, was named vice president of sales...**Dolby Laboratories** is now handling its pro audio sales to customers in Northern California and Northern Nevada directly from its San Francisco headquarters, while elsewhere in the U.S. Dolby products continue to be available through the company's dealer network...**NARAS** news: At a reception in Nashville, president **Michael Greene** announced that through the Academy's efforts with MusiCares, the first-ever comprehensive health plan for the music industry is now available for Tennessee residents. The program will provide affordable health care for professionals in many aspects of the music industry. For more information on obtaining MusiCares insurance, please contact the American Medical Security regional sales office at (800) 264-1050. Also, NARAS recently added two new branches, one in Philadelphia and one in Texas...**Steve McCormick** is the new co-owner and vice president of **Comprehensive Technical Group** (Atlanta, GA). The company also appointed **Lewis Frisch**, formerly Eastern regional sales manager and press officer for Amek U.S., as sales manager...**Soundscape Digital Technology Ltd.** of the UK selected **Virtual Designs Ltd.** of Westlake Village, CA, as the exclusive U.S. distributor of its line of multitrack hard disk recorders. Virtual Designs hired **Charles Bosson** as director of marketing for the Soundscape line...**James M. Frische**, chairman and CEO of **Digital Audio Disc Corp.** (Terre Haute, IN), and president of **Sony Disc Manufacturing**, recently became the first graduate of Purdue University's industrial engineering program to receive an honorary Doctor of Engineering degree...**The Synclavier Company** (Lebanon, NH) joined the Digidesign Development Partners group and will be making it's new generation of user interface software compatible with Digidesign's hardware systems...**AKG Acoustics Inc.** welcomed **Los Lobos** to it's group of endorsers...**Telos Systems** (Cleveland, OH) tapped New York pro audio dealer **AudioTechniques** to help expand the market for Telos' Zephyr Digital Network Audio Transceiver product...**Klay Anderson Audio Inc.** of Salt Lake City recently signed an agreement with UK-based **Malcolm Hill Associates** to exclusively distribute in the U.S. Hill's line of Chameleon power amps...Two new reps for Minneapolis-based **Telex Communications**: **P.B. Bowers Inc.** is handling the company's pro audio line in Texas, Oklahoma, Arkansas, Louisiana, Mississippi and Western Tennessee. **Thisco** is the new rep in New Mexico, Utah, Wyoming, Colorado, Eastern Montana, Southern Idaho and Western Nebraska...**Bogen Communications Inc.** of Ramsey, NJ, appointed **Anne Le Maistre** to national marketing manager, telecommunications products. ■

—FROM PAGE 12, CURRENT

the control tracks your finger motion, regardless of where you move your finger on the screen. The Touch-Pro offers 16-bit converters, 3-band channel EQ, six aux sends, and eight subgroups. A basic 2U rack-mount system comes with a 1GB internal hard drive, AES/EBU and S/PDIF I/O and eight analog inputs and outputs on XLR or ¼-inch connectors. An optional expander ($1,000) adds eight more analog inputs and outputs and SMPTE/MTC sync capabilities.

It looks like the Summer NAMM show has found a rebirth in the home of country music. Let's hope the association keeps the momentum by returning to Tennessee next year.

—Steve Oppenheimer

TENTH ANNUAL TEC AWARDS SPONSORS

The Mix Foundation for Excellence in Audio announced that 33 professional audio manufacturers and facilities will lend their financial support to the Tenth Annual Technical Excellence & Creativity Awards, to be held November 11 at the Westin St. Francis in San Francisco, on the second night of the Audio Engineering Society convention.

JBL Professional (Northridge, Calif.) is a Platinum sponsor, and Gold sponsors include Alesis Corp. (Los Angeles); Ampex Recording Media Corp. (Redwood City, Calif.); AMS Neve (Bethel, Conn.); Cardinal Business Media (Ft. Washington, Pa.); and Solid State Logic (Begbroke, Oxford, England). Twenty-seven other companies will be Silver and Bronze sponsors.

CORRECTION

In the June "Industry Notes" and July "Insider Audio," we mistakenly reported that IDB Communications acquired EDNet. IDB signed a letter of intent to acquire EDNet in March 1994, but later determined that it would not conclude the acquisition. IDB continues to offer its 3D2 Network. ■

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You'll See it First from Sonic

Every year, for the past eight years, Sonic Solutions has pioneered new technology. This year is no exception.

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No other audio workstation delivers the breadth of features, the easy expansion, and the affordability of the Sonic System. Around the world, Sonic systems are at work in audio post production for film and video, radio production, music editing and CD prep.

Sonic was the first (and is still the only) to offer background loading and unloading to the hard disks and background DSP. We were the first to offer 12 tracks of playback from a hard disk; 24 channels of digital I/O; direct recording to a CD; and the first to deliver a DSP-based noise reduction system — NoNOISE®.

MediaNet™ Replaces "Sneaker Net" with True Digital Video and Audio Networking

Some vendors just talk "open systems;" Sonic delivers them. With over 250 MediaNet systems already installed, only Sonic can deliver today a network solution that handles the real-time requirements of multimedia.

MediaNet's unique architecture permits playback of multiple digital video and digital audio streams without slowing down any of the systems on the network. This allows your most creative resource – the engineer – to keep working even during high-speed data transfers.

MediaNet is an open network compatible with all standard Macintosh (and Power PC) applications. And MediaNet will soon support the Networked File System ("NFS") standard to link your Macintoshes and UNIX systems (such as those from Silicon Graphics) with transparent, full-bandwidth network performance. MediaNet supports FDDI and Copper FDDI, and later this year the emerging ATM standard, allowing you to choose among performance and price points.

SonicCinema™ Provides PreMastering of VIDEO-CDs

SonicCinema, another first, allows real-time MPEG 1 encoding of audio and video, sequencing of tracks, and high-speed recording of the MPEG program directly to VIDEO-CD. Just like the PreMaster Audio CD pioneered by Sonic, the VIDEO-CDs can then be sent to the plant for direct glass mastering.

If you would like more information or would like to attend a Sonic seminar in your area, please call your local dealer or our product hot line at (415) 485-4790. If you want to see it first, you'll see it from Sonic.

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USE READER SERVICE CARD FOR MORE INFO

World Radio History

by Stephen St.Croix

WRITE OR WRONG

I DO IT MY WAY

THE THREAT OF COMMONISM

It has come to my attention that many, many writers have begun to write a lot like I do. They are using the same flippant, casual, careless, irresponsible evasive style that I've been using for over 15 years. Further adding to this insult/compliment, they are emulating my second and perhaps even more significant trademark; their material is essentially void of relevant *content*! But this insidious problem reaches even deeper. They have even begun attempts at copying my clever, cutesy little biographies.

REALITY CALIBRATION

If there are any readers out there who think some other person, maybe an editor or friend, writes these descriptions of how clever and impressive the authors of columns are, wake up and smell the egos! Though Santa Claus does exist, the truth is that writers themselves concoct these little accolades, hiding behind the illusion of that imaginary "second person." Yes, you got it; all those glowing descriptions, impressive qualifications, compliments and praise come from the minds of the praisees themselves. [*Editor's note: Actually, Steve, we write a lot of 'em.*]

Now I am not one to complain... Wait. I should be straight—*of course*, I'm one to complain. You know that. While I have praised stuff that has impressed me, I have certainly complained bitterly and sometimes relentlessly about stuff that has *de*pressed me. Remember 20-bit converters and poorly written workstations? Now there's a thought: products that come onto our market these days that were not manufactured at all but were *written*.

HOW TO READ PRODUCT REVIEWS

I don't want to write like the other guys, and I don't really think that you want me to. If you want rational technical articles, you know whom to turn to. If you want product reviews, again you know what to do: find the review, check who wrote it, pull out your secret industry decoder ring (that invaluable database, the one that tells you the biases and alliances of each author...wait; you *do* have one of these, don't you?) and use it to decode what was *really* said.

While I have praised stuff that has impressed me, I have certainly complained bitterly and sometimes relentlessly about stuff that has *de*pressed me.

If a review is soft, that is, if it has a lot of specs and numbers and general functional descriptions, but positive comments are rare and weak, like "improved somewhat over the previous model" instead of "impressive improvement," or "faster" instead of "fast," be suspicious. It may actually be a bad review, hiding behind the realities of commercial publication.

Here are a few more "politically

—CONTINUED ON PAGE 196

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HEAR THE FUTURE

DIC'S NEW 8MM DIGITAL AUDIO CASSETTE IS DESIGNED FOR DIGITAL AUDIO MULTI-TRACK RECORDING!

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It bridges the gap for Tascam DA-88 users who require a true digital audio cassette designed to deliver the highest levels of performance possible. Today's tape based digital 8 track recorders incorporate technology originally designed for video but that's where the similarity ends. Video technology compensates for the drop outs inherent in video cassettes but Digital Audio Multi-track Recorders require drop out free performance. **That's what DIC's new 8mm Digital Audio Cassette is all about... Digital Audio Multi-track Recording! No identity crisis here!**

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Walter Afanasieff's personal-use studio

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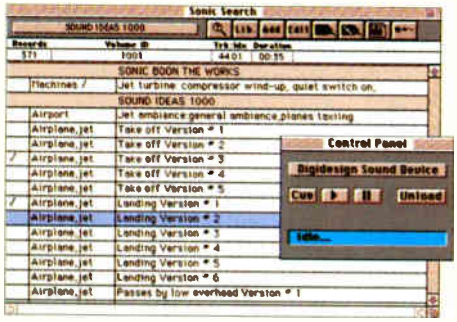

- Searches through all major SFX libraries simultaneously.
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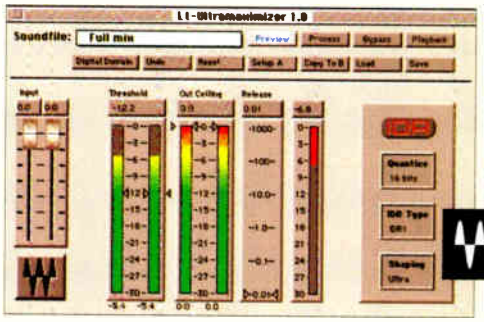

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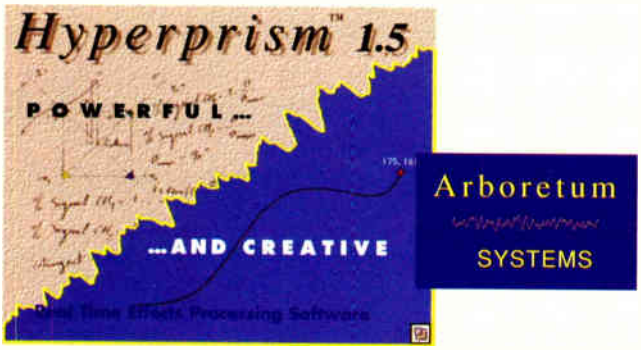

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by Bruce Merley

THE GREENING OF THE INDUSTRY

ARE YOU ENVIRONMENTALLY AWARE?

AUDIO NIGHTMARE #23

No, not a new digital multitrack format without a synchronizer. Imagine all of the audio tape you have ever used in your life dumped off of reels and hubs and left in heaps in your front yard. Are you a successful recording engineer? Then how about tape in your front yard, back yard, basement, spilling out of your attic, billowing like piles of synthetic seaweed over onto your neighbors' yards and into the street. Are you a studio owner? Consider truckloads of old tape being dumped in ever-growing mountains of plastic and oxide, covering acres and acres of once fertile farm land. What if you had to be personally responsible for all the audio tape you have used in your lifetime, for its entire lifetime? Where would you put it?

AUDIO NIGHTMARE #23, V. 2.0

Imagine a world in which every electronic device you ever purchased stays with you throughout your life. Every stereo component, every Walkman, every VCR, every television, every computer, every telephone and answering machine following you around wherever you go. Burned-out CRTs, corroded, sand-filled boomboxes, speakers with gaping holes in their cones—the electronic wastes of a lifetime. You try to leave them at dumps and landfills, but they are all closed, filled to capacity. You try to fix them to sell to others, but there are no replacement parts—or worse, the device has no more use.

AUDIO NIGHTMARE #37

What if there were a world where you could never turn down the volume? Where no matter what you did or where you went, the ambient noise or sound level was always at least 60dB SPL. And what if you could not regularly distinguish noise from program, music from auto engines, speech from air conditioner noise, music from speech, sound from thought? Whole lives would be spent in a constant listening struggle as people try to discern meaningful communication in a world of sound chaos.

These Kafka-esque images from a pessimistic mind are hardly believable. But they are not so strange, and

ILLUSTRATION: AD McCAULEY

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they could be only too real in the not-so-distant future: This week, our office building instituted mandatory in-house trash separation. All our trash cans and wastebaskets have been labeled by type of materials. But every single receptacle in *our* facility was labeled "Paper Only." We're not allowed to generate any other garbage. What about the banana peel from your lunch? Too bad, we have no containers for organic matter. Take the banana peel home with you. Perhaps you could swap it for some paper trash with one of the other tenants on your floor...A bureaucratic snafu in the name of environmental responsibility!

In all seriousness, we tend to think of our industry as environmentally benign and that the toxic avenger need not look to the audio industry for a pound of flesh. After all, didn't our industry work to help Sting save the rain forests, help the pygmies defend their culture, help Greenpeace to save the whales, help Native Americans, help farmers, help...Well, sort of. At least some folks did. But in general, we're not very good at looking in our own back yard and asking the tough questions about ourselves. Just how innocent or benign is the audio industry? Are we toxic offenders? Are we polluters? Do we, as an industry or as a group, contribute to the global environmental problems we all face today? And what can we do about it?

Just how innocent or benign is the audio industry? Are we toxic offenders? Are we polluters?

According to the scientific community, we have two fundamental global problems that dwarf every potential war, economic disaster or political catastrophe possible on this planet. They are overpopulation and environmental destruction through pollution and depletion of resources. It has been clearly demonstrated that at the present growth rate, our planet will not be able to feed the human population by the end of the next century. There will be mass starvation. There likely will be widespread warfare as nations struggle to control productive farmland. Our lives, and certainly our children's lives, will be fundamentally changed for the worse.

Assuming we are able to successfully stem the population explosion, we must still face problem number two, the destruction of our environment through resource depletion and pollution. Without dramatically altering the way human beings use planet Earth we *might* survive through the next century, but not without staggering consequences. Crop failures, famine, economic disasters, new illnesses and diseases, loss of natural environments, lowered standards of living, higher death rates—all will begin to take their toll on homo sapiens' ill-fought war to control and abuse the earth. Without major changes, you will begin to see these things happen in your lifetime. Indeed, you already

—CONTINUED ON PAGE 194

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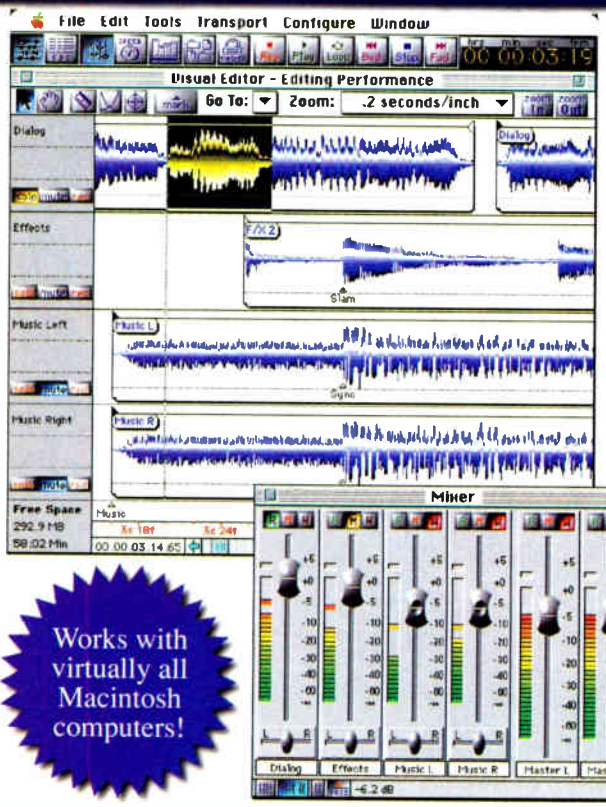

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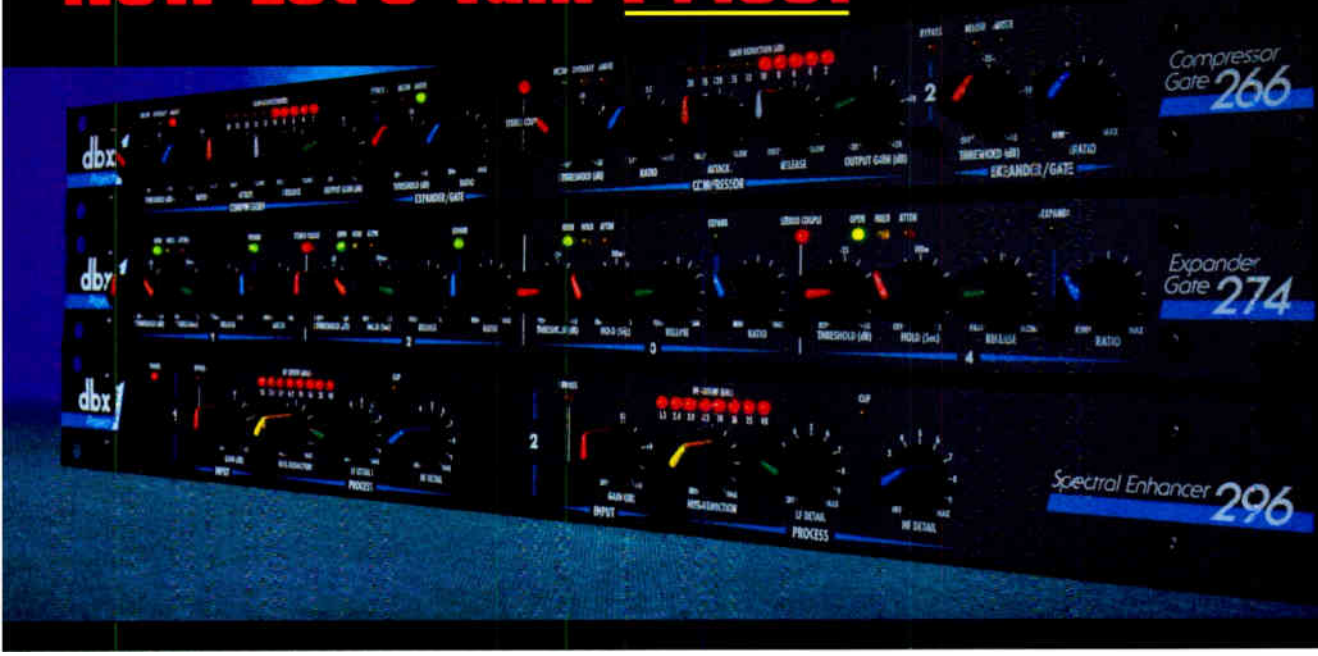

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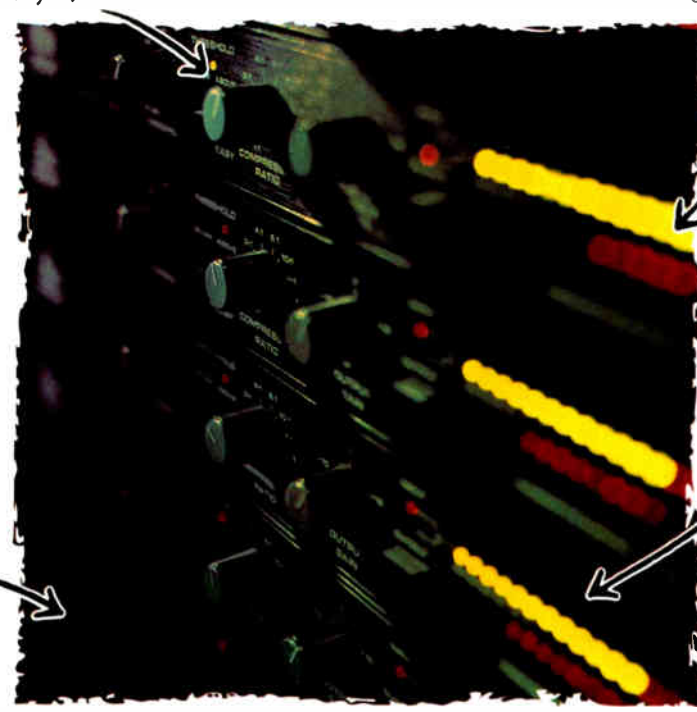
"The mark for the highest threshold ever reached without blowing speakers."
CBGBs 1983

"Metering is so visable it drew bugs."
Red Rocks, Colorado 1989



"Easily drove long lines over an acre of land."
Farm Aid, 1986

"A dent from where the thrashers knocked over the rack."
San Francisco, 1992

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When the original dbx 160X compressor/limiter was built some 12 years ago, it was built to last. After a slew of tours and out-of-town gigs, we've found that 99% of them are still on the road today. Which isn't bad. But then again, it isn't perfect. (Truth be told, that other 1% wreaked havoc on our egos.) Which is why we've designed the new and improved dbx 160A compressor/limiter. It operates simply and flawlessly to give you the legendary dbx sound by offering superb metering and a choice of hard knee or OverEasy™ compression. It also offers the best output stage for driving long lines. All this is just the right amount of tinkering and tuning to bring the dbx 160A up that extra notch. After all, you shouldn't be the only one on the road giving 100%.

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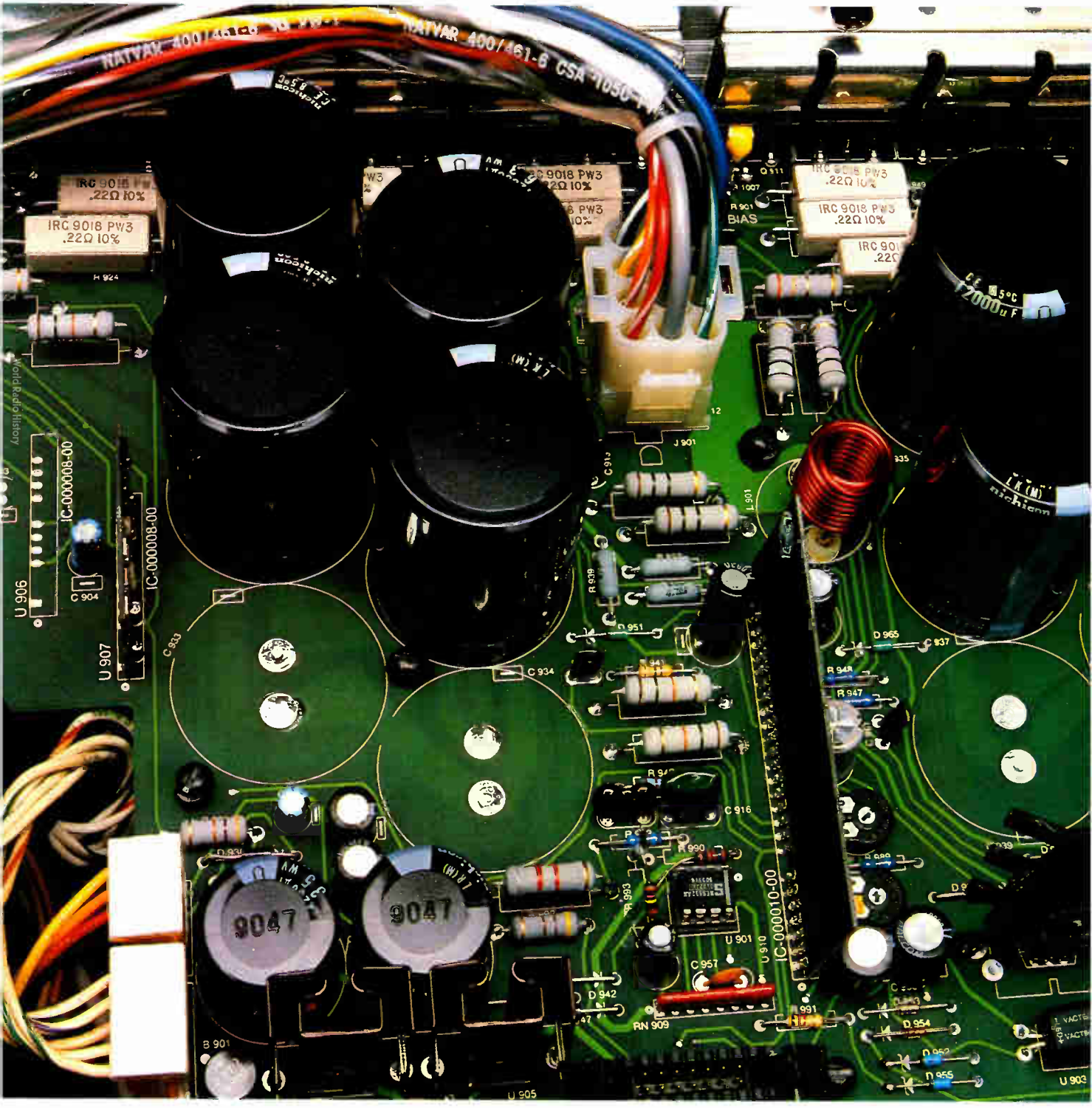

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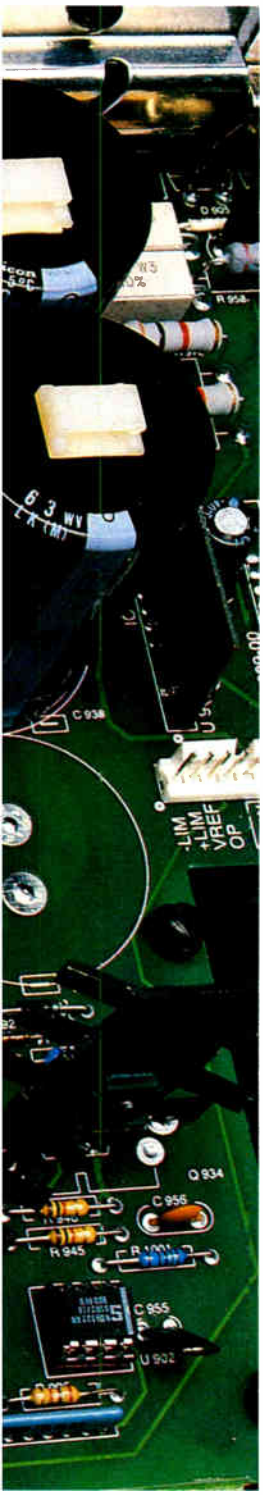
IN AMPLIFIER DESIGN



EX 4000 CIRCUITRY PHOTO COURTESY QSC AUDIO PRODUCTS

In many ways, amplifiers are the Rodney Dangerfield of professional audio: They just don't get the respect they deserve. Though amplifiers are a critical link in any audio chain, the selection of a high-quality power amp is usually a purchase that somehow gets set aside in favor of some "must-have" digital megaprocessor or flavor-of-the-week near-field speaker. This is particularly ironic, as amplifiers play a vital role in defining the sound of any audio system, and the small reference speakers (from which most engineers base their production decisions) are all too often powered by low-performance, "hand-me-down" amps. In comparison to the cost of a quality console, a decent power amplifier is quite reasonable.

Power amplifier technology has advanced by quantum leaps over the past decade. Although it was a major issue 15 years ago, reliability is less of a problem in modern amplifier designs. Today's amps have the ability to drive low-impedance and/or highly reactive loads without blowing up. Of course, reliability is of paramount importance in any professional application—whether studio monitoring or fixed or touring sound reinforcement applications. Looking beyond the marketing hype common in amplifier advertising, the reality is that today's amps are more reliable than ever.

Computer-aided design techniques employed by amplifier manufacturers help not only in optimizing circuit topologies, but also in creating new solutions to heat dissipation problems. Heat is the enemy of any electronic device. With the trend of more powerful amplifiers becoming squeezed into ever-smaller chassis, heat—and the ability to deal with it—has led to a number of innovative approaches in thermal management. Among these are new heatsink materials and designs, or the placement of heat-producing output devices into cooling ducts. And sometimes, passive solutions such as these are used with various combinations of multispeed, forced-air cooling under "intelligent" control.

Today, many professional amplifiers offer plug-in accessories that provide users with the flexibility to custom-tailor amplifiers to meet any need. These accessories include crossovers, input cards, output configurations, limiters, etc. Replacing an external active crossover with a plug-in card makes a lot of sense. Cards are typically much less expensive than dedicated outboard units; fewer rack units equates to a lighter, more compact rig in touring applications; and reliability invariably increases when the amount of cabling or interfacing decreases.

Obviously, the "add-ons" that show the most promise to the professional audio community at large are in the realm of computer control, and amplifiers are ideal devices to benefit from centralized control. Systems such as Lone Wolf's MediaLink (with more than 35 pro audio companies currently involved as licensees), Crest's NexSys, Crown's IQ 2000 and QSC's QSControl all provide for the remote control and monitoring of system operations.

The Audio Engineering Society has been involved with the standardization of sound system control for years and created the PA-422 standard four years ago. Currently, the AES has several groups working within the SC-10 subcommittee on Sound System Control; more details on their progress should be available by this fall's AES convention in San Francisco. [*For more information on the topic, see the "Computer Control" series by Bob Moses that appeared in the March '93 through*

by George Petersen

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March '94 issues of Mix.]

However, all the computer-control pizzazz in the world becomes meaningless if a system doesn't sound good. And with the exception of those amplifiers that are specifically intended for low-fidelity applications—such as paging or automated announcement installations—the ultimate criterion in amp design is audio performance. The designer's job is made more difficult by the realities of product weight, size, power consumption, heat dissipation and financial constraints—in addition to creating gear that often must perform under grueling, difficult conditions. Balancing such factors in the quest for hyperfidelity is what truly defines the art of modern amplifier design.

As a way of translating designs into reality, the following section lists a variety of professional amplifiers. One current model from each manufacturer (listed alphabetically) was selected to represent the company's most advanced design, whether a top-of-the-line model or a new approach in a mid-line product.

AB SYSTEMS

The Sub 1859 from AB Systems (Roseville, CA) is a 3-channel amp with two full-range stereo channels (each with 225 watts into 8 ohms or 385 W into 4 ohms) and a summed mono subwoofer channel that delivers 850 W at 4 ohms or 1,125 W into a 2 ohm load. Features include selectable subwoofer crossover frequencies (80/100/130/160/200 Hz), temperature-controlled forced-air cooling, balanced and unbalanced inputs and Soft Clip speaker protection. Retail: $1,499.

ALESIS

Unveiled at Summer NAMM, the Matica 800 from Alesis of Los Angeles is a 2-rackspace model providing 400 W/channel into 4 ohms (1,300 watts bridged-mono). Innovations include CoolSync™ transistor cooling, which determines fan speed settings based on the power density of the program material, rather than being heat-triggered. A rear-panel "aLink™" interface connects to accessories to come from Alesis—such as crossovers and specialized sound contractor modules—as well as an industry-standard computer network interface due later this year. Retail: $699.

ASHLY

The Ashly Audio (Rochester, NY)

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1. To enter the *Mix/Electronic Musician* Alesis Dream Studio Sweepstakes, print your name, address and phone number on the attached Subscription/Entry form or a facsimile thereof and mail it to the *Mix/Electronic Musician* Alesis Dream Studio Sweepstakes, P.O. Box 8845, Emeryville, CA 94662-0845. Enter as often as you wish, but all entries must be postmarked separately. **All entries must be received by October 15, 1994.**

2. The *Mix/Electronic Musician* Alesis Dream Studio Sweepstakes is not open to employees of Alesis Studio Electronics Corp., Cardinal Business Media, Inc., all other companies owned or affiliated with Alesis Studio Electronics Corp. or Cardinal Business Media, Inc., such companies' advertising or promotion agencies, and members of those employees' immediate families. This offer is subject to all applicable federal, state, provincial and local laws and regulations and is void where prohibited or restricted by law.

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One M-EQ 230™ Equalizer	$ 249
One QuadraVerb™ Processor	$ 499
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One S4™ Rack Mount Synthesizer	$ 999
One QuadraSynth™ Master Keyboard	$ 1,499
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One QuadraSynth™ Stand	$ 299
Two 19" 15-Space Racks	$ 360
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TOTAL VALUE	**$34,646**

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es where permitted by law. Prizes won by minors must be awarded in the name of parent or guardian. Prizes will be distributed by Alesis Studio Electronics Corporation, whose address is 3630 Holdredge Avenue, Los Angeles, CA 90016, and shipped at Alesis Corporation's cost within the U.S. only. All taxes and duties, shipping outside of the U.S. and any other expenses not specified herein are the responsibility of the sweepstakes winners. Random drawings to award all unclaimed prizes will be conducted from all eligible entries received. In order to win a prize, residents of Canada, and wherever else mandated, will be required to correctly answer a skill-testing question administered by mail. Any litigation respecting the conduct and awarding of a prize in this publicity contest by a resident of the Province of Quebec may be submitted to the Regie des lotenes du Quebec.

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MFA 8000 (800 W/side into 8 ohms; 1,500 watts at 2 ohms), is a dual-mono amp with independent circuitry for each channel, sharing only the power transformer and AC input. The two-speed fans and limiting/protection circuits are controlled from sensors in four locations within the chassis. The MFA 8000 has a modular design, and the power amp core is a discrete, fully complementary, all-bipolar design, with multiple power supply rails switched via high-speed MOSFETs for increased efficiency. All MFA amps are compatible with Ashly's PowerCard series of input option accessories. Retail: $2,295.

ARX

The top-of-the-line SX-1500 from Australian company ARX (U.S. offices are in Petaluma, CA) is a 2-channel design offering 450W/side into 8 ohms or 700 W/side into 4 ohms. Features include Soft Clip limiting, four variable-speed fans, and improved Ultra Fin cooling technology, providing a 250% increase in effective heatsink surface area. Retail: $1,598.

AUDIRE

Distributed by KRK Monitoring Systems (Huntington Beach, CA) the top-of-the-line Audire Otez is a true dual-mono design providing 500 watts per channel into 4 ohms or 1,000 watts bridged-mono at 8 ohms. While essentially a Class A/B design, the Otez combines the efficiency of a Class A/B amplifier with the smoothness of a true Class A design. All Audire amps state a frequency response of 2 to 100k Hz (-1 dB). Retail: $3,569.

AUSTRALIAN MONITOR

Australian Monitor's (U.S. offices in Malvern, PA) Opal 2802 delivers 280 watts per channel into a 4- or 8-ohm load. Featured are a flat 20 to 20k Hz frequency response (±0.5 dB), silent convection cooling with thermally switched fan and a mono bridge mode. Options include limiters and highpass and lowpass filter cards. Retail: $1,275.

BGW

The Performance Series 2 from BGW (Hawthorne, CA) delivers 300 watts/channel into a 4-ohm load from a 32-pound, 2-rackspace package. Inputs are active-balanced on TRS ¼-inch and XLRs; the output stage uses 20 200-watt high-speed power transistors, and all of the Performance Series 2's basic circuitry is located on a single field-replaceable module. Retail $929.

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BRYSTON
Designed for surround mixing, bi-amplification or operating several sets of near-field speakers from a single amp is the 8B NPB, a multichannel design from Bryston of Montpelier, VT. The 8B NPB's four amplifier sections (each with separate power supplies) can be configured as a 2-channel (400 W/side at 8 ohms), 3-channel (two channels at 120 watts, one channel at 400 watts) or 4-channel (120 W/channel into 8 ohms) unit. Features include balanced or unbalanced inputs, silent passive cooling and a bandwidth that extends beyond 100 kHz. Retail is $2,695; a THX version is $2,995.

CARVER
Top of the line in Carver's (Lynwood, WA) redesigned PM Series II amplifier range is the PM-1400, delivering 700 W per channel into a 4-ohm load. The PM-1400 uses two Class H (switching) power supplies for stereo, dual mono or bridged mono operation from a lightweight package. Options include plug-in input transformers, programmable crossovers, and a MediaLink-compatible PowerLink™ computer control module for monitoring of nine operational parameters and remote control over functions such as input level, polarity, power up/down and low-speed fan lock. Retail: $1,250.

CHEVIN
Now available in the U.S. is the UK line of Chevin Research (offices in Crystal City, MO) power amps. Designed for pro touring applications, the amps use high-current, high-voltage power supplies combining high efficiency and cool running; all models are single- or 2-rackspace designs weighing from nine to 26 pounds. Internal systems include SoftClip circuitry and protection from DC faults and shorted loads. Two-channel models include the A2000 with 375 W/ch into 8 ohms, or 1,200 W/ch into a 2-ohm load. Retail: $2,945.

CHORD
Designed to complement the line of Dynaudio Acoustics monitors is the new series of high-end reference power amps from Chord Electronics Ltd., distributed in the U.S. by Audio Exchange Intl. (Boston). The top-of-the-line SPA1232 DA is rated at 300 watts/channel into 8 ohms and combines a switch-mode power supply and 16 150-watt MOSFETs per channel, resulting in a "sliding bias" A/B design that operates primarily in Class A, with Class B operation only in the most demanding situations. Retail: $5,799.

CLAIR BROTHERS AUDIO
Specifically designed to power Clair Brothers Audio (Lititz, PA) loudspeakers, are custom-modified Crest or Carver amps, available either separately or in complete packages in road cases, with transformer isolated inputs, EP-style outputs and twist-lock AC connectors. The stereo CBA 2200 delivers 1,100 W/channel into 4 ohms; 1,400 W/channel into 2 ohms or 2,800 W mono bridged at 4 ohms. Retail: $2,500.

CREST
The 9001 from Crest Audio (Paramus, NJ) is a 2-channel amp incorporating a Power Density™ engineering design, delivering 3,000 watts/channel (full 20 to 20k Hz bandwidth) into 2 ohms from a 3-rackspace, 110-pound chassis. The amp also uses a Tri-Class™ variable output topology, which runs at Class A at low levels,

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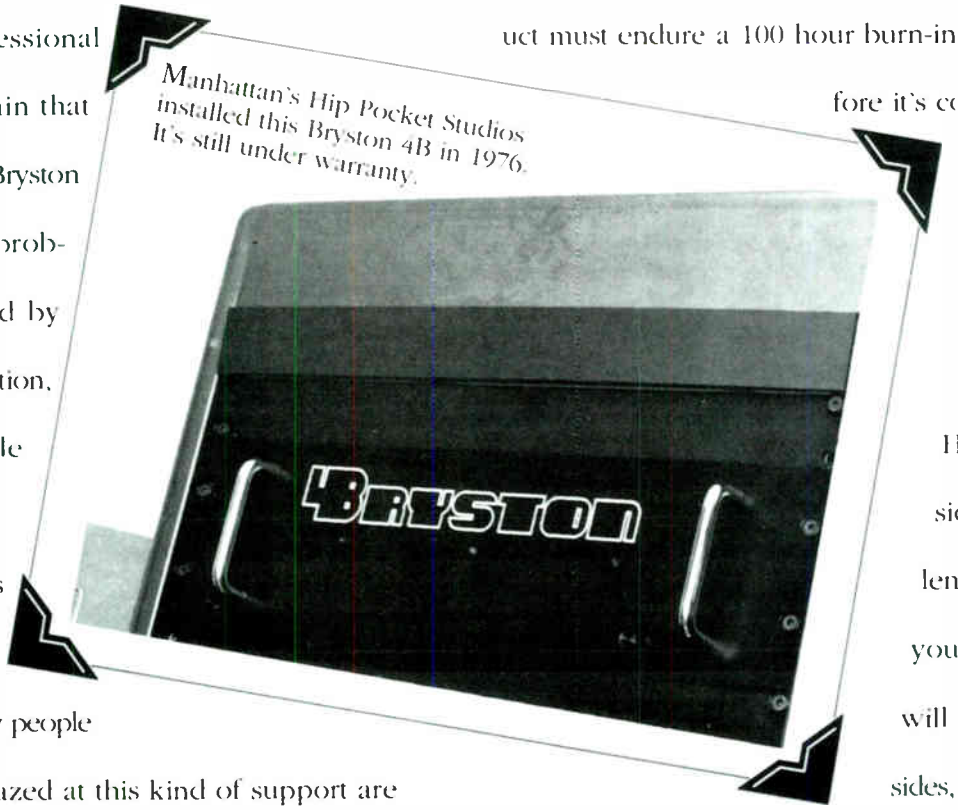

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Class A/B at mid levels and switching to Class H at high levels. Its modular channels use a total of 28 bipolar and 24 MOSFET devices, with high-speed Burr-Brown analog ICs and no electrolytic capacitors in the signal path. A variable-speed fan determines airflow based on heatsink temperatures. Retail: $4,200.

CROWN

The Macro-Tech 5000VZ from Crown (Elkhart, IN) produces 5,000 watts (bridged-mono into 4 ohms) or 2,500 watts/channel into a 2-ohm load. The VZ (Variable Impedance) technology dynamically adapts to signal and load conditions, and each channel can be set for maximum current capability, maximum voltage capability, standard VZ high/low-impedance switching or bi-Output Device Emulation Protection mode. Programmable Input Processors offer expandability for future technology, as well as connection to Crown's IQ System computer control protocol. Retail: $3,495.

DEMETER

From Demeter Amplification (Santa Monica, CA) comes the VT275HF, a low-distortion, all-tube reference power amp. The 4-rackspace amp has four Sovtek 6550 power tubes, high-grade Bifiler output transformers, a regulated 350V high-voltage supply for the two 12AT7A and 12AX7A preamp tubes; output is 75 watts per channel into 2, 4 or 8 ohms. Retail: $2,250.

ELECTRO-FORCE

Housed in a 13-pound, 2-rackspace chassis is the 800-SR-4 from Electro-Force (Anaheim, CA). Delivering 500 watts/channel into 4-ohm loads, the 800-SR-4 uses pulse-width-modulated MOSFET output devices operating at an efficiency said to be 90%, thus reducing power consumption and eliminating the need for cooling systems. Retail: $1,095.

EV/DYNACORD

New from Electro-Voice/Dynacord is the P 1050 Processed Precision Power Amplifier, designed to be matched to any touring loudspeaker system. The internal processor (which can also be defeated, if desired) is switch-selectable for use with second- or fourth-order vented enclosures. Also standard are three

frequency curves for matching the LF response of the speaker, 151Hz and 311Hz highpass filters, and a limiter with selectable time constants. The output of this 2-rackspace amp is 550 W/ch into 4 ohms or 1,300 watts bridged-mono. Retail: $1,900.

FENDER

The SPL-9000 from Fender-Sunn Pro Audio (Scottsdale, AZ) is a dual-channel design delivering 450 watts/chan-

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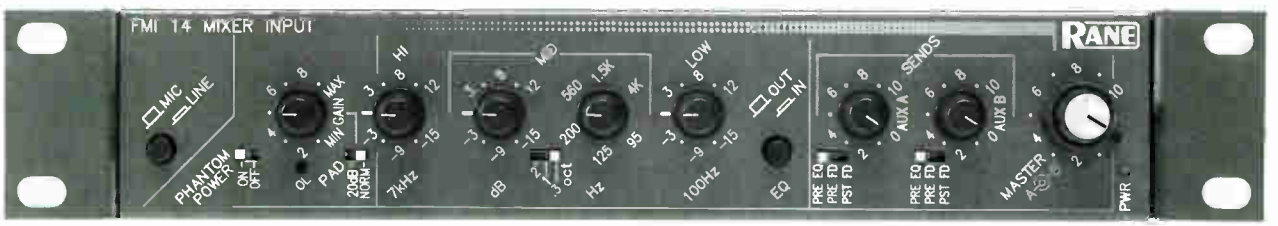

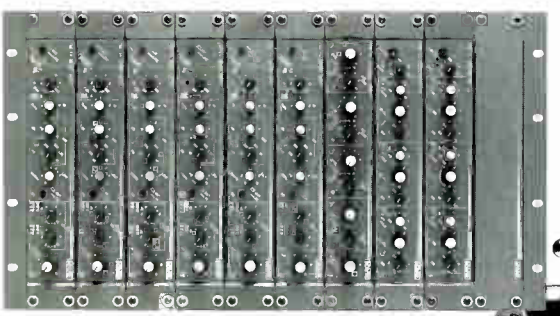

The Flex Series FMI 14 Microphone Preamplifier is simply the shortest path to the cleanest, purest recordings—digital or analog. This compact module offers the kind of serious features found on big consoles, but without the extra circuitry, switching and long routing lines.

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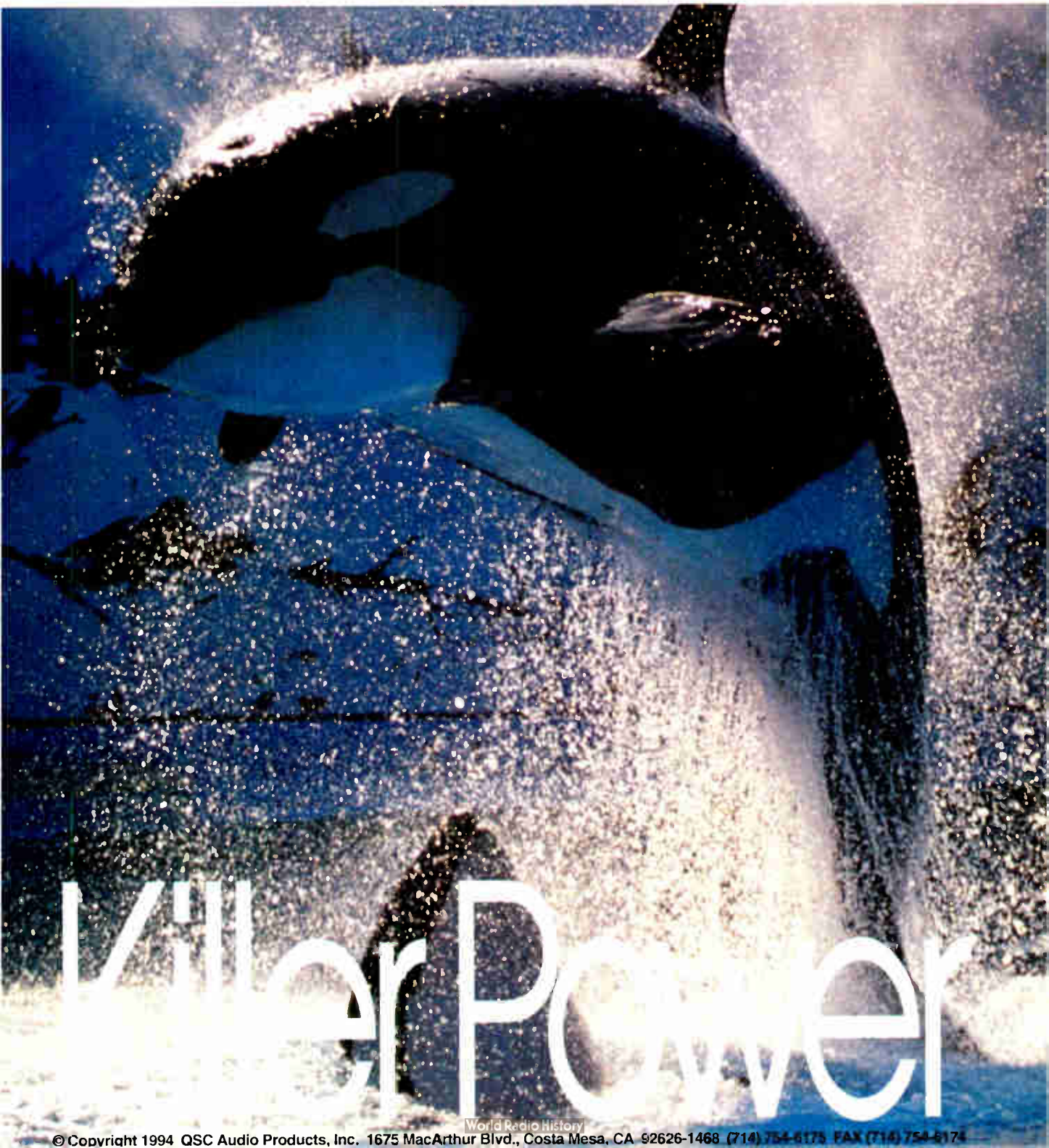

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nel into a 4-ohm load or 900 watts bridged-mono at 4 ohms. Features include two-speed forced-air cooling and gradient air exchanger, delayed turn-on, analog computer protection circuits and optional MediaLink computer remote control. Retail: $950.

FOCUSRITE

Unveiled at AES Amsterdam, the Red 5 stereo power amplifier from Focusrite (dist. by Group One Audio, Farmingdale, NY) delivers 250 watts/channel into 8 ohms, with a transient output capability of 800 watts. The amp uses a high-frequency switching power supply for cool, efficient operation, combined with pure Class A driver stages and output stages that run in Class A/B mode in a sliding bias arrangement. Retail: $3,600.

GEM

The top-of-the-line PA1555 from Gem Sound Corp. (Bronx, NY) outputs 600 watts per channel into 4 ohms. This fan-cooled design features MOSFET output devices and is mono-bridgeable for 1,200 watts into a 4-ohm load. Retail: $1,499.

HAFLER

The 9505 trans*nova balanced amplifier from Hafler (Tempe, AZ) is a true differential-input power amplifier. Each port of the input differential stage is buffered with a high-impedance JFET buffer pair for direct signal access to the amplifier without conversion to an unbalanced signal. This fast (3 MHz), fully cascaded, JFET input, two-stage front end drives eight lateral MOSFETs on each output channel. Output is 375 watts/channel into 4 ohms or 750 watts bridged mono. Retail: $2,200.

HILL

Now available in the U.S. through Klay Anderson Audio (Salt Lake City) is the Chameleon line of Amplifiers from Malcolm Hill Associates (Bearsted, Kent, England). The top model in the line—the 2500S—outputs 1,250 watts/channel into 4 ohms (or 2,500 watts bridged-mono) from a single-rackspace chassis. The amp uses a

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That flexibility is another key to the collaboration that the DSP4000 forms with its owner. The DSP4000 works like you do. Today you're tracking— the DSP4000 is a pitch corrector and subtle de-tuner. Tomorrow, you're mixing — the DSP4000 is a reverb with pitch shift on track one, a parametric EQ with compression on track nine. Try doing all that with any other effects processor.

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And that's what elevates this unit above the competition. In the rack, it's a one-of-a-kind effects processor. But in the right hands, it becomes a *creativity* processor. It's well worth a few hours of your time to get your hands on a DSP4000. Get a full demo and see why creative people are finding the Eventide DSP4000 inspirational.

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conventional linear power supply and symmetrical Class A/B design, and is several inches less deep (now 19.3 inches) than earlier Chameleon models, so the new amps fit in standard rack enclosures. Retail: $2,160.

HOT HOUSE

The M500HV from Hot House (Highland, NY) is a monoblock design with a high-voltage power supply and 16 linear, complementary MOSFETs packed into a 2-rackspace chassis. Frequency response is said to extend to 292 kHz (-3 dB), and power output (not including 3 dB of headroom) is 600 watts into a 4-ohm load, with a maximum peak current capacity spec of 95 amperes. Due to the absence of global feedback, multiple M500HVs can be combined in parallel or series bridged pairs for output combinations up to 3,600 watts at impedances as low as half an ohm. Retail: $1,799.

JBL

As its name suggests, the MPA1100 from JBL Professional (Northridge, CA) delivers 1,100 watts per channel into 4 ohms. All MPA Series amps feature Open Input Architecture, allowing the use of removable input cards for custom configurations. Among the optional cards are a 2-channel, two-way crossover and a -18dB/octave sub-bass crossover for implementing a separate sub-bass feed from the mixing console. Retail: $2,595.

MANLEY

Manley Laboratories (Chino, CA) offers a range of high-performance solid-state and vacuum tube gear. The top-of-the-line 880 is a 400-watt monoblock reference amplifier, based on 16 Sovtek 6550 KT88 output tubes with separate DC power supplies for the input stages and the Multiple Arrayed Geometric Inductive Coupling™ output transformer with Basketweave/Litz Interleave. The latter is a proprietary method of output transformer manufacturing, which is said to result in a 5Hz to 300kHz bandwidth design with no insertion loss. Retail: $13,000/pair.

PEAVEY

The CS1200X is the top model in Peavey's line of linear power supply amps (the company also has a series of digital switch-mode amps). The amp delivers 630 watts/channel into 4 ohms or 1,800 watts bridged-mono into a 4-ohm load. As with all members in the CS line, the CS1200X features DDT™ compression, two-speed forced cooling via a tunnel-style heatsink arrangement, a full-power bandwidth that extends to 50 kHz, and a selection of plug-in accessories for specialized applications. Retail: $1,399.

QSC

Just announced from QSC Audio Products, Costa Mesa, CA, is the company's most powerful unit, the MX 3000a, a 2-channel amp offering 1,300 W/side or 3,200 watts bridged mono (measured at 1 kHz into 4 ohms). Frequency response is stated as -3 dB at 100 kHz. The MX 3000a's high-efficiency design is said to reduce system-cooling requirements and AC power draw by 50% over conventional designs. Features include a built-in limiter, sophisticated thermal management and a flexible interface standard. Retail: $1,998.

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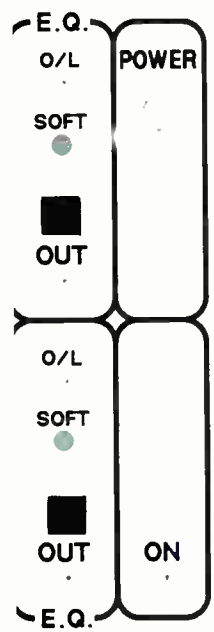

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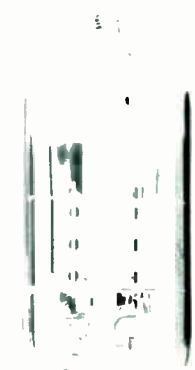

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RAMSA
The WP-1400 from Ramsa/Panasonic (Cypress, CA) uses a dual-voltage power supply in a Class H configuration, whereby the low-level power supply operates at low-input signal levels. When high-level signals appear, the Class H circuitry instantaneously switches to the higher-voltage power supply. The output devices are mounted in a wind tunnel-style heatsink, which is continuously cooled by a variable-speed fan. Built in a 3-rackspace chassis, the WP-1400 delivers 400 watts/channel into 4 ohms or 800 watts (bridged-mono). Retail: $800.

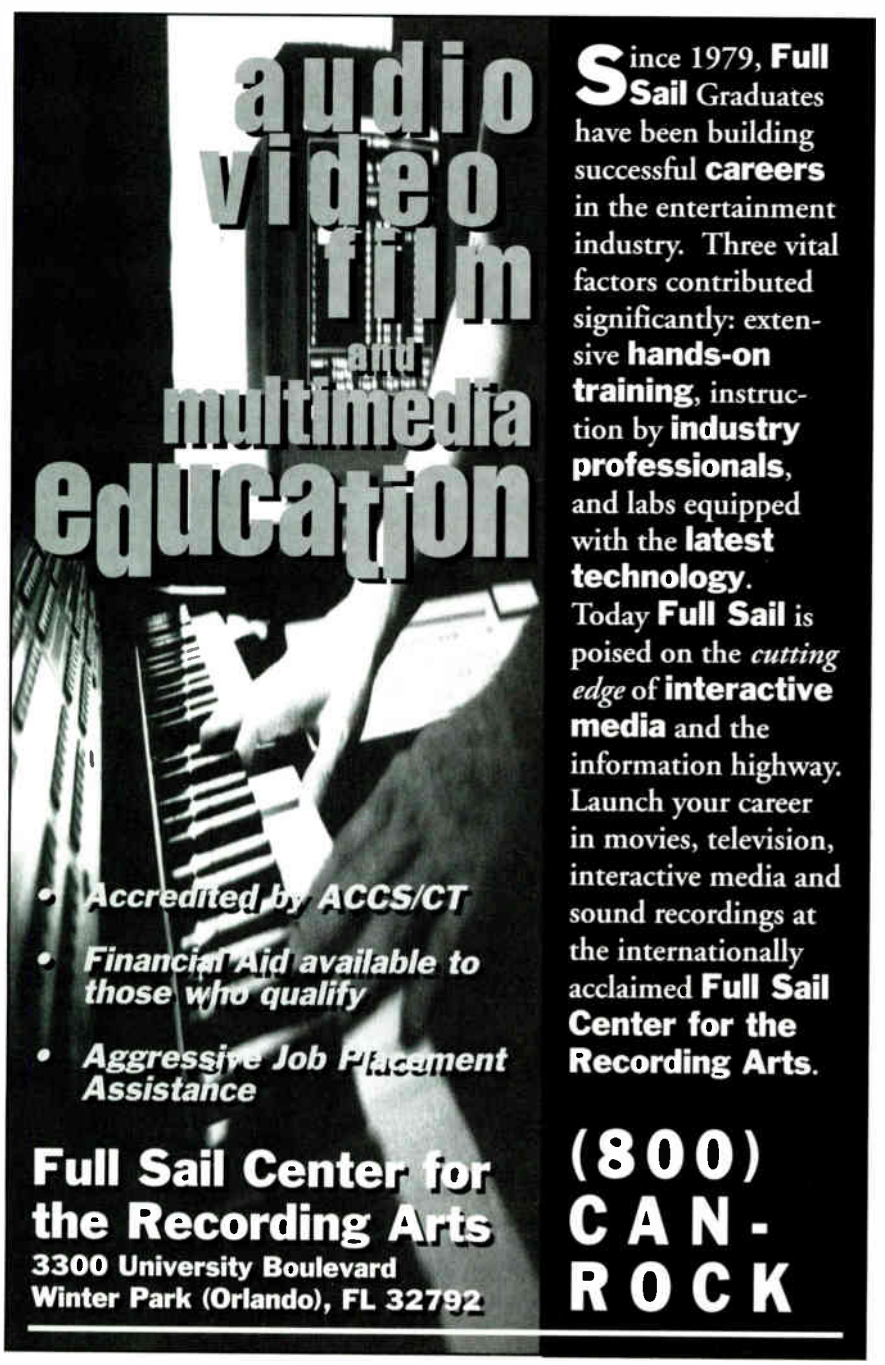
RANE
The MA-6S from Rane Corporation (Mukilteo, WA) is a 3-rackspace unit housing six independent amplifier channels, each delivering 150 watts into a 4-ohm load. Alternatively, adjacent amplifier pairs can be used in bridged-mono to provide 300 watts into 8 ohms. Applications include special venue audio, stage monitoring and surround sound playback. Selectable ultrasonic and 80Hz high-pass filters are standard. Retail: $1,599.

SAMSON
Samson Audio (a division of Samson

Technologies, Hicksville, NY) has introduced the Servo 500 bipolar power amp, producing 250 watts/channel into 4 ohms or 500 watts bridged-mono into 8 ohms. The "Servo" feature is part of the feedback loop, automatically controlling DC offset in the speaker terminals for efficiency and accuracy, while built-in protection circuitry disconnects the speaker load in case of overcurrent, shorted wires or overheating. Retail: $450.

SOUNDTECH
SoundTech (Vernon Hills, IL) debuts its Power Source Series of lightweight, high-output amps that make use of switching power supplies. The PS1300 is a 2-channel unit capable of 650 watts into a 4-ohm load—from a two-rackspace chassis weighing only 21 pounds. Power bandwidth is said to be 5 Hz to 65 kHz. The amp combines a high switching rate design with large capacitors for on-demand power at all times; additionally, dual extruded cooling tunnels (each with a variable-speed fan) are an integral part of the chassis, thus cooling the circuitry while creating a rigid enclosure. Retail: $1,299.

STEWART
The flagship in the Stewart (Rancho Cordova, CA) PA-Series is the PA-1800, a 650 watts/channel (at 4 ohms, or 1,800 watts mono into 4 ohms) amplifier combining a Class H approach with a switching power supply. This true dual-monaural amp, in a 2-rackspace, 17-pound chassis, has a stated bandwidth extending out to 45 kHz (-3 dB) and incorporates an "intelligent" short-circuit protection scheme that doesn't affect the output signal until the load goes below half an ohm; the protection circuitry on each channel operates independently. As the current draw during turn-on is only 6 amps, staggered power-up configurations are unnecessary. Retail: $1,699.



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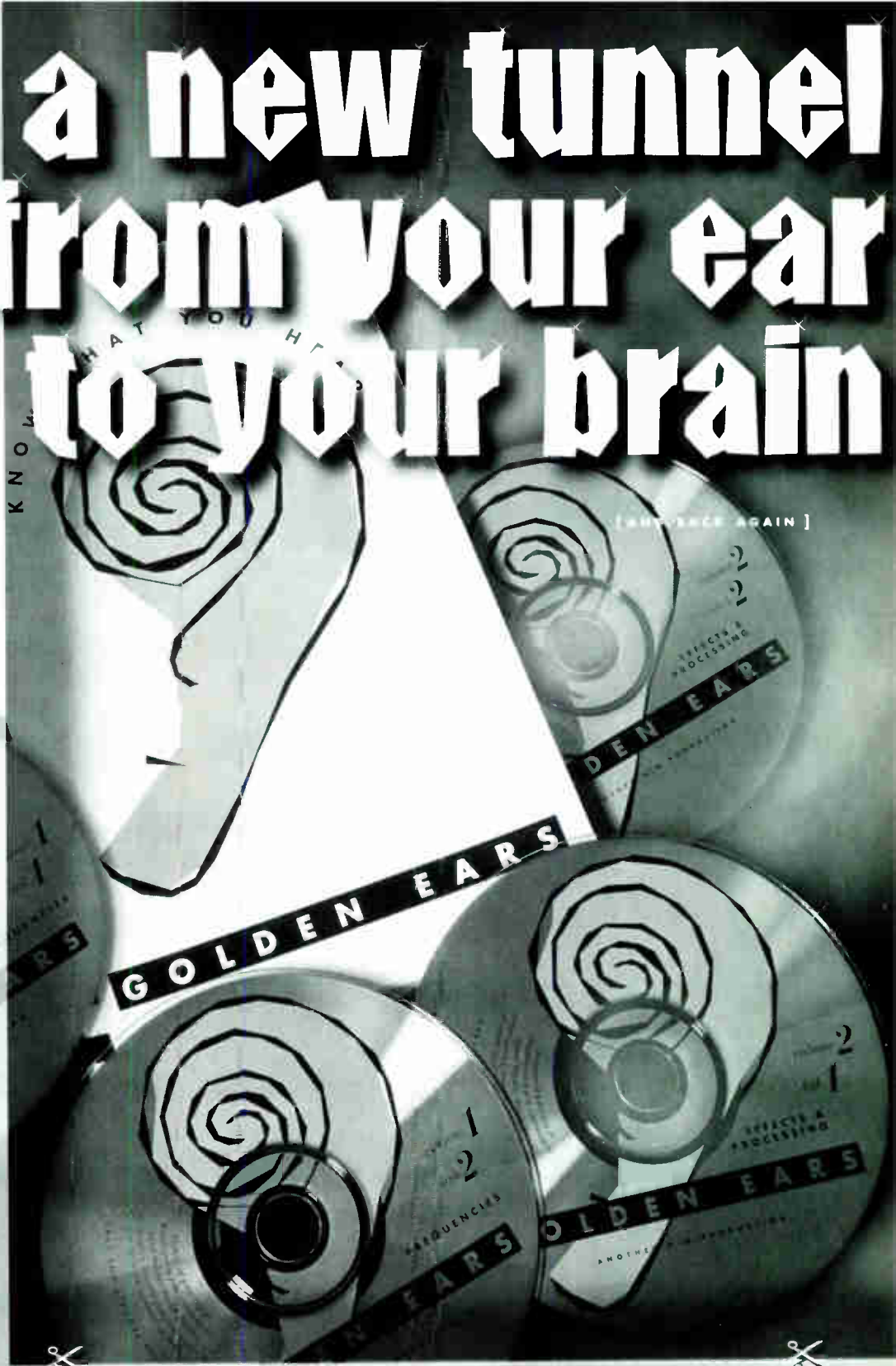

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TOA

The P1090D from TOA Electronics (South San Francisco, CA) is a 2-channel amp that delivers 450 watts/channel into 4-ohm loads or 900 watts into 8 ohms, bridged-mono. Standard features include independent protection circuits on each channel against short circuits, thermal overload and excessive DC offset on the outputs, along with 15Hz highpass filters and two rear-panel ports for plug-in accessory modules. TOA has recently demonstrated a MediaLink-compatible control and monitoring system in both Macintosh and Windows environments. Retail: $1,398.

YAMAHA

Announced at AES a year ago is the new H Series from Yamaha (Buena Park, CA). The top-of-the-line H7000 delivers 950 watts/channel into 4 ohms or 1,900 watts bridged-mono into 8 ohms—from a 2-rackspace chassis. Power consumption is a low 600 watts, thanks to Yamaha's patent-pending HED (High Efficiency Drive) system, which provides an efficiency boost without using drive voltage switching, pulse width modulation or switching series regulators. A 15-pin remote connector on the rear panel provides compatibility with MediaLink protocol networks. Retail: $2,249.

YORKVILLE

Yorkville's (Niagara Falls, NY) most powerful power amp is the Audiopro 3400, which delivers 1,200 watts/channel into 4 ohms or 2,400 watts bridged-mono at 8 ohms. Efficiency is said to be above 75%, and features include a toroidal power supply, subsonic filters and an Energy Management System. The latter keeps AC breakers from tripping by monitoring and regulating AC power consumption to stay under 15 amperes. Retail: $1,679. ■

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by Paul Potyen

DIGITAL WORLD '94 WRAP-UP

Five short years ago, Seybold Seminars held its first Digital World Conference at the Hilton Hotel in Beverly Hills. Organized to facilitate the exchange of information and ideas among industry leaders concerning the future of digital media and the interactive marketplace, that first conference drew 350 participants, from companies like IBM and Sony to independent artists and visionaries like Ted Nelson and Michael Crichton. This year's event, held June 6-8 at the Los Angeles Convention Center, was a multifaceted affair that attracted an estimated 20,000 people.

It was easy to draw parallels between the growth of the conference and the awakening multimedia industry that has been its focus over these five years. As in the past, the conference itself provided a consistently high level of insight and lively dialog among industry leaders on a variety of topics, but Digital World '94 featured several other events: the first annual Interactive Media Festival, the Creative Cafe, and 100,000 square feet of digital and interactive product exhibits. At $995, the conference itself attracted about 1,000 industry "haves"; while the exposition fee was $50, and included admission to the Creative Cafe as well as the Interactive Media Festival Gallery.

PHOTO: PAUL POTYEN

One of the exhibit highlights, Radius' VideoVision Telecast, featuring 30-frame, 60-field, full-motion video capture and playback, with Betacam in/out in a rack-mountable system that meets both RS170-A and CCIR 624-4 specifications for broadcast video

CONFERENCES

In past years, the conferences provided a wide range of experiences to participants, from technology demonstrations to philosophical debates. With the inclusion of other events in this year's agenda, the focus of the conference itself seemed to lean more toward topics of interest to corporate executives: restructuring business to take advantage of digital media; advertising, marketing and selling in a new era of digital media; and other strategic implications of the digital revolution. For example, the opening session featured presenta-

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tions by Jim Clark, former chairman of Silicon Graphics; Christopher Galvin, president & CEO of Motorola Inc.; and Thomas Dolby.

Dolby, the affable iconoclast, managed to ruffle more than a few feathers with his pointed remarks about the neglect of artists on the part of communications and technology companies that are involved in the feeding-frenzy of corporate mergers and buy-outs. (See sidebar: "Dolby's Perspective on Multimedia.") Dolby's sentiment was echoed by other artists and provoked interesting responses from other artists and corporate executives.

Although many of the topics were not particularly close to this writer's heart, the level of dialog that resulted among panelists was consistently informed and articulate. One of the more stimulating sessions, called "Content and Process: Turning Ideas into Product," brought together Ron Cobb of Rocket Science Games, Brian Ferren of Walt Disney Imagineering, Homer Flynn of the Cryptic Corporation (see "The Residents

Thomas Dolby's Perspective on Multimedia

Thomas Dolby is a familiar name to pop music lovers, with several best-selling albums and music videos to his credit, including his quirky techno-hit,"She Blinded Me with Science," which achieved Top 40 status in 1983. He is also a highly respected audio-industry producer known for his willingness to experiment with the latest audio production tools, frequently pushing them to their limits in pursuit of his musical vision.

PHOTO: PAUL POTYEN

But there is an even more eclectic and experimental side to Dolby, one that is not yet well-known to the masses. Dolby started Headspace in 1992 as a full-service audio company offering top-notch sound design and music for interactive media. The company has scored music for the Sega interactive CD-ROM game *Double Switch*, three location-based entertainment ride films for Iwerks Turbo Tour, and audio for an upcoming virtual world entertainment game. He has also developed a software-based technology he calls AVrE (Audio Video Reality Engine), which he demonstrated at the Digital World conference.

I spoke with Dolby about Headspace at his studios, lodged in a rented house in North Hollywood. In one room his main composer, Mike Kapitan, was busy scoring a new game with his battery of synths, effects boxes and sequencer-equipped Macintosh. In

—CONTINUED ON PAGE 53

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'Freak Show' CD-ROM," *Mix* June, '94), musician and multimedia artist Peter Gabriel, and Bill Gross of Knowledge Adventure. The stage bubbled with creative energy as each talked about the issues they faced in breathing life into their ideas.

The presentations were as unique as the products these people created: Ferren's description of a traveling interactive presentation of the 200th Anniversary of the Bill of Rights (sponsored by the U.S. Government) was eccentric and hilarious; Gabriel was thoughtful and moving in describing his goals for the *Xplora 1* CD-ROM; Gross' presentation, which included a demonstration of one of his companies' products, *The 3-D Body Adventure*, was a fast-paced and inspiring adventure in itself. About the only thing that each effort had in common was a combination of creative vision and technical expertise—usually the result of a collaboration between two or more people.

INTERACTIVE MEDIA FESTIVAL

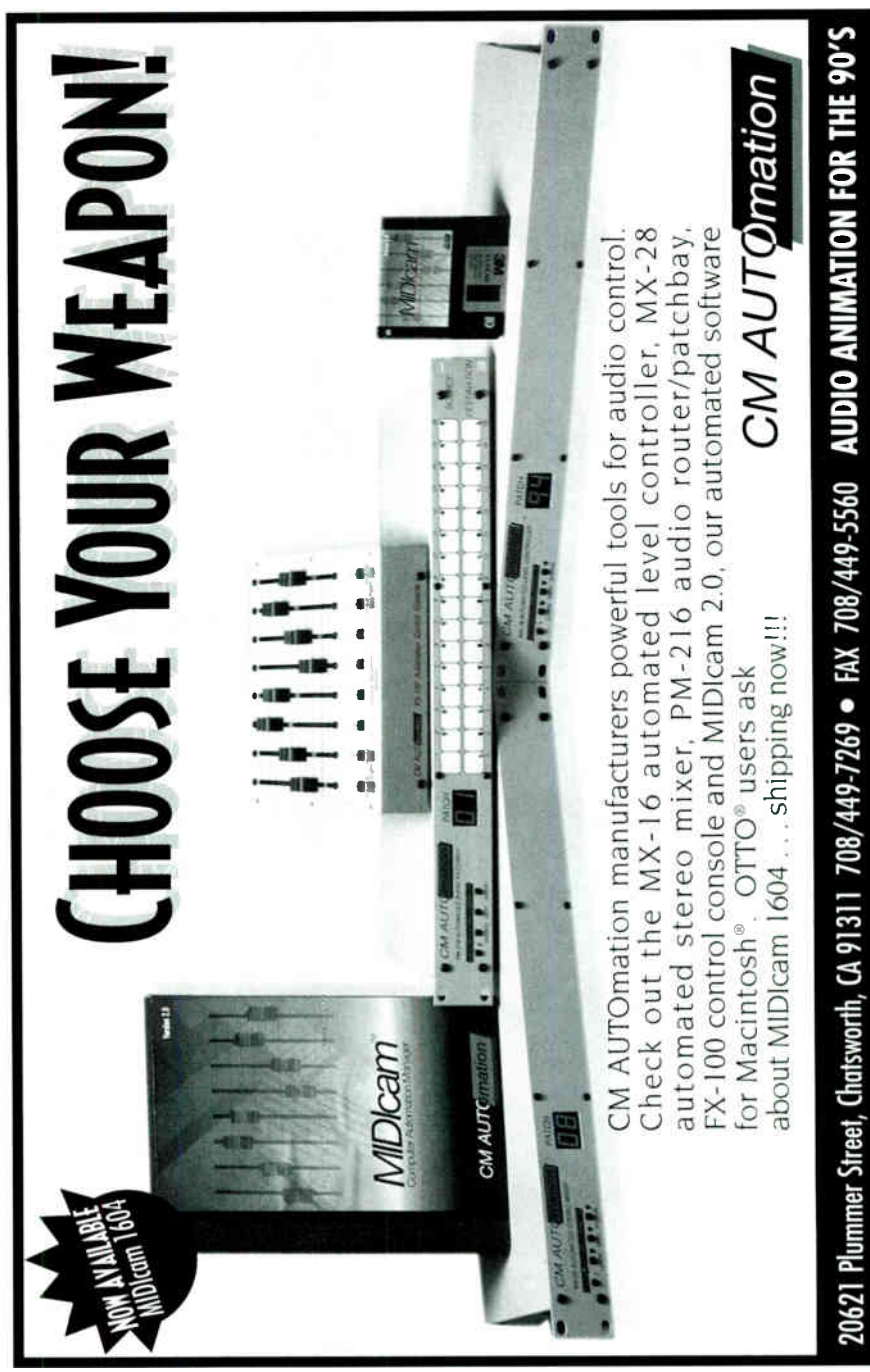
Throughout the conference and exposition, participants waved the "Content is King" flag. Everyone seemed to agree that without content, multimedia was not much more than an expensive, electronic garden hose. (To this observer, the flag waving from some in the corporate sector was a trifle disingenuous: There seemed to be no shortage of imaginative ideas, but there was a distinct need for funding.) Mindful of this issue, the Interactive Media Festival saw its debut here. Sponsored by Motorola and produced in association with the American Film Institute and Cunningham Communications, the IMF was designed to encourage development of interactive media and art.

The Interactive Media Festival Gallery featured the works of the 25 finalists who emerged from a juried competition of interactive media works. However, there were no categories of competition; there was no distinction made between artistic works and products; and the result was eclectic: The Electronic Arts' 3DO title *Twisted* was presented alongside a demonstration of Mosaic, a shareware package from NCSA, University of Illinois, for graphically navigating the Internet. Soft Force (from Dendrite Forest, Topanga, Calif.), an environment of grass, trees, waterfalls and a dome filled with biofeedback tools to help participants explore their own minds, coexisted in the same hall with Sega's *Virtual Fighter*. A curious competition indeed.

CREATIVE CAFE

According to Seybold Seminars chairman Jonathan Seybold, "We are at the point at which control is passing from the technologist to the creative artist who will begin to push the envelope and create some really interesting interactive content." To address the issues from this perspective, Digital World and the Writers Guild of America/West sponsored the Creative Cafe, described as "an informal forum where artists, writers and producers were invited to discuss the creative issues of the interactive media revolution."

Topics ranged from violence in video games to the role that artists play in shaping the new media. Sessions were well-attended and featured high-level industry spokespersons as well as artists from a variety of disciplines who have been actively involved in the industry. The Creative Cafe was located in the same area as the exhibitions and, unlike



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the conferences, was open to the exhibition attendees. Open discussion between panelists and the public was encouraged, with uneven results in the quality of informed dialog. Nevertheless, the Creative Cafe provided an excellent opportunity for the growing legions of wannabes to learn more about the industry.

EXHIBITS

Since its inception, Digital World has always had a venue for exhibits of the latest in digital technology from manufacturers. But this year marked the advent of a full-blown (and heavily attended) trade show, with 100 company demonstration booths. The usual suspects were on hand, including publishing giants Compton's New Media, Sony Electronic Publishing and Voyager; as well as software tool developers like Adobe Systems and Macromedia.

Two of the the highlights on the show floor were technology demonstrations from Apple Computer and Radius. As an adjunct to its new QuickTime 2.0 demo—which was expected to be shipping by the end of June; see "QuickTime 2.0: A Multimedia Standard?" *Mix* July '93—was a preview of QuickTime VR, which lets you composite a sequence of scanned still photographs into a 360-degree image. Interactive "hot spots" can be added to any particular location, and the user can navigate laterally as well as zoom in or out of the image on the screen.

The most exciting aspect of the demo was the inclusion of audio in a manner that is location-dependent. If you're standing at the seashore you hear the surf, but if you turn around and move away from the beach, the surf sounds melt into the background and you begin to hear songbirds. Apple was not announcing a delivery schedule for QuickTime VR, but promised that when it *does* become available it will be offered on Mac and Windows platforms. QuickTime VR is expected to be available for developer licensing by the end of 1994.

Radius (San Jose, Calif.), makers of the popular QuickTime-based VideoVision digital video editing and production system, was showing VideoVision Telecast. Designed for video professionals, VideoVision Telecast features 30-frame, 60-field, full-motion video capture and playback, with Betacam in/out in a rack-mountable system that meets both RS170-A and CCIR 624-4 specifications for broadcast video. Audio features include two analog XLR inputs and four XLR outputs, and two channels of XLR AES/EBU in/out (RCA S/PDIF digital in/out is also available), with 20-bit D/A converters with 8-times oversampling. The system also supports full genlock, SMPTE LTC and VITC read/write, and YUV, RGB and S-Video I/O. (My apologies to you less dweeby readers.) The system is designed for the Macintosh Quadra Series and includes a 19-inch rack-mount box, two NuBus cards and Adobe Premiere QuickTime editing software. Radius announced availability scheduled for the fall.

The message at Digital World '94 was clear: The multimedia industry is no longer a promise; it's a reality for entrepreneurs as well as corporate types. "Multimedia" might not yet mean the same thing to everyone

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who met at the L.A. Convention Center for this event, but the discussions that took place were designed to foster dialog and convergence among the disparate existing and future players in this expanding industry. ■

Paul Potyen is a Mix *associate editor and a producer at ESCAtech, a Bay Area multimedia company specializing in sound.*

—FROM PAGE 49, DOLBY'S PERSPECTIVE

another room Alberto Garcia was in charge of "file management," sample-rate conversion and preparation of sound files for their intended platform. The centerpiece of Dolby's room was a tricked-out Neve 8038 console that he purchased from Peter Townshend's Eel Pie Studios in the UK.

Dolby makes a distinction between navigability and true interactivity. "What we're currently calling interactivity would be better termed navigability," he explains. "What people are calling nonlinear is parallel timelines or paths within the same cycle. If you go through an experience that was created in one of the current authoring environments, all you're really doing is hitting transport controls; they are presentations rather than an interactive work. The next level of interactivity is going to be behavioral: Wherever you go, whatever you do, there will be repercussions. In the current set of titles, after you've 'learned' to navigate the environment, what are you left with? Shitty video and shitty audio."

AVrE is Dolby's first attempt to demonstrate his point using audio cues. A seamless soundtrack plays in the background as the player explores a cave. The soundtrack changes according to the location of the mouse, as well as the speed of mouse movement: An idle exploration of the cave's environs creates a distinctly different sonic ambience than a mad dash through the same space. And players can face distinctly different consequences as a result of their behavior. In the extreme case, rude behavior results in the players falling through a virtual trap door to their doom.

—*Paul Potyen*

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MULTIMEDIA CHIP SHOTS

GLYPH INTELLIGENT SCSI SWITCH/EXTENDER

Glyph Technologies (Ithaca, NY) is shipping its Intelligent SCSI Switch/Extender for all SCSI-1 and SCSI-2 applications. It allows any two SCSI initiators—such as a Macintosh or PC and a music sampler—to share from one to seven SCSI devices in a daisy chain. The switch also will double the allowable SCSI cable length between the initiator and the SCSI device. Available in either a rack-mount or desktop configuration, the SCSI switch is targeted at users who want to share SCSI devices such as removable hard drives, MO drives and CD-ROM drives without recabling. The rack-mount version retails for $595; the desktop version is $495.

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DIACOUSTICS MIDI RENDERER

Described as a user-modifiable software synthesizer capable of producing 8- or 16-bit digital music when used with existing PC audio cards, MIDI Renderer from DiAcoustics (Huntsville, AL) creates digital WAV files from any MIDI music file. The software comes with a set of standard synthesized sounds conforming to the General MIDI spec and is capable of creating new sounds using different synthesis techniques, such as sampling, additive synthesis, wave sequencing and FM synthesis. MIDI Renderer is available on CD-ROM for OS/2, Windows and DOS platforms at a price of $129. Minimum system requirements are DOS 3.1/Windows 3.0/OS/2 2.0, 2MB RAM, Windows 3.0-OS/2-compatible sound card and a CD-ROM drive.

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JLCOOPER AV8R

AV8r is an 8-channel, rack-mounted edit suite mixer from JLCooper (Los Angeles), designed for controlling audio with computer-based video workstations. Industry-standard protocols GVG-100, GPI and ESAM I and II are fully supported.

Circle #203 on Reader Service Card

ADVANCED GRAVIS ULTRASOUND MAX

Advanced Gravis Computer Technology (Burnaby, B.C.) is shipping UltraSound MAX, the latest addition to its UltraSound line of PC audio boards. MAX offers 16-bit recording and playback with "3D Holographic Sound," as well as RAM-based editable wavetable sound conforming to the General MIDI spec. The card also features digital audio compression, including ADPCM, 4:1 16-bit A-Law, and μ-Law. Priced at $300, UltraSound MAX works with all 386 and higher IBM PCs and compatibles.

Circle #204 on Reader Service Card

ROLAND SOUNDCANVAS DB

FM-type sound cards will be given a facelift with a snap-on card from Roland Corporation (Los Angeles). Roland's popular wavetable-based General MIDI module, SoundCanvas DB provides digital signal processing, reverb/chorus and instant access to 128 CD-quality synthesized sounds and six complete drum sets. A dedicated microprocessor allows manipulation of more than 200 voice parameters per note in real time on existing FM cards. SoundCanvas DB is available for $229.

Circle #205 on Reader Service Card

CREATIVE TECHNOLOGY VIDEO BLASTER RT300

Video Blaster RT300 is a new video capture card for the PC from Creative Technology Ltd. (Milpitas, CA). It uses an Intel processor and Indeo technology to digitize and compress video data to a screen size of 320x240 pixels at 30 frames per second in a single step. Software-only playback of the resulting Indeo video files is possible on 386, 486 and Pentium processor-based PCs. Video Blaster is designed to be used in desktop video applications with ShareVision PC300, which features an audio compression card, fax/modem, software and headset. With the addition of a video camera, Video Blaster and ShareVision PC300 provide full video/audio transmission over a standard analog phone line. Video Blaster RT300 was scheduled to ship in July at $499.95. ShareVision PC300 is priced at $749.

Circle #206 on Reader Service Card

MACROMEDIA DIRECTOR 4.0 FOR WINDOWS

Scheduled for September delivery is MacroMedia's (San Francisco) Director 4.0 for Windows, a multimedia authoring tool offering binary file compatibility so that applications created in Windows or on the Macintosh can be seamlessly delivered on either platform. (For more on Director, see "Audio in Mac Authoring," page 56.) Released in Mac format earlier this year, the Windows version of Director 4.0 requires a minimum 486-based PC with at least 8MB RAM and Windows 3.1 running DOS 5.0 or higher. Priced at $1,195, the program will also be available as a $299 upgrade to registered users of Director Player for Windows.

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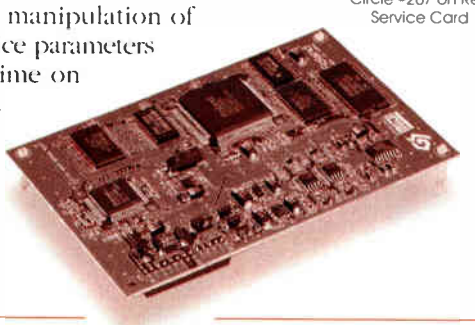

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by Philip De Lancie

AUDIO IN MAC AUTHORING

PART 2: DIRECTOR 4.0, PRODUCER PRO AND APPLE MEDIA TOOL

In part one of this article, we looked at integrating audio into multimedia productions and how powerful control over sound may be exerted in the HyperCard authoring environment by using the QuickTime and CD-Audio X-Commands. These XCMDs offer possibilities such as changing the volume of a sound in response to user actions, and playing a specific segment of a CD-Audio track from within the CD-ROM portion of a mixed-mode disc.

Despite these capabilities, and the program's superior HyperText capabilities, HyperCard in its present state has some serious limitations. Chief among these is its lack of cross-platform support, meaning that it cannot be used to create productions that play back on Windows-equipped machines. Few developers are interested in an authoring environment that shuts them out of 60% or more of the computer-hosted multimedia market. So what are the alternatives, and how do they stack up when it comes to handling sound?

The good news is that a wide range of off-the-shelf programs are available for integrating individual media "elements" (sound, video, text and graphics) into a finished production. Some lean toward simple slide show-style presentations, others toward sophisticated interactivity in which the end-user's responses are the main determinant of how the program unfolds. The bad news is that there is presently no magic tool that does all things easily and well. Each has limitations that could make an otherwise beautifully serviceable program impractical or impossible

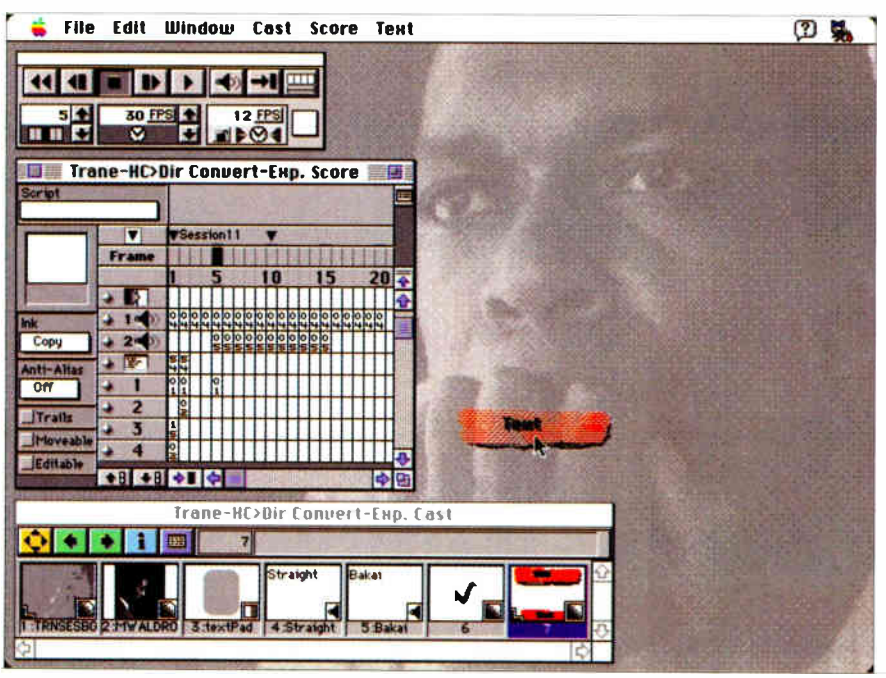

Figure 1: ***A Director setup showing (from top) the control panel, the score and the cast window. Cast member 4 (the sound file "Straight") appears in the score's audio channel 1 while cast member 5 ("Bakai") is in channel 2.***

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for a particular project. So choosing an appropriate authoring tool is absolutely critical to a project's success.

The most widely used authoring program on the Macintosh today is Macromedia Director, recently released in Version 4.0 for both Mac and Windows. Two newcomers have lately set out to challenge Director's dominance of this field: Apple Media Tool and Passport Producer Pro. Each includes provisions for creating products that will play back on Windows machines.

These three programs are all quite different in their approach to media integration. Their suitability for any given project depends not only on the goals and design of the envisioned result but also who the creative team will be and how the production process will be organized. Not surprisingly, their sound handling capabilities vary widely as well.

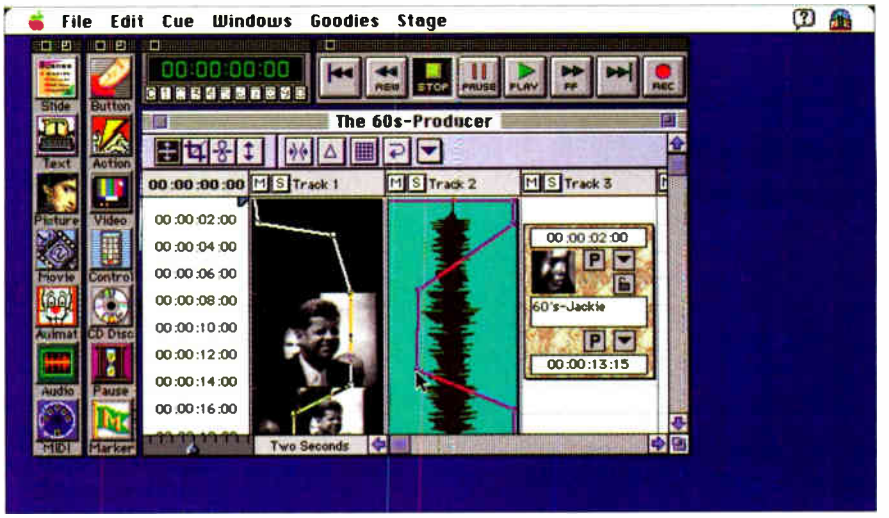
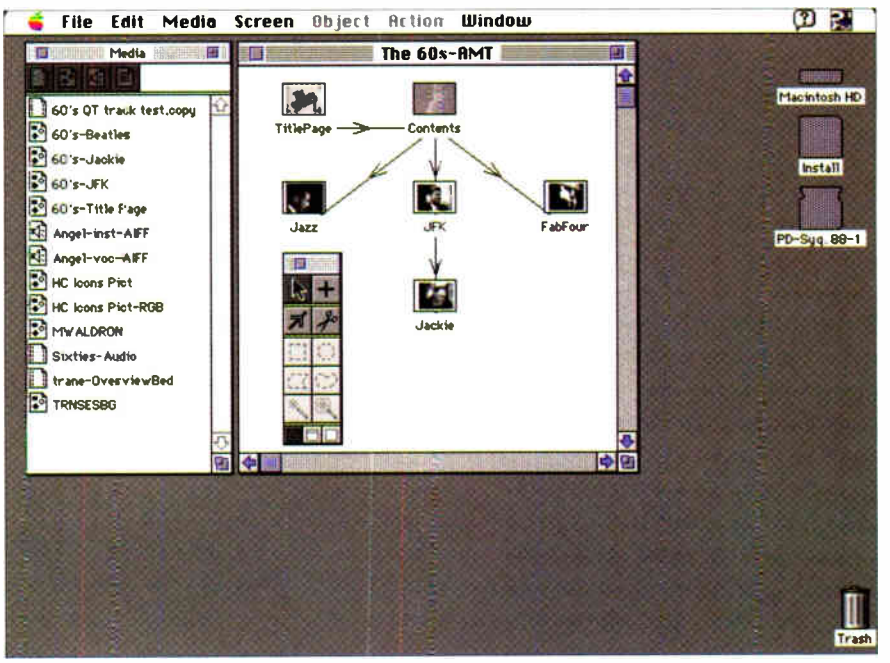


Figure 2: A Passport Producer Pro setup showing (from left) the cue, counter, and transport palettes and the cue sheet. The playback levels for tracks 1 (a QuickTime movie) and 2 (an audio file) are set by dragging the handles on the "envelope line" in the cue. (Below) Figure 3: Apple Media Tool's media window (at left) shows the media elements available in a project, while the map window (at right) gives an overview of the flow of screens in a project, which may be edited using the Tools palette shown at the lower left of the map.



DIRECTOR 4.0

Director's strength and versatility stem from the fact that it synthesizes the attributes of two distinct approaches to authoring. At one level, it is a time-based tool using an animation-rooted organizational scheme in which a series of "frames" make up a "movie." At another level, Director's Lingo scripting language allows the author to exert control over nearly every aspect of the movie's navigational flow and its component media elements.

In theory, Director's dual levels offer the best of both worlds—synchronized linear flow and high interactivity—each available as needed. In practice, it also makes the program a bit more complicated than its competitors. Director comes with five manuals totaling more than 1,600 pages, as well as a reputation for a steep learning curve.

The media integration process in Director typically begins with a "cast" of media elements to be used in the movie. Director can work with sound cast members in the SoundEdit, AIFF and AIFC file formats, as well as .snd resources. AIFF files may be linked rather than imported, which means the sound remains in a separate file that is called as needed from within the movie. Sound-only QuickTime movies may also be used and are always linked externally. Linking helps to keep down the size of the movie file, and it reduces RAM requirements, since linked sounds can play directly from disk rather than being preloaded into RAM. But problems will occur on playback if a movie is designed to play a linked sound at the same time that it is loading other media elements from the same source drive.

Sounds may be recorded from within Director (assuming sound input hardware is connected) using the standard Macintosh System sound-recording dialog box. But for professional recording and editing, it is assumed that specialized external applications such as Sound Designer or SoundEdit 16 will be used. Director allows external programs to be launched automatically for creating and editing without leaving the authoring environment (assuming you have sufficient RAM for both programs at the same time).

Cast members that have been created, imported or linked show up in the cast window. But they don't make it onto the "stage," which is the part of the production that will actually be seen on playback, until they are called in Lingo or placed in the "score." The score is a grid with a time axis (measured in frames) running across the top and channels

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Some feature specifications indicated are for D&R Vision consoles equipped with Dual MultiTask or Deluxe mono input modules.

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running down the left side (Fig. 1). Each cell of the grid may contain a "sprite," which is a reference to a cast member. A column of cells shows all the sprites on stage in a given frame; a row of cells shows the contents of a given channel over a number of frames. Two channels of the score are set aside for sound.

Sounds are placed in the score by selecting a range of cells corresponding to the duration of the sound at the current frame rate, then designating the desired sound in the Set Sound dialog box. (Sounds may be previewed in this dialog.) If the length of the sound doesn't correspond well with the sequence of frames it accompanies, frames can be added to the movie, the frame rate for the scene can be changed in the score's tempo channel or the movie can be made to pause until the sound finishes. Sounds may also be set to loop.

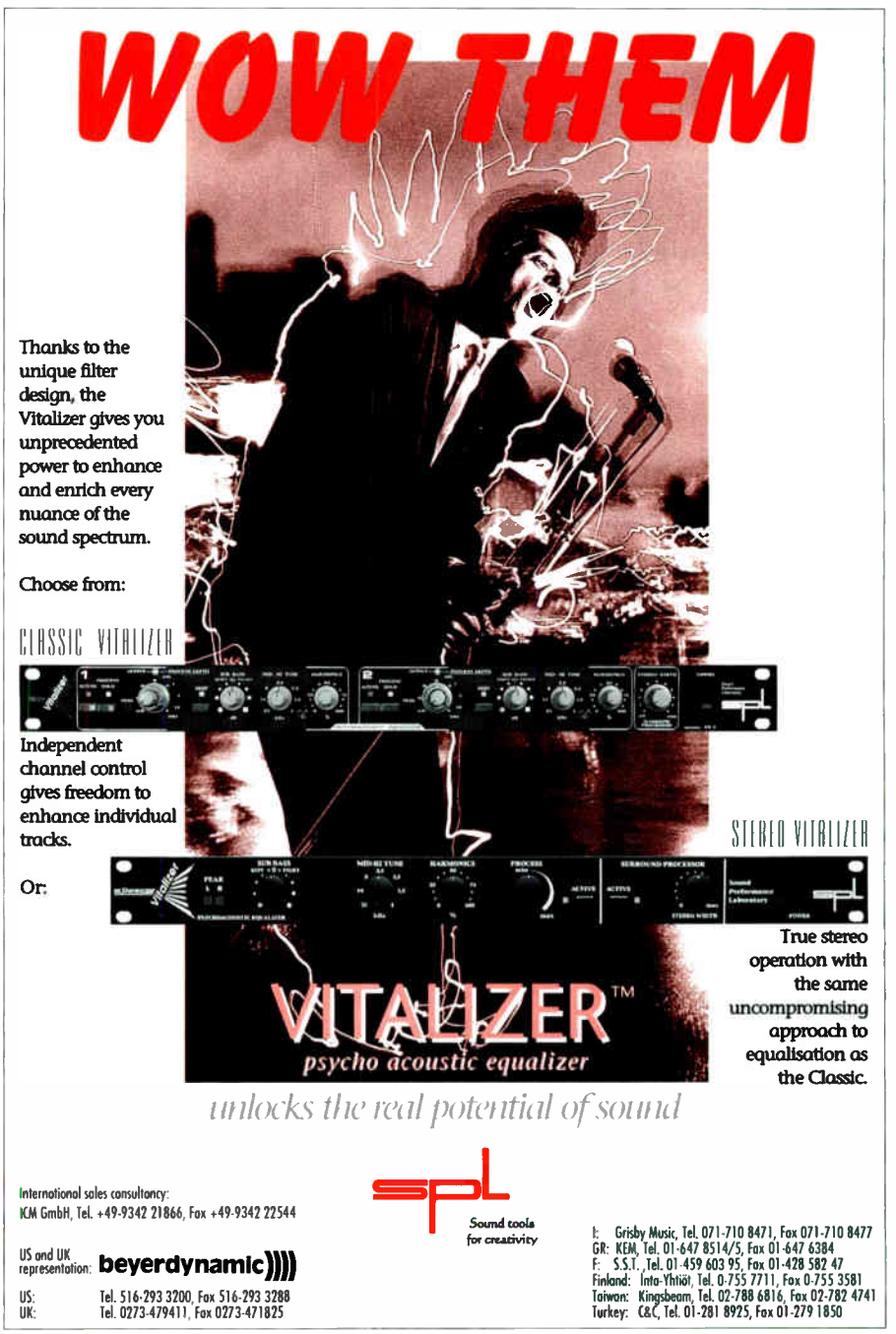
While the score allows basic control of sounds, it is possible to exert much greater control via Lingo. Like HyperCard's HyperTalk, Lingo is a relatively English-like scripting language, which is far more accessible to non-programmers than traditional programming languages. In Director 4.0, Lingo gets compiled when a movie is saved for playback. According to Macromedia, this makes script execution much faster than in previous versions.

Using Lingo commands, any sound cast member can be made to play or stop at a specific frame or when a specific condition is true or false. The level of a sound may be set, and sounds can be made to fade in or fade out over a specified period of time.

Additional control of a sound with Lingo may be exerted by declaring the sound to be a "puppetSound," which is Macromedia's way of saying that Lingo (rather than the score) will be "pulling the strings." Puppet sounds don't need to be in the score; they are called by name from Lingo scripts and thus transcend the score's channel limitations. Because scripts can use conditions and variables, puppet sounds allow the author to design interactive settings in which the sound played in any given situation is affected by choices and actions taken by the end-user.

Director has a timer that can be started when a sound file begins and then used to initiate other events in the movie at certain points in the sound. Greater synchronization possibilities are offered by storing sounds as audio-only QuickTime movies and using Lingo's control over digital video sprites. Among other things, you can *get* (find out) or *set* the current location within a sound (*movieTime*), determine the place within a sound that playback begins and ends (*startTime* and *stopTime*), set the speed and direction of playback (*movieRate*), and control the sound's level (*the volume of sprite*).

Mixed-mode CDs, which allow the audio portion of a CD-ROM to play back on a normal CD-Audio player, are a potentially important avenue for music industry involvement in multimedia. Unfortunately, Director doesn't handle Red Book audio tracks directly as linked files. Instead, Macromedia has opted for the decidely less user-friendly approach of having the author make Lingo calls to XCMDs and X-Objects, the bits of external code that allow Director to communicate with and command the playback of a CD-ROM drive.



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Director comes with the Apple CD Control X-Object; the HyperCard CD-Audio XCMD may also be used. For Windows playback, Lingo provides a means of making MCI (media control interface) calls. It is important to note that device drivers exist on both the Macintosh and Windows sides whose implementation of standard CD-drive commands is either incomplete or different from the norm. So not all mixed-mode discs (whatever program they are authored in) will work properly on all playback drives. Still, by relying on third-party vendors to come up with the code that links Director to the drive, Macromedia avoids taking responsibility for fully supporting mixed-mode capabilities.

All in all, Director offers a fairly complete set of tools for working with audio. Not all of the common production tasks are as straightforward as they should be, especially compared to Passport Producer Pro. But for highly interactive projects, Lingo gives Director a level of control that its competitors can match, if at all, only by adding code created in far less accessible programing environments.

PRODUCER PRO

For audio engineers, Passport Designs' Producer Pro is probably the easiest and most-familiar authoring environment available. Like Director, Producer uses a time-based metaphor. But while Director uses a series of discrete frames, Producer's approach to time is more continous, like a multitrack tape striped with time code.

Producer has two main component parts: the Stage and the Cue Sheet. The Stage shows the onscreen position of the graphical media elements at a given instant in the production's timeline. The Cue Sheet shows the entry, duration and exit of the elements—each in its own track on the sheet—relative to the time axis running down the left side of the screen. While it's easy to switch between the two views, an ideal production setup would include one monitor for each.

Producer works with a variety of common sound file formats, including 8- or 16-bit AIFF, QuickTime and Sound Designer or Sound Designer II. Sound playback is handled by Apple's Sound Manager system extension (Version 3.0 is strongly recommended). Producer also has built-in capabilities for accessing Red Book audio tracks from a disc in a CD-ROM drive. And the program includes very extensive capabilities for integrating MIDI that, while beyond the scope of this article, merit further investigation as a memory-efficient means of incorporating music.

Existing sound files are added to a Producer production by dragging the audio cue icon to the desired location on the cue sheet and then using a standard dialog box to locate the source file to be associated with the cue. The dialog allows files to be previewed. New sound files may be recorded from within Producer (assuming sound input hardware is installed) at a variety of sample rates and bit resolutions as determined by the sound-input-settings dialog.

During the production phase, audio (as well as all other) files do not become part of the Producer document, but rather remain external

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files referenced from within the program. A single source file may be referenced by multiple cues, so a separate copy of a sound is not needed for each occurrence. Media elements may be updated by simply substituting a new source file that has the same name as the old.

Producer offers more than one approach to editing elements. The sound editor, like the program's other internal editors, is designed for fast, simple edits. It offers a waveform-display window with basic cut and paste capabilities. For more sophisticated operations, Producer allows each media type to have an external editor associated with it that can be launched from within the program. Any application that can read files of the type to be edited may be associated with a file. That means you could use Sound Designer II, for example, as the external editor for some audio files and SoundEdit Pro for others.

Once sounds are edited and placed on the cue sheet, Producer provides many useful options for controlling how they play back. The cue's position on the cue sheet determines when the file starts playing. The point within the file at which playback starts (if not the beginning) is set using the crop feature, which may also be used to trim a cue by setting its out point before the end of the file. Sound files may also be easily stretched or shrunk to fit into a desired duration, though this affects the pitch and tempo of playback.

Since the cue manipulations all take place on the cue sheet, it is easy to see and synchronize time relationships between a set of cues onstage at the same time. Producer also lets you set the volume of a cue (relative to the end-user's volume setting). Overall cue level is set via a pop-up slider, while the volume at any given point in a cue may be adjusted by clicking and dragging on the "volume envelope" at the right of the cue's waveform display (Fig. 2).

For mixed-mode work, Producer's approach to using Red Book audio is straightforward. A whole track may be incorporated by adding a CD Disc cue to the cue sheet and selecting the desired track number from the dialog box. If just a specific segment of a track is needed, the cue can be cropped.

Because Producer is inherently time-driven, it excels at the sorts of synchronization tasks that require callbacks, handlers, variables and other scripting techniques in some other programs. Thus, Producer's strength is its blessed simplicity, which makes putting together a presentation as painless as possible for those who find that creating and programming don't mix.

While the lack of a scripting language may be an asset for presentations, however, it can limit interactivity. Producer supports the creation of buttons which can take the end-user to any predefined "marker" placed in the cue sheet. But without variables and conditionality, it is difficult to go beyond simple navigation and design more sophisticated responses to the end-user's choices or actions. Passport is aware of this limitation, and is rumored to be working on this aspect of the program for future versions. But for now, Producer, despite all its strengths, is better suited to creating navigable presentations than truly interactive experiences.

APPLE MEDIA TOOL

The first thing to know about Apple Media Tool is that, while available separately, it is only one part of a complete authoring package offered by Apple as the Apple Media Kit. The Media Kit was specifically designed for a team-oriented production process utilizing specialists for each of the required tasks.

Media Tool is the front end of the Kit, designed for rapid media integration by nontechnical, design-oriented team members. Once the structure of a production is framed-in with Media Tool, it is handed off to the team's programmers, who refine and extend it with the Media Tool Programming Language, a complete object-oriented programming environment. A project modified in the Programming Language may not be reimported into the Media Tool for further work.

Though Apple's approach is a radical departure from the jack-of-all-trades, do-it-yourself spirit of HyperCard, it is a valid reflection of the way that large-scale media productions are often organized. Apple claims that the Media Kit lets the creative and programming parts of a team each concentrate on what they do best, and that the Media Tool Programing Language—freed from the need to be comprehensible to non-

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programmers—is optimized for speed and power.

The downside of all this is that Apple has neglected the capability to do many of the common tasks that are available in other off-the-shelf authoring products, arguing that these features will be custom-added to productions using the Programming Language. In terms of sound, for instance, the Tool has no provision for changing audio levels during playback, no means of addressing or controlling a CD-ROM for mixed-mode discs, and no way to use the current time in a QuickTime movie (video or audio-only) to trigger and synchronize events.

The good news is that a wide range of off-the-shelf programs are available for integrating individual media "elements" into a finished production.

Perhaps most limiting is the unbreakable bond established between sound "objects" and the "screens" in which they play. A screen is the basic organizational unit in Media Tool. Unlike the linear flow of Director's frames, screens may be ordered and linked however the author sees fit. This is great for interactive projects, especially since an overview of a project's structure may be easily created, viewed and changed in the map window (Fig. 3).

Screens contain objects, each of which is "filled" with an externally referenced media file. While a given file may be referenced by an object from more than one screen, the objects themselves do not carry from screen to screen. This presents real problems with time-based files such as sounds and QuickTime movies, because it is not possible (using the Tool alone) to play a single continuous file—a music bed with narration, for instance—across multiple screens.

Despite these limitations, Media Tool is extraordinarily well-thought-out from the standpoint of managing the production process. Referencing individual or multiple media files and assigning them to objects is menu-based—all very straightforward and efficient. The program also makes it easy to substitute one file for another, to check that all referenced files can be found and to purge unused files from the "media list."

Another convenient feature is the built-in mechanism for creating "interludes" to cover transitions between screens. Interludes allow the author to designate graphics and sound to play while the end-user's machine loads the objects associated with the next screen into memory. Interludes can loop for a specified time or just until the next screen is ready for display.

Media Tool works with sound in the .snd, AIFF, QuickTime and .WAV (for Windows) file formats. It makes no attempt to overlap the capabilities of existing media creation and editing tools, instead allowing powerful specialized programs such as Sound Designer II and Adobe Premiere to be launched from inside as external editors.

Although Media Tool has no timeline against which to synchronize sounds with other objects, it does allow each object and screen to be assigned its own duration, and objects can be made to start and stop (or appear and disappear for graphic objects) in response to commands from other objects. These features allow the creation of some limited synchronization, but more sophisticated and complex interactions need to be programmed in the Language.

Media Kit appears to be effectively conceived for its target class of users, and Apple eventually plans to build in a means of incorporating external code—analogous to "plug-in" XCMDs—for extending the Tool's capabilities. But for the time being, the Media Kit's conceptual division between creating and programming, and the limitations built into the Tool as a result, mean that developers who want more control with less dependence on programmers will likely steer clear. ■

Philip De Lancie is a mastering engineer at Fantasy Studios, Berkeley, Calif.

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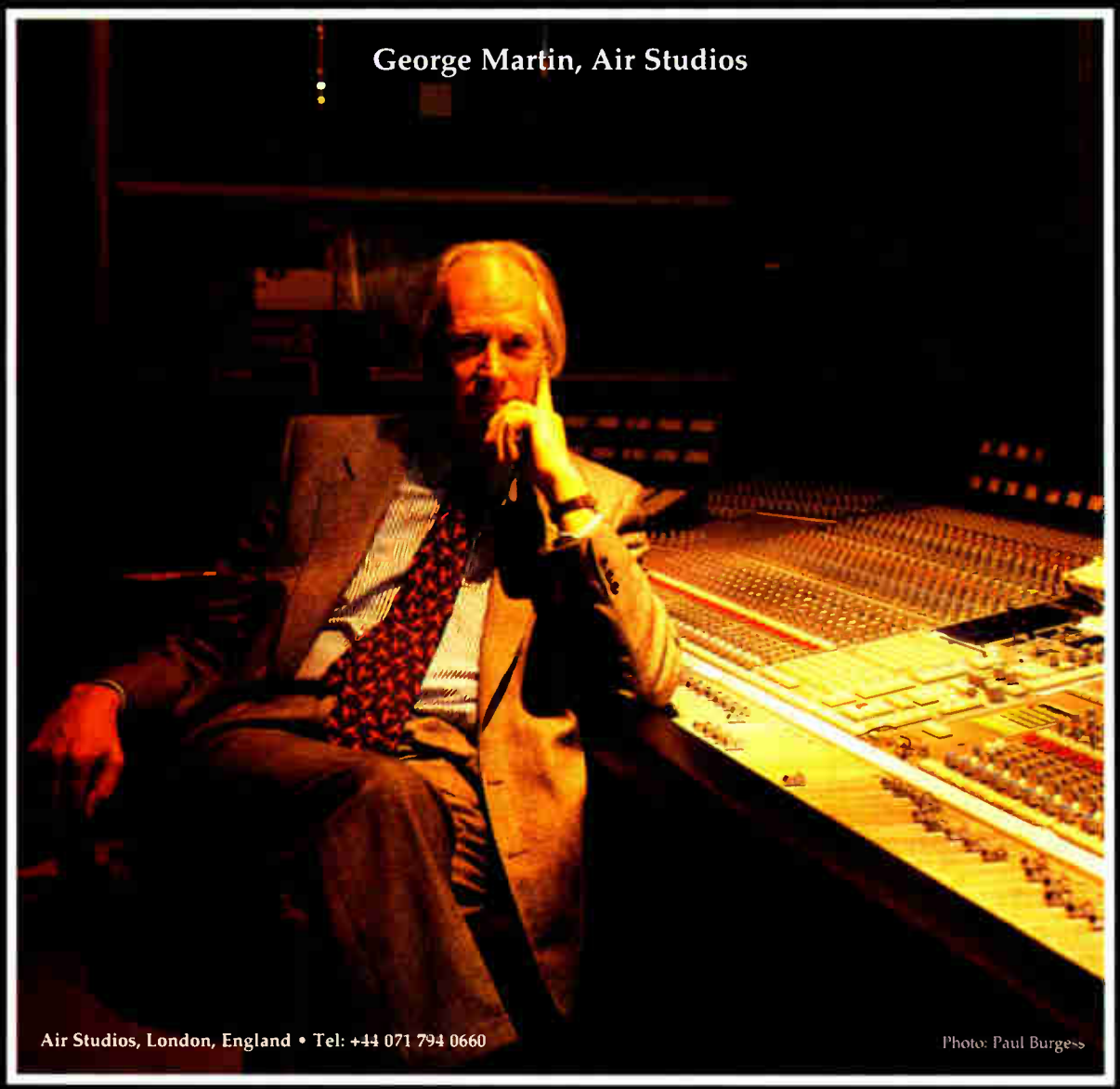

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MIX MAGAZINE PRESENTS

SOUND FOR PICTURE

FALL 1994

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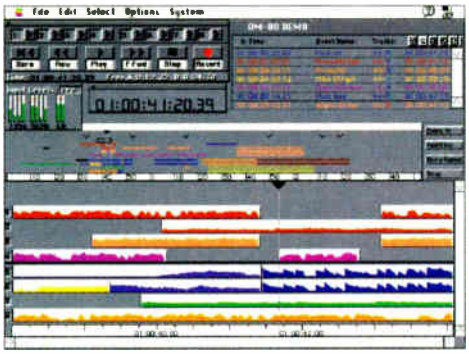

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A SUPPLEMENT TO MIX · SEPTEMBER 1994

EDITOR'S NOTE

Music, effects and dialog. When I got my first assignment to write about sound for film—interviewing the sound team for *The Doors*—this triangle provided a simple means of breaking down the process of adding sound to picture. Music can be original score or borrowed source; effects can be recorded originally, designed in the editing room, pulled off a CD or in-house library, or created in a Foley session; and dialog can be taken from the production track or recorded later in an ADR session. In a simple world, creating the sounds and synching them to picture is the province of a sound editor; balancing the triangle is the province of the re-recording mixer.

But then you throw in production sound mixers, DAT pull-ups and pull-downs, edit decision lists, telecine, transfers, time code, laybacks—and suddenly adding sound to picture is not so simple. A massive number of elements and processes go into assembling the soundtrack for a feature film, television show, commercial spot or multimedia presentation.

Mix has been covering sound for picture since the first issue in 1977. We've seen musicians migrate into post-production, and we've seen video houses open state-of-the-art audio rooms. We were there at the birth of music videos, and we reported on the advent of long-distance, multichannel audio transmission over phone lines. We've seen Moviolas replaced by digital audio workstations and facilities that are beginning to build completely sprocketless film-mixing rooms. What will happen in the next five years...or 17 years? Talk to anybody involved in sound for picture, and the enthusiasm rubs off—it's an exciting time to work in audio post.

In this special semi-annual supplement, *Mix* takes a look at trends and issues affecting the New York and L.A. post-production industries. *Mix* editor George Petersen gives some advice on how to use the new modular digital multitracks in post applications. Contributing editor Mel Lambert examines system networking of digital audio workstations and reviews the Studer Editech Dyaxis II Multidesk console. Vancouver writer Tim Moshansky interviews three effects recordists, and contributing editor Dan Daley finds out how project studios can enter the world of surround-sound mixing. Finally, "Sound for Film" columnist Larry Blake begins a four-part series on pitfalls to avoid in the post-production process.

We hope that you find this special supplement useful in your own work. If you have comments on our coverage of the audio post-production market, please don't hesitate to drop us a line. See you at AES!

Tom Kenny
Mix Associate Editor

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New Products for Film/Video Sound

On the cover: Studio 1 at Todd-AO, designed by Paul S. Venaklasen & Associates, features a custom ADM console with 65 Flying Faders-automated EQ ins and 54 non-automated EQ ins. The room, which this summer handled the mixing duties on *Renaissance Man* and *Blown Away*, among other projects, includes a JBL Theater System behind the screen, with 415s on each channel. To hear the bottom-end punch of the digital-sound-on-film formats, the company installed 22 Bag End ELF System subwoofers (16 for discrete subwoofer channels and six used in pairs for left-center-right), which company president Chris Jenkins called "the most musical subwoofers on the market." The Bag Ends are powered by two Crown Macro-References (6,000 watts); the rest are powered by Ramsa WP-9440s. **Photo:** Henry Heine.

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THE RETURN OF THE LOTS

A TOUR THROUGH L.A.'S POST COMMUNITY

Heading out from the corner of Sunset and Highland in Hollywood, you can find any audio, video or production service you might need within a 20 minute drive, in any direction. Hollywood Digital, next door to the Cat and the Fiddle, is within striking distance of a Hollywood. Paramount Pictures is a short jaunt down to Melrose. You can walk to Todd-AO and 525 Post to the south, with Soundelux a short hop to the north, along the Walk of Fame and across from Mann's Chinese Theatre on Hollywood Boulevard. Serafine Sound Design, Pacific Ocean Post and Skywalker South—out on the West Side—are right down the recently reopened Santa Monica Freeway. Or you can go over the hill and be in North Hollywood and Burbank in minutes, stopping at Weddington, Advantage Audio, Warner Bros., Universal, Disney, Sony, Fox or any of dozens of music rooms, editorial houses, production companies and post facilities.

It's a steel-mill town, said more than one source on *Mix*'s recent tour of the L.A. post-production community, referring to the fact that the entertainment industry drives the local economy. But there's one important difference: Steel died, and so did the small factories in the small towns surrounding Pittsburgh. The entertainment industry is evolving, exploding into new markets and new formats. And this is changing the shape of audio post-production technologically, sociologically and economically.

Perhaps the biggest change going on in Los Angeles right now, and the one with the broadest implications, is that film studio sound departments are back! Sony Pictures Studios completely revamped its audio facilities in 1991-92, installing Harrison boards and as many as 40 Waveframe workstations, updating the Cary Grant Theatre and moving toward all-digital post-production.

CONTINUED ON PAGE 12

BY TOM KENNY

Photo illustration: Todd Barbee/Macropolis

An L.A. Travelog

OAKLAND TO BURBANK is the easiest air commute going. Lodging at the Mondrian rock 'n' roll hotel on the Sunset Strip. A few observations on a three-day hike through the L.A. post community: The workstation wars seem to have settled down, with each house deciding on a different platform; someday soon they will all talk to each other. While most musicians seem to have picked the Alesis ADAT as the modular digital multitrack of choice, the post industry has embraced the Tascam DA-88; likewise, the new Mackie 32x8 consoles are everywhere. And, the move out of L.A. to the West Side is real. That's where we started on Monday morning, D-Day.

LIZ EARLS

Frank Serafine, holding Dioji, and the staff of Serafine Sound Design

MONDAY, JUNE 6

BREAKFAST AT SERAFINE'S, VENICE

Actually, it was breakfast at the Rose Cafe, outdoors on the patio, followed by a tour of Serafine Sound Design. Frank's been in Venice, happily, since 1985 and now sees the infrastructure coming. Jim Cameron's Digital Domain is located there. Oliver Stone, Chiat-Day Advertising, Hans Zimmer. Serafine has put together a family-type atmosphere; everybody on the ten-person staff is a musician. Foley, music, effects, sound design. Heavily invested in E-mu products (E-IIIXP). Serafine has an AudioFile, bought a Tascam DA-88 for recording Foley, mixes sound design elements on a Mackie 32x8. A comfortable place, where Dioji the studio dog has full run, and Frank lives upstairs, with his baby grand. Note: Frank's dad stormed the beach at Normandy, then moved on to Berlin.

Projects: Just finished audio and effects for the new Space Shuttle motion simulator ride at Great America in Gurnee, Ill.; picked up design and mix for the full TV season of *Thunder in Paradise*; look for his extensive effects collection to come out on CD-ROM.

A walk among the rollerbladers of Venice Beach, dip a toe in the ocean, then...

LUNCH AT PACIFIC OCEAN POST, SANTA MONICA

Audio facilities have fruit baskets; video facilities serve catered lunch to staff and clients...and journalists. Beef Wellington today—a strange choice for L.A.; I had the salad. POP president Alan Kozlowski exudes Eastern mysticism—listens and absorbs more than he talks. Has played Carnegie Hall with Ravi Shankar. Office full of music memorabilia (signed McCartney photo, Jackson Browne tour paraphernalia—Alan handled multimedia stage presentation) and guitars, even a sitar. High, high-end video. Just bought Kodak Cineon digital film systems. First Neve Capricorn digital console in North America. Mary Reardon gives a great tour.

Quote from Kozlowski: "The technology is there to facilitate exchange between creative people. Anybody can buy the technology, but there's no substitute for vision and professionalism."

Note: This town is fueled by Evian and Pellegrino. It's more expensive than gas, and it's handed out everywhere. Four bucks a pint in the Mondrian honor bar.

Tried to get into Skywalker South on the way back to Hollywood, but James Cameron seemed to have the place locked out in a mad rush to finish *True Lies*, which was rumored to be "way behind" and still too long, with one week to go before the final mix. So, it was on to Burbank and Warner Bros., from the 10 to the 405 to the 134 to the 101, with a gas tank on empty. Now that's scary.

LIZ EARLS

POP president Alan Kozlowski

HAPPY HOUR AT WARNER BROS.

Don Rogers, now in his 60s, is working 16-hour days and, by all appearances, loving it. Not often do you get a chance to redesign such a massive audio department. He took two hours to give us a walking tour of the future, through construction zones and partially installed SSLs. Judging by the couches in the scoring stage, the facility was in dire need of an upgrade. Watch for Warner's to have the first install of

World Radio History

OUR 8•BUS REALLY

We get a lot of calls from folks asking about who's using Mackie 8•Bus Recording/PA consoles.

Good question. After all, a board's only as good as its users.

So we grabbed the latest stack of 8•Bus Warranty Registration cards and hit the phones.

The names in this ad represent a cross section of current 8•Bus users. They range from platinum supergroups tracking new albums to high school choirs, from bar bands to sound designers working on network TV series and feature films. There'd probably be more names but we didn't want to make the type any smaller than it already is — or keep tying up our already clogged phone system.

As our production of 8•Bus boards increases, so does this list.

In a way, it's confirmation of the raves that magazine reviewers have heaped upon the console. Above all, it's proof that the Mackie 8•Bus is a serious tool for professionals. A tool that's getting used day-in and day-out for major projects.

Call our toll-free literature line 8AM-5PM PST and talk to a genuine Mackoid (no voice mail!). We'll send our obsessively-detailed 24-page color brochure on the 8•Bus Series.

Then become a part of this list by visiting your nearest 8•Bus dealer.

Currently in Spain tracking new album on multiple Mackie 24•8 consoles.
Def Leppard

Sound design & mixing of commercials for G.I. Joe, Kenner Toys, Hasbro Toys, Transformers ½-hour show, infomercials.
Lawrence Wakin • Tapestry Productions Inc. • New York, NY

Tracking for Madonna.
Shep Pettibone • Mastermix Productions Ltd. • New York, NY

Recorded Grammy-Nominated "Sunday Morning" off of the album Millenium on 24•8, currently working on new album exclusively on console. "The 24•8 survived the 7.1 San Fernando Valley earthquake. It's definitely built for rock 'n' roll."
Sheldon Reynolds • Earth Wind & Fire • Los Angeles, CA

Music scoring for Pepsi Cola and McDonalds and Six Flags TV & radio commercials.
The Listening Chair • Dallas, TX

Recording and mixing of acoustic music & sounds from the American West. Recent albums include "Charlie Russell's Old Montana Yarns" by Raphael Cristy and "Where the Red-Winged Blackbirds Sing" by Jim Schulz.
Bruce Anfinson • Last Chance Recordings • Helena, MT

Pizza Hut commercial scored to film, scoring of theme presentation for The BaseBall Network, self-produced album "Rick DePofi and the Mels," currently producing NY Noise's 1st solo artist, Aaron Heick (Chaka Kahn's alto player).
Rick DePofi & Craig Bishop New York Noise • New York, NY

[1] *Former posts include quality assurance with Warner Brothers, Sheffield Labs, Rainbow Records, Chief Mastering Engineer at JVC. Quote: "It's a great board, dude. Buy it!"*

Concert sound reinforcement at the Showcase Theater.
Bob O'Neill, Manager of Entertainment • Six Flags Great Adventure Theme Park • Jackson NJ

Used by students for learning recording and sound design.
The School of The Art Institute of Chicago, Sound Department Chicago, IL

Tracking for R&B and rap groups including vocals for Polydor artist T. Max.
Brad Young & Dow Brain Underground Productions Boston, MA

Dialog editing for Untouchables, TV series and Movies of the Week. "I work out of my home now. It's quite an achievement to be able to get a higher sound quality than most of the other sound houses in town."
3-time Emmy winner David Scharf Helix Sound • Los Angeles, CA

Wide range of multimedia projects including major motion pictures (the names of which can't be divulged).
John Acoca[1] • Oracular Multimedia San Francisco, CA

Jazz choir sound reinforcement and recording.
Dwayne Pedigo • Plano East Senior High School • Plano, TX

Sound effects, music and voice for Atari arcade games.
Brad Fuller • Atari Games Corporation • Milpitas, CA

Albums for alternative groups Twenty-Two Brides and The Cucumbers, demo for Freedomland.
John Williams • Ground Zero Studios • New York, NY

"Praise Songs" contemporary Christian album/CD, "Body Builders" children's album/CD.
Peter Episcopo • Bridge Song Media • Old Bridge NJ

Sound design for Pepsi Cola TV spot aired during last January mondo-bowl.
Hans ten Broeke[2] • Buzz, Inc. New York, NY

Sound reinforcement for theater presentations and concerts in a 300-seat theater.
Centre Culturel Franco - Manitobain • Winnipeg, MB, Canada

[2] *Quote: "It's the only analog component in my room. You hardly know it's there, it's so transparent."*

World Radio History

CONSOLES WORK.

TEC TECHNICAL EXCELLENCE & CREATIVITY 1994 NOMINEE

In studios...in clubs...in video and film production facilities... on the road: A sample of what satisfied 32•8, 24•8 and 16•8 owners are doing with their consoles (as of late April, 1994).

Frank Serafine, feature movie sound designer/SFX wizard in the Foley Room at his Venice, CA production complex.

Scoring for two Fox Televison NFL promos, theme & scoring for PBS children's series Storytime, song demos & album tracking, TV commercials, infomercials & demos.
John E. Nordstrom II
Love Den Productions
Pacific Palisades, CA

Album/CD tracking and mixing for the groups Mean Solar Day and Product.
Ramsey Gouda • Onion Head Studio of Chicago • Chicago, IL

MB•E Meter Bridge $695[4]

The Side-car $395[4]

Worship service and in-house con-cert sound reinforce-ment, recording of sermons.
New Life Assembly of God
Lancaster, PA

Skittles TV commercial, demo for new artist Nita Waitaker, original music for Terpsicorps modern dance company.
Lincoln Adler
Are We Famous Yet? Productions
Los Angeles, CA

Sound reinforcement in a live blues club showcasing live, regional & national acts such as Savoy Brown, Jr. Wells, etc.
Manny's Car Wash
New York, NY

DNA sampling CD with mega-drummer Bernard Perdie (3000+ album credits)!
Frank Heller[3] • Weasel Boy Recording • Brooklyn, NY

Rental for film mixing projects and home studios. "We love them because we never see them. They're great for our business."
Chris Dunn • Dreamhire
New York, NY

[3] *Quote: "This job had extremely unusual and demanding monitoring & effects requirements. I honestly couldn't have done it without the 32•8."*

[4] *Suggested retail price. Slightly higher in Canada.*

OTHER PROFESSIONALS WHO OWN AND USE MACKIE DESIGNS 8•BUS CONSOLES*

Dave Abbruzzese, *drummer for Pearl Jam*

Slash, *guitarist/songwriter, Guns 'N Roses*

Steve Brown, *guitarist/producer for Trixter*

Natalie Cole, *solo artist*

Greg Droman, *Grammy-nominated engineer for Linsey Buckingham*

Gregg Field, *drummer for Frank Sinatra*

Michael Frondelli, *Engineer-Producer (Eric Johnson, Crowded House, etc.), Creative Director for Capitol Records*

Bill Gould, *bassist for Faith No More*

Bashiri Johnson, *percussionist for Whitney Houston, Madonna*

Mick Jones, *producer for Van Halen, guitarist for Foreigner*

Art Neville, *producer, The Meters, keyboardist, Neville Bros.*

David Frangioni, *MIDI specialist/Engineer Aerosmith, Elton John, and Extreme*

Danny Kortchmar, *producer for James Taylor, Billy Joel, Rod Stewart*

Bruce Kulick, *guitarist for Kiss*

Kyle Lenning, *President Asylum Records, Nashville*

Clair Marlo, *Artist, Producer*

Queensryche

Dave "Snake" Sabo, *guitarist for Skid Row*

Ben Sidran, *producer*

Leo Sidran, *songwriter for Steve Miller*

Steven Tyler, *singer for Aerosmith*

**Mention in this list is intended to indicate ownership only and does not in any way denote official endorsement.*

Producer Ricky Peterson's Pre/Post Production Room with Mackie Designs 24•8 at Paisley Park.

R&B radio remix of Boz Scaggs' "I'll Be The One" for Virgin Records, recording solo album for the Japanese Go Jazz label.
Ricky Peterson, producer, Paisley Park
Minneapolis, MN

MACKIE.
20205 144th Ave NE • Woodinville • WA • 98072 • 800/898-3211 • FAX 206/487-4337
Outside the US, call 206/487-4222 • Represented in Canada by S.E. Marketing • 800/363-8855

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Rock Sweepers and IDS

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USE READER SERVICE CARD FOR MORE INFO

TimeLine WaveFrame's hotly anticipated disk-based dubbers, rumored to be in beta later this year. And watch for a *Mix* feature on the whole system install.

Back to the Mondrian to get dressed for L.A.'s hottest new club, the House of Blues. It's house band night, and we meet Mix's L.A. editor Maureen Droney for a Cajun dinner. Lulu, our waitress, waived the $10 charge and got us on the floor, where we danced till 2. Clean and loud Yamaha system.

***Wylie Stateman of Soundelux at Yuma Air Force Base, recording F-14 fighter sounds for* True Lies**

TUESDAY, JUNE 7
SOUNDELUX

Busy, busy, busy with *True Lies*, shuffling units over to the Skywalker stage and finishing up the design on some of the harrier-jet sequences. Quite a few WaveFrames, with other workstations as well, and the occasional Moviola. Projects in progress: *I Love Trouble*, *Natural Born Killers* (Oliver Stone), *Legends of the Fall* (Edward Zwick), *The Color of Night* (Richard Rush), and the high-profile *True Lies*, which will be a shoo-in for yet another Soundelux Academy Award nomination. Not to mention Hollywood Edge effects library, Advanced Data Encoding for importing film EDLs, and the newly opened Soundelux Media Labs (watch for some of Scott Gershin's musical-effects influence), for interactive projects.

Got a parking ticket. Can't expense that. Late for Weddington. Hollywood Freeway N to the 170, exit on Magnolia, through the Lankershim light, left at the unemployment office (ouch!) and right on Weddington.

WEDDINGTON PRODUCTIONS

Triple threat of Mark Mangini, Richard Anderson and Steven Flick. A Pro Tools house, though it's been difficult getting Anderson to convert from mag. Hey, who's arguing. A funhouse of audio, with a great sense of humor and a real working vibe. Small mix facility handled *Reservoir Dogs* and Quentin Tarentino's Cannes winning follow-up, *Pulp Fiction*. *The Lion King* (Anderson-Mangini tag-team) is a huge hit and should garner another Oscar nomination for effects editing. Huge library of sounds. Working on *The Puppetmasters* with Donald Sutherland (he's all ADR, they say) and *Little Big League*. Just put out *The Flintstones*, *Speed* and *Reality Bites*.

Back down to Hollywood...

LIZ EARLS

Thom Davis formerly of 525 Post

525 POST

I arrive to find out that one of the audio department's big draws, designer/mixer Thom Davis, will be in Nashville by the time you read this, setting up his own shop with a Euphonix console and 20-channel Fairlight MFX3. He's being replaced in-house by Damian Wagner. Working on MTV Movie Awards, Otari ProDisk and a Neve VRP-48. Again, video houses have catered lunch, though we're a little late and simply get some pasta salad with asparagus. High-end commercial house, one of the first to install fiber between buildings.

Six blocks up Highland, to...

ASPECT RATIO

An ad agency, essentially, but one that, like Cimarron and Kaleidoscope, puts out trailers for TV. Just missed the omnipresent movie trailer voice-over artist Dan LaFontaine, but did get to hear him on a 60-second spot for the upcoming Macaulay Culkin flick, *Richie Rich* (the ad imitates *Lifestyles of the Rich and Famous*). All the studios except Universal are clients. It's a ScreenSound facility. The most difficult part, according to chief engineer Craig Donnelly: Source material comes in on any and all types of formats, often unlabeled.

Dinner will have to wait. It's back up to Warner Bros. for a Bill Conti scoring session, mixed by Lee DeCarlo.

LIZ EARLS

Composer Bill Conti and mixer Lee DeCarlo listen to playback at a Warner Bros. scoring session

SCORING AT WB

Wow! Sixty-two pieces to score a Mike Ritchie film, *The Scout*, and all ready for downbeat at 7 p.m. Consummate professionals all around. Lee laments the loss of the ADM console (it's all-gold!) with the planned January overhaul; he recommends a Focusrite. The emotional, final 5-minute cue gets a standing ovation. They even call Albert Brooks (the star) during the playback and have him listen over the phone. It was election night in California, and cigar smoke filled the control room. "We're electing the next guvnor!" Ritchie said. Thanks to Damon Tedesco, second engineer (known as stage) for the night and son of Tommy, for getting us in. It was magic to these ears.

WEDNESDAY, JUNE 8
5555 COMMUNICATIONS

In-house ad agency on the Paramount lot, at 5555 Melrose, in the new Marathon Oil Building. Avids throughout, all linked by fiber. Custom Raindirk 40-in, 32-bus console for the TV trailer mixing suite. Machine room has dubbers and all transfer capabilities, but the main rack contains three Tascam DA-88s. To select an MDM, Chuck Garsha set up the Tascam, Alesis ADAT and Fostex ADAT on endless-loop program, turned out

the lights and went home for the evening. The Tascam was still running in the morning, perfectly locked. Real creative, experimental atmosphere. With a print division as well. An incredible 528-seat screening theater next door. Expect more from the main editorial and dub stages in the near future.

Only about ten blocks away, near the corner of Sunset and Highland, is...

LIZ EARLS

The machine room at Hollywood Digital

HOLLYWOOD DIGITAL

Valet parking! And I thought it was only all the restaurants. Super high-end commercial house. Three big draws on the audio side: SSL Omnimix (first in North America), Scenaria and director of audio Andre Perreault, not necessarily in that order. Two ScreenSound rooms, as well, connected to a central voice/Foley room. The Omnimix and Scenaria rooms are identical, which I found to be typical in video houses, so as not to offend a client when they get bumped out of a room. Again, a full lunch. Andre mixes the hugely popular *Larry Sanders Show* for HBO and about one Movie of the Week per month. Plus commercials.

What to watch out for: Andre wants a music-tracking room.

LAUBE-ROTH

A homelike feel. Comfortable, light, spacious and airy. Southwestern decor. Basically an Avid offline house that has incrementally added audio services. Eric Garcia runs the audio room with a rock 'n' roll mentality, adding music beds and scratch effects that are later finished at Margarita Mix. This way a client can preview at a much cheaper rate at the offline phase. Garcia started out with a Mac and an Ensoniq sampler, then added Sound Tools, then Pro Tools, and now has a full-bore MIDI cockpit with a Tascam 32x8, three ADATs ("every musician I know has one," Garcia says), ¼-inch capability and racks of keyboards and samplers. Studio bau:ton is designing a full-fledged music room for Garcia, who owns all the equipment personally. Look for creative, contemporary work in the future. A real musician's approach to sound design.

Off to a taping of the Leno show. Herded around the NBC lot like so many cattle. Later, we're out on Melrose for dinner at Cafe Luna, and Jay pulls up in black mask and cape, driving a vintage black convertible and dropping off a guest—it's a taped skit for a future show. They say it's really a small town, and now I believe it.

THURSDAY, JUNE 9

TODD-AO/GLEN GLENN SOUND

Henry Heine is in from Bag End to shoot the cover of this supplement—Todd's main stage at 900 Seward, where they just mixed *Renaissance Man*, followed by *Blown Away*. The Bag End subwoofers "are the most musical," says Chris Jenkins, president of Todd. Such a history here. Tremendous attention to quality control. Made a commitment to Fairlight workstations. Rebuilding studio 2, which is going to have an all-Tascam machine room—sprocketless! ("The time has come," Jenkins says.) Added Todd-AO Digital Images as a Silicon Graphics-based production center. Thanks to engineer Dave Tourkow for setting up the visit.

Hustle up to Burbank Airport, drop off the car, and we're back in Oakland an hour later. I love L.A.!

—FROM PAGE 6, THE RETURN OF THE LOTS

Then last year, Warner Bros. Studios in Burbank plucked Barry Snyder off the Sony lot (on a recommendation from Lorimar, now Warner Bros. TV), made him a vice president and asked him to work with Don Rogers on a $25 million, two-phase upgrade of its audio department. At the April NAB show in Las Vegas, you couldn't walk by a booth without some audio manufacturer whispering about how they were working on an install at Warner Bros.

The other big change involves telecommunications and technology. Every facility we visited talked at some point about fiber optics or one of the long-distance phone-line carrier networks, whether EdNet, Drums or Pacific Bell's ABVS. The big side effect of the (r)evolution in digital audio and video transmission is that location becomes less and less important. Many have fled from L.A. in recent years—to the West Side of town, namely Santa Monica and Venice, out to the Valley, or, at least in one case, all the way to Nashville.

LIZ EARLS

Don Rogers (left) and Barry Snyder of Warner Bros.

FULL-SERVICE FILM STUDIOS

Warner Bros. is the biggest news in town these days. Phase one of its huge audio renovation began in October 1993 and is expected to be ready this month. Four dubbing stages will come online—two for feature film work, designed by David Schwind and housing custom integrated SSL 5000/8000 consoles, dual JBL monitor systems and eight Turbosound subwoofers; and two for television work, containing Quad 8 consoles with Massenburg automation. The first project, a Sylvester Stallone action-adventure film titled *The Specialist*, is scheduled for September 6.

Twenty-five editorial rooms, both video and audio, have been added, driven mainly by Avids and TimeLine StudioFrame workstations. There also is an all-new Foley room, with a larger than normal dirt pit (at the request of Foley walkers—Warner solicited input), double doors big enough to drive a car through, a heated water pit, and rear projection on a high-de-

World Radio History

finition Sony screen to eliminate the shadows from Foley walkers as they perform on the stage.

Phase two will begin in January and involve an overhaul of the renowned scoring stage. The floor will be removed, as will the famed ADM console and its all-gold connections. Obviously, Warner is moving back into full-service post-production, as are Paramount and Fox, and as Disney and Sony did before them.

Now that the protracted takeover by Viacom is complete, Paramount is concentrating more audio services back on the lot. One area that is already up and running is 5555 Communications, the company's in-house advertising agency (in the newly constructed Marathon Oil Building) that handles trailers for TV and theaters, corporate reels and print ads. Chuck Garsha was brought in to oversee design of the technical systems, as well as the construction of a 528-seat THX screening theater.

Although the Marathon facility resembles an ordinary office building, the second floor is wired for the 21st century. Every Avid edit bay is fiber-optically linked. A small fiber-optic room, adjacent to the central machine room and connected to the Pacific Bell ABVS system, portends a future in which trailers will be mixed in the sound design suite, then sent to TV stations terrestrially with the push of a button and a dial-up from the phone bank.

Today, however, it's the sound design suite that has been garnering all the attention and attracting visitors from other facilities. Most come to see the new 40-in, 32-bus Raindirk console, which Garsha describes as "extremely flexible" and specifically made for trailer work. The room is set up as a high-end "living room," albeit one with a narration booth.

Three Tascam DA-88s have replaced the Magna-Tech dubbers in the quiet machine room, though Garsha admits that tape is an intermediate step until disk-based dubbers are ready. In the edit bays, they're moving toward the Seagate 9-gigabyte removable drives, and a rack in the machine room awaits the new AudioStation from Avid.

It could be argued that Disney started this back-to-the-lot movement about eight years ago with a multimillion-dollar renovation of its dub stages and ADR and Foley rooms. About 2½ years ago, the company put a crew of five in an editorial suite, film-style, and that's been upgraded to nine Digidesign Pro Tools and Avid AudioVision systems. Last year they did the effects work on six features, and that's only going to get bigger.

"The decentralization of the post-production services businesses that started happening in the mid-'70s and throughout the '80s—where most of the studio departments were shutting down and shrinking and so on—produced a lack of creative and financial controls in the production of films at the studios," says Chris Carey, director of post-production at Buena Vista Sound.

"I think what happens is that the natural progression of business takes you to one extreme, and then there are opportunities created," he continues. "It goes in cycles, where you get people with entrepreneurial minds—like myself or Don Rogers or Mike Kohut—in these positions who have a desire to see things built back again. And it's easy to justify now because the capital investment required is readily financed by the amount of revenue we can produce.

"The premise of our whole operation is to compete in the marketplace, at fair market value, with creative talent and quality. In order to do that, we saw that a complete-package service company was necessary: We had to dub, Foley, transfer, edit—do the whole thing."

The move toward full-service audio post on the lots has its parallel in the video industry, where houses like Hollywood Digital and Pacific Ocean

LIZ EARLS

Part of the ¼-inch library of sounds at Weddington

Post have put in top-of-the-line audio rooms in recent years. How this affects the post industry is anybody's guess, but it seems that the larger, well-established facilities will stay busy, the smaller, one-room project facilities will be able to maintain their niches—whether it's scoring for episodic television or scratch music and effects for commercial spots—and the middle ground will get squeezed.

Sound for feature films is a feast or famine operation, and you're considered only as good as your last film. If Warner Bros. or Fox or Universal steals back one or two films a year from some of the independent editorial houses around town, it could have a huge impact, especially if the independents are leasing equipment, trying to maintain payroll and locked into a high rent.

Todd-AO/Glen Glenn Sound is arguably the king of the independents, with a long history, no debt and a reputation for technical and creative quality. In essence, the company is an "audio lot," complete with its own scoring stage and satellite facilities.

LIZ EARLS

***Chris Jenkins of Todd-AO holding the main prop from* Blown Away**

"What we're seeing is that the studios have decided it's time to get back in the hardware side of the business, and they're using what they call 'soft dollars,' their own internal money, to fund it," says Todd-AO president Chris Jenkins. "And, for the first time in the past 15 years, they're starting to bring in high-quality guys who were working freelance or were working at other studios onto the major lots. Maslow and Landakker are going to Universal. A couple guys from Disney are going over to Burbank Studios. So there is a real threat to independent companies, and the unfortunate side is that the little guys get squeezed hard. The lower echelon—the person who could buy a Synclavier and operate alone and do one TV show a year, or the guy who could have one small mixing studio and do one episodic show or one small feature a year and make a nice living—that isn't there anymore. So the independents have a lot of pressure on them to perform."

Much of this is the nature of the business: performance and credits are paramount, and the well-managed, creative companies will weath-

er the good times and the bad. Weddington Productions and Soundelux are two independents with outstanding credits and creative talent. Neither is sitting still.

"Warner Bros. may be putting in 25 editorial rooms, and, sure, it concerns us, but they're not going to get the 25 top editors in town, and this is still a business that runs on creativity and talent," says Mark Mangini of Weddington. "People come here because of Richard Anderson, or Steven Flick, or myself, or any of our editors, and it's still going to be that way."

Be that as it may, Weddington has added low-budget feature film mixing as a service, and they have made inroads into special venue audio with the sound design for the Bat Car Theater Thrill Ride. Soundelux, meanwhile, opened an Orlando, Fla., facility a couple of years ago, and just recently leased the ground floor at their Hollywood Boulevard address to house Soundelux Media Labs, a relatively low-key but state-of-the-art entry into interactive sound design. The message: Don't keep all your eggs in the feature-film basket.

TELECOMMUNICATIONS & NEW TECHNOLOGIES

The irony in the film studios' move to bring audio services back onto the lots is that the revolution taking place in telecommunications is making location less and less important. Obviously the film studios have other things in mind, such as the previously mentioned creative and financial control. But for the rest of the audio post industry, whether television, commercials or corporate work, the ability to transmit full-bandwidth, multichannel digital audio over the phone lines changes the socioeconomic structure of the business. And now that fiber-optic lines are being installed across the country, digital audio *and* video will soon be sent simultaneously.

Facilities have been linking their rooms with fiber for years now. 525 Post tielined its buldings years ago because they owned the parking lot in between (renting the right-of-way is still expensive). Pacific Ocean Post in Santa Monica just linked its video facility with its audio department across the street. Pacific Bell was laying fiber along Seward Street, so Todd-AO had them "stub" it to the corner of their building while they decide where they want to go with it.

It's not that digital audio transmission is dependent on fiber; plenty of long-distance sessions have taken place already. It's just that fiber promises digital audio *and* video, and once the phone companies (or cable companies—the U.S. House recently passed sweeping legislation to allow the two to compete on each other's turf) establish a means of entry into the home, the way people work will change dramatically.

"The telecommunications impact upon what we do has a huge significance, in that location isn't going to be as much of an issue," Jenkins says. "Talent is always going to be number one. Location and the site you choose used to be number two, because people want to be comfortable, want to have an environment where they can work 16 hours a day, seven days a week. So the creature comforts are great, and the greatest creature comforts we have is where we make them up for ourselves.

"We talk about the whole impact of sending high-quality picture and multitrack audio in terms of space planning," Jenkins adds. "We own a lot of real estate on the street here, and we've talked about shedding some of the places that we lease. And I have no concern about doing it because I know the machine room for Studio 1, which is huge, isn't going to be there in four or five years. We're bursting at the seams with sprocketed dummies in a lot of places, and I know that in five years a rack of Tascams will take the place of this huge machine room. That's going to have a major impact."

Everybody we talked to said it's an exciting time to be in audio postproduction, from a technological and creative standpoint. But it's a transitional time. New formats and new standards are coming, but they're not here yet. While Chris Carey at Disney has handled a few long-distance ADR sessions from New York and elsewhere and acknowledges that they are becoming more commonplace and useful, he cautions against overstatement.

"It's useful, and it will become a big-time cost-saver a few years from now," he says, "but there's still a borderline, where if I have to do an entire's day worth of looping, it's a little bit expensive to do it electronically from, say, New York to Los Angeles. But if I have a few minutes worth of work, it definitely makes sense—it's less expensive than putting the editor and director on a plane, putting them up overnight and losing that time.

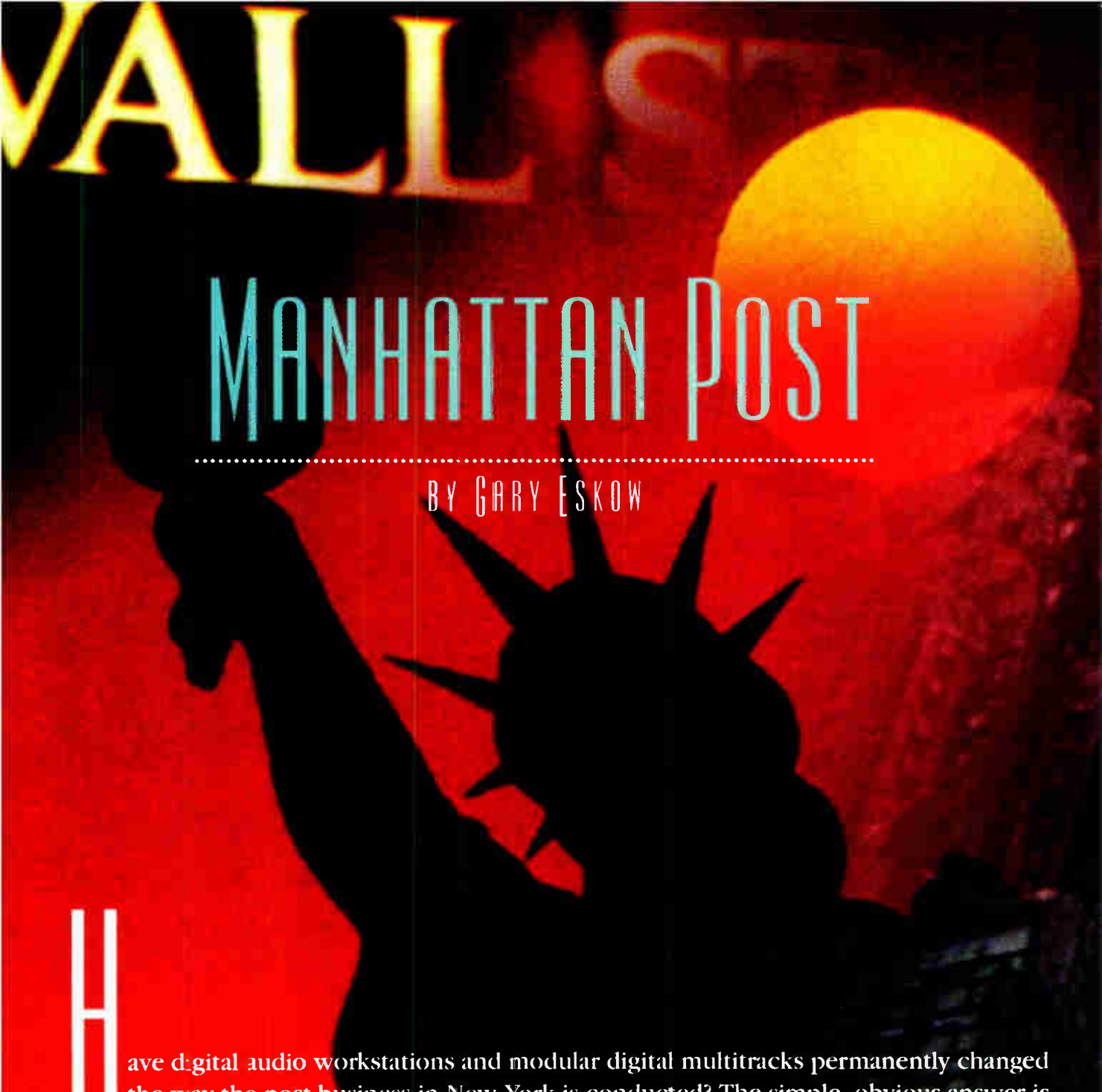
"What I see coming," he adds, "is a transition to entirely electronic postproduction. We've already done it with sound, and picture is not far behind, whereby we will shoot film, transfer it to an electronic media right at the dailies step, and not return to film until the final answer prints are created. In order to do that, one thing we're depending on is the increase in high-definition video quality for the previews process. We're discussing experiments to actually go out and preview a film in high-definition video, which means we won't have to convert back to film while the show is still cutting. When we're done, we cut the negative once."

Digital editing of picture will come. From an audio point of view, the fact that mixers and editors are now bringing workstations to the dub stage provides a hint of the future. "When we put the Fairlight on the stage for *The Firm*, all the guys who load tracks and record started coming in, and...it was sort of like the Zippo lighter with the natives in New Guinea," says Jenkins. "They looked at it and ducked and shucked around a little bit. And then they started coming to me and asking how they could train on this thing. They know that the days of a track loader, or a recordist, are extremely limited. You will still need people to do that type of work, but the track loaders are gone. When we did *The Firm*, we had one track running in the machine room and a picture, for three weeks. And the guy was sitting back there wondering what he was supposed to be doing.

"The whole business hasn't gone that way yet, but the significance is that it will change people's job duties, it will change the real estate requirements, it will change the way time is used. Before, you would have a 30-minute reel change to put up all the new units. Now, you take the disk out, flip it over, and you're back to work.

"So there's a sociological impact coming, and I think if you stay on top of those things, then you're going to stay on top of the business. But that's not to say that some young punk isn't going to come along tomorrow with one little idea and turn a company like this upside down." ■

Tom Kenny is a Mix *associate editor.*



MANHATTAN POST

BY GARY ESKOW

Have digital audio workstations and modular digital multitracks permanently changed the way the post business in New York is conducted? The simple, obvious answer is yes, but the folks out there in the trenches, the men and women who post audio for high-profile films such as *Wolf*, *Philadelphia* and *I Love Trouble*, as well as the spots and promos that feed the appetite of the entertainment beast on a daily basis, will tell you that change can bring chaos as well as opportunity.

Audio information can now be passed around easily. Source material collected in the field, ADR phone-patched between cities, an original score, effects and sound design work—all of these parts can now be shuttled back and forth between members of the team charged with creating a mix, with no signal degradation. However, because no workstation or digital tape system has established primacy, and in the absence of a global EDL protocol, there are times when a signal is all dressed up but has a hard time finding somewhere to go.

Photo illustration: Todd Barbee/Macropolis

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Our Digital Audio Workstation Is Now

Audio Mixers, New York

Fred Venitski (pictured) and Jimmy Regan have the distinction of owning and operating the most used Foundation 2000 on the planet.

Project Studios

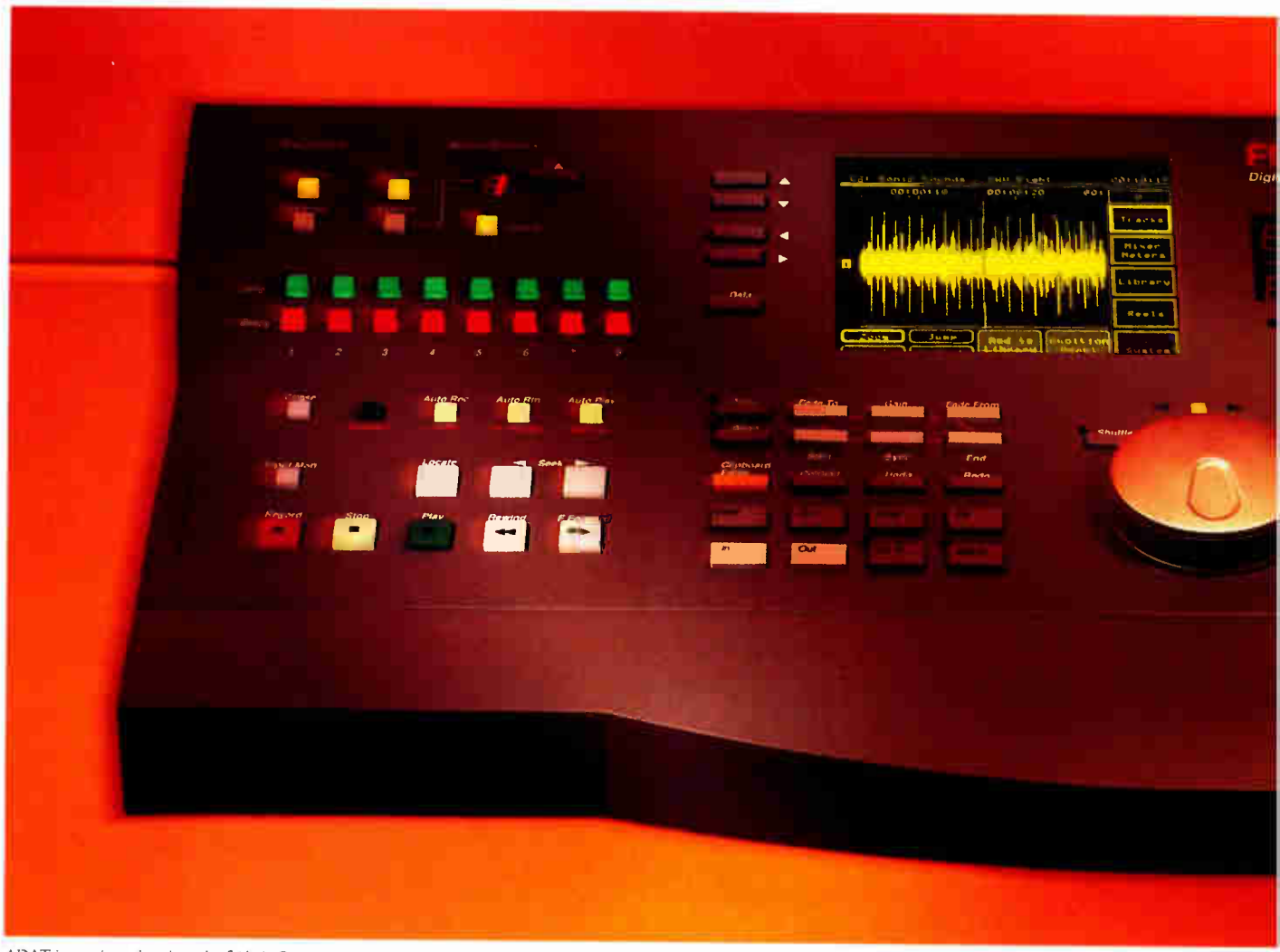
Whether you're working on a complicated soundtrack with thousands of edits, or on a straight ahead music demo, Foundation 2000 is fast and easy. Audio scrubbing is so clean that you'll swear you're rocking reels. Edits are seamless. Fades are smooth and glitch-free. Plus, you can specify the "Light Pipe" for direct digital interface with the popular ADAT™ and RD-8 digital recorders.

Soundstorm, Burbank

Gordon Ecker's busy facility (sound for "Black Beauty" and "The Fugitive") has a Foundation 2000 which controls and chases a JVC S-VHS video deck "beautifully."

Post Production Suites

Foundation 2000 is the fastest and easiest to use digital audio workstation available today. Dedicated editing buttons let you work at lightning speed, intuitively. Define a splice, cut it, and play it back instantly. Don't like it? Undo it and re-do it up to ten levels deep. And Foundation's Removeable Project Environment lets multiple editors work on a single machine.



ADAT is a registered trademark of Alesis Corp.

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PERFORMING WITH THE FOLLOWING GROUPS.

Merrill Lynch, New York

Scott Kersey is the audio engineer who recommended Foundation 2000 for one of the largest private television networks in the U.S.

Corporate A/V Facilities

A low cost plug-and-play solution for in-house production, Foundation 2000 offers comprehensive machine control and synchronization capabilities. You can integrate this system into an existing production set-up without any ancillary equipment. Need to bring in a free-lance engineer to work on a hot project? You can teach him how to operate this system in fifteen minutes.

Vermont Public Radio

Sam Sanders, a happy Foundation 2000 user since January, estimates that he has cut his production time in half.

Broadcast Production Facilities

Our unique Edit Controller looks and feels just like the recorders you work with every day. Foundation 2000 has no keyboards, front-end computers or mice to slow you down. The built-in touch screen shows you a wave form picture of your sound for instant visual reference. There's even an ASRC option so that you can convert one sample rate to another.

FOUNDATION 2000LS

Designed specifically for broadcast production, this random access recorder/editor features the speed, the ease of use, and uncompromising audio quality of Foundation 2000—for less than $15,000! It's the same dedicated user interface with touch screen display, real time operation, event based editing, wave form display, and expandability to a full Foundation 2000 at any time—the only workstation of its kind to offer this important feature. Test drive the high performance Foundation 2000LS in your studio. Call 1-800-7-FOSTEX or 1-212-529-2069 today to schedule a demo.

FOSTEX

USE READER SERVICE CARD FOR MORE INFO

We also found that the New York audio post community is going through a radical reorganization, with small companies creating niche markets and some industry biggies redefining the range of services they offer.

Stan Bochner is a bona fide heavyweight. As Mike Nichols' supervising sound editor since 1980, his resume includes work on *Silkwood*, *Regarding Henry*, *Working Girl* and, most recently, *Wolf*. A hands-on director such as Nichols wants to be involved in all stages of a soundtrack's creation, and Bochner stresses the advantage of his Pro Tools systems in this regard.

"The old Moviolas never had any flexibility," Bochner says. "You only had two tracks, and one of them was taken up with the guide, which left a single track to show your effects—hardly an ideal situation. In fact, it's hard to understand how a director had any real sense of the work we were doing! I'm a freelancer, and when I started working on *Wolf*, I had a 4-track Pro Tools system, which I bumped up to eight for this project." Pro Tools allows for 64 virtual tracks per four-voice system, which meant that Bochner had at his fingertips 128 virtual tracks, more than enough room to lay out his work for Nichols, and, in multiple viewings of a scene, show and explain his process in full.

Chris J. McLaughlin in Studio A of Back Pocket Studios

On *Wolf*, Bochner also used a Sonic Solutions system, a workstation that was much praised by a number of the editors and mixers *Mix* interviewed for this article. Computers are showing up on the mixing stage with increasing frequency, but facilities that would like online finishing rooms have a tough call to make: investing in the wrong technology could be costly, and rental companies are hedging their bets for the same reason. For the time being, independent engineers often end up lugging their systems around town, trying to rid their minds of the potholes of New York as they cab across Manhattan.

C5 Inc., where Bochner makes his editorial home, solved the problem of system compatability by going in with Todd-AO East and Sound One. "We told them we'd be getting into dialog editing on computers and told them that if they could provide a machine onstage, we'd consider purchasing the same system for our rooms," Bochner says. "That's how we bought into Sonic Solutions, which has been great for us.

"Our Sonic Solutions systems have changed the way we do business," he adds. C5 also houses a pair of NED Synclaviers and three PostPro units, but it's the relatively low-priced Sonic workstations that have allowed the company to shift all of its film audio editors into the digital world.

In order to survive, some music studios are complementing their services with audio post. Purists may argue that these studios are not equipped to offer all of the deluxe services like optical phone patching, layback capabilities and Foley stages, but we're living in a practical world, folks, and many clients find that a music studio with an audio workstation and talented staff of sound designers and composers has a lot to offer.

Cassie Davis is a producer at Chiat Day Advertising in Washington, D.C. When Nissan had three radio spots to record, Chiat Day decided to record music and voice-over in New York, where the client could attend sessions. Russo/Grantham, a popular New York music house, was Davis' choice for the original scores. The fact that Russo/Grantham's offices are in the same facility as Back Pocket Recording Studios was incidental to Davis, until the advantages of one-stop shopping were pointed out to her.

"When we realized that they could handle all our audio post needs on these spots, things got a lot simpler for us," says Davis. "First, we sent them the scripts, and they cast voice-over talent; the final decisions on talent were made by the agency and the client while the music was being recorded. Our clients really enjoyed having everything occur under one roof." Advertising time schedules—a joke at best—rarely allow for much contemplation or reworking, and the advantages of recording voice-overs and cutting them in a system like the NED PostPro, while music is being arranged and recorded, can be compelling for clients who want to be actively involved in both processes when time is at a premium.

Howard Schwartz of Howard Schwartz Recording, sans cigar

Peter Francovilla, engineer and digital editor at Back Pocket, focused on the way advertising projects evolve. "We get clients in here all the time who ask for a couple of hours to lay down a voice-over and mix to picture," says Francovilla. "Once they start working, they may ask us to pick a sound effect or two, and often the process will evolve to the point where they're asking us to get involved with the creation of a score. They can see our staff of composers in the hall, or maybe they walk by another room and hear some music they like, and that might excite them to ask us to help in that area as well."

Francovilla stresses the straight line connecting the team of composers, sound designers and mixers, all ready to hop into the post process

on a moment's notice. Time may have passed by mid-level rooms that offer only voice-over and simple layback functions, and perhaps we've entered an era that favors studios like Back Pocket that feature outstanding music services and modest but well-delivered audio post.

If one wants a fully rounded sense of what's happening in New York, a visit with the maestro of Big Apple post, Howard Schwartz, is a must. Schwartz sells and Schwartz delivers, and he has a track record of investing in technologies that work. Like others we spoke to, Schwartz sees a change in the kind of work being done in New York, with corporate communications—once a principal user of high-end production tools—almost completely gone from the scene, spot work coming back, and an increase in network programming that originates from the East Coast.

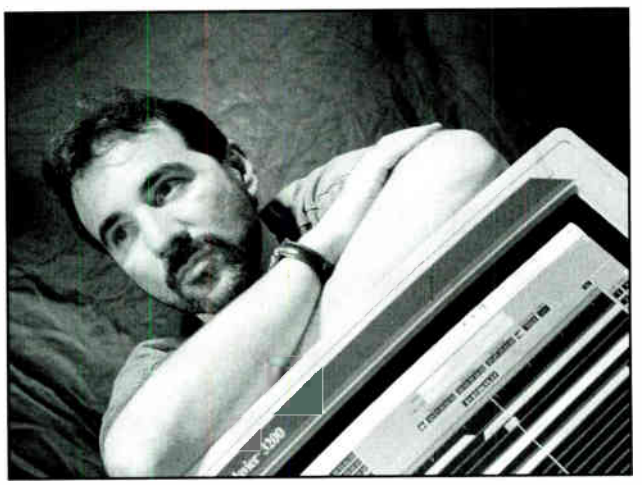
Whereas some facilities are banking on Sonic Solutions or a PostPro, Howard Schwartz Recording is playing the field. "I have every workstation," Schwartz says. "Five SSL ScreenSounds, an NED PostPro SD, two Pro Tools systems, an AMS AudioFile Spectra—and a capuccino machine."

Most facilities say that clients are beginning to expect digital phone patching—Schwartz's 13-room facility is hooked up with a host of optic interfaces, including ISDN, Switched 56, ED2, EDNet and IDG, and his digital patching network hooks his rooms up with more than 100 other facilities in 35 U.S. markets. For Touchstone's summer release *I Love Trouble*, featuring Nick Nolte and Julia Roberts, ADR work for the two stars was completed in New York via a phone patch with film executives camped out in Disney Studios in Burbank, Calif.

"Julia loved being able to do her work alone in a booth, not having to worry about the looks on the faces of a roomful of movie executives," says Schwartz. "Considering the expense of flying in a director—who was in pre-pro on his next project anyway, and a host of studio execs, and putting them up at the Carlyle or wherever, they saved a lot of money and time by working over the phone for the better part of a week."

We found another example of cross-continental digital transmission in our interviews, but this one involved picture as well as sound. Doug Di Franco, senior audio engineer at National Video, explains: "We're getting a lot of requests for digital phone patching now, but we haven't implemented that service yet. However, we're using our video satellite capability quite extensively. We recently had a project in here for Fox Cable Network, which was an overview of NewsCorp. This was a huge presentation in San Francisco, and we were working on the audio post very close to the deadline. What we did is lay back our presentation audio track, which we hoped would be approved (and was) onto a D2 tape of the finished cut. Then we sent it up to the satellite, which downloaded the piece into a D2 machine at a San Francisco facility. Within minutes of us completing our work, they had a digital copy in their hands."

Di Franco, currently up for two ITS Monitor Awards for audio, likes to use his NED PostPro/Synclavier hookup as a delivery medium, dropping right onto videotape through his SSL board. With 16 tracks on both the Synclavier and PostPro systems, Di Franco has plenty of tracks for sound design and dialog editing. He leaves two channels of the PostPro open for a stereo mix, which is laid back to picture via tielines. Backing up his work on WangDats, Di Franco will also drop a mix onto a time-coded R-DAT, should there be a need to finish at another studio.



Doug "Double Dee" Di Franco of National Video Center

Although project studios, and to some extent larger music studios, have been working with Alesis ADATs and, more recently, the Tascam DA-88, New York post facilities have been more reluctant to embrace these machines, preferring to get more deeply into workstations, which allow for much greater editing flexibility (although Alesis would make the case that its BRC unit is a powerful editing tool). Now that the dust is settling, and most facilities have bought into one workstation or another, facilities (ever hungry for more tracks), are looking at digital multitracks as a way to augment their workstation capabilities.

"Eventually, we'll go to digital multitrack," says Tom Fleischman, a re-recording mixer at Sound One who worked on Spike Lee's *Crooklyn*. "We're beginning to use the DA-88s. We like to edit in the Sonic Solutions and port the material over to a DA-88, eight tracks at a time. What we'll be doing is taking the DA-88s into the mix, freeing up the more expensive computer systems for other projects. Since all of our gear is centrally located, there will never be a problem going back into the computer if we need to redo a portion of a mix."

A recurrent theme that most mixers voiced was a desire to see a universal EDL system. Barbara Flynt-Bradley, chief mixer at Video Mix/Aquarius put it this way: "The Avid is the winner in the video field, and so people want to send you their EDL from the Avid and source stations. We have both the Sonic Solutions and SSL ScreenSound workstations, which can take the Avid EDL and autoconform it, but it would be nice to have a single language that didn't need to be converted, that all systems bought into the way the MIDI protocol was accepted by music manufacturers in the mid-'80s."

So there you have it. Some say the overall volume of post-production work has declined in the East, and others let you know how business is booming. However, there is almost universal agreement that the integration of workstations and digital tape recorders will become the de facto way of working in the near future. ■

Gary Eskow is a New Jersey-based musician and writer.

SYSTEM NETWORKING

The Speed and Connectivity Challenge For Workstation Users

Behind the hype and hoopla about the "Information Superhighway" lies a powerful and rapidly evolving set of technologies. Current state-of-the-art networking schemes are capable of quickly transferring gigabytes of digital information—including video, audio, graphics and text—over long distances, and these networking protocols are poised to change the way we live our lives, both at home and in the studio.

BY MEL LAMBERT

WHAT ARE WE ATTEMPTING TO ACHIEVE?

Today there exists a need in a cluster of sound editorial rooms or a multiroom CD-mastering facility equipped with workstations to access a common pool of digital audio data. The goal of fast, easy access to relevant data can be achieved using two methods: 1) duplicate the material onto magneto-optical, phase-change or removable hard drives and provide a copy for each room; or, 2) store files at a central location and allow transfer by individual users via a high-speed interface to a workstation or editing system.

For many, the "sneaker-net" concept represents a realistic networking solution for now. However, keeping track of these duplicate copies—not to mention their high media cost—and having to continuously update multiple sets of files, can be a logistical nightmare. It is the second technique that's attracting more attention from audio facilities, as high-speed data networks become available to manufacturers. But in practice, it's not a simple approach.

Let's consider the technical parameters. A stereo stream of 16-bit audio at a 44.1 kHz sampling rate generates just under 90 kilobytes of data per second. With packaging overhead and other factors, we need to use high-speed storage devices capable of delivering data rates in the multiple Mb/sec range—particularly for multichannel editors and workstations capable of handling real-time crossfades.

The optimal speed for sound file transfer can be achieved via SCSI-compatible interfaces. But having to offload the material, buffer it through a copper or fiber-optic interface, recover it at the receiving site and port it to the second workstation will slow down the data throughput.

This is why some manufacturers are using switched-SCSI interfaces to provide high-speed file access from individual systems, with communications and I/O assignment between platforms being handled by conventional serial networks. Such a hybrid approach offers a practical compromise between speed and accessibility—particularly if simultaneous access to files can also be provided. In addition, some switched-SCSI systems provide integral database and offline backup functions that can dramatically streamline the kinds of routine tasks required in a multiroom facility.

But if the system components are separated by more than 80 to 100 feet, or it is necessary to reconfigure systems dynamically as subsystems are added or removed during the course of a production, then a copper or fiber-optic network is a viable alternative.

COMMUNICATION PROTOCOLS AND DATA HIGHWAYS

Fortunately, there already exists a wide variety of robust and reliable communications schemes for transferring data between workstations.

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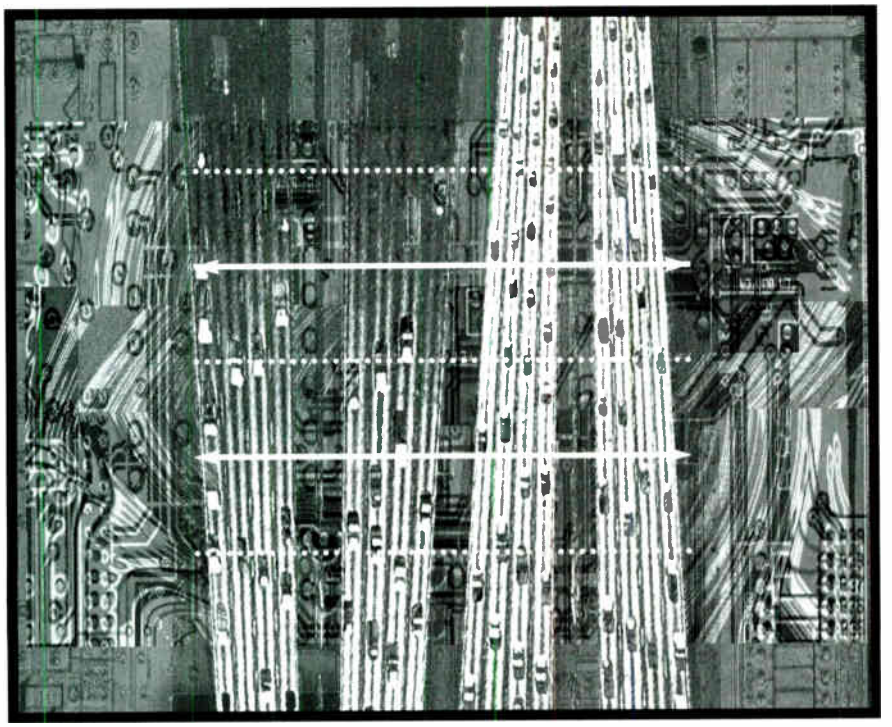

PHOTO ILLUSTRATION: TIM GLEASON

Apple LocalTalk and Ethernet should be pretty familiar to Mac users. But, because their slow speed and/or data-transfer protocols preclude their use for anything more than "browsing" of stereo sound files on a network and non-real-time file transfers between systems, these protocols have little application in multichannel workstations. Ethernet's 10 Mb/sec is further restricted by its CB-like protocol, whereby any device on the network can transmit at any time into the channel. If any two or more transmissions collide, however, the only recourse is for each workstation to try again.

Playback of 24 channels of audio and a digitized video image requires a data throughput of 30 to 40 Mb/sec. At the heart of current generation high-speed networking devices is a dedicated interface card for the storage drive(s) that converts the replayed audio data into a serial form that can be sent via CDDI, FDDI, or the new, lightning-speed ATM Local Area Networks (LANs).

FDDI (Fiber Distributed Data Interface) is a recognized standard for high-performance networks, allowing workstations to be connected in a star array, with individual nodes spun off from one or more concentrators via duplex fiber-optic cables. FDDI supports cable runs up to a mile or so between nodes; theoretically, a single FDDI ring array could run as long as 100 miles. The FDDI standard offers 100 Mb/sec bandwidths employing a Token-Ring protocol that was designed purposely to provide continuous data output even when multiple traffic streams occur on an audio network.

During conditions of high data traffic on a network, transmission integrity of each packet of audio information is vital—even the smallest delay or holdup can cause audible mutes and glitches. To ensure delivery of audio data, we need a continuous, guaranteed data rate, and once the transfer has begun, we cannot tolerate even the smallest of interruptions. Token-Ring networks ensure that each workstation node observes strict access protocols, to prevent data collision and ensure that available bandwidth is shared properly.

The downside is that FDDI networking is pretty expensive; the cost per node can run to several thousand dollars. Alternatively, it might be more appropriate for smaller networks to use CDDI (Copper Distributed Data Interface), a twisted-pair implementation of FDDI that is limited to distances of 150 to 300 feet between nodes. CDDI-based disk-interface cards and bridges cost between 50% and 75% less than those of FDDI units.

PEER-TO-PEER NETWORKS VS. MEDIA SERVERS

Peer-to-peer networking allows any workstation to send audio, video and other files, together with other information, directly to any other workstation on the network. Media Servers, on the other hand, are dedicated workstations that connect to the various fixed and removable storage devices, and handle high-speed delivery of data files upon demand. (Some networks cannot function without a server, which functions as an intermediate step in the data-transfer process.) Major criteria for server selection are high-bandwidth I/O capacity, the ability to accommodate media-specific processing functions such as video capture and compression, plus an adaptable operating system. A flexible system architecture destined to simplify future expansion should include support for peer-to-peer networks as well as media servers.

ATM: ASYNCHRONOUS TRANSFER MODE

The hottest new network format is ATM (Asynchronous Transfer Mode). It offers 1 GB/sec and higher transfer rates over copper and optical networks and will see increased acceptance as soon as the chipsets become available in sufficient quantities and at affordable prices. The ATM protocol is extensive in its scope—it's been developed to handle communications between large databases and extremely fast I/O ports—and follows the seven-layer Open Systems Interconnection (OSI) reference model. The protocol covers the reference model's Layer 1 (physical-medium layer) and Layer 2 (link layer).

Unlike traditional LAN structures such as Ethernet and Token-Ring networks, ATM offers enhanced flexibility and communication efficiency due to its switched and multiplexed technology. Within the discrete ATM Adoption Layer (AAL), which forms the bridge between data in its native form and the ATM network, source data is broken down for transmission into small, 48-byte "payloads." At the receiver, the AAL is responsible for reassembling data into its original form.

During transmission, the AAL passes these small payload segments through the ATM Layer, which adds a five-byte header containing the requisite routing and control information needed to get the packet through to its destination. In essence, an ultra-high-speed data switch connected between the various sources and destination acts like

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NETWORKING CAPABILITIES OF DIGITAL AUDIO WORKSTATIONS

(WITH COMMENTS FROM THE MANUFACTURER)

MANUFACTURER/SYSTEM	System Networking	Data-Transfer Rates	Network Protocols	MO File Transfer?	Disk Capacity	OMF Compatible?	Native-OMF Disk Files
AVID TECHNOLOGY **AudioVision and AudioStation**	ATM Peer-to-Peer	Sustained: >30 Mb/s per stream	TCP/IP Avid Media	✓	9 GB	✓	✓
"Avid plans to offer AvidNet networks and Media Server Series of products, starting in mid-1994. AvidNet is based upon Asynchronous Transfer Mode technology and requires a fiber-optic infrastructure. The networks can be configured: To Support greater-than-real time transfer of digital media (video, multitrack audio, graphics, etc.) in a Peer-to-Peer Configuration (without a server); or for Client-Server Playback of real-time video and multitrack audio using Avid Media Server. AvidNet Peer-to-Peer configurations will be available at the end of this summer for Avid's post-production and broadcast products. The ability to digitize, edit, browse, file transfer and playback of digital video and audio in real time will be available with the Media Server at years end. AvidNet's goal is to achieve Local- and Wide-Area transmission intuitively through the desktop application. A series of low-cost, functionality-rich Media Series will evolve in the near future."							
DIGIDESIGN **Sound Designer II and ProTools II**	Ethernet FDDI & CDDI Peer-to-Peer & Client Server	Sustained: 8 Mb/s	CSMA/CD TCP/IP	✓	128/256 MB 650 MB 1.2 GB	✓	✓
"Digidesign is working closely with Apple and other major networking developers in order to provide a variety of networking options and prices to our customers. We will support all major standards via Apple's file-sharing protocols."							
DIGITAL AUDIO RESEARCH **Sabre, Delta Plus, Sigma Plus and SoundStation Gold**	**FUTURE** Ethernet Peer-to-Peer & Client Server	Sustained: 6 Mb/s Burst: 10/100 Mb/s	TBA	✓	650 MB 1.2 GB	FUTURE	NA
"DAR's plans for networking are to initially offer Ethernet peer-to-peer and client-server functionality, which will be made compatible with accepted standards as they emerge. DAR has been offering audio mobility via optical disk for several years and has recently introduced recording, editing and playback from 1.3 and 0.65 GB MOs on all of its audio workstations. This provides operational and audio compatibility between a full range of workstations. All information related to the audio, including EDLs, EQ, pan and gain is carried on the optical. The range of machines with which DAR can exchange audio on MO is planned to grow during the current year."							
DOREMI LABORATORIES **DAWN II Workstation**	**FUTURE** FDDI & ATM Peer-to-Peer & Client Server	Sustained: >40 Mb/s Burst: >100 Mb/s	Token Ring	✓	1.2 GB	FUTURE	✓
"The arrival of multimedia made it more difficult for the computer industry to choose a high-speed network. Due to the high throughput required for video, the industry is likely to choose a network with a speed exceeding 1 Gb/s. Doremi is preparing a major hardware upgrade (DAWN 3) to its workstation product line that adds a high-speed SCSI as well as a high-speed Network. Scheduled for introduction at the AES convention October 1994, DAWN 3 will feature a high-speed, general purpose, peripheral Input/Output connector. By plugging in a dedicated interface card, any network format can be used. Doremi is first designing a 100 Mb/s FDDI interface card. Should the computer industry choose a higher-speed network, Doremi will design an interface card for it and update its product line without a need for re-engineering."							
FAIRLIGHT ESP **MFX-3 Workstation**	**FUTURE** Ethernet ATM Peer-to-Peer & Client Server	Sustained: 4 Mb/s	TBA	✓	1.2 GB	FUTURE	FUTURE
"Compared with high-speed networks, the performance, capacity and compact removable-media features of MFX-3 provide an elegant solution for the very large data transfer needs of DAW installations. While networks may be useful for connection to a central server of common sounds, the cost-effectiveness and practicality of a server is questionable where only one or two suites would need to access such a library. Transfer of media from other breeds of DAW may be possible over a network, but preference to date is to use removable media such as HD, MO or tape. MFX-3 can sustain recording and playback of 24 simultaneous, continuous tracks on a single removable 3.5-inch hard disk with a net duration of 12 track hours. The system can typically sustain 12 tracks on a removable optical disk with net duration of two hours. The introduction of 2.6GB optical disks in early 1995 will provide up to 24-track playback with four-hour duration . Operators can transfer large projects quickly by carrying a removable disk to the destination workstation for plug-and-play, akin to 24-track tape. MFX-3 provides an Ethernet hardware connection, and networking features are planned for the future. We plan to provide the ability for operators to quickly and transparently browse through shared libraries of sounds via a network, and import to their working project. This will also allow offline backup by network to remote devices."							
FOSTEX CORPORATION **Foundation 2000**	**FUTURE** FDDI & ATM Mixed Species	Sustained: 7.2 Mb/s	TCP/IP Token Ring	✓	1.2 GB	FUTURE	✓
"Fostex will leverage the networking capability against Macintosh and Power PC platforms. The current information provided is preliminary as this network is still under development. However, [users] should expect improvement over data transfer rates and supported protocols upon release. It is Fostex's intention to provide a fully functional and high-speed data transfer network suitable for professional applications using large files."							
LEXICON **OPUS**	NA			NA		NA	NA
"Efficient data interchange among workstations of various types (Audio/Video) by different manufacturers is recognized by Lexicon as a major industry objective. Networking via high-bandwidth electronic transmission is a subset of this objective which will be of use to our users. Lexicon is a supporter of OMF and has ongoing development in this area. At this time, Lexicon is unable to comment on a release schedule."							
MICRO TECHNOLOGY UNLIMITED **MicroSound**	Ethernet Peer-to-Peer Client Server Mixed Species	Sustained: 8 Mb/s	Microsoft NetBEUI	FUTURE	TBA	NA	NA
"As a result of its basic architecture, finished Projects can contain sound files stored on remote drives on peer systems or file servers. Multiple monaural and stereo sound files can be transferred between workstations simultaneously, even with 10 Mb/s Ethernet cards. All networking software will work with MicroSound files and most have been proven compatible. Future plans include ATM server-server high-speed transfers supporting large multi-workstation installations with 100-150 Mb/s server interchange."							

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NETWORKING CAPABILITIES OF DIGITAL AUDIO WORKSTATIONS

(WITH COMMENTS FROM THE MANUFACTURER)

MANUFACTURER/SYSTEM	System Networking	Data-Transfer Rates	Network Protocols	MO File Transfer?	Disk Capacity	OMF Compatible?	Native-OMF Disk Files
Otari Corporation **ProDisk 464 Workstation**	NA			NA		NA	NA
"Other than 'Sneaker Net' —removable hard drives—Otari is not currently offering networking and has no plans to implement networking for its ProDisk DAW. Otari is studying the market's requirement for networking."							
Roland Corporation **DM-80**	**FUTURE** Format TBA	TBA	TBA	✓	650 MB 1.2 GB	NA	NA
"Roland has been providing 'cost effective' digital production tools for the audio and video industries for a few years now. Based on our current DM-80 owner profile, we have found that networking is not an issue of major importance at this time. As the market drives the requirements for networking, file transfer, media exchange and other interchange issues, Roland's future products will respond in kind . Roland is deeply involved in exploration of all the various networking protocols currently available. We will provide networking features on future products, as defined by customer demand."							
Siemens Audio **AMS-Neve AudioFile Plus**	ATM Mixed Species	TBA	TBA	✓	1.2 GB	✓	✓
"AMS-Neve will unveil new developments in networking capabilities at the upcoming AES Convention in San Francisco."							
Solid State Logic **ScreenSound, Scenaria and OmniMix**	*See Below*						
"To discuss data rates and the range of technology available only serves to cloud the issue. Facilities need to consider the practical advantages offered by the manner in which that technology is implemented. The success of an imaginative hybrid system like SoundNet is the way in which it uses both Ethernet, for control data, and SCSI switching for audio. Its database and off line backup capabilities are also part of the business of resource management. Combined, these functions make SoundNet a highly successful method for doing this — and as our ad says, 'Manage your resources and you manage your profits. SoundNet is still the only audio network system in day-to-day operation. Its hybrid structure combines the control convenience of an Ethernet serial LAN with a super- high speed data matrix that can assign blocks of resource to each user with full unrestricted access to audio and project material. A single SoundNet will comfortably provide up to 56 channels of digital audio simultaneously—each with a margin for 150% varispeed—plus perform a simultaneous high-speed data backup or restore, representing a sustained data rate of over 74 Mb/s, without any interference or service waits."							
Sonic Solutions **Sonic Station**	FDDI CDDI ATM (Future) Mixed Species	Sustained: *Network:* 100 Mb/s *Node-to-Node:* 24 Mb/s Burst: 100 Mb/s	TCP/IP Token Ring AppleTalk MOTP	✓	1.2 GB	✓	NA (AIFF)
"Sonic Solutions is currently the only manufacturer delivering a true network which permits: simultaneous playback of 80-100 channels of digital audio; simultaneous access to the same hard disk and same sound files for playback across the network; high-speed file copying in the background while still working in the foreground. MediaNet is compatible with any standard Macintosh application; over 500 MediaNet nodes have been shipped for digital audio, digital video and prepress applications. MediaNet is currently available as Client and Server Nodes in both FDDI and CDDI. Sonic will offer an ATM version as the ATM standard is completed and ATM chipsets become available."							
Spectral Synthesis **AudioEngine and AudioPrisma**	**FUTURE** Format TBA	Sustained: 100 Mb/s Burst: 622 Mb/s	TCP/IP	✓	650 MB 1.2 GB	FUTURE	NA
"Spectral networking solutions are centered around the concept of scalability, as are our workstations. The Spectral Net is a highway between our AudioPrisma single-board workstation and AudioEngine DAWs. For that reason it utilizes both server and peer-to-peer topology, and offers both low-cost and high-performance options."							
Studer Editech **Dyaxis II**	Ethernet InterMix ATM (Future) Mixed Species	Sustained: 147.456 Mb/s (InterMix) Burst: "Who Cares!"	TBA	✓ With Dolby AC-2 Digital Data Compression or Linear 16-bit	128/256 MB 1.2 GB	✓	✓
"Studer Editech offers two different networking options for Dyaxis II. The first—Network Browsing—is included in the new release 2.0 MultiMix software; the second—InterMix—will be available in September 1994. In the longer term, we expect ATM solutions to prevail, but the priority must be for industry compatibility and not proprietary solutions.The first option provides Network Browsing of sound files via standard inexpensive Ethernet connections. In V2.0, the user calls up the sound server, auditions the sounds and then creates a transfer list. MultiMix loads the requested audio in background while editing continues. InterMix is a hardware-based solution based on 200 Mb/s serial interconnect. In its initial release, Dyaxis II units may be chained together into configurations as large as 128 channels. During 1995, a bridge to an optical fiber ring will be made available for interconnection between systems up to 2 km. The approach provides a giant patch bay, but is more than a collection of point-to-point routings. InterMix provides Mix-bus spanning of an entire facility, allowing simultaneous mixdown from 128 channels located anywhere in the facility. Local connections use differential co-ax for distances up to 60 meters."							
Studio Audio & Video, Ltd. **SADIE editor**	Ethernet ATM (Future) Peer-to-Peer	TBA	Any	✓	1.2 GB	FUTURE	FUTURE
"SADiE currently incorporates a cost-effective Ethernet Peer-to-Peer network. Running under Windows 3.11, SADiE's Ethernet link is quick, simple and inexpensive to install. Future plans will concentrate in fast ATM networking, which we plan to be retrofitted to existing technology."							
TimeLine Vista **StudioFrame DAW-80**	**FUTURE** FDDI Client Server	Sustained: 50 Mb/s Burst: 100 Mb/s	CSMA/CD	✓	1.2 GB	FUTURE	✖
TimeLine Vista **MediaSound**	**FUTURE** Ethernet Mixed Species	Sustained: 75 Mb/s Burst: 155 Mb/s	TCP/IP	✓	1.2 GB	✓	✖
"TimeLine is developing a high-speed network for the DAW-80 and a series of compatible products. The StudioFrame DAW-80 is built around the Intel/Windows platform, which benefits from the most rapid network technology advancements of any computer architecture. MediaSound editing application for Silicon Graphics Workstations supports networking with standard SGI hardware. MediaSound also supports OMF-compatible file transfers."							

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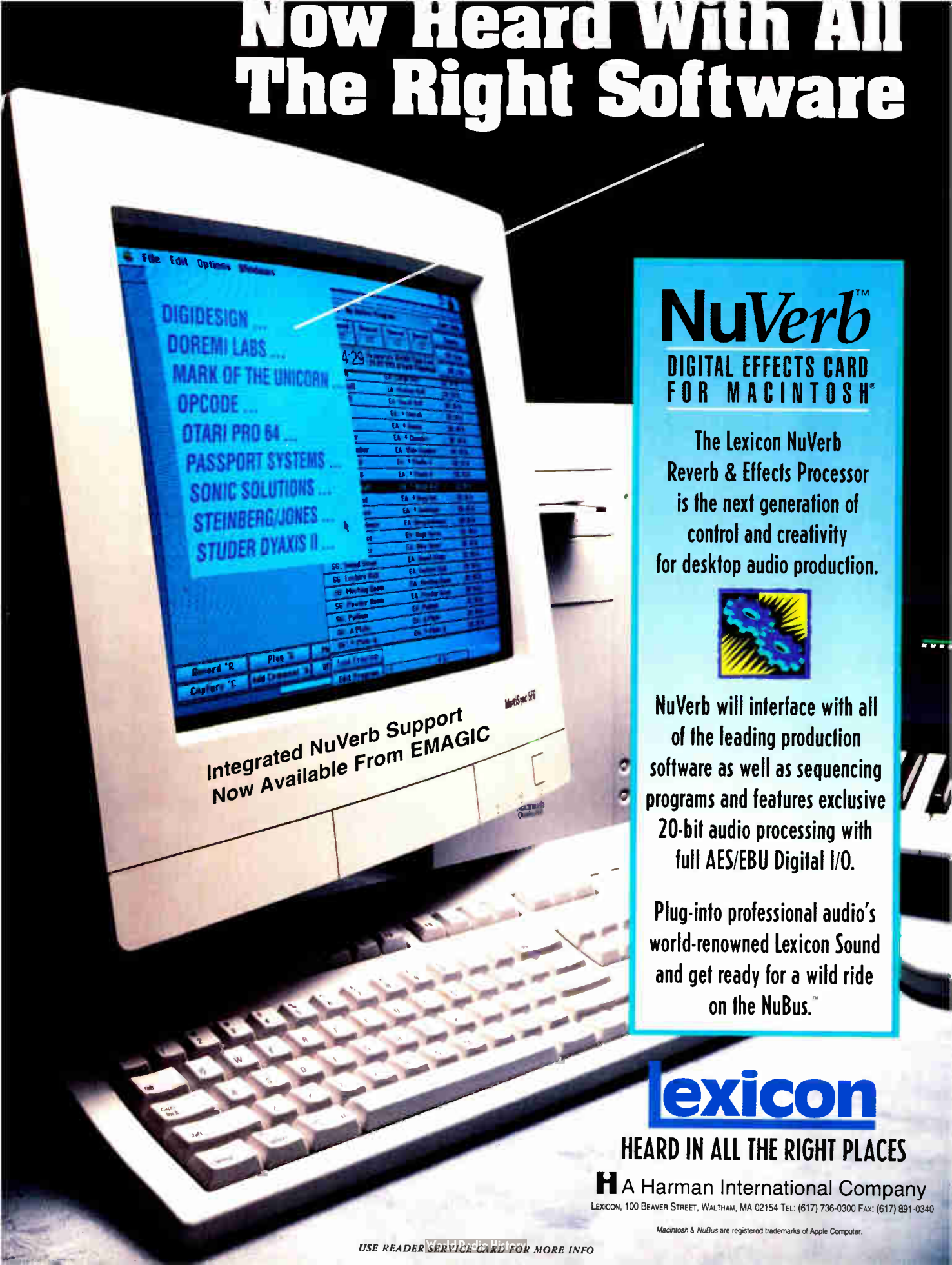

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a frantic traffic cop, directing small packets of data via the fastest route. Such a switched configuration provides a dedicated bandwidth to support multiple, simultaneous data streams during real-time audio/video recording, playback, editing, file transfer, and/or database browsing.

And the really big deal with ATM technology is that it supports not only a high-speed local environment for media exchange but also future options for wide-area connectivity. In particular, media and data files will be routed through ATM-compatible routers, network switches and gateways. Links to ISDN (Integrated Services Digital Network), Switched-56, T1 or T3 links are also being developed. Leased ATM bandwidth will soon be available from telecommunication firms that offer 45 Mb/sec or more bandwidths within urban areas, and across country.

INFORMATION EXCHANGE: PROGRESS WITH OPEN MEDIA FRAMEWORK

Sharing audio files and editing information between workstations from the same vendor is a given. But what of material from another device? OMF Interchange (OMFI) is rapidly becoming *the* standard for digital media exchange. OMFI provides a common interchange format that spans multiple media types, multiple applications, multiple platforms and multiple vendors. It goes beyond media exchange to directly support the production process, by defining standardized compositional and editing notations. In this way, different systems can not only exchange digital media but also descriptions of how they should be combined into completed projects. OMF ensures that both sides of the connection can communicate through a consistent, common fomat.

Open Media Framework allows both the content and descriptions of edited audio and video program material to be shared, exchanged and augmented, as necessary. At the heart of OMFI are a series of APIs (application programming interfaces) that translate file structures from a proprietary format to one that can be read by other OMF-compatible systems. In OMF parlance, digital media files become "Ingredients" for a designated project, while the program descriptions—how the native sound files, etc., are arranged and being mixed, edited and otherwise processed—are referred to as "Recipes." Ingredients can comprise various media, ranging from animation frames to digitized audio. OMF Recipes also support EDL-style information, allowing time code-based data relating to edit points, crossfade profiles, multitrack source/destination assignments and signal-processing data to be standardized via the appropriate file structures.

The goal in developing OMF was to provide a common language for describing sound files and their companion editing and processing information so that they can be exchanged via removable media and networks. In that respect, it is currently being implemented in an increasing number of workstation systems. Several companies now support the direct recording of OMF-compatible files and their transfer via a high-speed network between software applications. In this way, all files are available instantly without the need for an additional decoding stage between OMFI and the platform's proprietary disk formats.

TOWARD THE FUTURE

Networking is, without doubt, a major discussion topic these days. Many workstation manufacturers are offering high-speed file access, in one form or another (see the accompanying table for a description of current implementations from the major workstation players). The ability to use digitized audio, video and multimedia material, plus companion databases and other system information from remote locations throughout a facility, can dramatically enhance our day-to-day creativity in the studio. But networking options are rapidly changing; keep an eye out for new developments.

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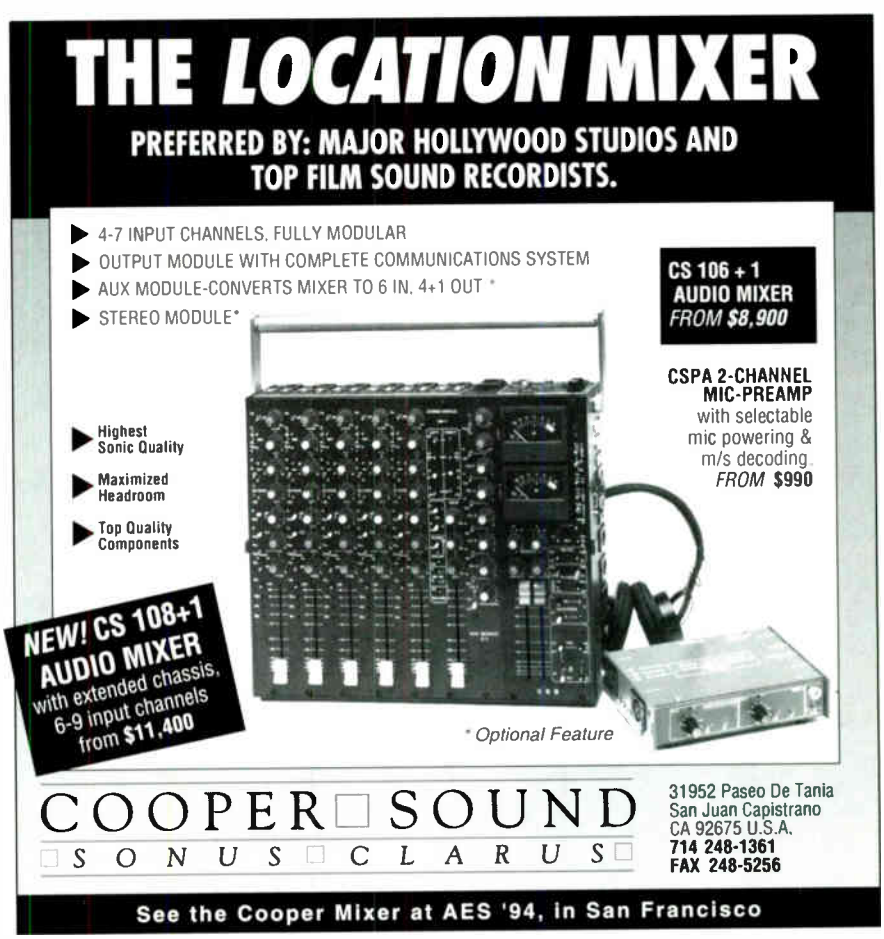
"AvidNet: Statement of Direction," a White Paper published by Avid Technology; May 1994.

Network World: The Newsweekly of Enterprise Network Computing, Framingham, MA; (508) 875-6400; Fax (508) 820-3467. ■



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by Dan Daley

YOU'RE ABOUT TO BE SURROUNDED

Surround sound—you've heard of it and heard it. It started out in theaters for film and has, in the last several years, become a staple of network broadcasts. Unlike other types of professional aural effects, surround sound is a phenomenon driven by consumer demand; though few consumers vocally insist on more reverb or more dynamic panning, they are speaking with their checkbooks and credit cards, buying home theater systems in ever-increasing numbers.

Remember what happened as the number of cable channels proliferated a few years ago? That new diversity was the proverbial foot in the door for project studios into the field of audio-for-video. As the demand for programming increased and individual budgets decreased, projects were perfectly positioned and suited to enter the fray. The same thing could happen again, this time in the area of surround audio, for picture and otherwise.

The first thing you need to know is that the field is not crowded, technologically speaking. At least not yet. In fact, it got a bit less crowded when Shure abandoned its HTS format a little over a year ago. That left Dolby as the primary third-party major supplier of basic, multichannel surround encode/decode systems to broadcasters and film studios, with relative newcomer DTS nipping at its heels. (Proprietary systems, like the one developed by LucasFilm for its own films, are also in use.)

The Dolby 4-channel system is quite simple to implement. The encoder is the SEU-4, which is not sold but either rented on a per-project basis or leased at about $1,000 per year. The SDU-4 decoder lists for about $2,200. The terms of the encoder lease specify that the lessee must also purchase a decoder. For many project studios, that's not an insurmountable price to enter into a new technology niche.

Dolby SEU-4 and SDU-4

Surround encoding/decoding is transparent to the media used as source or storage. All it needs to see is four discrete channels of audio—left and right stereo, a center channel (cumulatively known as LCR) and a fourth mono channel for surround information, which the black box will matrix into a stereo format. The system does require a minimum of five speakers: three for LCR and at least two for surround playback, as

well as the appropriate amplification of the monitors.

There are few hard-and-fast specifications for the audio environment. It's advised that the LCR monitors be placed on the same horizontal plane and that for video, the center channel be placed as close to center over or beneath the picture as possible. Film systems assume that the center channel will be placed behind the screen and will be amplified sufficiently to project a balanced signal mix.

Consoles need the ability to do adjacent channel panning to get the most out of a surround effect. The console can send left-right, and the decoder will place it LCR accordingly. The surround channel itself has a bandwidth topping out at 7 kHz, with only one octave missing at the top.

Matrixing is also an issue, although again not an insurmountable one. Michael O'Hora, who handles tech services in the Northeast for Amek as well as independent tech services for New York-area studios, designed the matrix at Brigg's Bakery.

"The simplest design is to feed the left and right buses normally and then dedicate another bus for the surround information," O'Hora says. "You might have to give up an aux bus—as we did on Brigg's console—and on smaller consoles with only four aux sends, that could be a problem. But anyone with an Alesis ADAT and a Mackie console could easily get into this." O'Hora cautions that the adjustment to surround mixing is a bit disorienting initially from a conceptual point of view but that once users get used to multiple bus outputs, it's like riding a bicycle.

Spatial manipulation technologies have already found their way into project studios: Roland's RSS, to name one. But they're still regarded as high-end options that have generated much interest but little demand at this level. Few project studios have implemented the more mature surround technologies for the same reasons. But some project studio owners consider them diamonds in the rough.

Lee Murphy, owner of Brigg's Bakery, uses the Dolby system for his audio-for-video work but points out that the proliferation of consumer decoders could make surround for audio-only projects commonplace in the near future. "There's no reason to think that at some point—and it might not be too far away—surround could be used on records," Murphy says. [*Ed. Note: More than 300 records have been released in Dolby Surround.*] "I think we've been too preoccupied with some of the more high-tech aspects of the business, like workstations. Once we realize as an industry that there's something else out there with similar marketing appeal, we'll go for that, and surround might just be it."

Frank Serafine, a film effects designer in Los Angeles, has a rather elaborate project studio and has been doing surround mixes—with both Dolby and DTS systems—ever since he opened the location three years ago. "The major consideration has been building [the studio] with the thinking that it accommodate

Other Contenders

Although Dolby is the most widely recognized name in surround audio technology, there are entities working the corners of the market. The one most applicable to this story is from RSP Technologies, the pro division of MI signal processing manufacturer Rocktron. RSP's Circle Surround is a 4-channel system introduced a little more than two years ago. It was initially aimed at the project studio market, according to company sales manager Bill Rowe.

Based on a "gut feeling" as well as supporting literature in pro and consumer audio journals that predicted this trend, RSP developed and marketed Circle Sound as a 4-channel system with discrete and full-bandwidth rear channels. Rowe claims that this is what sets the technology apart from other systems, whose surround channels' bandwidth generally tops out at around 11 kHz. A complete encoder/decoder system with a controller that works with any console with four assignable outputs could be purchased outright for $2,166.

However, this is one of those areas where consumers lead the market. Although several hundred Circle Sound systems have been sold worldwide to date, no consumer audio manufacturers have taken any licenses to include its circuit chip in their playback systems, Rowe concedes. Without that, RSP (and any other manufacturer's surround system) is limited in application. RSP's experience has been that closed-loop environments, such as dance clubs, that want to include program material and play it back within controlled spaces, have been the primary application to date.

RSP Technologies' Circle Surround Decoder

"Sales have been slow," Rowe admits, despite a marketing campaign that includes advertising in project-oriented publications. "The consumer tail definitely wags the professional dog." However, he adds, RSP is in negotiation with several playback manufacturers, including a major American auto manufacturer, about disseminating its decoder technology. "We intend to stay in this market," he says.

Another manufacturer worth noting is DTS, the only one that seems to be causing Dolby any concern. The system is intended for film use, and music applications are not high on the company's agenda at the moment, according to Jeff Levison, studio services engineer with DTS. That 6-channel system is also available under license terms, like Dolby's, with no charge for the hardware components. DTS' audio resides on a CD-ROM disc that plays in sync with the film—an approach Levison says is easier to reproduce and print. "It's also very robust and almost fool-proof," he says, "and has less compression than most digital audio systems." Beyond theatrical film releases, Levison affirms that DTS has some ambitions in the home video market, via both laserdisc and cable delivery methods.

whatever surround technologies will be around ten or 20 years from now," he says. Serafine had his Otari 54P console customized to accommodate a more complex matrix with that goal in mind. It was designed and built by Randy Honaker, whose company, Audio Visual Design, has also done similar work for other film audio studios. It's an 8-channel matrix (LCR, L surround, R surround, rear surround and a subwoofer) that makes control ultimately discrete, according to Serafine.

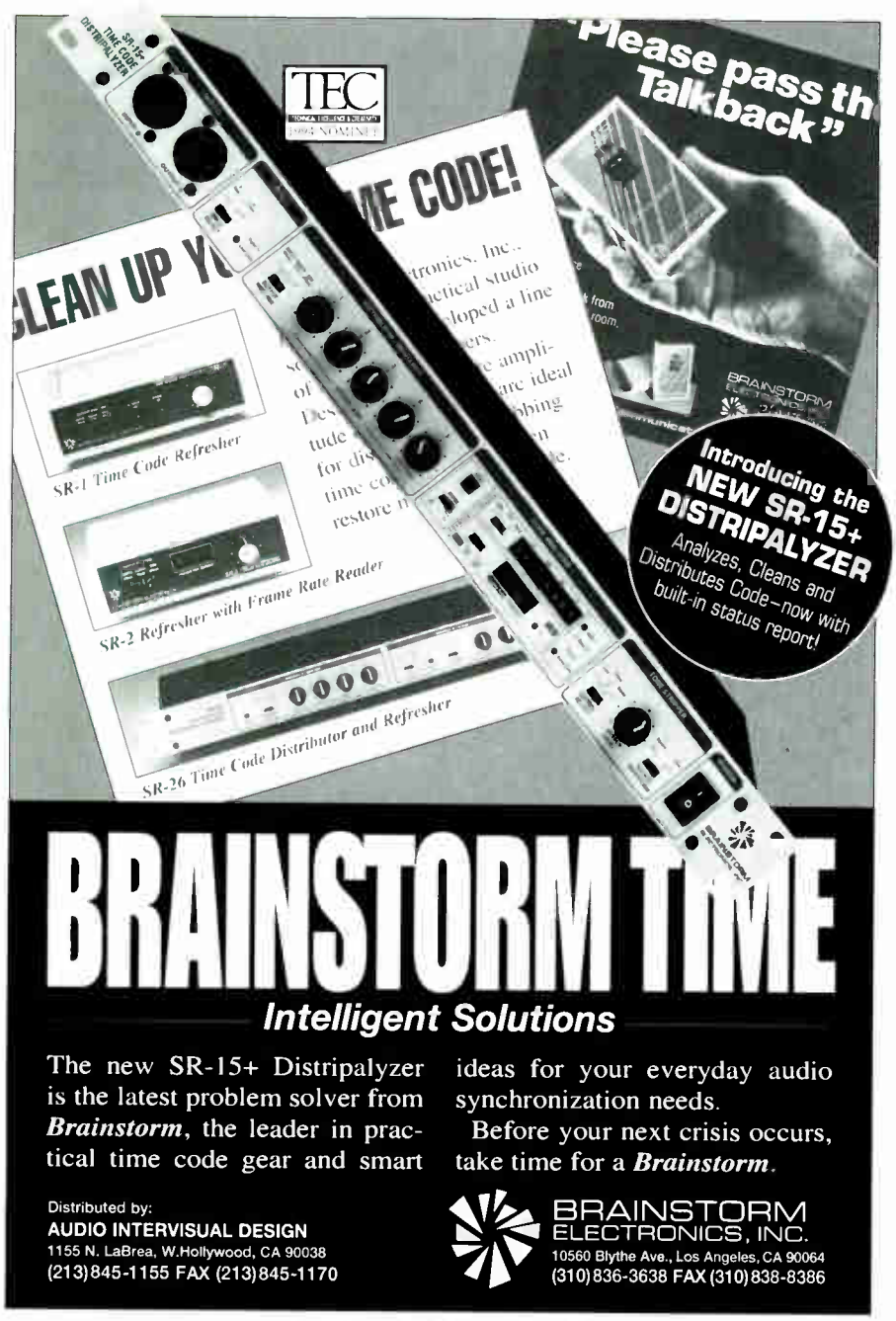
Honaker's design allows for eight modules that are switchable between machine input and output for A/B comparisons and the ability to route signal from tape output to any of eight speaker systems. The design can be applied to most consoles, but Honaker stresses another element of using surround—one that could be the basic spec in an otherwise minimally specified field. "The biggest pitfall is level," he says. "Get a Radio Shack SPL meter and use pink noise to make sure that all the speakers are critically balanced at 85 dB."

Even Serafine uses surround sparingly for music-only applications; a pair of BASE systems are used instead to move the image forward and backward. "It usually doesn't make sense to put the music into the surround mix in our experience with films," he explains. "But we've done some experiments, such as [the project we did for] the Peter Gabriel theme park ride, and there were no phasing problems. It's a matter of demand, and I think that that will come from things like CD-ROM. I think that format will become a major one for music because it can hold more information."

The possibilities for surround sound in project studios, however, are enormous. Jim Hilson, a surround engineer with Dolby, points out that video games are becoming a big market for surround, and project studios have been at the forefront of that market segment. "The minimum you need is a stereo bus and an aux send," he explains. "You can automate some of the moves using the kind of automation systems available to project-level studios, and you can buy a box for 4-channel panning, which is something that larger consoles have built-in. The big consideration [for project studios] is that they be able to do it with the equipment at hand. People will find ways to do it, once the incentive is there."

Which brings up another possible reason for surround's slow growth in the project studio realm: There's not much incentive for Dolby and others to mass-market their encoders to lower-end users, because the big money for them is in licensing the decoding technology to consumer equipment manufacturers. The compulsion to implement surround will come from increased audio-for-picture work at this level. It most likely will be driven by cable, and from an anticipated trend toward surround encoding of records—something for which there is no timetable other than the continued increased sales of decoder-equipped consumer stereos. That, says Larry Maglinger of Custom Audio Video shop in Owensboro, Ky., is coming soon. "Everything that's coming out now in terms of home stuff is [Dolby] Pro Logic," says Maglinger, whose store outfits a lot of high-end stereos in the region. "It's only a matter of time before we start seeing records encoded." ■

Dan Daley is a Mix *contributing editor.*



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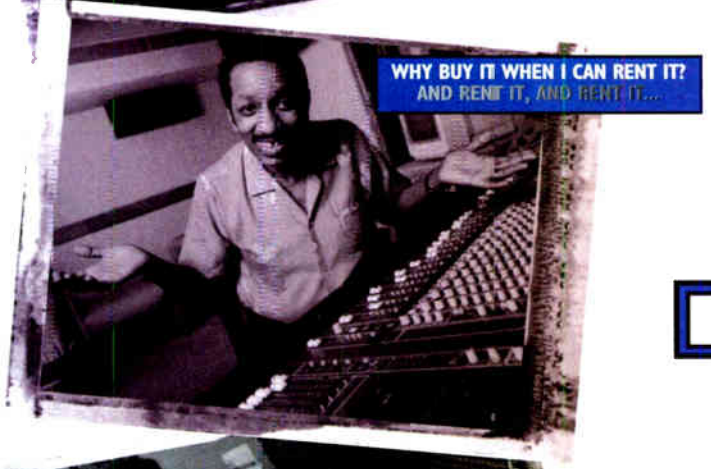

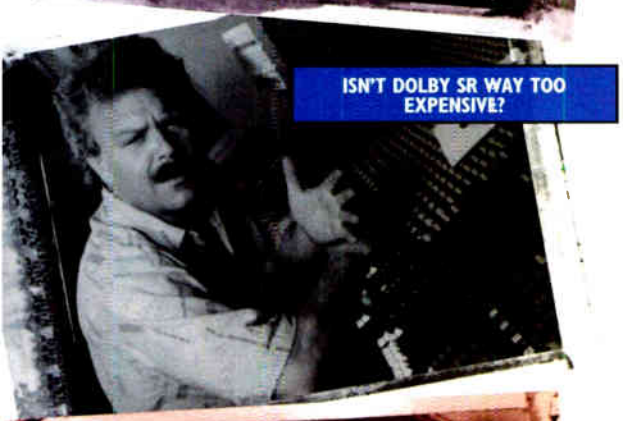

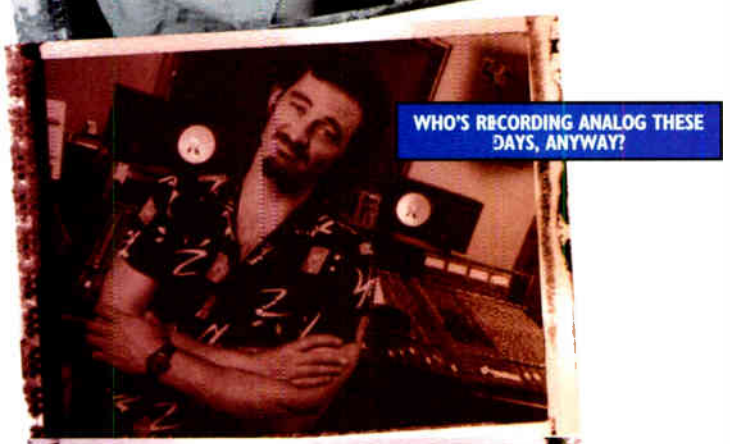

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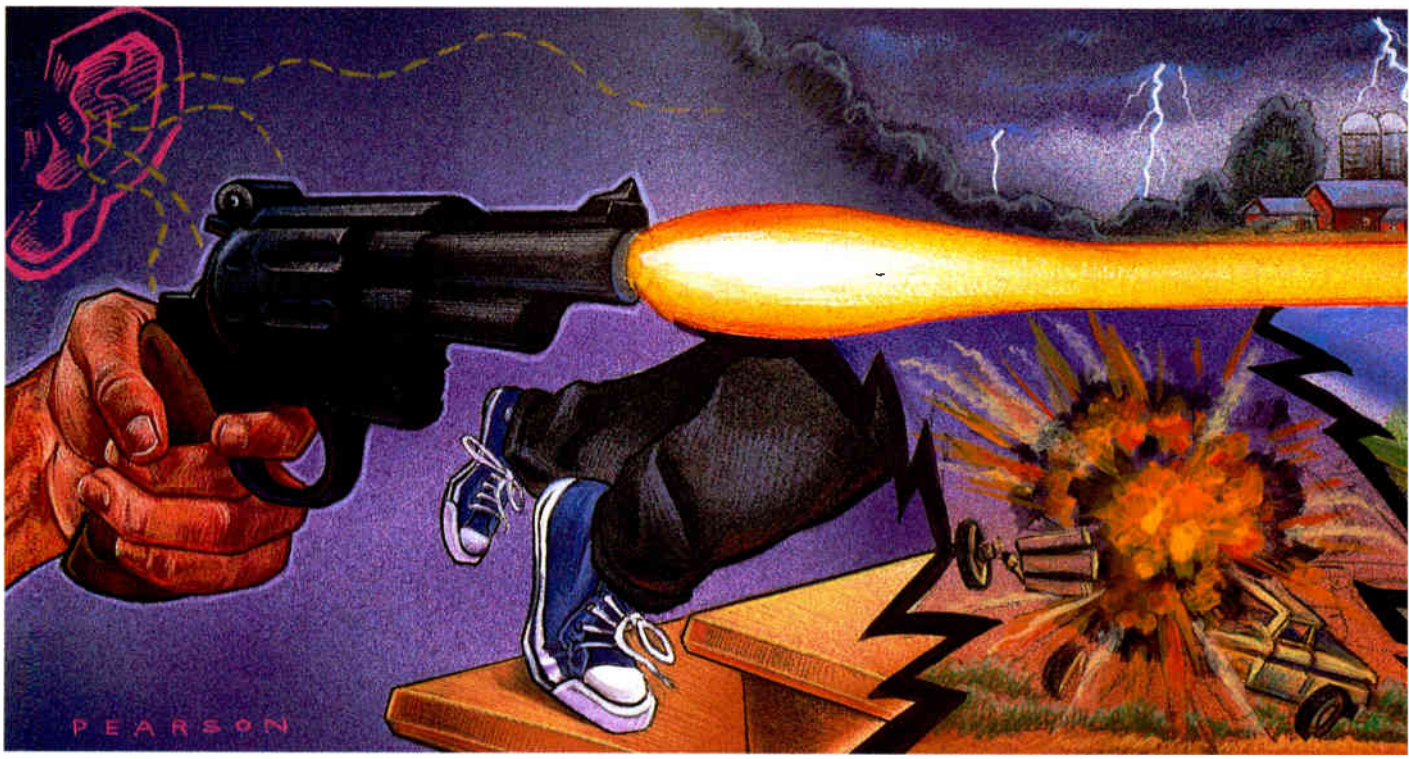
BY TIM MOSHANSKY

When I was 12, I got my first tape recorder, a Realistic model from Radio Shack with a condenser mic and handle for $50. I would take it around the neighborhood recording cars, planes, people and, basically, discovering the world of sounds around me. I had a tape called "Gunshots, Explosions and Military Sounds." I would re-create the sound of car crashes using my voice and combinations of jars and glasses that I would smash with metal objects, or record explosions and gunfire from war movies. My family thought I was crazy.

Recording sound effects for movies, I was to find out, isn't that much different from what I did back then. Although recording for a major motion picture obviously takes a lot more skill, organization and focus, it still requires a childlike creativity—that "I wonder what that would sound like" approach to finding interesting and usable sounds.

To get an accurate account of today's world of film sound effects recording, *Mix* spoke with representatives from New York, L.A. and Canada who are among the best in their field. From big-budget features to independently financed films, effects recordists use many of the same approaches and ingenuity to get good, usable sound takes, and often find themselves in some precarious adventures.

Andy Aaron, a sound effects recordist based in New York City, got his start working at American Zoetrope and then Lucasfilm. He recalls living on a destroyer for a week doing maneuvers in the Pacific, recording effects for *Return of the Jedi*. "The captain gave me complete carte blanche to record anything I wanted," Aaron says. "I recorded lots of different engine room sounds, lots of aiming of the missiles and motors, which could later be matched to some other device. Sonar sounds and quite a bit of weaponry and firing guns, and machinery that would support things like that—large amounts of clicking and buzzing and complex metal machinery that moved ammunition around."

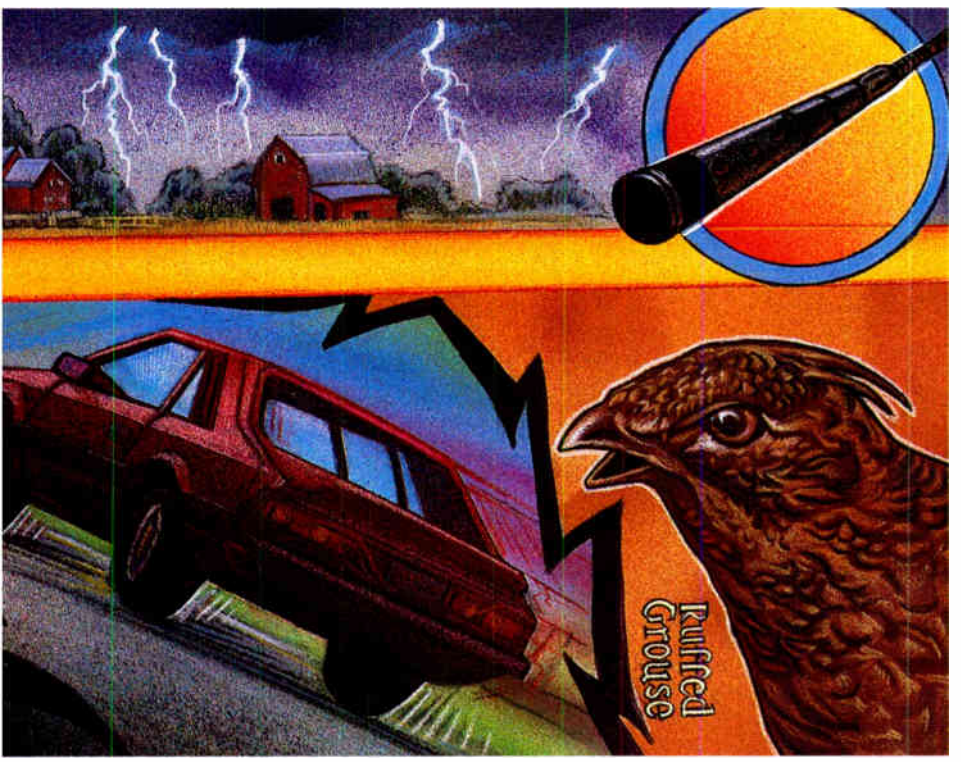


From big-budget features to independently financed films, effects recordists use many of the same approaches and ingenuity to get good, usable sound takes, and often find themselves in some precarious adventures.

Aaron had another unforgettable experience later in his career, recording storms for the final scene in *Cape Fear*: "I went to the Langmuir Atmospheric Research Laboratory in New Mexico, which is 11,000 feet up," he explains. "I got to live with scientists in bunkers for several days and record thunderstorms as they passed over. When we got there, they said, 'You know, sometimes you have to wait several days before a thunderstorm comes by.' So we looked around, and they said, 'Well, it's 5 o'clock. There's not going to be any thunderstorms, let's go in and have dinner.' Then we started to hear some rumbling, so

we went out to record. We had walkie-talkies, and they told us to keep in touch because they detected a thunderstorm coming in.

"It kept getting closer," he continues, "and then we heard, 'Run! Run! Get inside immediately!' They'd never seen voltage levels this high, and they told us to go to this special bunker that's made out of copper and not to come out. So we threw the microphones outside. And all of a sudden it was like total night, like somebody had turned the lights out.



WIDE WORLD OF SOUNDS

FILM SOUND EFFECTS RECORDING

ILLUSTRATION BY JIM PEARSON

And we were surrounded in lightning. In the midst of that, we realized that we shouldn't be wearing headphones because there's a microphone cable going out to something that in most likelihood will be hit by lightning. We got amazing quad recordings, and that's what you hear in the movie."

Aaron and many of his colleagues believe that if you want to find a cool sound effect, you should go out and find it in the real world and not try to re-create it with synthesizers or electronic gizmos. "I was with [sound wizard] Ben Burtt once," Aaron says, "and a guy came in to sell us a synthesizer. He set up the thing and began twiddling all of these knobs and made all of these amazing sounds. And then Ben said, 'Can you make the sound of a pick-up truck skidding down a road, crashing through a fence, rolling over and exploding?' To me that's a great description of what it is we do as sound effects recordists."

Ken Johnson, a sound effects recordist based in L.A., became interested in sound at an early age, recording shotgun blasts, car skids in empty parking lots and his personal favorite—train sounds. "I had really no plans on doing what I'm doing now. It was just a hobby to me then," he explains.

Johnson was recording a special steam train that was coming into Union Station, and he met sound effects editor Richard Anderson, who was recording the same train with a Nagra and a Schoeps on a stereo bar. This led to a gig as librarian at Thunder Tracks (which later became Weddington Productions), and he learned a great deal working with their recordist, Doug Hempel (who went on to become an Academy Award-winning mixer). He has since worked on nearly 100 films, including *Top Gun*, *Days of Thunder* and *Robin Hood*, and has produced a series of sound effects CDs.

Part of Johnson's success as a sound effects recordist can be attributed to his interest in mechanical en-

gineering, which helps him understand the nature of sounds and how he can create them. His first work on a feature film, recording sound effects for *Gremlins*, is a good example of his ingenuity and knowledge of the mechanics of sound.

"They were having a hard time getting the sound of a Gremlin eating a test tube," Johnson recalls, "and on the Foley stage they were using a pair of pliers to crack a real test tube. Test tube glass is different than other glass that has that nice 'chimey' sound. So I took their Nagra home, put on some leather gloves, and I took a light bulb and heated it with a torch so I could let all of the vacuum out without breaking it. Then I crushed it in the leather gloves and gave it sort of a chewing sound."

Johnson is also a specialist on guns and ammo. He recently completed work on *Wyatt Earp*, which required lots of firing, whiz-bys, ricochets and so forth. "I found out a really interesting thing about guns when recording," he says. "One .38 pretty much sounds like another. What's really important is the location that you record them in, because that seems to be what tailors the sound the most—the acoustic quality of the location. If you go in the forest, it's more like a reverb; if you get a rocky canyon, you get more of that jet trail-off sound of a gun. Some places have more bottom end, and some are brighter. The best thing is to find a combination of wood, rocks and gravelly earth."

Although blanks work in some locations for a warm "pop" sound, Johnson suggests using real ammo for most effects situations. When fired, according to Johnson, a lot of rounds are supersonic. "The bullet itself makes a sonic boom," he says. "If you put the mics downfield a couple of hundred yards and fire a round past them, you actually hear the bullet go over with a little crack, and then a split second later you hear the shot—sort of a dull, muffled thump. That little sonic boom that the bullet makes echoes off everything it passes, and that's what gives it that nice trail-off that you don't get so much with blanks."

For field recording, Johnson uses a Sony D10 Pro DAT machine, which he likes because of its ruggedness, and a custom-made preamp, which he feels is the key to getting good-

quality, big sounds. He gets a hot signal in the preamp and then brings it into the DAT at lower levels to avoid digital distortion. For microphones, he relies on his Schoeps. "They're practically bulletproof," he laughs, "and I actually put a bullet through one once." For sound design and manipulation, he uses an Akai S1000.

After ten years of paying his dues in the recording scene, Johnson would like to eventually move into a supervising sound editor position. Still, he loves to record sounds and says he's never bored. "It's always a challenge," he concludes, "it's always something new, it's always something that's never been done before, and you wonder how you're going to get by this one."

Far removed from the bright lights and big cities is a different kind of world, one where the stars have names like Wolf, Muskox and Beaver, and the locations are the Prairie Grasslands, the Boreal Forest and other natural wonders. Karvonen Films, an award-winning independent Canadian nature film company, is run by Albert Karvonen and his family. More than 50 of the company's films have been seen on television by an estimated audience of 50 million people in over 40 countries. From an early age, everyone in the family, including daughter Ava and son Downy, have been involved in the filmmaking process.

Accomplished sound recordist Ava Karvonen, has learned that you can't just go out and point a microphone and record sound; there is plenty of research to be done before any tape is rolled. "Because we're doing nature documentary sound recording," she explains, "we usually have several different species in one film. When you're recording sounds, you have to realize that certain birds and animals only make noises at certain times of the day, or of the year. The other thing is trying to identify them. For example, if the editors say they want a specific bird recorded, like a Franklin's grouse or a ruffed grouse, you have to know what it looks like and what it sounds like before you go out and record it."

Karvonen and crew recently traveled north to the High Arctic to film and record *Country of the Muskox* during the rutting (mating) season. "When you're recording a muskox in the rut, it's dangerous, because you can be charged by one," Ava says. "You have to be very specific about where you are and how you're moving when you're recording. You don't want to scare the species off, but you want to get close enough to get a good take."

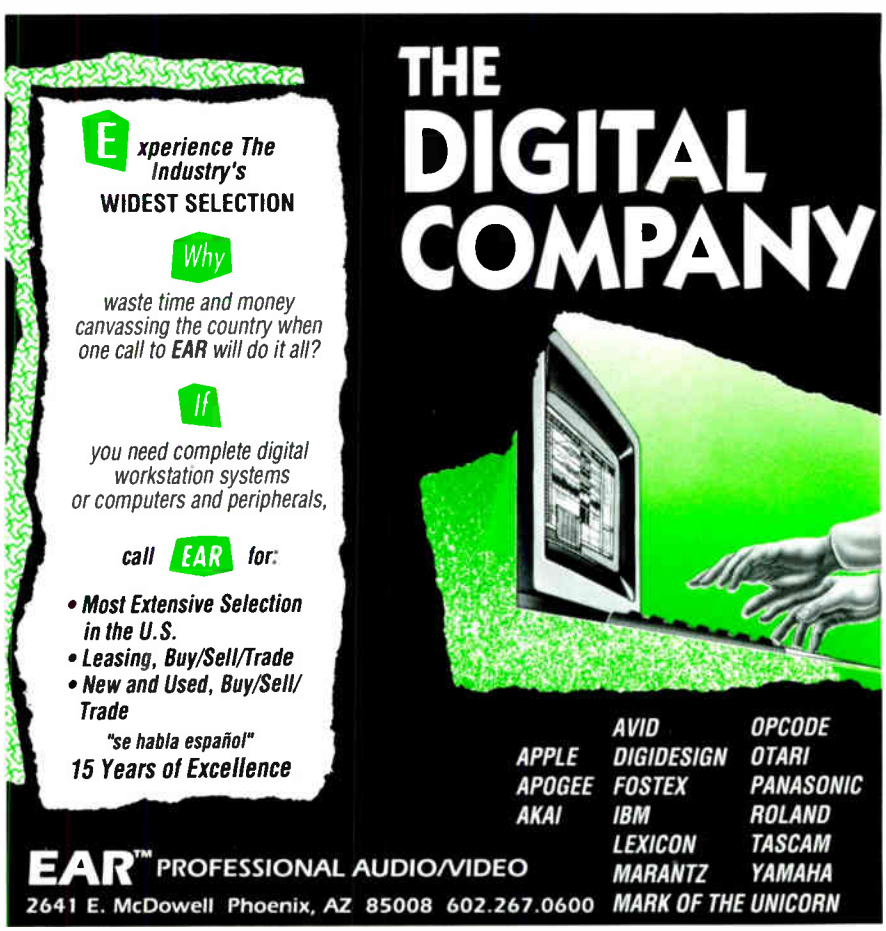
The crew followed the herd on foot (no snowmobiles) and had to haul all of their equipment around for two months. Being environmentalists, they were conscious of having the least impact possible on the species and its habitat. Fortunately, they didn't have to worry about annoying sounds like compressors, highway noise, airports, Caterpillars or lawnmowers.

As a result of their efforts, Karvonen Films has some of the best muskox recordings in the world. "Some people recently bought some muskox sounds from us," Downy says, "and they were just amazed that we captured so many muskox sounds. Someone from New York just called us for some beaver sounds. We have the beaver sounds from right in the den. How many people have access to that? And they're not faked; they're real sounds. You can't go and hire a beaver."

Karvonen Films still uses an older-model mono Nagra IV-S, with a Sennheiser microphone, and they rarely, if ever, record sync sound. "The Nagra is something we've worked with over the years," Ava explains, "and at this point, we are trying to decide if we should switch to DAT or not. DATs need ideal conditions, and we don't always have ideal conditions. They don't work well if it's extremely cold, like minus 30 degrees Celsius, or if it's extremely wet." Karvonen is currently transferring their best sounds over to DAT.

Although nature sound recording can often be tedious, elusive and less than glamorous, there is always a light at the end of the tunnel. "When you record a really good, clean, sharp sound," Ava concludes, "and it's a rare sound, or a unique sound, or a sound that's difficult to get, it really makes it all seem worthwhile, and it's hard not to feel proud of what you've done." ■

Tim Moshansky is a freelance writer, musician and film sound enthusiast based in Vancouver, British Columbia.



USE READER SERVICE CARD FOR MORE INFO

by Mel Lambert

STUDER EDITECH DYAXIS II

MULTIDESK ASSIGNABLE CONSOLE

The user interface. As digital audio workstations evolve and take on many of the same features and functions, the user interface becomes critically important. A 20-inch color monitor is a great device for displaying information—particularly if it is connected to a graphics station that can create dazzling high-speed displays of waveforms, editing profiles, and other vital data. But I don't consider a glass console the best way of driving such a system. After all, a mouse is a mono-functional device; you can only change one thing at a time via point-and-click options. A far better and more appropriate design approach would incorporate a control surface that features hand-sized buttons and faders that more closely mimic the way we work in the analog domain. This approach would also take full advantage of the assignability that comes with digital, computer-controlled technologies.

The new Studer Editech MultiDesk Assignable Console for the Dyaxis II workstation offers a useful combination of compactness and extensive creative power. Designed to plug directly into the Dyaxis II processor racks and the host Macintosh graphics display, MultiDesk can dramatically streamline many of the workstation's mixing and editing functions. It is available in either desktop or stand-alone configurations, at a suggested price of $15,000. Given the enhanced functionality it offers the Dyaxis II "power user," that's a remarkable value.

MOVING-FADER MIXER AND MACHINE CONTROL SECTIONS

The MultiDesk control surface provides an array of assignable faders, knobs, buttons and wheels for dynamic control of Dyaxis II's mixing, editing, transport and external machine control functions. The unit is divided into three sections. The Mixer Panel handles control and mixer automation for up to 24 channels of source or hard disk playback, via up to six Dyaxis II processor units. (Each Dyaxis II processor handles four analog/digital channels and interconnects with other frames via a high-speed serial bus to provide a maximum of 24 replay channels—the equivalent of 48 simultaneous hard disk "events" during real-time crossfades.)

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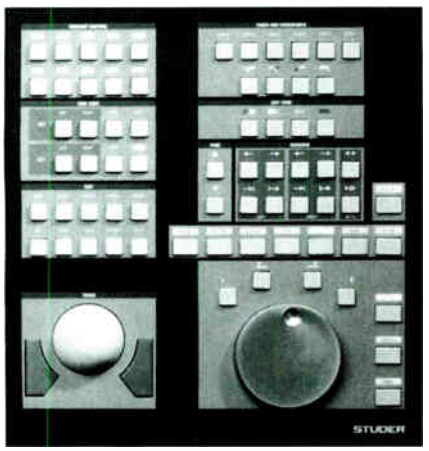
Nine assignable moving faders—eight for channel control, plus a master—automate off-disk replay levels and are shared between processors. Panning is between a master 2-channel output bus, which also can be reassigned to an input channel for rerecording. Four assignable knobs and shaft encoders plus 14 soft switches allow the user to call up and modify pan levels, EQ, trim and channel assignment, as well as a variety of setup parameters. A vacuum-fluorescent (VFL) panel displays the corresponding channel, EQ status and automation status. Located directly above each channel fader are a series of buttons that control input/replay, solo, EQ, mute and automation functions for that channel.



Edit panel

Dyaxis II supports a mode where the system can be set to both Input and Repro at the same time. Using this mode, it is possible to simultaneously play back a disk track and monitor the analog/digital input to that channel. Very handy. An additional port is fitted to the controller, allowing direct connection to the optional MultiMeter panel, which places eight channels of assignable level display directly in front of the user. The MultiMeter unit also functions independently of the MultiMix screen software, allowing visual displays of levels from each processor's four output buses, for example, regardless of what the screen is set up to show.

The Mixer Panel is well-laid-out and easy to use. It functions just like a regular mixing board—although only eight faders are available simultaneously. The eight faders are in two banks of four to follow the Dyaxis system of four channels/tracks per processor. A series of pushbuttons to the right of the fader bank control the assignment of physical faders to the six processor systems. Each of the two banks can be individually assigned to the four channels of any processor in the system. Also, the "tape-machine" controls for each track are intuitive; if you have ever used an analog multitrack, then Dyaxis II's safe/ready, input/repro and related functions will be familiar. Punch-ins/outs also can be performed on the fly—a function not always provided on other workstations.

The moving-fader automation package will be familiar to many *Mix* readers, having been supplied on an OEM basis from Uptown Systems. Within the system, levels and control functions are hooked up seamlessly to the MultiMix II software, which provides dynamic storage and recall of all system functions against time code. After a few minutes, you forget that the controller is connected to a workstation and use the mixer in a conventional manner, complete with assignable EQ, level trim, output pan controls and moving-fader automation.

The Edit Panel handles transport, editing and machine-control functions. The Transport Control Section consists of "rewind," "fast forward," "reverse," "stop," "play," "pause," "record" and "autorecord" buttons. (Rewind, fast forward and reverse are operational only when a selected external machine supports that operation.) A scrub and shuttle wheel provides real-time control of transport functions, as well as edit trim. Finally, a standard Kensington trackball connects via an ADB port to the host Macintosh.

The central QWERTY keyboard, used to label mixes and other system functions, also is connected to the host Macintosh. Studer-Editech recommends a fast 68040 Mac as host; in the very near future, MultiMix system software will be available in Power-PC format. Because the MultiDesk keyboard is a standard ADB item, it can be used with familiar Macintosh system utilities such as CE Software's QuicKeys, which allows frequently used keystrokes to be assigned to a single function key.

THE SYSTEM IN USE

Space precludes me from providing anything more than a cursory overview of the Dyaxis MultiMix II software, which is now in V2.0 release

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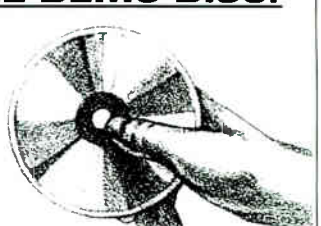

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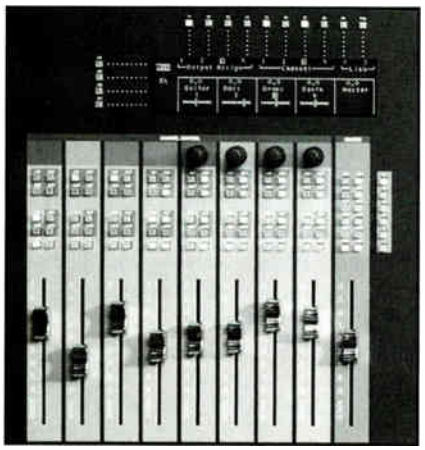
(see "Field Test: Studer Dyaxis II," *Mix*, April 1993). The MultiDesk lets Dyaxis II operate like a conventional recorder/mixer combination, while making use of the dedicated edit control buttons and machine controls. Now, instead of having to call up a separate screen display to stop/start various machines or set up a chase-sync mode, these operations are assigned to specific buttons. Up to four external audio/video transports can be controlled directly from the Edit Panel, with full choice of master/slave configurations and time code parameters. User-selectable command protocols include standard VTR 9-pin, TimeLine Lynx, Studer ESBus, Tascam DA-88 and ASC Virtual Recorder.

Of course, the sound of the Dyaxis parametric EQ section hasn't changed; it still sounds excellent. But many operations are now greatly streamlined. The EQ Page on the VFL panel shows the type of EQ profile applied to the input or disk track—bandpass, lowpass or highpass—plus the center frequency, gain adjustment and bandwidth/Q setting for each band. Settings can be labeled and stored to disk for subsequent recall and reassignment to other sound cues. The Mix Page shows the names of the four current fader channels, with pan (for disk tracks), source selection (analog, digital or mix output), plus output assignments.

While the VFL window is relatively small, the display is clearly laid out and easy to follow. Frankly, I would prefer to see a window that offers a display of eight sets of channel functions at a time. But, given the speed with which you can call up a bank of inputs, alter the values, store the modified settings and move onto another bank of channels, it's a minor problem. And all system information is also displayed on the companion color monitor(s) that show the familiar MultiMix windows and graphics, including a real-time display of a channel's parametric EQ response.

As might be expected, the Edit Panel dramatically streamlines the editing process. A dedicated scrub/shuttle wheel allows edit markers to be located easily: In scrub mode, one revolution equals one second of audio. When trimming the edit point without audio playback, resolution of the wheel is magnified by a factor of ten. All in all, it allows rock and roll/scrub editing as easily as analog techniques, but with far greater resolution and precision.

In the transport control's Default mode, Dyaxis II replays what has been marked for editing by the left and right cursors in both the MultiMix "source" and "destination" areas. While normal playback occurs between the left and right cursor, with MultiMix, the "Now Line" is always with the left cursor unless you are playing, paused or scrubbing the free cursor. Each of these interlinked functions—whether you are fine-tuning an in/out-point or listening through a section, for example—have been mapped to dedicated keys.



Mix panel

Dedicated buttons are provided for a variety of MultiMix functions, including Sync Cut, Split, Ripple, Paste, Punch Paste, Insert, and Zoom In and Out. Cursor Block controls move the cursors, as well as perform audition and trim functions to the left, right or both cursors.

Particularly useful are the "Audition/Trim up to Left" and related buttons, which cause Dyaxis II to play up to or from the left/right cursors and then stop. Double pressing the button will loop-audition the operation, enabling fine-trim of the cursor position with the scrub wheel, or using the left and right keyboard arrows to trim by a predefined amount. A related section provides edit- (splice) and event-based audition, plus trim functions. Having selected a splice or event, you can replay the outgoing or incoming audio of the selected splice; alternatively, the Event In or Out section can be replayed or looped.

Six preset fade and crossfade profiles can be assigned to a set of dedicated buttons and laid onto selected cues in the graphic EDL window. Fade time assigned to these buttons can be tagged with mm:ss:ff values, as well as a contour value (attenuation in dBs at the fade's center).

The "Set and Get" left/right controls, as well as Capture and Go-to buttons, function exactly as those on the MultiMix screen. Set Left changes the cursor's time code value to that stored in the time code buffer without moving it; the same operation can be performed on the right cursor.

THE BOTTOM LINE: IT WORKS!

The Dyaxis II is one of the more intuitive, easy-to-master editing and hard disk storage systems available today, and the new MultiDesk Assignable Console is destined to attract a great deal of attention. It offers a good compromise between too many and too few controls. Often, a large analog console simply gets in the way during editing sessions; even while remixing edited tracks from hard disk, you really need access to only eight simultaneous channels as you modify and adjust the relative balances. Full dynamic automation of every level, mute, pan and EQ function makes it easy to build a complex mix in sections, laying off channels to hidden virtual controls as the mix session progresses. While all of these functions can be achieved from a glass console and mouse/keyboard commands, the process can quickly become tiresome.

Studer-Editech's MultiDesk Assignable Console for the Dyaxis II is a carefully conceived product. It creates an excellent balance between a virtual and physical work surface that dramatically simplifies and streamlines the types of repetitive tasks we encounter every day in the audio production studio. A great device!

Studer-Editech Corp., 1370 Willow Road, Suite 201, Menlo Park, CA 94025; (415) 326-7030; fax (415) 326-7039. Contact: Gerry Kearby. ■

Former editor of Recording Engineer-Producer *magazine Mel Lambert currently heads up Media&Marketing, a consulting service for pro audio firms and facilities.*

World Radio History

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

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

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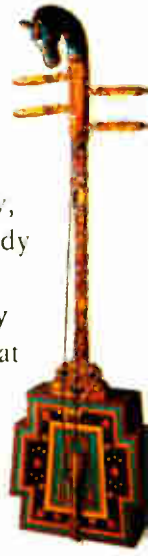

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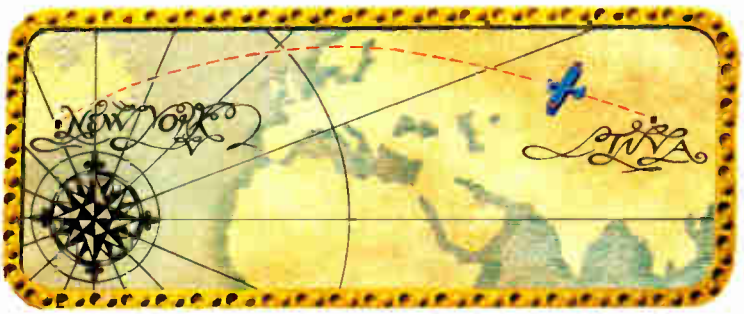

If the Tuvans wanted to use the DISQ System to make an album, they might have to travel to a city many Americans find foreign.

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World Radio History

BY TOM KENNY

POST·SCRIPT

SOUND FOR FILM

"I'm Still Here," Part One: Production Sound

by Larry Blake

The premise of this four-part column is really simple: Almost everyone involved in the film sound food chain—from production sound, to sound editing, to re-recording, to theater service people and projectionists—really want to do a good job. That's both the good news and bad; bad because we often don't know when to "leave well enough alone." "Can't see the forest for the trees." "Keep it simple, stupid." "If it's not broken, don't fix it." And so on.

The term "I'm still here" really does deserve to be included in the above hallowed list. It was thought up by a friend of mine who was commenting on how sound editors will often cut three dozen background tracks and two dozen Foley tracks in a seeming effort to let the director (and, if the stuff makes it past the final mix, the audience) know that they are "still there." The implication here is that a few stereo BGs and Foley for principal characters alone would have supported the drama on the screen just fine, thank you very much.

It is an understandable occupational habit for each of us to want to make the most of our piece of the puzzle, and even the best have a hard time knowing when to call it quits because the only thing worse than bringing too many units to the stage is not providing the director with enough options.

I fully expect that each of these four parts will offend the group under discussion. Since I am an active member in two of them (sound editing and re-recording) and will blast *my* peers in due time, I hope that the others will appreciate the spirit in which my remarks are intended. In other words, don't send threatening letters to my cat. Now, on to production sound.

Of all the three major parts of film sound—production, sound editing and re-recording—production sound is the one with the most potential to be simple. I would hasten to add to this that the *best* tracks are done in just this manner: a boom mic in the hands of a skillful operator mixed on a console with clean, fat preamps, and recorded on something like a DAT or a Nagra with Dolby SR. Complicating things further is, of course, sometimes necessary, and it's just too bad that radio mics and extensive looping (ADR) sessions have become taken for granted by so many directors and producers.

Even when setups are relatively "simple" single-boom mic situations, many production mixers find ways to keep busy. The idea that mixers on location "get creative" with equalization and, God forbid, noise gates, makes my skin crawl. Where it would have been best to highpass a good boom-miked track at 75 Hz and leave everything else flat, I've seen production mixers working the EQ like it was going out of style.

First and foremost, there's no way one can accurately judge the frequency response of the track with standard production headsets. Second, at the time of recording you have no sense of how everything is going to cut together. Third, introducing potential variations in EQ above and beyond the usual factors of mic placement and actor performance level will just make it that much harder for everything to cut together. Granted, there is a time and place for EQ during original recordings, with the classic example of helping a buried lavalier radio mic poke through clothing. Otherwise, in bringing the voice out of the mud, the re-recording mixer would be bringing up noise, too.

The other mortal "I'm still working here" sin in production mixing is to be moving the fader throughout a scene. This can create a post-production nightmare because the precious fill (i.e., the room tone between words) will vary not only from shot to shot but also within shots, creating big-time headaches. Of course, if you're recording on a Nagra at 7.5 ips and have a loud adult speaking to a little child, then letting the fader ride will just not work. But, please, if you're dealing with well-modulated professional actors, don't feel self-conscious about letting that fader sit there.

An old cliché has production mixers "mixing for dailies," meaning that tracks are EQ'd to sound

—CONTINUED ON PAGE 44

World Radio History

Modular Digital Multitracks in Post-Production

by George Petersen

Sparkling sound quality, low-cost removable media and a compact enclosure (with an equally compact price), have created increasing interest in using modular digital multitracks (MDMs)—such as the Alesis ADAT, Fostex RD-8 and Tascam DA-88—in post-production. And MDM use in multitrack recording for scoring and mixing to picture is becoming more common, even in high-end facilities.

In the post environment, MDMs provide a convenient means for storing multichannel M&E (music and effects) submixes, as well as a format for storing unmatrixed 4- and 6-channel final mixes. Advantages of using MDMs for these post-production tasks include the relative ease of digitally creating safety clones and backup copies of important sessions, and the fact that (with the appropriate hardware) time code can be accessed without "losing" an audio track.

Over the years, a variety of formats have emerged for storing audio elements during the production process. During the 1980s, the 1-inch analog 8-track became the de facto standard for storing audio submixes in video applications. And in long-form, music-oriented projects—such as concert films—analog and digital 24-track machines were the format of

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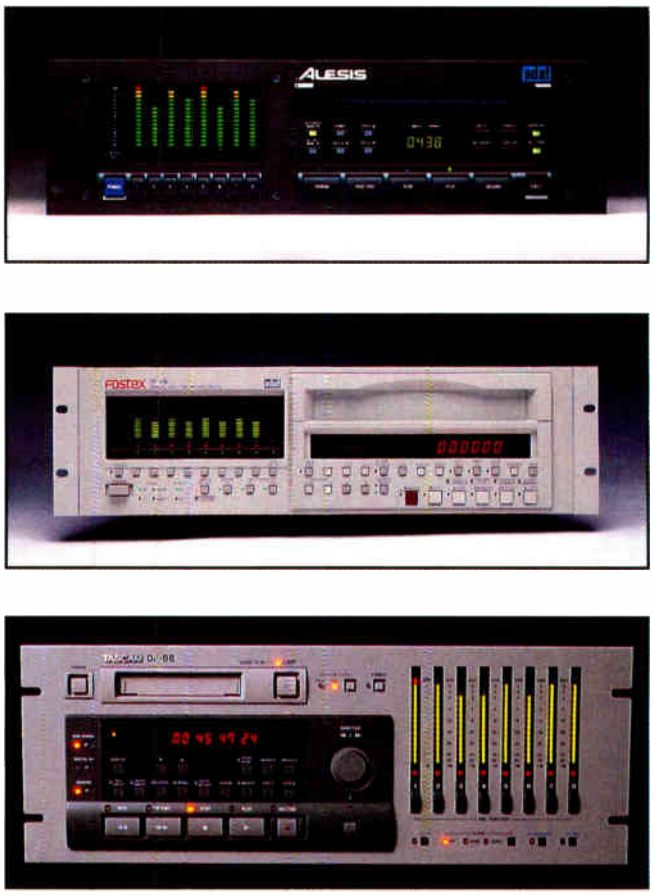


Top to bottom: Alesis ADAT, Fostex RD-8 and the Tascam DA-88

Cary Grant Theatre At Sony Pictures Studios

The world's largest console—a 244-input GLW Harrison MPC-1—was installed in June 1993 at Sony's renowned Cary Grant Theatre. The automated, digitally controlled board features 72 mix buses, a 256x256 routing matrix and 8-channel THX monitor system. The room is equipped with SDDS®, Sony's 8-channel discrete digital sound-on-film format. "Harrison built this console for our needs," says re-recording mixer Kevin O'Connell, who works with Rick Kline almost exclusively out of the Cary Grant Theatre. "The console enables us to do some of the creative things we only dreamed about before—with use of its automated panning, automated EQ, automated channel assigns—in today's shortened post-production schedules." ■

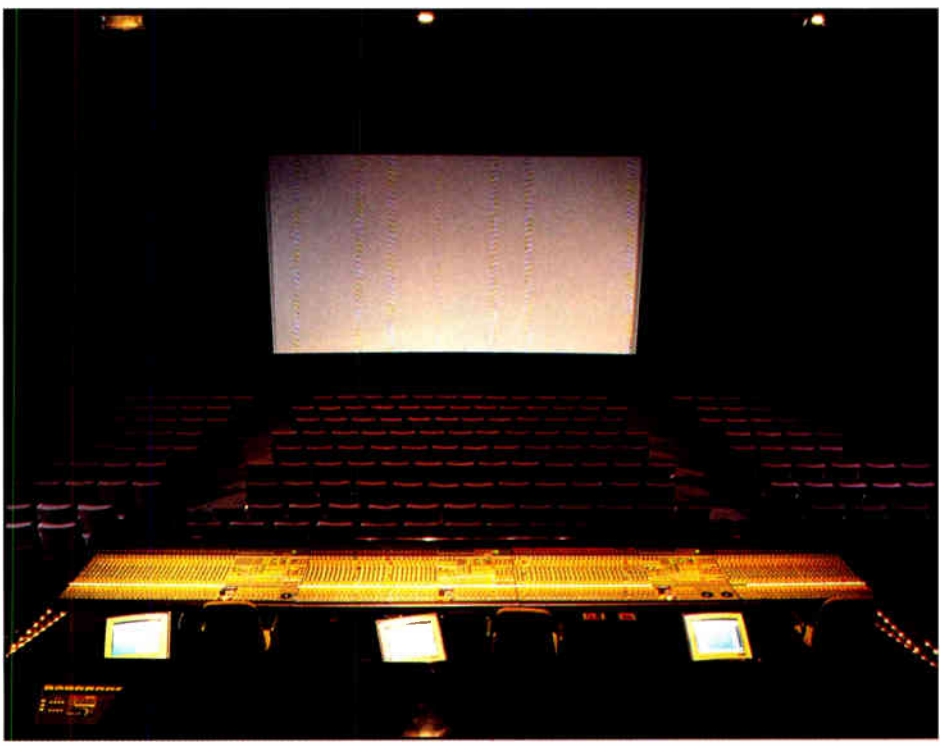


PHOTO: CAESAR LIMA

World Radio History

—FROM PAGE 42, SOUND FOR FILM
best in whatever situation the dailies are screened. This is mind-numbingly shortsighted, and I've even heard of mixers giving the transfer bays instructions for fader moves and single-ended noise reduction when transferring production tapes to mag. Give me strength!

Going to as many movies as I do—and spend time thinking about—I have come up with a simple formula for distributing the credit (or blame) that the production or re-recording mixers should take for a movie's great (or crappy) dialog track.

SITUATION ONE

If the production dialog sounds consistently rich and sonorous, chances are that the production sound team broke their collective ass and used a boom mic for most of the film. In these instances, I believe the post-production sound team need only hold up their end of the bargain with creative quality control.

Granted, even the best production tracks undergo a large amount of microsurgery in dialog editing—no matter what some production crews may think or have been told, virtually no track goes through unaided. Similarly, when dialog re-recording is done right, it's both smooth-sounding *and* intelligible regardless of what other racket is going on in a scene. Unfortunately, this is rarely the case, or "whadidhesay?" would not be the most common word spoken by moviegoers. Nevertheless, if you believe that there is a real human attached to the voice that you hear, you can feel pretty safe in giving the production team more than 50% of the credit.

SITUATION TWO

The dialog sounds terrible. All other things being equal, the blame goes straight to the director: Either he or she didn't give the production team the time and respect to get a good track, or they didn't know enough early on to fire them.

Despite what many production sound people say, I think that it's rare that decent production tracks are "ruined" by those of us in post. I do believe that while too many re-recording mixers will strip the life out of tracks while trying to get traffic noise out, it's usually not done at the expense of what was originally a great recording. (I'll talk at length about this travesty in the third part of this series.)

SITUATION THREE

It sounds just okay. This is almost impossible to call from an armchair, but I would tend to distribute the credit/blame to both parts. The film sound path is an interdependent, as-strong-as-the-weakest-link system: Just as the quality of the dialog heard in the theater can be no better than the print master, sound editors and re-recording mixers can't make a silk purse out of a sow's ear. (Or, as the venerable, indelicate old L.A. re-recording saying goes, "You can't polish a turd.")

One of the toughest things about production sound is that the quality of the production tracks our brothers and sisters create is to a scary degree a function of the cooperation they receive by the other departments. The grips who really know how to lay dolly tracks, electricians who keep light ballasts as far from the set as possible, and costumers who avoid using synthetics, etc., all contribute to the quality of the location audio.

There's no need to have an adversarial relationship between sound and other departments: A boom operator buddy of mine who has done dozens of features told me that among the very favorite people that he's ever worked with was the great Italian cinematographer Vittorio Storaro, who told him, "If [the lighting's] no good for you [to get the boom in right], it's no good for me." This is the point of view of not just a cinematographer, but a consummate *filmmaker*, and whenever I hear a cinematographer pissing and moaning about accommodating the sound crew, I just smile and think of Mr. Storaro. ■

Larry Blake is a sound editor/re-recording mixer who lives in New Orleans for reasons too numerous to mention, although going to Hansen's Sno-Bliz for a sno-cone on a hot summer day would be a good start.

—FROM PAGE 43, MDMs IN POST-PRODUCTION
choice. However, in most motion picture work for television and feature films, sprocketed mag film has ruled the roost, as it offers ease of editing in a globally accepted format. With the application of Dolby SR in film dubbers, the audio quality of mag tracks made a significant stride, especially when combined with 35mm film's playback speed of 90 feet per minute (or in tape recorder terms, a respectable 18 ips).

As early as 1991, at the New York AES Convention, a group of Mitsubishi engineers presented a technical paper on the development of a dual-mode digital recorder/player (4 tracks at 96 kHz or 8 tracks at 48 kHz) that stored up to 2.7 hours of audio on ½-inch videocassettes. Designed for specialized HDTV broadcast and exhibition applications, the system marked the beginning of compact, video-based digital audio transports (i.e., MDMs) as a medium for storing and playing multichannel mixes.

The Mitsubishi system never got much further than the prototype stage, although today's MDMs should be able to fill the bill. And

Other Multichannel Mix Applications

MDM systems provide an ideal storage format for multichannel playback systems in other situations besides the silver (or perforated) screen.

These include playing multichannel sound effects in theatrical applications, specialized exhibits such as planetariums, museums and conventions, theme parks and dozens more. To add an extra dollop of pizazz, unused audio tracks on a playback MDM could be used for recording automated sync tone pulses for controlling slide projectors, and while we're at it, a MIDI-equipped MDM—or a recorded time code track routed through a SMPTE-to-MIDI converter—could also trigger MIDI Show Control data, for controlling lighting and other special effects. The possibilities are endless. —*GP*

why not? MDM features such as low-cost (removable) media, excellent sound quality, long record times and ease of making perfect clone backups are all strong reasons to consider these as a possible alternative to the film dubber. Other advantages of MDMs include their near-noiseless performance (at least noiseless when compared to a film dubber clacking away) and a compact size that puts 100 or more MDM tracks in the space required by a single 6-track dubber. And with more and more gear being crammed into machine rooms these days, space is always at a premium.

Multichannel disk-based digital audio workstations continue making progress toward replacing traditional mag film cutting in dialog, effects and music editing applications. However, expecting your dubbing stage to have the same model and configuration of workstation available when you mix can be a chancy proposition.

In such cases, making an MDM copy of the workstation tracks offers two distinct advantages: For one, the tracks are backed up in an audio format, so if a system crash occurs during the mix, the MDM tracks can be re-accessed almost immediately, as opposed to waiting for the workstation to reload the tracks from standard data backups, such as tape streamers or optical disks. Second, making backups is always a good idea, and with an MDM system, the creation of single (or multiple) backups is a simple procedure. And MDM tapes have an enormous data capacity; for example, the 100-plus minutes of recording time on the Tascam DA-88 provides the equivalent of more than 4 GB (4,000 MB) of storage—on a tape costing less than $10!

Another factor to consider in using MDMs for audio post is the ubiquity of these recorders. Today, with tens of thousands of MDMs in use worldwide, these machines have become a common fixture in studios of all sizes. So a film composer working in a home studio should have no problem delivering multichannel scratch mixes of works in progress to directors or music editors—while keeping a first-generation backup copy for reference. MDM technology also provides a convenient means of storing 4- or 6-channel LCRS mixes, whether in the project studio or large dubbing theater.

To be truthful, MDM decks are hardly the ultimate solution in every production situation, although they do make for a useful tool in the audio professional's bag of tricks. And until you can buy terabyte flashRAM or bio-cubes for $10 at your local K-Mart, MDMs may provide the missing link between sprocketed mag drives and new formats to come. ■

Mix editor George Petersen is the author of Modular Digital Multitracks: The Power User's Guide, *available through Mix Bookshelf.*

TUTORIAL: Surround Mixing in The Project Studio

Stereo motion picture sound has been around since the days of Disney's 1940 classic *Fantasia*, which used multiple interlocked optical film transports, synchronized with the projector to achieve its landmark 6-channel stereo presentation. In the 1950s, 4-channel 35mm and 6-channel 70mm films became popular, although the special prints—coated with thin stripes of magnetic material along the sprocket holes—were fragile, expensive to make and required film distributors to maintain a dual inventory of mono and stereo prints. The system was less than perfect.

When produced for stereo release, a 35mm theatrical film begins with a 4-channel mix, known as LCRS, referring to the Left, Center and Right channels (located behind the movie screen) and a mono Surround channel, which is routed to speakers along the back and side theater walls.

In the mid-1970s, Dolby unveiled its Dolby Stereo system, which took the LCRS channels and used a matrixing system to encode the four channels into a stereo pair. This stereo pair is printed as two optical tracks that are placed closely together, so the stereo pair is picked up as a single mono signal in theaters not equipped for stereo. In a Dolby Stereo-equipped theater, a 2-channel optical pickup sends the signal to a Dolby Cinema Processor, which decodes the two matrixed channels back into the original LCRS channels.

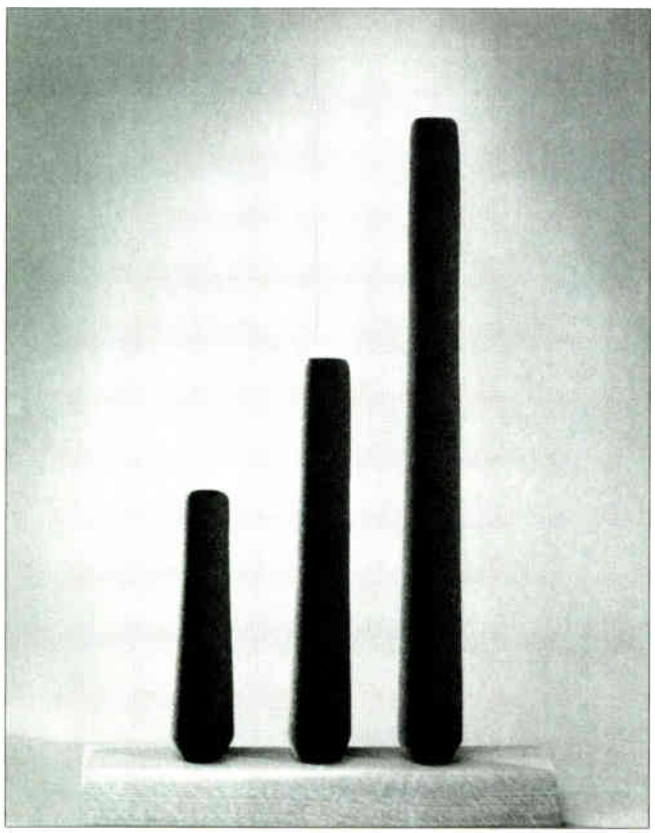
The Dolby Stereo prints are playback-compatible with mono theaters, so there is no need for film distributors to stock separate inventories of stereo and mono prints. Also, once the original stereo sound negatives are made, the costs of producing a stereo print are identical to making a mono film. For these reasons, film studios became very interested in stereo films, and with the success of early Dolby Stereo releases—such as *Star Wars*—an increasing number of theaters began upgrading for stereo playback.

So what does this mean to the typical project studio? Well, for one thing, any Dolby Stereo film released on a stereo videocassette also retains all the matrixed information for decoding 4-channel playbacks, and consumer interest in 4-channel home-theater playback systems is on the rise. And because of this, opportunities for creating stereo soundtracks for lower-budget video productions may be available to the independent composer/engineer/producer. Once you've mixed a project to the LCRS components (plus a time code track), it's possible to access a surround encoder (either through a rental company or by booking a couple hours at a larger studio that has one) and transfer the LCRS tracks to a Dolby-encoded pair for layback to the video master.

Fortunately, MDMs are fairly portable, so if you go to a larger studio for the transfer, be prepared to bring your machine along with you, just in case the studio doesn't have the deck you own

—*GP*

New Products For Film/Video Sound



WINDTECH SHOTGUN SCREENS

WindTech, distributed by the Olsen Audio Group (Scottsdale, AZ), has a new line of windscreens for most popular pro shotgun mics. Available with a 0.69-inch inside diameter (stretches to fit mics up to 0.875 inches thick), these washable, open-cell foam windscreens effectively reduce wind, breath and pop noise, while remaining sonically transparent. Three sizes are available: The SG-1 ($19.95) fits mics with a capsule length up to 7.25 inches; the model SG-2 is $24.95 and handles up to 11.5-inch capsules; and the $29.95 SG-3 fits up to 21-inch shotguns.

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AMP CAPSTANS FOR AMPEX VPRS

AMP Services (West Palm Beach, FL) now offers solid ceramic capstan sleeves for Ampex VPR 6 and VPR 80 capstan motors. Guaranteed for life against wear, scratching or chipping, the new capstans are said to eliminate flutter, optimize tape handling and make a noticeable improvement in punch-in time. The retrofit is done on a fast one-day turnaround basis.

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DYNAMAX DIGITAL CART UPDATE

Fidelipac (Moorestown, NJ) announces two new versions of its successful Dynamax DRC1000 Series of digital cartridge machines, which feature variable sampling rates, AES/EBU digital I/O and a PC keyboard for titling and editing material. One version, equipped with the new 25MB NEC floppy disk drive, can store more than ten minutes (with up to 99 cuts) of stereo 15kHz audio on a single disk. The new unit can also play the 13MB and 2MB disks used in previous DRC1000 decks. A second version uses 128MB, 3.5-inch magneto-optical disks. One recordable/erasable disk can store an hour of stereo material; an optional 230MB drive will be offered this fall.

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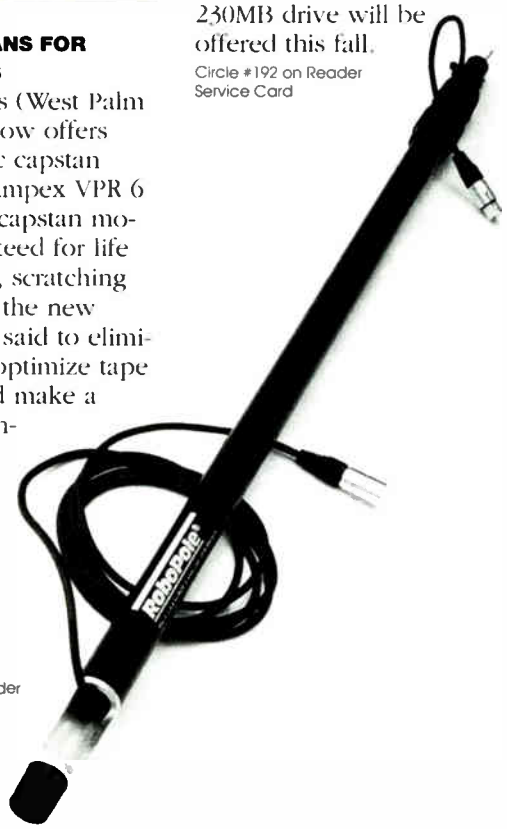

HARRISON OCTAPAN

Harrison by GLW (Nashville, TN) announces the Octapan, an 8-channel automated panning system that supports up to eight separate faders for stereo, quadrophonic, LCRS, split-surround, 70mm and other multichannel mix formats. The system includes eight trackball panners with LED positional indicators and a Quicktouch interactive video graphics interface, which allows fast panner assignments, real-time automation and real-time X-Y positional display (with divergence) of all panners. Now standard on all Harrison MPC film consoles and Series 12 automated mixers, Octapan is also available for retrofit into other consoles and as a stand-alone unit.

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ROBOPOLE PORTABLE MIC BOOM

From The Equipment Emporium (Arleta, CA) comes RoboPole®, an affordable handheld mic boom (fishpole), with three telescoping, black-anodized aluminum alloy sections, prewired with an internal Canare XLR cable. Two versions are available: RoboPole Long extends from under 6 feet to nearly 15 feet and weighs 3 pounds, 5 ounces, including the 22-foot internal mic cable. RoboPole ENG ranges from 40 inches to 7.5 feet in length and weighs 2 pounds, including its 15-foot cable.

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CLIFF JONES AT AIR STUDIOS

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by Mr. Bonzai

RUSS TITELMAN

WARNER BRO'

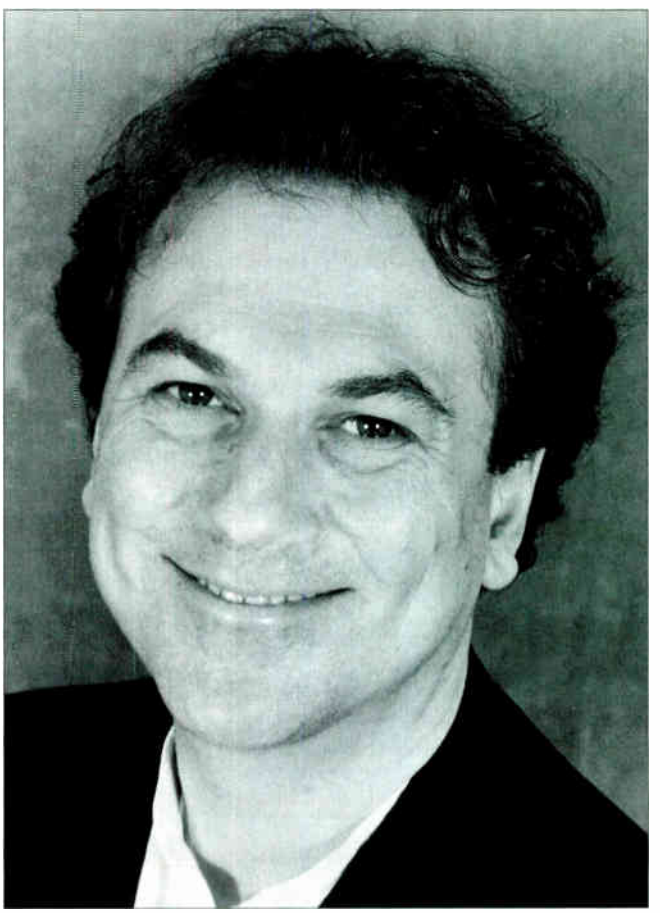
Is the record producer a captain navigating a supertanker through uncharted waters and then guiding the fat project through the Panama Canal? Or is a producer a coach—pepping up the team, calling the plays and watching the carnage from the sidelines? Maybe the producer is a modern version of the shaman; a witch doctor directing the primeval forces of nature. Through it all, though, a producer must hear the dream and make it reality.

Warner Bros. VP of A&R Russ Titelman has helmed creative ships through tempestuous times for nearly a quarter of a century. Through it all, his impeccable taste and the luck of the draw have been with him. Creative friendships with the likes of Randy Newman, Eric Clapton, James Taylor, Paul Simon, Chaka Khan, Steve Winwood, and the long ride with Warner Bros. head honchos Lenny Waronker and Mo Ostin have proven productive, even *re-productive*.

Imagine this little squirt sitting in his living room in the late '50s with Phil Spector and then becoming a member of The Spectors Three while still in high school. Next came teenage songwriting with Mann & Weill, King & Goffin, a guitar gig on the TV show *Shindig*, bizarre soundtrack work with Jack Nitzsche (*Performance*, starring Mick Jagger), and producing the Little Feat 1970 debut for Warner Bros. Since then, he's racked up a billion-dollar batch of great albums, and is now a big squirt, loving every minute of re-creating rock 'n' roll, reinventing popular music.

Join me now in Mr. Titelman's L.A. hotel suite, pull up a giant cappuccino and munch on *these* biscuits...

Bonzai: What's your secret?
Titelman: Being in the right place at the right time is part of it. Because of Eric [Clapton's] success, the collaboration has worked out very well and we've stuck together. We started with *Journeyman* in '88, then we did a live record, The Albert Hall *24 Nights*, and then the soundtrack for *Rush*.
Bonzai: Isn't that where "Tears In Heaven" first appeared?
Titelman: Yes, on the soundtrack, which was really like making a [conventional] record. We were together from the start. I was there for support and guidance on the writing of the music, and just a bounce for him—an objective ear.
Bonzai: Is it pretty much just the two of you working out things together?
Titelman: Well, in that case Randy Kerber was a big part of it. Eric got together with Randy, who is a great arranger and keyboard player. In



World Radio History

fact, Randy played piano on Rickie Lee Jones' first record. He's a phenomenal musician, so he and Eric sat in a room. Eric would play his ideas and Randy would orchestrate on the synthesizer as it went along. In most cases we added real strings. After that came *Unplugged*.

Last year we won a Grammy for Record of the Year and Album of the Year, but Record of the Year, "Tears In Heaven," came off the *Rush* soundtrack and Album of the Year was for *Unplugged*. So we won for two different albums, which might be a first.

Bonzai: Let's go back to your early days. Didn't you meet Phil Spector while attending Fairfax High [in L.A.]?

Titelman: Well, I actually met him when I was in junior high. My sister was in high school, and her boyfriend was Marshal Lieb, the other guy in Phil's group, The Teddy Bears, with Annette Kleinbard, who later changed her name to Carol Connors. Phil and Marshall graduated, and Annette was still going to high school, and Phil wrote music while he was studying to be a court reporter. You know, Phil was a very good jazz guitar player. I don't feel that I ever became a great player.

Bonzai: But good enough for *Shindig*?

Russ Titelman and Eric Clapton with their Grammys for* Unplugged *and "Tears In Heaven"

Titelman: Yeah, I was okay as a rhythm guitar player. When I got the call for the show, I was in New York writing songs, signed to Screen Gems/Columbia Music, Donny Kirschner's publishing company. I had met Barry Mann, who was my idol, in Los Angeles. I wanted to be at his publishing company, working in New York with Mann and Weill. Barry had heard a demo I made of one of my songs and liked it. I met him and I thought I had gone to heaven. He said, "Great song—come to New York and we'll write together."

Bonzai: What was the song?

Titelman: "Just a Little Touch of Your Love." I went to New York and I started writing with Barry and Cynthia. Then I met Carole King and Gerry Goffin and wrote with them. We made a couple of records. One of the girls in The Cookies sang a song that Barry, Cynthia and I wrote. We called that group The Cinderellas. Three girls from New Jersey and this girl Margaret, who was in The Cookies. "Baby, Baby, I Still Love You" and "Please Don't Wake Me," which was the first record I really produced, outside of the demos I had done. I also made a record by The Cookies with Carol and Gerry called "I Never Dreamed." I loved that record. This was early 1964, when I was 19 going on 20.

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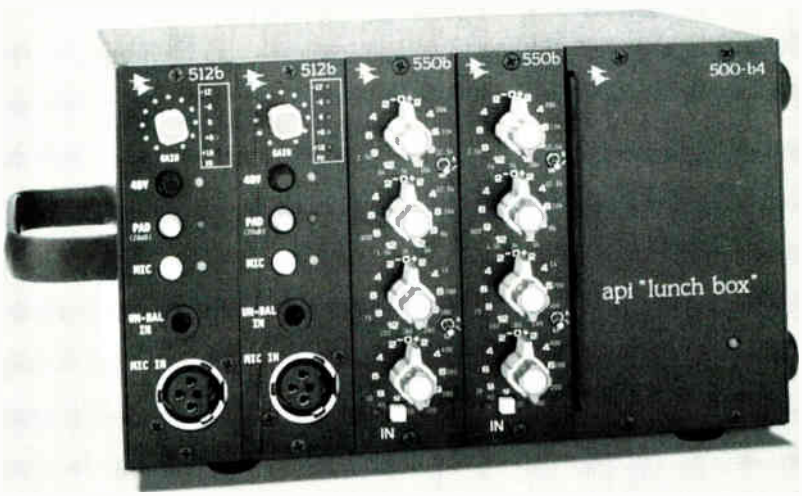

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Bonzai: So, were you on a roll?
Titelman: Not hits, but a roll as far as I was concerned, working with the best people in the world.
Bonzai: How did being in the *Shindig* band affect your life?
Titelman: Steady money coming in was something, and I got to play, under the gun, every week. We were the band behind most of the artists who appeared on the show. We played behind Jerry Lee Lewis, Jackie Wilson, on and on. I got to see everybody and play music behind these great artists. You see, I was bitten by the bug years before—Phil used to rehearse in my living room. I'd come home from junior high and there was Phil, Marshall and Annette rehearsing "To Know Him Is to Love Him" in 1958.

When I went away to camp that summer they put the record out and all of a sudden Phil was on *American Bandstand* with a Number One record. So, he sent me to Burdell Mathis, and that's where I started taking guitar lessons.
Bonzai: How did the producing career get started for you?
Titelman: Well, I'd been a musician, playing on sessions and hanging out. The music business was entirely different in those days. I used to hang out at Metric Music with Lenny Waronker [now president of Warner Bros.], go over to Screen Gems where Brian Wilson would be working. Time went on, and I started taking sitar lessons at the Ravi Shankar School of Music in 1968. I met Lowell George there—he could play anything you could put into his hands, while everybody else was clunking away trying to pull the string correctly.

> I think that the music that we loved—and still love to this day—is timeless. People will probably be listening to Eric Clapton records in 30 years, 50 years.

Bonzai: Were you guys high on LSD at this time?
Titelman: Whatever we could get our hands on [Laughs]. We all got together and did the *Performance* soundtrack, which Jack Nitzsche wrote. Ry Cooder, myself and Randy Newman were the core of the band for the film.
Bonzai: Incredible experience. Of course, I was totally fried when I saw the film.
Titelman: We were fried when we did it [Laughs]. Interesting film, but bizarre. We went to a screening and do you remember when James Fox gets whipped? Randy leaned over and said to me, "Your mother will be *so* proud of you."
Bonzai: Did you play on "Memo From Turner?"
Titelman: We played on all of it. That started as a track that Traffic had done, and they didn't like the way it worked. We had a click track and Jagger's voice, and we just played behind it. I played the Keith Richards rhythm part, and Ry played slide. I think Bobby West played the bass, Gene Parsons the drums. And the

Run Silent, Run Deep

ASHLY was the first to release a series of professional, fan-cooled amplifiers featuring power MOS-FET technology. The new CFT-1800 now offers the superior fidelity and rugged reliability of MOS-FET output devices in a quieter, convection cooled package. Designed primarily for use in recording studios, post-production facilities, or broadcast control rooms, the CFT-1800 will also satisfy even the most demanding audiophile enthusiast. In stereo operation, the powerful CFT-1800 delivers more than 300 watts per channel. Mono-bridged, the amplifier will put out a thundering 600 watts RMS for those room shaking subwoofer applications.

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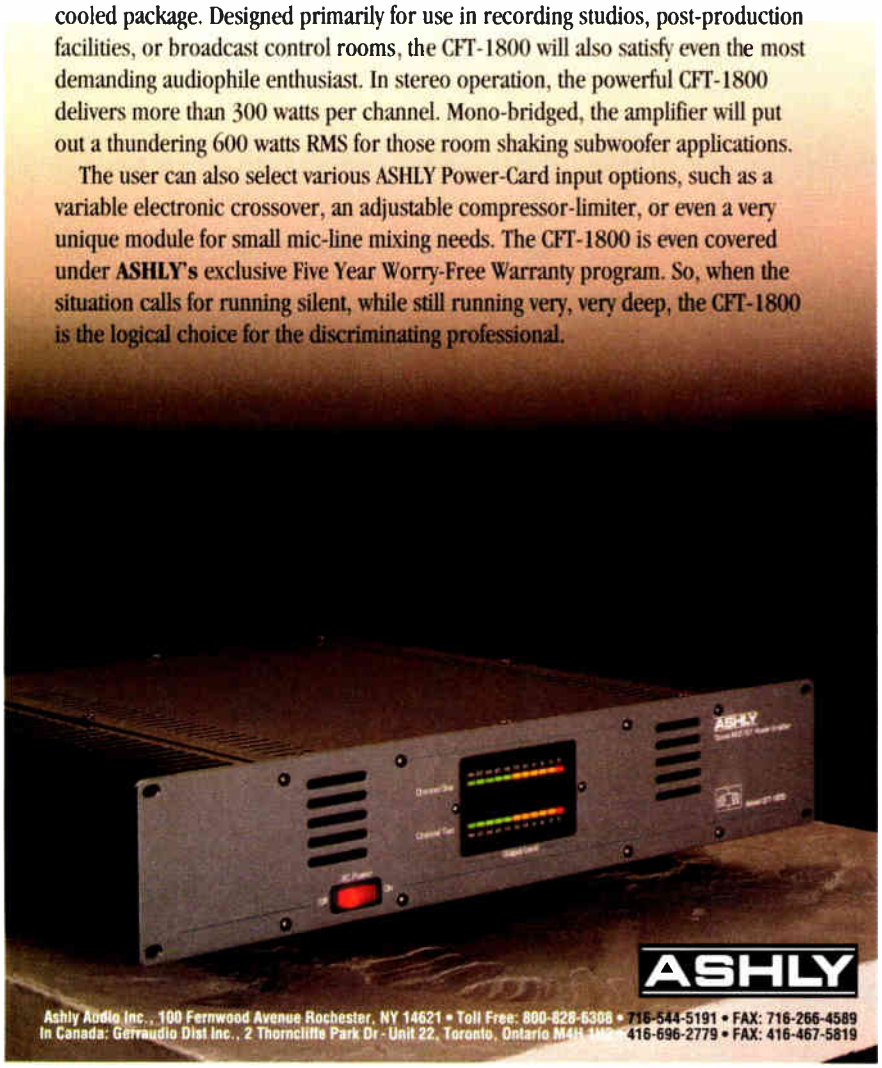

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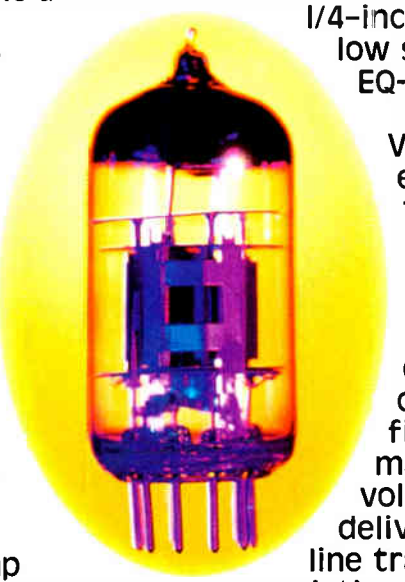

The output stage of the VMP 2 is all-tube, as well, and employs a power-amp design to create the +19 dBm output capability which is available on either a fully transformer-balanced XLR connector or a 1/4-inch phone jack. And a custom-designed power supply consisting of a special low-hum field power transformer with magnetic shielding and high-voltage regulator circuitry delivers the juice without power-line transients and voltage variations.

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keyboard stuff was Randy.

Bonzai: Were things more flexible in those days?

Titelman: Very flexible, and a lot of experimental stuff going on that soundtrack. We asked Lowell to come in, and he played shakuhachi, I played the veena. We made all this crazy noise. In fact, Jack Nitzsche next did the *Candy* soundtrack, which was thrown out. We got plastered, watched the movie and did all this crazy stuff. There was this guy named Mr. Wheat, who made giant "boo bams," percussion instruments as big as this room. They were huge cardboard tubes with skins stretched on the tops, and you had to climb up a ladder and then bang away on them.

Anyway, Lowell was putting together a band—Little Feat. He was going to sign to Lizard Records, and I had a friendship with Lenny Waronker. I took Lowell and [Little Feat keyboardist] Billy Payne to Lenny's office on the Warner lot. Lowell and Billy played a couple of songs and Lenny said, "Great. Go talk to Mo and let's make a record." That was the first album I produced, in 1969.

Then Lenny brought me in for Randy's live album, and then we made *Sail Away* and Ry Cooder's *Paradise and Lunch*. In the meantime, I had signed Graham Central Station and made the album with Larry Graham from Sly and the Family Stone. I hate to use the word, but that was a *seminal* R&B record. Larry made up that whole slap bass style, and he had all these songs he'd been working on for years—so slimy, and smelly, and funky. You talk to any bass player, and they all idolized him. Larry was the cat.

Bonzai: Tell me a little about Randy Newman.

Titelman: The funniest person I've ever met. I was talking to him the other day and we just laughed for 20 minutes.

Bonzai: How's his Faust project coming along?

Titelman: It's supposed to be produced on Broadway sometime soon. Randy is the Devil, and James Taylor is God—typecasting. [Laughs]

Bonzai: You produced James' *Gorilla* and *In the Pocket*. Did those records come together pleasurably?

Titelman: They did. *Gorilla* was one of the best experiences. Two and a

—CONTINUED ON PAGE 198

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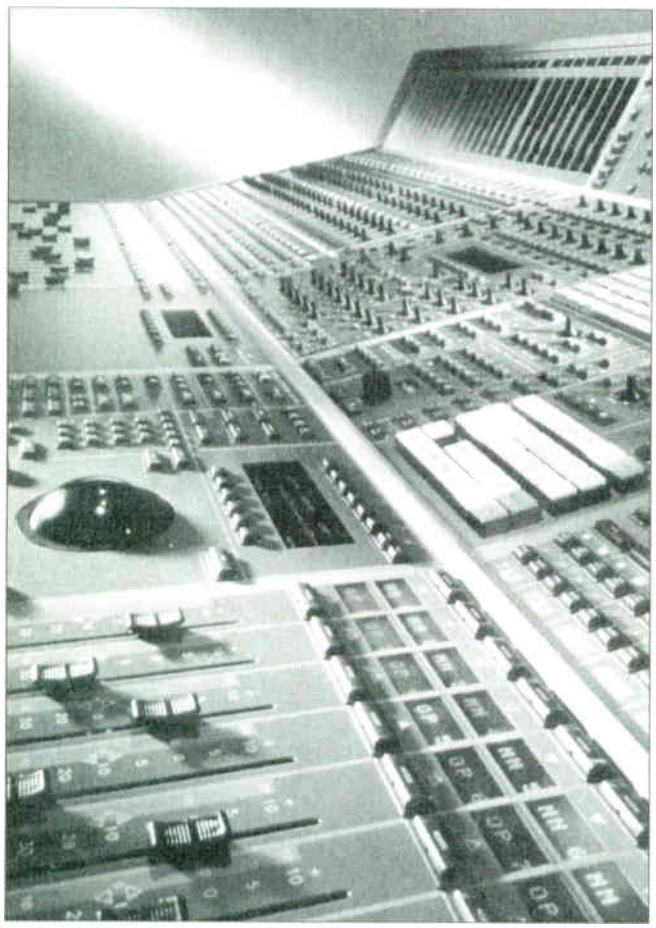

NEVE CAPRICORN UPDATE
Neve (U.S. offices in New York City) announces Version 2 software for the Capricorn all-digital console. New features include multi-engineer operation, where several Assignable Facilities Units can operate independently on a single console; a Capture Time Code feature for reading the absolute time code location of a parked transport and applying all automation values from that point; modulation metering; and a dedicated Play Safe button.

Circle #226 on Reader Service Card

SPECTRAL SHIPS AUDIOPRISMA
Spectral Synthesis, of Woodinville, WA, is now shipping its AudioPrisma™ hard disk recording system, which features 96 tracks (12 simultaneously to/from the hard drive), 12-channel mixing with EQ, and up to eight channels of I/O to and from the system. Priced under $4,000, AudioPrisma operates on a single PC-AT plug-in board and includes Prismatica™ Windows-based control interface software.

Circle #227 on Reader Service Card

MTA SERIES 900
Designed by Trident founder Malcolm Toft, the Series 900 console from Malcolm Toft Associates (distributed in the U.S. by David Michaels Associates, Woodland Hills, CA) provides the same quality as MTA's top-of-the-line 980 board but in a package intended for the serious project studio. The 900 is a split design, available in a standard 32x24x24 configuration; however, each input module has two line inputs, providing 94 inputs in mixdown. Other features include 4-band sweepable EQ, eight effects sends (switchable pre/post-fader), and automute grouping. U.S. pricing begins at under $30,000.

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AUDIX PH5 SERIES II
Audix (Tualatin, OR) announces an improved version of its popular PH5 monitors. The new PH5-II features a 40-watt RMS power amp, in a larger, vented enclosure with a 5.25-inch woofer and 0.75-inch dome tweeter, for a frequency response said to be 50 to 20k Hz. The 6.3x9.3x6.5-inch cabinets weigh 26 pounds per pair and are also available in a shielded version for multimedia or video applications.

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DIGIDESIGN PRO TOOLS 2.5
Digidesign (Menlo Park, CA) announces the availability of Pro Tools Version 2.5, a Macintosh-based multichannel digital audio recording/editing system. Enhancements include a new edit window with full access to metering, sends, EQ level and voice assignment in one window, 100 autolocation points (with any combination of name, current time/selection and zoom level), scroll during playback (for real-time visual feedback), new keyboard shortcut commands and an IAC extension allowing MIDI sequencers to run concurrently with Pro Tools in the foreground or background. New versions of Pro Tools include the 2.5 software; registered owners of earlier versions can upgrade for $286.

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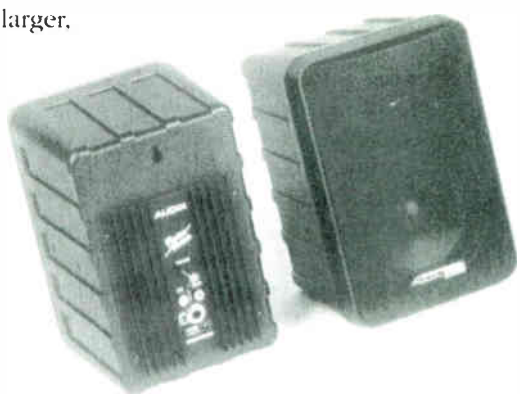

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CRL DIGITAL TESTER
Circuit Research Labs, Tempe, AZ, offers the DAA-50 a handheld digital audio analyzer for identifying and determining the integrity of AES/EBU or consumer digital signals. A simple LED display indicates channel status, such as sampling rate, emphasis or copy protection, as well as interface errors (no lock, parity or CRC errors, etc.). Additionally, the DAA-50 has an internal, 8-times oversampled D/A converter with headphone output for audio monitoring of signals being tested.
Circle #232 on Reader Service Card

B&K 4021
Bruel & Kjaer Microphones (distributed in North America by TGI of Kitchener, Ontario) is now delivering its 4021, a miniature condenser mic that combines the cardioid capsule of its popular 4011 mic with miniature SMD transistor electronics. Optional clip-on swivel mounts are available for violin, cello or bass miking applications, and the mic is also offered as the 4022, which is essentially identical but has cable connections at the rear of the capsule to facilitate hiding the cable in film/video applications.
Circle #231 on Reader Service Card

TWELVE TONE CAKEWALK PROFESSIONAL 3.0
Twelve Tone Systems (Watertown, MA) released Version 3.0 of its popular Cakewalk Professional™ sequencing software. New features of this $349, 256-track program for Windows-compatible computers include support for MIDI Machine Control devices (such as the Alesis, Fostex and Tascam modular digital multitrack recorders), 96 assignable onscreen MIDI faders, groove quantizing and printed notation with lyrics.
Circle #233 on Reader Service Card

SCHOEPS COMPACT CONDENSER MIC
From Schoeps (distributed by Posthorn Recordings, New York City) is the Compact Condenser Microphone line, which includes models, that, despite their small size (typically under 2-inches long, depending on the capsule type), offer the same performance of the CMC models in the Colette Series. The new CCM mics are true condenser types, and their miniature internal electronics are powered from any 12-48 VDC phantom source. The capsules are not interchangeable, although CCMs are available in cardioid, supercardioid, omni and figure-8 versions; all include an attached 10-foot cable with XLR plug.
Circle #234 on Reader Service Card

ZOOM 9150 GUITAR PROCESSOR
Designed for studio or live performance use is the 9150 from Zoom (distributed by Samson Technologies, Hicksville, NY). Priced at $599.99, the 9150 is a single-rackspace processor that combines a 12AX7A tube preamp stage with 27 different types of digital effects (including reverbs, delays, pitch and phase shift, flange, chorus, tremolo, rotary speaker simulator), available in 99 factory and 99 user settings.
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T2 CONSOLE

Announced at the Audio Engineering Society convention a year ago, the M4000 mixing system from Tactile Technology (Cerritos, CA) is now shipping. An expandable design configurable from 48 to 240 inputs, the M4000 consists of a single control surface (resembling a conventional mixing console) and up to five rack-mount electronics packages that can be remotely located, thus keeping the work surface compact. All mix parameters (faders, mutes, equalization, aux sends/receives, pans, routings, etc.) can be automated via an internal processor, so no external computer is necessary. The automation includes full MIDI implementation along with eight relay-controlled switch outputs, four TTL and four opto-isolated connections. The basic 48x8 console with static snapshot automation is $33,000; add $4,000 for the dynamic automation package (faders, mutes, pan, etc., and internal 250MB hard disk), and $10,000 for motorized faders. Additional 24x8 dual in-line expanders (adding eight more subgroups and 48 more inputs in remix) start at $17,000, so a complete 96-channel automated system is $64,000.

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TRIDENT VECTOR AUTOMATION

Trident (U.S. offices in Nashville, TN) announced that its proprietary Trimix automation (developed for the Series 90) is now available for the Vector 432 console line. Trimix offers automated control of up to 12 switches and the long and short faders on each input module, eight DC subgroup masters, and cue list-based autolocation and synchronization of two tape transports and a MIDI sequencer. Trimix is available in VCA or moving fader versions.

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DIC DIGITAL HI-8MM TAPES

Designed for use with the Tascam DA-88, a new line of Hi-8mm tapes from DIC Digital (Teaneck, NJ) offers versions approximately 10% longer than standard tapes and provides a true 120, 60, 30 or 15 minutes of recording time. The tapes feature a specially engineered back coating for improved shuttling in demanding post and studio applications.

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HOT OFF THE SHELF

New software for the TC **Electronic M5000** incorporates two new early reflection algorithms and a demo version of its MD2 Multiband Digital Mastering Dynamics package, offering post and mastering engineers full control over dynamics—including frequency-dependent limiting/compression—entirely within the digital domain. Call (805) 373-1828 for info...The **Middle Atlantic AX-S** is a line of fixed-installation racks that allow an entire bay of gear to be rolled out from the rack for servicing or reconfiguration, with articulated cable carriers that protect AC, audio or data lines when the equipment is being moved. AX-S systems are available in units handling from 15 to 43 rackspaces. Call (201) 839-1011...Crown has released **"Live Sound for Houses of Worship"** ($29.95), an 84-minute tape designed to educate nontechnical personnel at churches and synagogues on basic and advanced aspects of audio. To order, call (800) 342-6939...Now available: a 76-page catalog of **Belden's Brilliance line** of audio and video cables. For a free copy, call (317) 983-5262..."**Shaping Your Sound**," the acclaimed five-tape, 6.5-hour series covering the basics of recording and mixing, is now only $99.95 (individual tapes are $29.95). The series is available through Mix Bookshelf, (800) 233-9604, or First Light Video, (310) 558-7880...The **MilesTek Catalog** offers discount pricing on tools, cables and connectors, with an emphasis on BNC/coaxial types. For a free copy, call (800) 524-7444...Bag End's "**Guide to ELF Systems**" is an informative 24-page explanation of its innovative Extended Low Frequency subwoofer technology. For a free copy, call (708) 382-4550...**First Com's "Master Series"** of CD production music highlights all-star composers, with the first disc in the series focusing on noted-composer/guitarist/songwriter Billy Joe Walker Jr. For more information, call (800) 858-8880...**Music Directory Canada** ($29.95) has over 6,000 listings of Canadian companies and facilities, such as booking agents, music educators and record labels. Call (800) 265-8481 or (905) 641-3471 to order...**The Atlas/Soundolier Summary Catalog** (SC-11) provides info on 94 products ranging from mic stands, studio booms, adapters, equipment stands and accessories. Call (800) 876-7337.■

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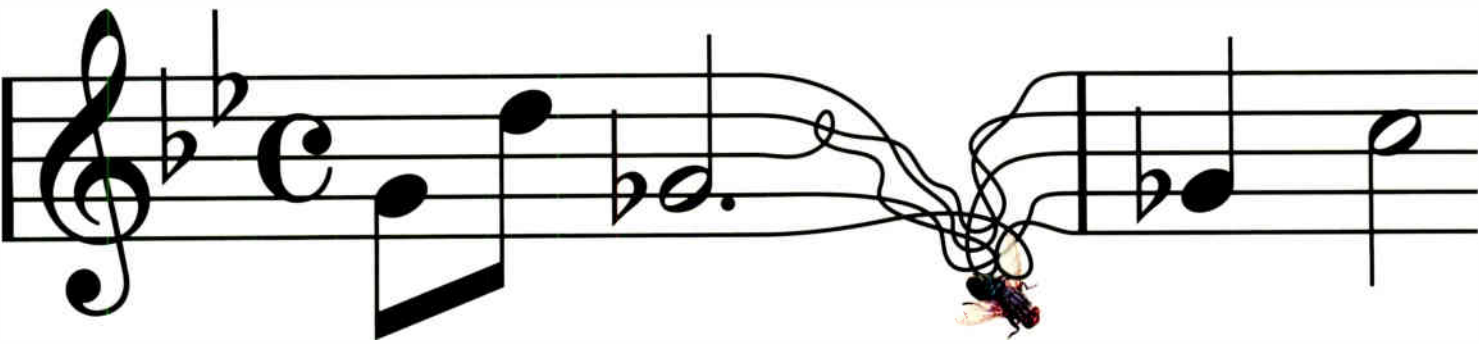

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by John McDaniel

JUPITER SYSTEMS

MULTIBAND DYNAMICS TOOL

MDT (Multiband Dynamics Tool) by Jupiter Systems is a software "plug-in" for Digidesign's Sound Designer II digital editor for the Macintosh. It adds digital compression, expansion and limiting in both destructive and non-destructive modes. MDT's graphic interface allows the user to draw custom I/O curves that define the output level as a function of input level. In Multiband mode, MDT allows selective dynamic control over either three or five separate frequency bands to create a multiband compressor/expander, spectral enhancer, de-esser, or dynamically controlled EQ.

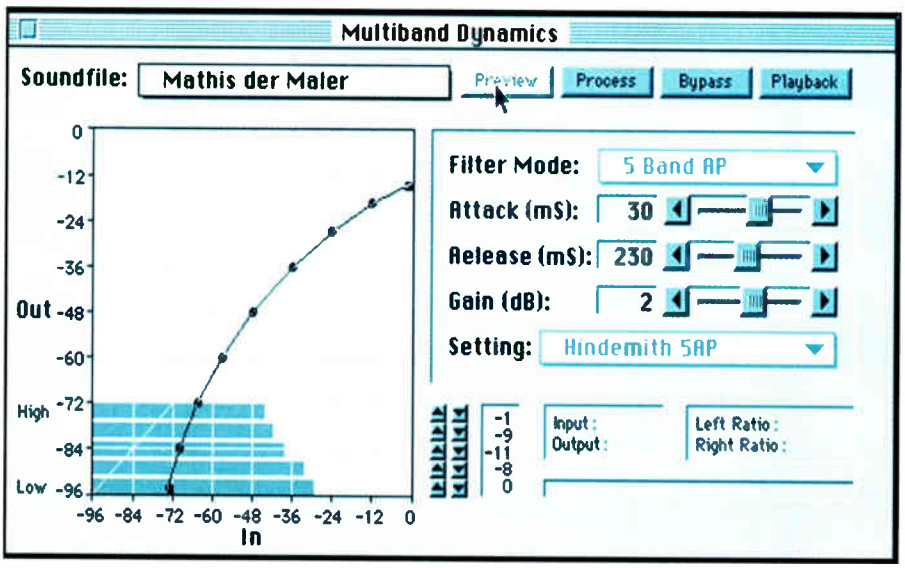

Figure 1: "Gentler Compander Curve" screen

MDT is compatible with Sound Designer 2.5 or greater and OSC's Deck 2.1 or greater. It supports real-time playback via Sound Designer II through Sound Accelerator II, Audiomedia I or II, or Pro Tools DSP cards. Sound Accelerator I owners may run single-band operations in real time but must use a Batch mode for multiband processing.

Rather than mimic the look of an outboard device with lots of virtual knobs, Jupiter Systems has chosen to graphically display the I/O curve of the current processing function on an X/Y graph. A moving bar graph (referred to as the Peak Level Indicator) displays the control signal (input) used by MDT to determine the output level. The bar graph's response is affected by the release time setting, reflecting, as Jupiter puts it, "the time it takes for peaks to be averaged out of the level calculation." An input offset, adjustable from 0 dB to -96 dB, lets the user change the relationship of the input signal to the I/O curve, thereby controlling the amount of processing applied. Sliders adjust values for attack (1 to 50 msec), release (1 to 5,000 msec) and post processing gain (±24 dB).

An I/O curve and its related parameters are referred to as a "setting." These are selected via a pop-up menu, and an unlimited number may be saved. A bypass button toggles processing during playback for easy comparison to the unprocessed file. Beware that some combinations of settings and program material can put nasty transients through your system during switching. Test the bypass at a lower level first or use it only when playback is stopped.

The "gentler compander curve" (Fig. 1) has a compression threshold of -36 dB and increasing compression ratios (i.e., the slopes of the line segments defined by each threshold "dot" on the curve) of 1.3:1, 1.6:1, and 2.2:1. The expander portion of the curve begins at -48 dB and also

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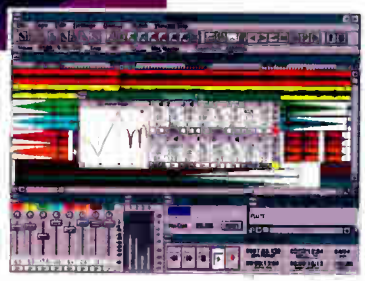

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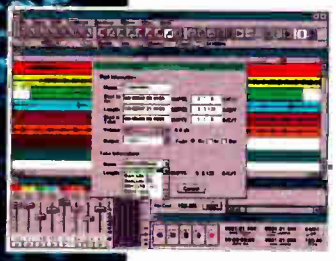

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displays increasing ratios from 1:1.3 to 1:1.6, 1:2.2 and 1:3. An input level of -24 dB will be compressed by 2.5 dB to -26.5 dB, while an input level of -60 dB will be expanded by 4 dB to -64 dB. Any output level can be determined by finding the input and output values corresponding to a point on the graph of the processor's curve. In fact, it's the *only* way to note how much gain reduction is going on. A gain reduction meter was in the original design, but you can only do so much with a 56001 chip.

The graph is laid out on a 12dB grid (one screen pixel per ½ dB in order to fit MDT on a 640x480 display), which makes it difficult to see with much detail what's going on. Because the input indicator's response is governed by the release time of the processor, slower release times let you see the peaks more easily. A crosshair cursor helps determine the amount of gain reduction. As it moves around the grid, its I/O coordinates are displayed to the right of the graph. Just place it on the curve in line with the peak shown below on the input meter and then subtract the output value from the input value.

SINGLE-BAND PROCESSING

When the Full Band filter mode is chosen, MDT performs as a single limiter, compressor, expander or compander. A wide variety of settings provide either single compression ratios or curves with "soft knee" or "tube" characteristics. Working alongside three different outboard compressors (one tube), MDT kept pace. It controlled a hyper-voice-over read and suitably squashed a spot destined for AM radio. Sampled percussion received some added punch, as did a synth bass. MDT applied some gentle smoothing to already compressed lead and background vocals. As with a piece of outboard gear, you can go too far and dull the sound or succumb to pumping. If your source file is recorded fairly hot, your gain after processing may be limited to 2 dB or 3 dB. It would be nice to have a limiter in addition to the compressor to tame overshoot on aggressive percussion, but DSP limitations prevent such an option.

The "tube" I/O settings are graphed as companders, usually with three break-points and increasing ratios (some gentler, some harder) on the compression side of the curve. The expander portions usually have four break-points and tend to mirror the slopes of their compressing counterparts. Up to 30 break-points may be placed on a curve and moved with a click and drag of the mouse. The I/O curve bends to follow the movement of the cursor while the slopes of the line segments to the left and right of the point are displayed to the right of the graph. The gentle compression and tube settings work as graphed—noticeably nicer than a compressor lacking a soft-knee setting.

MULTIBAND PROCESSING

Multiband processing is offered as an antidote to the pumping and dulling that results when a compressor working on a full-range signal—such as a mix—is dominated by peaks concentrated in a particular frequency range. In Multiband mode, MDT divides the program material into either three or five frequency bands centered on 140, 1,120 and 8,960 Hz (three-octave spacing) or 40, 160, 640, 2,560 and 10,240 Hz (two-octave spacing), respectively.

Multiple bar graphs display the peak input level for each band, while independent offsets allow you to adjust the sensitivity of each band to the I/O curve. Four digital filter modes are provided: Standard, AP, LN and AP/LN. The Standard mode filters add noticeable coloration to the signal even at a 1:1 (no gain change at any input level) ratio. The manual notes that "an artifact of the [Standard] parametric equalizer filters is that the extreme high and low frequencies are attenuated." The AP filter mode is designed to eliminate this problem by providing "minimum coloration at gains around 0 dB" and "zero degree phase shift in the center of each pass band." It sounds much better than the Standard filter mode and passes the 1:1 test.

Why even offer Standard mode? AP mode is good for 12 dB of gain reduction at most. After that, severe phase artifacts appear. For higher gain reduction you must use the Standard filters. LN mode filters are optimized for low digital noise. They are intended for use with low-level, sustained signals requiring a great deal of gain. The LN filters don't handle peaks, wide dynamic ranges or

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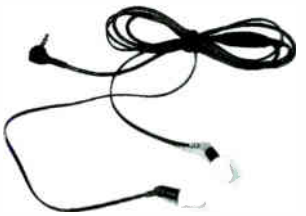

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certain spectral concentrations well, clipping easily.

My first test for multiband processing was an orchestral excerpt with a wide spectral range and broad stereo field: the end of the first movement of Hindemith's *Mathis der Maler*; a long, full orchestral climax with chugging strings, independent lines in various registers, brass swells, timpani and a prominent glockenspiel.

In Multiband mode, you begin by balancing the compression over the various bands by setting the release time to at least 1,000 milliseconds to slow the input indicators. You then adjust each input offset so that each band receives equal compression during full band peaks. On the Hindemith piece, maximum compression was adjusted to about 3 dB (give or take a pixel) when the full orchestra converged on the final chords. With the "tube" I/O curve, compression ratios throughout the passage most often fell in the 1.5:1 to 2:1 range when activated. I processed the file in Standard 3- and 5-band modes, AP 3- and 5-band modes, and Full Pass (single-band) mode.

Each file was assembled one after the other along with the original unprocessed file and balanced for volume. The Standard modes were predictably colored. The Full Pass mode was dulled a bit at the highest compression levels. The original file was identifiable in a blind loop of all files on the basis of the stereo field alone. The AP modes, although lacking a great deal of coloration or dulling, seemed to exhibit a slight collapse of the stereo field as compression reached its maximum. The 5-band AP filters seemed a tiny bit less prone to the folding in of the extreme right and left separation of the string sections.

I performed the same test (same "tube" curve with a slightly shorter release time and 4dB to 5dB maximum compression) on a CD sample of some punchy electric jazz/rock with similar results in Standard and Full Pass modes. In the AP modes, the mix sounded more stable. Slightly reducing the amount of compression in the uppermost band of the 3-band AP mode added a little sizzle and an open quality to the mix. Relaxing the uppermost band of the 5-band AP mode left out the sizzle and retained the open quality. Continuing to back off the compression in the upper bands of both AP modes allowed me to play with that open quality to the point of actually bringing out the heavy snare reverb.

Going back to the original file and switching the processing in and out while monitoring a mono sum revealed some out-of-phase artifacts in the processed material. It's obvious in Standard mode, subtle in AP mode, and seems to depend on the amount of compression. With patience, you can find a balance between compression and tonal balance that takes advantage of MDT's sound. The interaction of the multiple bands is the key to creating a processed mix that sounds more open, yet packs some punch.

Other functions on MDT's list include de-esser, spectral enhancer and dynamic EQ. Same principles; different curves. As a de-esser, MDT uses the uppermost of the five bands to selectively control sibilance. I put a particularly sibilant female voice-over (recorded in Pro Tools) through MDT and A/B'd it to an outboard compressor keyed by an EQ'd sidechain. Compared to the outboard compressor, MDT's two-octave band (centered around 10,240 Hz) seemed a bit above where I needed it but reached down low enough to dull the overall sound of the VO. I could better hone in on the sibilance with the EQ'd sidechain controlling the outboard processor; this resulted in a more open sound in the upper midrange while better controlling sibilance. Overall, MDT is better used for subtle tonal control than for trying to zero in on a particular detail, whether in a complete mix or a specific element.

For Pro Tools users, MDT offers a hint of things to come rather than easily accessed DSP power. Depending on your application, using it as a replacement for an outboard device on mix elements can be cumbersome. If you track vocals or acoustic instruments with Pro Tools as part of a larger setup involving virtual MIDI tracks, or a multitrack recorder, the steps in the process can get to be numerous: record in Pro Tools; combine regions from various takes; bounce to disk to consolidate into one file and balance levels; export to SDII (once for each track if you're working in stereo); process destructively (save that original!); export

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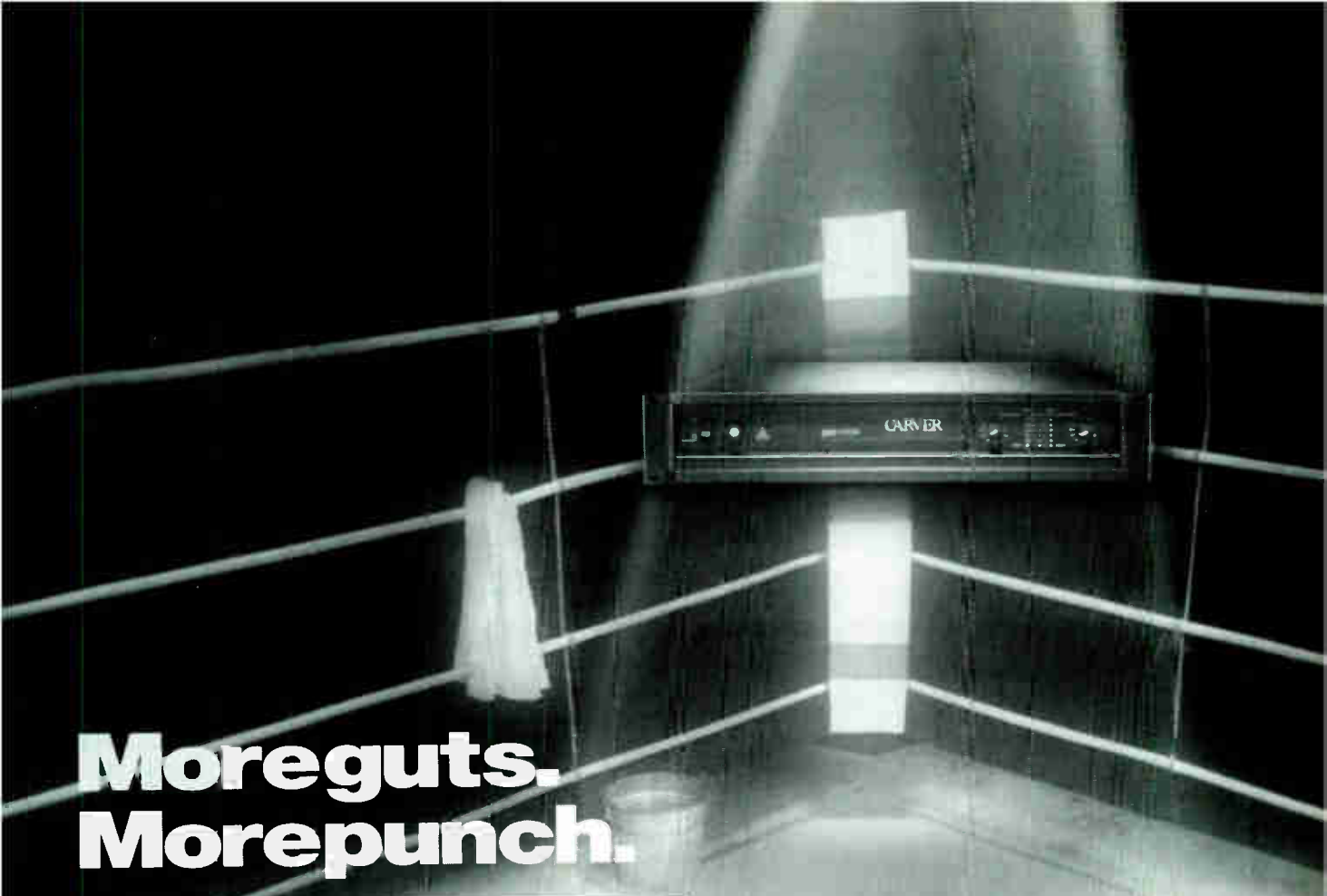

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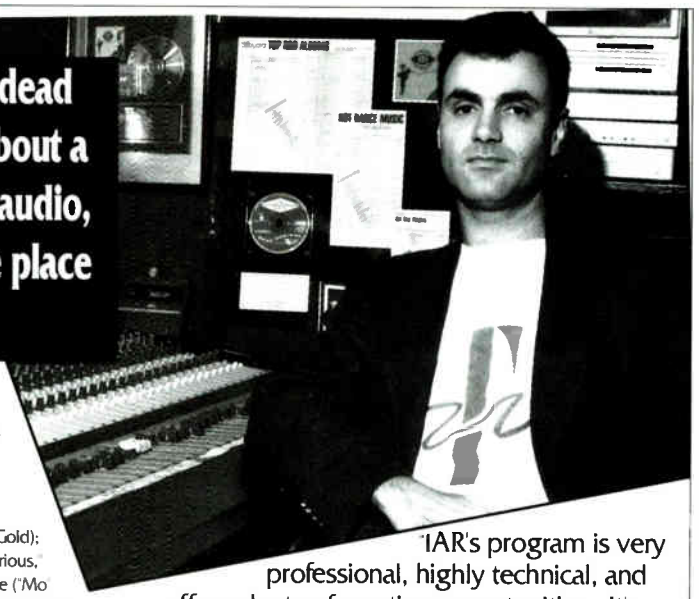

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back to Pro Tools; resync; listen to your processing in the context of the mix; etc...

If you work primarily in Pro Tools, the consequences of using MDT are more disk space and more time. If you're on the clock and the deadline looms, chances are you'll insert that outboard box you know so well, tweak it as the mix develops and get on to beating the delivery service. Digidesign's long-awaited TDM bus with its DSP farm option will allow for processor plug-ins within Pro Tools. Jupiter plans to port MDT and upcoming products now that TDM is a reality.

It takes awhile to get a feel for using MDT, but the more you use it, the more consistently you can tweak to get what you want. MDT's likely allegiance will be found among those who either use Sound Designer II as a reservoir for stereo mixes or refuse to leave the digital domain. Sample addicts will find MDT's ability to rework existing samples very attractive—altering reverb tails, reshaping samples tonally, pumping up grooves with multiband compression (or deconstructing them with severe compander effects on certain bands), or even experimenting with bizarre curves and inverse gain ratios. You'll want to use it on completed mixes (gently!) more often than on individual elements in a multitrack setting, simply because of the time spent shuffling files around.

Jupiter's Multiband Dynamics Tool is not colorless, but few things are. Time invested in tweaking the 3- or 5-band AP filter modes will reveal a compressed mix with a tonal balance that uses MDT's sound to best advantage. At $399 list, it is the most attractively priced of the Sound Designer plug-ins. MDT is especially worth the money if your collection of plug-ins—just like your rack—is growing with tools used to get a certain sound in a certain situation. Give MDT a listen for what it can do and do well.

Jupiter Systems, Box 697, Applegate, CA 95703; (916) 878-6666 or (800) 446-2356. ■

John McDaniel owns and operates Sonic Arts Digital Audio Services in Cincinnati, providing custom music and audio production services in a variety of media.

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World Radio History

by Paul Potyen

The Yamaha CDE100 CD recorder can be connected to PCs, Macs or workstations via SCSI interface.

YAMAHA CD EXPERT

CDE100 CD RECORDER

In 1989, Yamaha introduced the first CD-Digital Audio (CD-DA) recording system to the world: The YP Programmable Disc System included a recorder/encoder/decoder running from a host PC that retailed in the $50,000 range. Subsequent technological leaps have brought several other manufacturers into the market with less expensive and more flexible SCSI-based CD-DA/CD-ROM recorders—notably Sony's CDW-900E, JVC's Personal Archiver and Personal RomMaker, and Pinnacle Micro's RCD-202—leaving the Yamaha systems to gather dust. Now the Japanese monolith has jumped back into the race with the first quadruple-speed CD maker: the CD Expert.

The implications of a 4x recorder are significant: With falling prices of blank recordable discs—I've seen 74-minute discs selling for as little as $12.60—it becomes economically feasible for some mastering/duplication facilities to do short runs of audio CDs and CD-ROMs themselves, rather than send a single gold master to a conventional CD replicator.

But it takes more than a well-designed piece of hardware to make a useful tool. As many who have shopped for a digital audio workstation know, the key is in the software. And that's true in spades here as well. But first let's look at the Yamaha box.

The CD-Maker from Alea Systems incorporates the new Yamaha mechanism (see sidebar, p. 135).

CD Expert is available in an external (CDE100) and internal (CDR100) configuration. With it you can record data onto CD-R discs—including audio and computer data—in connection with a computer. It uses the new

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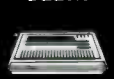

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SCSI-2 protocol, which allows high-speed transfer of data. It is a platform-independent software-controlled device that can be used in MS-DOS, Windows, Macintosh and UNIX environments. The unit is also capable of operating as a CD-ROM reader (although on my Macintosh Quadra 650 I was unable to mount either an audio or a Yellow Book disc).

The current version of CD Expert conforms to the two recording modes outlined in the Orange Book Part 2: Track-at-once and Multisession. Track-at-once also lets you record data to disc a track at a time, but the disc can't be played until a final Table of Contents is written to the disc. Multisession mode lets you record to disc a track at a time, but the disc can be played in between recording sessions. Up to 99 sessions are allowed. It does *not* support Disc-at-once mode. What this means for those who want to make audio discs is that the firmware allows only two-second gaps between tracks on a CD. More about this later.

The CDE100 can be purchased in two configurations: with or without an internal 1,080MB hard disk (seek time is 10ms). The hard disk has a separate SCSI ID from the recorder, and users also have the option of installing their own internal hard disk into a diskless CDE100. The two versions are physically identical. The front panel has a stereo mini headphone jack, a volume control, status lights for both the recorder and the hard drive and x2/x4 speed indicator lights. (The unit can also be set to record at single and double speed; when neither speed light is lit, the unit will operate at single-speed.) The rear panel has a power switch, -10dB audio outputs on RCA phono jacks, SCSI ID selectors for both the CD-R and the hard disk, a parity switch (for correct configuration adapter cards on PCs), a termination power switch, and two SCSI-2 connectors (not the same as the standard 25- or 50-pin SCSI connectors).

The CDE100 will work for double- and single-speed recording with most blank media, but I was unable to record to a Kodak PhotoCD on this unit using any of the software I had on hand. Yamaha Japan has established a testing procedure for approving 4x recording capability with blank media from different manufacturers. Blank discs that pass this test will have a Yamaha 4x logo printed on them. As of this date, Yamaha-approved 4x discs are available from Mitsui Petrochemicals (212/867-6330) and TDK (Port Washington, NY, 516/625-0100). Other media may work, but Yamaha does not guarantee results at 4x with non-approved discs. It's also important to note that if you want to record at 4x, you'd better have a fast SCSI drive. My 1.3GB Maxtor (16ms access time) was not fast enough.

Yamaha does not supply any software with the CD Expert. Several companies have announced software

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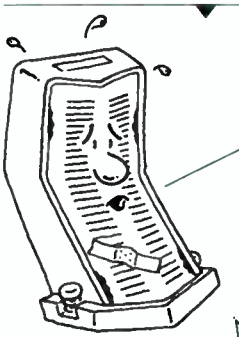
The basic CD-Maker Station consists of a control unit for an external CD recorder, 1GB drive and membrane keyboard. It builds ISO 9660 images on a stand-alone basis and also supports CD-DA, CD-I and custom CD images. Alea also optionally offers the control unit with one or more Yamaha CDR100 devices and SCSI multiplexing for simultaneous recording to as many as four CD-Writers.

The CD-Audio Station includes a stand-alone control unit for mastering CD-DA, CD-XA, CD-I and custom CD images, a 1GB hard drive, a 2x CD-Writer (4x writer available as an option), data DAT tape drive and membrane keyboard. Other configurations are also available, including a 75-disc transporter, multiple CD-Writers and larger-capacity hard drives.

Both units are designed to accept audio and/or computer data from a wide variety of SCSI-based sources and press CDs. The company also sells blank media, CD-ROM readers and a variety of application software.

Alea Systems, Inc., 5016 Dorsey Hall Dr. #102, Ellicott City, MD 21042; (410) 995-5830.

TALKING HEADS



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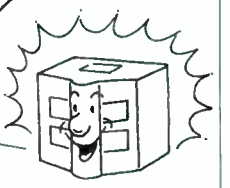

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support for the device (see sidebar), but at the time of this review it was apparent from telephone conversations with several of these companies that the software support is much more fully implemented on the DOS/Windows platforms than on the Macintosh side. The only company that was able to send Macintosh software was Elektroson USA, and it soon became apparent that this software was not robust or even friendly compared to Macintosh apps that I have used in connection with other CD-recording systems.

Unfortunately at the time of this evaluation, I didn't have a Windows system available to test Elecktroson's Windows software.

Elektroson calls its Macintosh software GEARMac, and Version 2.2 supports HFS, ISO 9660, CD-XA and CD-DA. The company claims that it supports all currently available CD recorders; however, I was unable to confirm that. I *am* able to report that:

a) I was unable to record a successful HFS disc.

b) The ISO 9660 disc I made was unreadable.

c) While I was able to burn and play an audio disc, it allowed me to include a non-audio file in the playlist! When I played that track, it made an unpleasant spitting noise.

Also, AIFF files have an unacceptable spit at the beginning. Tech support told me that I would need to remove the AIFF header in order to avoid that particular glitch. Also, when you select files from your hard disk and add them to your playlist, GEARMac mysteriously replaces the file names with note icons, making it difficult to know what you're doing! Suffice to say, Elektroson needs to improve GEARMac substantially.

I had somewhat more success using Digidesign's MasterList CD audio mastering package. Digidesign does not officially support the Yamaha unit, although the code has been written to provide the ability to interface with it. The main problem with this hardware/software combination is that the Yamaha firmware forces one to use *only* two-second gaps between audio tracks. In an attempt to work around this limitation, I used MasterList CD to manually insert Index 1 points (track start IDs) at the appropriate locations of a single Sound Designer file containing all

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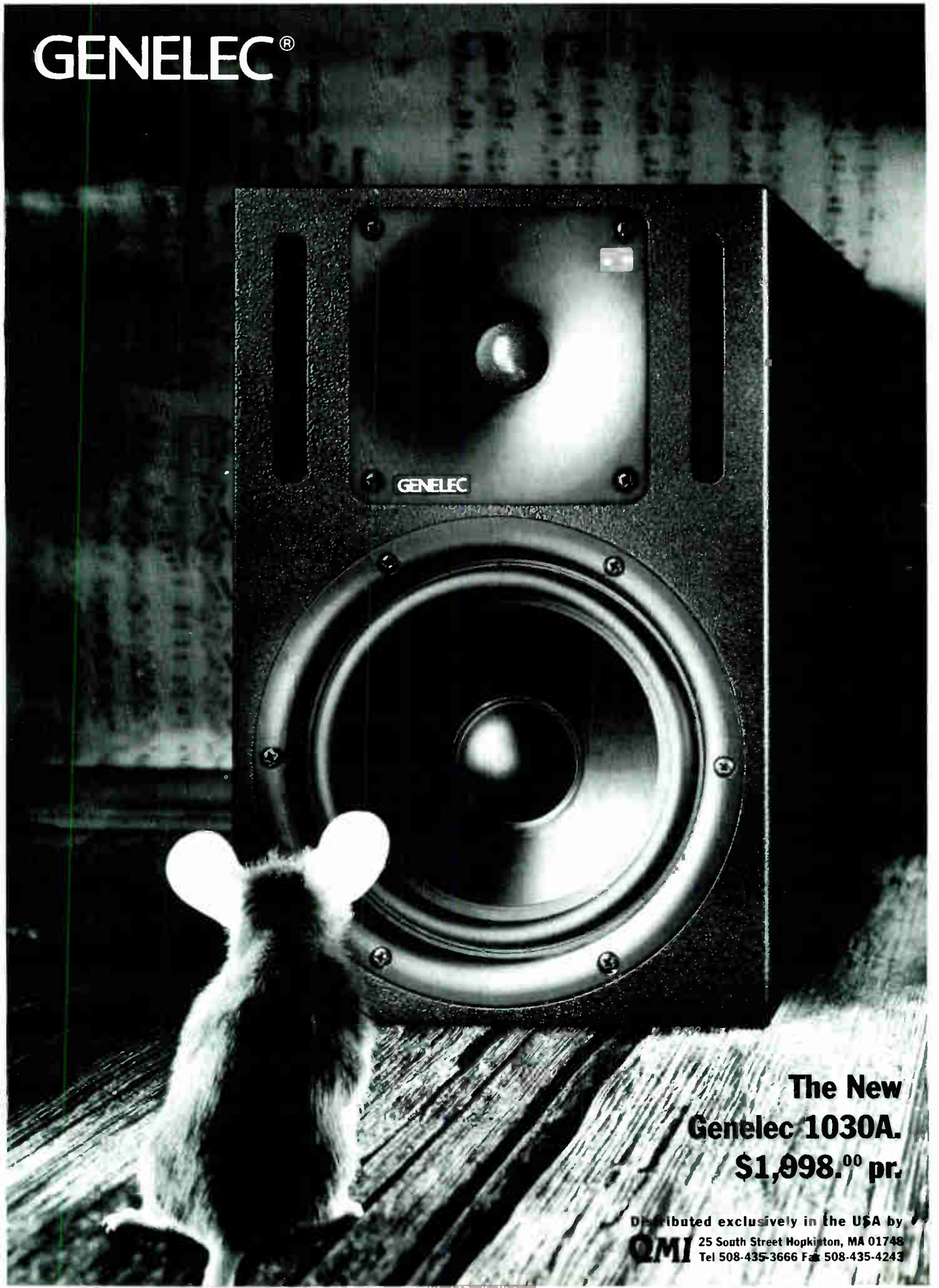

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my tracks. Unfortunately, when I attempted to create my disc, an alert box informed me that this recorder required an index 0 (pre-gap) of *exactly* two seconds for each track! If you want more than two seconds of silence, you can work around this by adding silence equal to whatever additional amount you want for each track. It's an inelegant solution and doesn't address the scenario where you want *less* than two seconds between tracks, as I did for this particular project.

In supporting Track-at-once mode in the first version of its CD Expert firmware, Yamaha has made the decision to support the larger market of computer applications, rather than the audio industry. But the company has promised that by the time you read this review, the recorder will support both Disc-at-once and Track-at-once mode. Purchasers of the earlier model will be offered a free firmware upgrade to allow this. And Yamaha has certified a total of 11 software companies as vendors of CDR100 software (see sidebar). It's apparent that they have also addressed initial efforts to a different market, and many of them will undoubtedly have shipping versions for their announced platforms by press time.

In any event, the initial release version of Yamaha's CD Expert is a breakthrough product whose real potential as a productive audio tool has yet to be tapped.

Yamaha Systems Technology, 981 Park Drive, San Jose, CA 95131; (408) 437-3133. ■

CD Expert Software Vendor List

Company	Platforms supported
Alea Systems Inc. 5016 Dorsey Hall Dr. #102 Ellicott City, MD 21042 (410) 995-5830	SCSI/all platforms
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Digidesign Inc. 1360 Willow Rd. Menlo Park, CA 94025 (415) 688-0600	Macintosh (CD-Audio with MasterListCD)
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Meridian Data Inc. 5615 Scotts Valley Dr. Scotts Valley, CA 95066 (408) 438-3100	DOS Windows Novell
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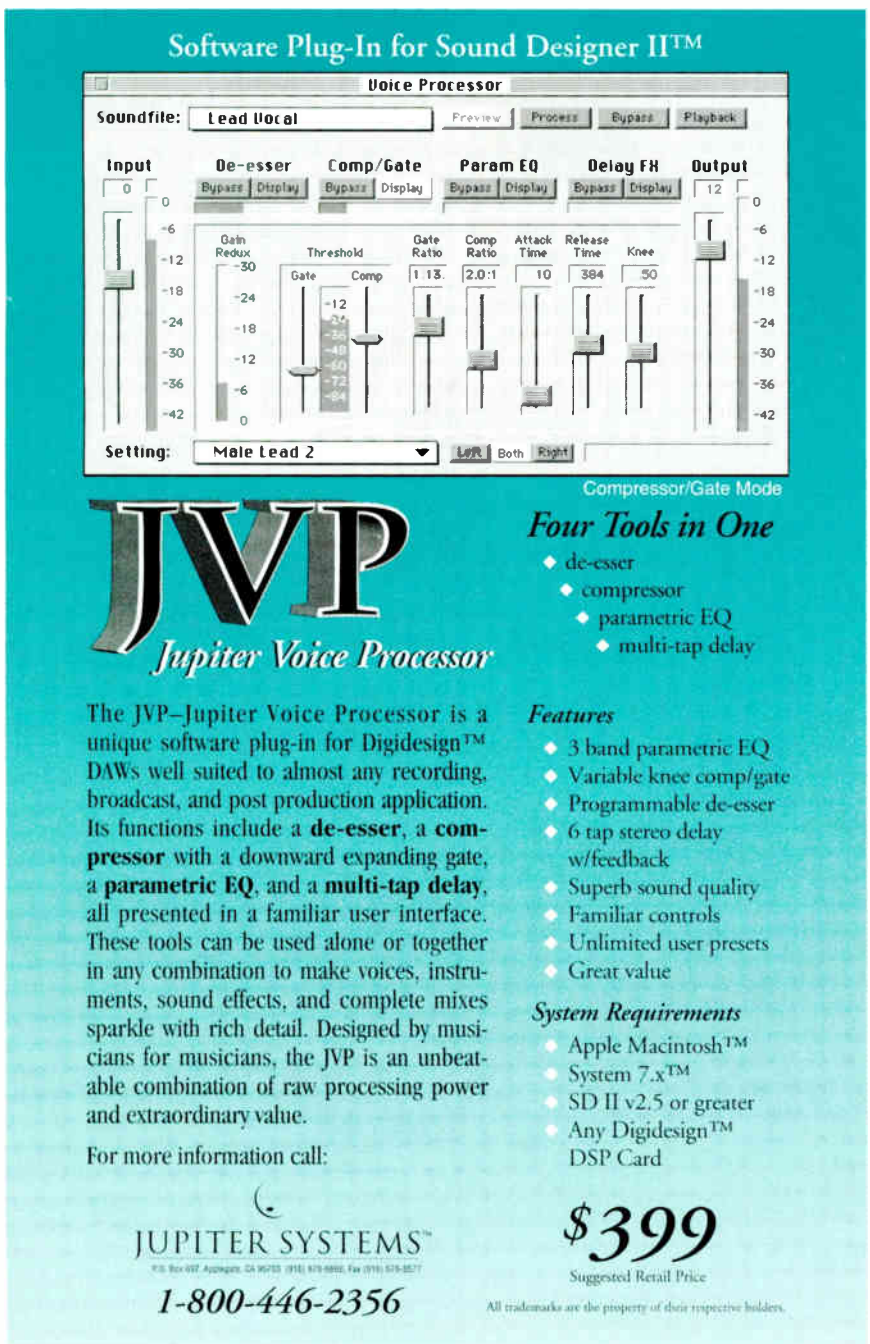
Trace Enlighten 1040 E. Brokaw Rd. San Jose, CA 95131 (408) 437-3382	DOS Windows
Young Minds Inc. 1910 Orange Tree Ln. #300 Redlands, CA 92374 (909) 335-0581	Unix Windows Macintosh*

*not available at the time of this evaluation



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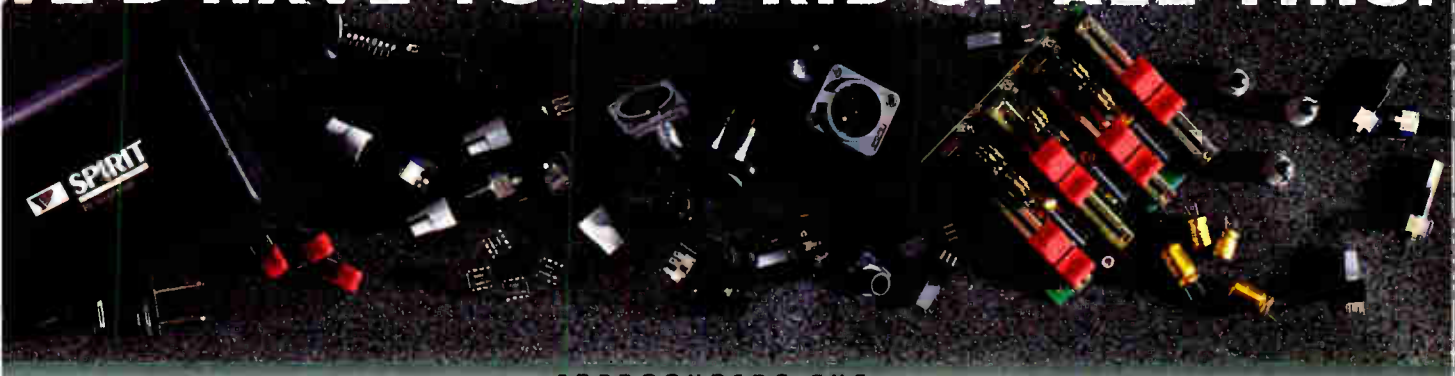
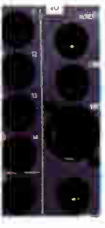
TO MAKE OUR MIXER SOUND JUST LIKE THE COMPETITIONS' WE'D HAVE TO GET RID OF ALL THIS!



INTRODUCING THE

SPIRIT FOLIO RAC PAC

CHANNEL INPUTS



he Spirit Rac Pac offers mic and line inputs on all mono channels with gain adjustments from -50 to +8. Also included are two stereo channels 4 line level inputs) for single ader control of your stereo eyboards or drum machine.

MID SWEEPABLE EQ

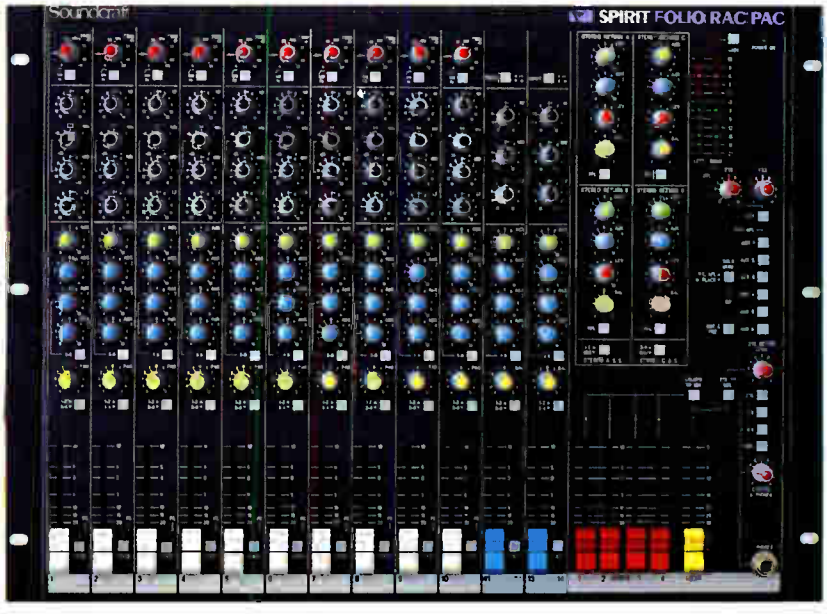
lith the Spirit Rac Pac we let ou select the frequency points... om 250Hz to kHz. Our competitors select our mid frequency oints for you. Ve think you're ntelligent enough o decide what's best for our music!)

TRUE DIRECT OUTPUTS

he Spirit Rac Pac features ndividual inserts **and** true post ade equalized direct outputs. he competition makes you hoose one or the other. And, if ou choose direct outputs, your ignal bypasses the EQ.

AUXILIARY LOOPS

he Spirit Rac Pac gives you 6 auxiliary outputs, and the ability to solo ll 6, not just the first 4, like other



HOW WE RACK UP AGAINST THE COMPETITION

	SPIRIT FOLIO RAC PAC (RP 28)	MACKIE 1604	SAMSON 2242
TOTAL NUMBER OF INPUTS	28, including 6 returns & tape returns routed to mix.	24, including stereo returns	30, including 4 stereo returns
EQ	3 Band with sweepable mid on Mono inputs 3 Band fixed on stereo inputs	3 Bands fixed only	4 Band fixed
AUX SENDS	6 (Aux 1 - always pre-fade, Aux 2 - Pre/post switchable globally)	6	6
STEREO RETURNS	6 (4 stereo returns, 2 stereo FX returns)	4	4
HIGH PASS FILTER	Yes (at 100Hz)	No	No
SUB GROUPS	4 discrete	No (2 separate stereo buses)	No (2 separate stereo buses)
TWO TRACK RETURN	Yes	No	No

mixers! Plus, the Rac Pac provides a return for all 6 with stereo returns. That's 12 additional inputs!

4 SUB GROUPS

The Spirit Rac Pac provides 4 discrete sub groups which are assignable to separate left and right stereo outputs. Other mixers require you to sacrifice your channel mute function to achieve 4 sub groups.

EXTERNAL POWER SUPPLY

The Rac Pac provides an external power supply, which eliminates any chance of that annoying 60 cycle hum!

With built-in features like a high-pass "rumble" filter, direct outputs on all mono channels, true sub groups, and a full master section with control room outputs and two track returns, why would you settle for anything but the Spirit Folio Rac Pac?

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World Radio History

by Dave Tosti-Lane

SADiE
DIGITAL AUDIO EDITOR

The SADiE digital audio editor from Studio Audio and Video Limited (Nashville) is a relatively new entry in the field of full-feature digital editors operating in the Microsoft Windows environment. First introduced in 1992, SADiE has quickly evolved through a series of updates and revisions into an extremely capable software/hardware combination (see sidebar, "Hardware Configurations"). Among the features distinguishing SADiE from the rest of the pack are its ability to provide 9-pin interface for external hardware machine control (with the addition of an RS-422 interface card), the capability of auto-conforming edit decision lists, implementation of network features for multiple SADiE systems and PQ editing functions for CD mastering.

Although SADiE is something of a newcomer to the DAW scene, Studio Audio and Video Limited is not a newcomer. The company was formed in 1991 by principals with long-standing experience in both the computer and recording industries to produce digital and analog sound cards. SADiE Version 1.0 was introduced in the UK in 1992 and debuted in the States at AES in San Francisco that same year. Now at software Version 2.1 (upgrades are free to registered customers for life), there are more than 500 SADiE systems in use worldwide. I've been told by users of the system that the company has been extremely respon-

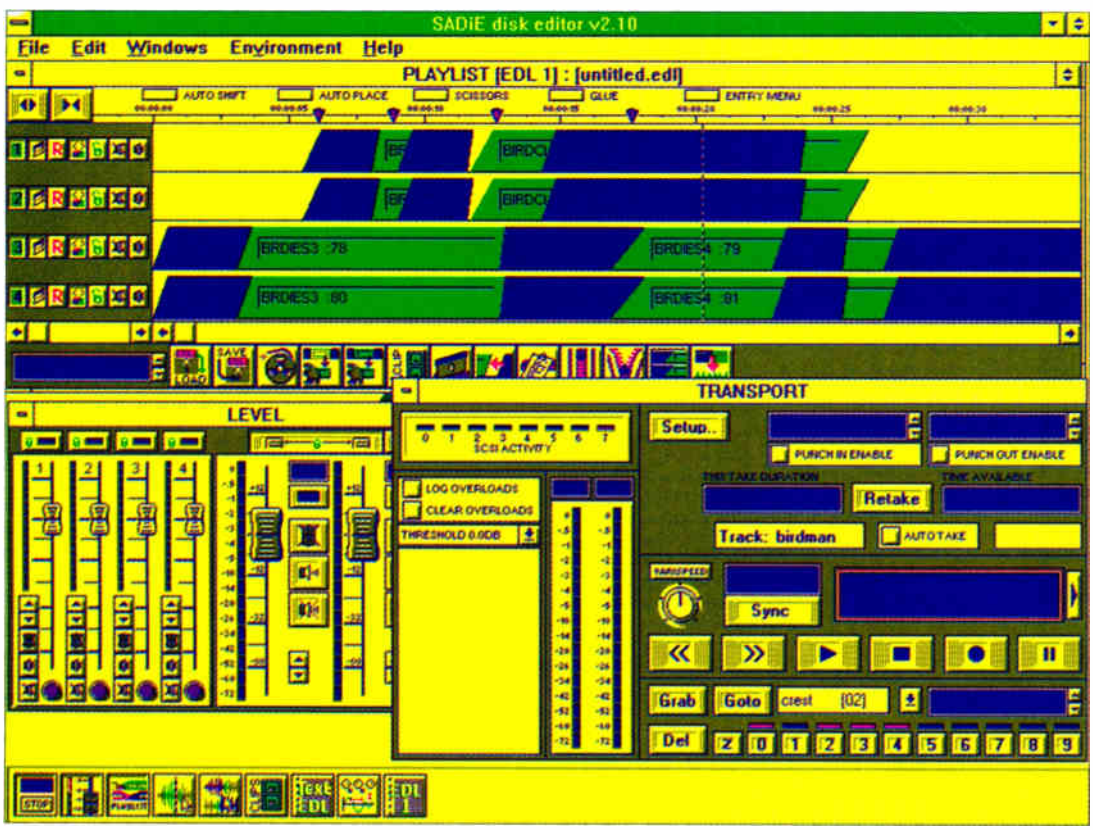

Figure 1: SADiE Transport window, with controls for recording and playback

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PORTABILITY

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Record your vocal or lead guitar tracks while simultaneously listening to the rest of the mix.

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Quad Studio comes with Turtle Beach Quad software and the legendary MultiSound Tahiti™ audiophile sound card. For MultiSound owners, Quad software is available separately.

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sive to customer input, and that the product has seen significant productivity increases with each release.

SADiE's operation is based on a paradigm of tracks, streams and clips. "Track" refers to the original sound file recorded into the system. This takes a bit of getting used to, given the common use of track as a fixed playback channel. A complete track (sound file) can be separated into one or more "clips"—simply a portion of a track. Clips can then be moved around and placed in a playlist, either graphical- or text-based, which provides the main working environment for assembling a sound sequence.

Each playlist is organized into "streams," the equivalent of tracks on a multitrack recorder. A playlist has either four or eight streams, depending on the mode selected. The collection of clips arranged on streams within a playlist makes up an edit decision list. Once a clip is placed in an EDL, it is also referred to as an "EDL Entry." Modifications to an EDL entry are not automatically updated to the original clip, so you can maintain an unmodified clip library for future use. This all sounds much more complicated than it is.

Getting started is so simple that I was recording sound within two minutes of connecting the power cord. And that was without even a peek in what turns out to be a well-organized manual. As with most DAW systems, SADiE has a Transport window (Fig. 1) with all the usual controls for recording and playback. As with all SADiE windows, it can be quickly reconfigured from a simple "transport controls" arrangement in the main toolbar of the program to a fully configured display with controls for automated punch-in/out, ten numbered autolocator controls, peak program level meters for incoming signal, SCSI activity meter and automatic logging of overloads. Also included in the Transport window is a varispeed control for real-time variation of playback speed, providing pitch variation (accomplished digitally by continuous variation of the playback sample rate).

In Record mode, whenever you press the razor-blade icon, the stream is cut and the EDL entry appears in the playlist. In this way, you can create any number of rough cuts while recording, instead of waiting for the file to be completely recorded before

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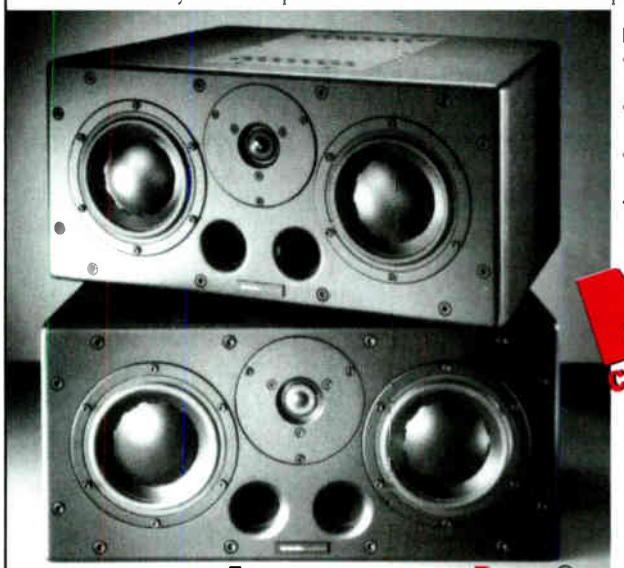
Created as a "high-energy" monitoring system, the M1 is designed for console-top music mixing. Built to operate in the most demanding of studio applications, and taking into account the interference effects created by the console surface, the M1 is the first monitor to even approach "flat" response, with imaging and dynamics beyond any other nearfield monitor available today.

Looking for even more? When the M1 is combined with our ABES (Active Bass Extension System), a highly accurate full-range monitoring system is created with response down to 35Hz. The M1/ABES system – the power of main monitors in a nearfield package.



M1 features:
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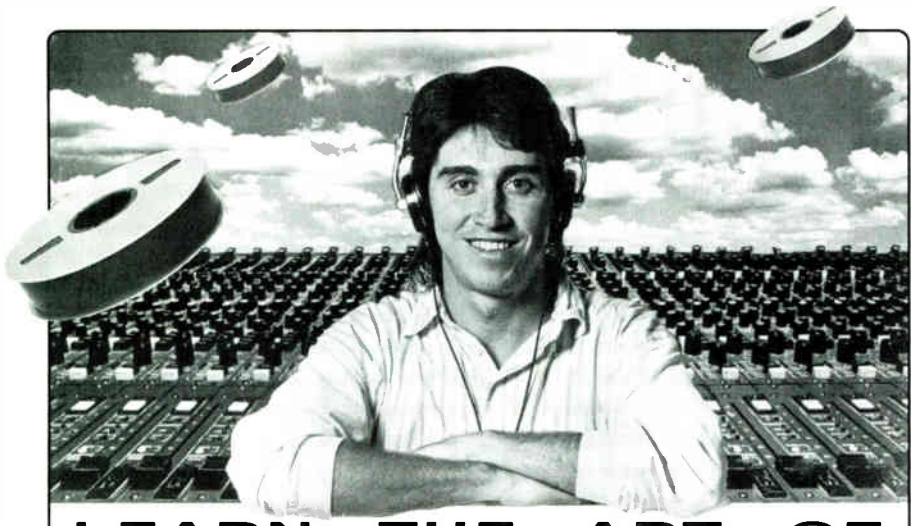
beginning to create the building blocks of audio needed to assemble a composition—a very useful feature. In fact, you are even able to modify fade-in and -out defaults while recording. This sort of feature can get you out of the studio in time for dinner! (Well, at least in time for dessert.)

The Playlist window is the main working area for a SADiE session. It consists of either a 4- or 8-stream graphical time line display of the session EDL. Each sound segment (clip) is represented by either a single (mono clips) or double (stereo clips) bar with the fade-in and -out for the clip represented as a ramp at the beginning and end of the bar. In 4-stream Display mode, clips may overlap, and crossfades are indicated by diagonal splices between adjacent clips (Fig. 1). In 8-stream mode, individual clips never overlap on the display, but crossfades are still indicated by the slopes of the ramps on adjacent pairs of streams.

Clips may be repositioned in the playlist by simply grabbing and sliding them with the mouse. When Auto-shift mode is engaged, all clips on streams beginning after the start point of the selected clip are automatically adjusted to retain their relative position. A Clip Details window (Fig. 2) allows immediate adjustment of all parameters for the selected clip, including fade-in and -out ramps (20 possible curves), pan for each clip channel, level balance of the two channels of the clip, output routing for the clip (four possible output channels), independent phase reverse for each channel, a toggle for reverse play of the clip, and time controls for start and stop times of a clip, both within the playlist EDL and with respect to the original recorded track. All of these parameters may be modified instantaneously and auditioned from within the Clip Details window with no processing time required, although it is necessary to "write-back" the changes to the EDL clip before exiting the Clip Details window.

Accessible from the toolbar in the Playlist View is the Playlist Overview, which shows a waveform display of the actual combined output of all the streams playing on each output channel. The overview display can be set to color all signals over a selectable threshold in red, so that by dialing in the desired headroom, the display



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Hard Disk Recording Doesn't Have To Be Hard On Your Wallet.

"...in a price/performance comparison, the DR4d would be hard to beat. Thumbs up on this one."
George Petersen, MIX Magazine

"...great sound, useful features, and friendly operation... technology that is sure to set a new standard in affordable recording"
David Frangioni, EQ Magazine

Ah, decisions, decisions. You want to buy a new multitrack recorder, and you want to go digital so that you'll get the best possible sound quality. And you'd like to buy a hard disk recorder, rather than tape, so you can get random access editing power. And finally, it's got to be something you can really afford. But there's a problem.... don't all hard disk systems require expensive add-in hardware and software, to already expensive computers? Not anymore!

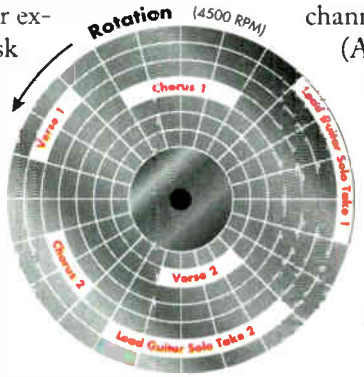
TEC 1994 NOMINEE

The DR4d is the solution for those looking for an alternative to expensive, complex computer-based systems, or the limitations and mechanical uncertainty of tape recorders. It offers a perfect combination of hard disk recording benefits with an easy-to-use interface.

The DR4d can record up to four tracks simultaneously to standard SCSI hard disks, either internal or external drives. An optional 213MB internal disk offers 40 track minutes of recording (44.1kHz) right out of the box. To expand your recording time, simply connect external drives to the DR4d's supplied SCSI port.

With standard tape machine-style controls the DR4d is by far the easiest hard disk recorder to operate, which means that you can get to work immediately creating music rather than setting up and operating a computer system. Punch ins/outs can be performed manually or automatically from the front panel, or by footswitch, naturally.

Now you can start to take advantage of random access editing. You can cut, copy, and paste sections of audio with ease. Our Jog/Shuttle wheel lets you scrub through the audio at various speeds, forwards or backwards. Try out different arrangements. Create perfect tracks by combining the best sections from multiple takes. And you can edit with confidence, because if you change your mind you can instantly Undo your last edit - even after the power is turned off and on again! Imagine it. Do it. It's that simple.



On a spinning hard disk, the sections of music can be accessed almost instantaneously by the moving heads of the drive mechanism. This allows you to seamlessly output parts regardless of their location on the disk. Also, music can be easily rearranged in ways not possible with tape.

You can instantly move to 108 memorized locations at the touch of a button, and these locate points may be entered manually or on-the-fly. It's also simple to set up **seamlessly looping** repeat sections, so it's easy to jam over tracks. No more wasting time on rewinding tape!

Of course, how the DR4d sounds is as important as how it works. Advanced 18-bit oversampling A/D and D/A converters insure crystal clear sound, and with a full 96dB dynamic range, the DR4d offers no-compromise specs. The four balanced 1/4" input and output jacks are switchable between -10 and +4 operation, and 2-channel digital I/O is included standard (AES-EBU and SPDIF) with two additional digital ports optional.

Need more than four tracks? Four DR4d's can be linked to create a 16-track system. And for synchronization to other gear, just add the optional MIDI or SMPTE interfaces.

And best of all, the DR4d is an **affordable** reality: suggested list is only $2495.00 (or $1995.00 w/o hard disk)! Multitrack disk recording *is* within your reach, so see your Akai dealer today for a complete demo!

Now Available - Version 3.0 Release: Track Merging, Midi Machine Control, and Midi Time Code support!!

On tape, the sections of music are physically located far from each other, separated by many feet of the tape itself. Since you have to move all that tape past the heads to get where you want to go, it's impossible to jump instantly from one section to another. It wastes time, and limits creativity!

Intro Verse 1 Chorus 1 Verse 2 Lead Gu

DR4d

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PRE-Q Model MIC 502

The Microphone Preamplifier/Level Translator At The Top Of Its Class

SUGGESTED RETAIL PRICE: $339.99

With the Behringer PRE-Q we offer a high-quality, extremely low-noise and low-distortion preamplifier designed for the most demanding applications in the field of digital and analogue recording. This dual-channel device provides a combination of those functions most frequently used in practice: level gain and level translation. Useful extra functions will efficiently facilitate your work. Owing to its excellent and low-noise audio quality, the PRE-Q is particularly suited for direct connection to DAT machines or other digital recording equipment.

The Microphone Preamplifier At The Top Of Its Class

The heart of the PRE-Q is a new, extremely low-noise microphone preamplifier circuit providing high transparency in sound. In combination with the Behringer operational amplifiers and a sophisticated circuit design with ultra-low noise and almost unmeasurable distortion, the PRE-Q offers an extremely wide dynamic range of more than 130 dB! A switchable phantom power supply and a 20 dB pad, which reduces the gain of high-level input sources, allow the PRE-Q to operate with almost any kind of microphone.

The Universal Level Translator

In addition to its high-quality microphone amplifier, the PRE-Q also incorporates a separate level translator which can both reduce and increase line-level gain. In this way, it is possible to convert the levels used in home-recording into studio levels so that tape machines, VCR's and other hifi equipment can easily be interfaced with professional devices. This process can also be performed in reverse order, where studio levels can be reduced in gain to match the lower levels used in semi-professional equipment.

User-Oriented Extra Functions

A phase inverter and a tunable high-pass filter are available both for the microphone amplifier and the line-level translator. In contrast to conventional designs using a simple rumble filter with a fixed cut-off frequency, the Behringer PRE-Q includes a tunable high-precision filter with a slope of 12 dB. This feature allows for perfectly adapting the circuitry to different programme sources, thus eliminating low-frequency interference.

Simple Interfacing through Servo-Balancing Circuitry

Like most Behringer equipment, the PRE-Q is equipped with special servo-balancing circuitry. This servo-function is capable of detecting balanced and unbalanced pin assignments and adjusts the output level automatically, thus avoiding level differences. For interfacing the PRE-Q to the outside world, both jack and XLR connectors are available, and three LEDs accurately monitor the output level.

The PRE-Q As A Reference Unit

Do you want to hear the real sound your high-quality microphones produce? Test the PRE-Q, compare it to microphone amplifiers that cost ten times its price, and let your discerning ears decide.

Specifications

▵ Microphone Input	
Type :	transformerless, DC decoupled input
Input impedance :	>3 kOhms, balanced
Gain :	+15 to +60 dB
▵ Line Input	
Type :	transformerless, DC decoupled input
Input impedance :	40 kOhms, balanced
Gain :	-12 to +12 dB
▵ Output	
Type :	servo-balanced output stage
Max. output level :	+29 dBm, balanced +23 dBm, unbalanced
▵ Noise	
MIC mode :	-99 dBu typ. (20 dB gain, 22 Hz - 22 kHz unweighted) -72 dBu typ. (60 dB gain)
LINE mode :	-104 dBu typ. (0 dB gain, 22 Hz - 22 kHz unweighted)

- ▵ -20 dB pad for gain reduction of high-level microphone signals
- ▵ Switchable phantom power (+48 V)
- ▵ Phase switch for inverting the phase
- ▵ Tunable rumble filter (15 to 350 Hz)
- ▵ Level indicators for : -20 dBu, 0 dBu and Clip (+18 dBu)
- ▵ Behringer's extremly low-noise operational amplifiers BE027/037
- ▵ Jack and XLR connectors available
- ▵ Optional high-performance output transformer OT-1 available

For more information, please call 1-800-328-2882.

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EDISON Model EX 1

Stereo Image Enhancer / Phase Correlation Meter

SUGGESTED RETAIL PRICE: $329.99

With the EDISON, we are presenting a new psycho-acoustic processor, which is based on "Virtual Stereo Image" technology and permits total manipulation of spatial content such as width and depth of the stereo image. This three-dimensional technology is a "secret recipe" in American studios and makes it possible to release the untapped stereo resources of your music - an effect which audibly enhances and intensifies the spatial characteristics of the sonic image. We have advanced beyond existing technology, incorporated an additional phase correlation meter into the unit, and offer the EDISON at a price that is just a fraction of what you would have to pay for a comparable system.

Unleash The Stereo Potential Of Your Music

Many years of research in the field of psycho-acoustics have revealed that a typical stereo signal contains much more spatial information than the human ear can perceive. For instance, the ear is very sensitive to changes in phase and frequency, but is fairly immune to changes in level. A similar problem is encountered when human perception tries to locate and position instruments in a complex recording, either left/right and/or front/rear.

The Behringer EDISON is capable of intensifying and processing such spatial information. The result is a distinctly better positioning of instruments in the stereo domain (even beyond the physical position of the loudspeakers), higher resolution and detailed reproduction within the room, and an increased depth separation ("front/rear" localization). By manipulating these effects in "real-time", negative side effects such as "condensed" midrange can be avoided. In addition, the audio experience can be radically enhanced , which until now has only been possible in top productions, using extremely costly and complex systems.

The Integrated Phase Correlation Meter

Basically, any recording should be checked for proper phase response, i.e. for mono compatibility. Very often, serious mistakes are made during the final mixdown: even if the stereo recording sounds great, when combining the stereo signals to one mono signal, phase cancellations can result. Correct mono compatibilty is important because most reproduction media (radio, TV, sound reinforcement systems etc.) are mono systems, and mono incompatibility can cause serious problems. Phase cancellations can even "delete" complete instruments or groups of instruments from the sonic image. Apart from the mono compatibility test, the phase correlation meter also detects incorrect signal polarity and other problems with reference to phase.

Although the EDISON is fully mono compatible owing to its innovative circuitry, i.e. it does not cause any phase shift, the final mixdown should always be checked for proper phase response. EDISON's integrated phase correlation meter precisely indicates the mono and stereo contents of the programme material as well as any phase errors. Therefore, the EDISON forms part of what should be standard equipment in any studio.

In bypass mode, the EDISON's phase correlation meter is disconnected from the signal processing section and can be used as an independent measuring instrument.

EDISON - Total Stereo Experience

In reality, the EDISON can process any stereo signal. The resulting coded stereo signal requires no decoder or similar device during reproduction. For this reason, the EDISON can be used in music and film productions, in mastering and sound reinforcement applications, in broadcast and TV studios, recording studios, dance clubs and, last but not least, in your home hifi system. Capitalize on this technology from top American studios and enhance your high-quality recordings to release the stereo potential of your music!

Specifications

- Mono compatible "Virtual Stereo Image" processor
- Integrated Phase Correlation meter
- Servo-balanced inputs and outputs
- Max. input/output level : +21 dBu
- Frequency response : 20 Hz to 20 kHz (+0; -0.5 dB)
- THD : <0.005 % @ 0 dBu (1 kHz)
- Noise & hum : -92 dBu (22 Hz to 22 kHz)
- Relay controlled hard-bypass with auto-bypass function during power failure (failsafe relay)
- Cut-in delay to avoid switch-on thumps
- Optional high-performance output transformer OT-1 avaiable

- Jack connectors, model EX 1J
- XLR connectors, model EX 1X

For more information, please call 1-800-328-2882.

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ULTRAFEX® II Model EX 3100

Multiband Sound Enhancement Processor At The Top Of Its Class

SUGGESTED RETAIL PRICE: $349.99

Since its announcement, the ULTRAFEX has caused a sensation. This high-end sound enhancement processor is based on our many years of experience and discoveries in the field of psycho-acoustics. The unit is one of the world's best selling sound enhancers and finds widespread application in some of the world's most renowned studios, sound reinforcement systems as well as in broadcast and TV studios.

Since the introduction of the first devices, the technology of Enhancers and Exciters has made tremendous progress. Although the fundamental principles of this technology have been well-known for a long time, engineers have been able to refine and improve the essential components over and over again. The Behringer company has also contributed considerably to this development:

With the introduction of our "Natural Sonic" Processor which functions independently of level, we have set new standards. Problems, previously encountered on conventional Enhancers and Exciters are restricted operating level range plus increased noise level during signal processing and audible "distortion". These are typical shortcomings of conventional circuit designs and are completely solved by the development of our new circuitry.

The Behringer "Natural Sonic" Processor

The Behringer "Natural Sonic" principle is based on frequency-selective phase shifting in conjunction with programme-dependent equalization and pulse enlargement. An automatic and natural frequency correction during signal processing offers a quality of sound enhancement that has been almost inconceivable until now. The programme-dependent processor permits the "musical" and unobtrusive transparency required for classical programme material, yet also provides the necessary brilliance for pop recordings, without introducing any additional noise, non-related harmonics or any other kind of distortion.

Integrated Noise Reduction System

Due to the laws of physics, Exciters and Enhancers basically increase noise in the programme material during process. Therefore, we have integrated a special and fully automatic noise reduction system into the ULTRAFEX. In this way, noise produced by the Enhancer's operation is faded out automatically.

Bass Processor

Apart from processing the upper harmonic ranges, users of the Behringer ULTRAFEX have access to an innovative bass processor. The numerous stages of processing during the recording, reproduction, copying and effecting processes, increasingly delay the phase of the bass frequencies, when compared to the remaining frequency ranges. This is why the low-frequency range suffers from a loss in power and fundamental bass definition.

With the help of frequency-selective phase shift combined with low frequency boost, the bass processor of the Behringer ULTRAFEX is capable of compensating for this loss, giving the programme material new bass presence. Using the SHIFT switch, the corner frequency can be changed from 50 Hz to 100 Hz, and vice versa.

Surround Processor

The fact that hearing impression largely depends on the positioning of the instruments within the stereo field is often neglected. Therefore, we have integrated a switchable and fully automatic Surround Processor in the ULTRAFEX, which is able to dramatically improve the intensity of the spatial stereo effect. The programme material gains in liveliness, "depth" and transparency. As in a cinema or theatre system, the listener has the impression that the orchestral instruments are placed all around him. The Surround Processor enlarges the stereo basis dependent upon the programme material without audibly colouring the sonic image.

Pressure From Above Or Power From The Bottom

Standards in terms of sound quality have never been as high as they are today. For example, the transmission quality in broadcast and TV stations, record or CD productions and live concerts etc., has a decisive impact on the stiff competition for audiences and listening figures.

Take advantage of the famous Behringer sound enhancement systems to make your recordings, tape copies and PA applications etc. gain the attention they merit. Transparent, powerful and low-noise audio experience attracts the listeners, and the more listener you have, the greater your success will be. Enhance your good name as an audio engineer witn Behringer equipment.

Specifications

- Multiband "Natural Sonic" Processor
- Noiseless and level-independent ALC circuit
- Bass Processor with switchable corner frequency (50/100 Hz)
- Automatic Surround Processor
- Switchable Noise Reduction system
- Frequency response : 20 Hz to 20 kHz (+0; -0.5 dB)
- THD : ‹0.008 % @ 0 dBu (1 kHz) (MIX set to min.)
- Noise & hum : -94 dBu (22 Hz to 22 kHz) (MIX set to min.)
- Servo-balanced inputs and outputs
- Max. input/output level : +21 dBu
- SOLO switch for monitoring the pure effect signal
- Relay controlled hard-bypass with auto-bypass function during power failure (failsafe relay)
- Cut-in delay to avoid switch-on thumps
- Jack and XLR connectors
- Optional high-performance output transformer OT-1 avaiable

For more information, please call 1-800-328-2882.

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PLEASE TEAR THIS OUT AND KEEP FOR YOUR REFERENCE

BEHRINGER

Innovative Solutions In High-Quality Audio

First and foremost, Behringer signal processing is created to excel in every kind of recording situation. Endowed with audio performance that has earned critical acclaim and widespread professional acceptance in studios around the world, our products include unique features dedicated to offering engineers a level of control and flexibility not typically found in this class of processor.

The following special insert has been created to provide you with in-depth technical information relating to a selection of our most current and relevant professional recording devices. For more information about the full line of Behringer Specialized Studio Equipment, please CALL (516) 932-3810, FAX (516) 932-3815 or WRITE: Samson Technologies Corp., P.O. Box 9068, Hicksville, NY 11802-9068.

PROFESSIONAL RECORDING PRODUCTS

1993 -1994

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COMPOSER Model MDX 2000

The Interactive Dynamics Processor

SUGGESTED RETAIL PRICE: $469.99

The Behringer COMPOSER is our unique dynamics processor, based on new, interactive technology. In a compact package, this extremely powerful and versatile signal processing tool provides the four most commonly dynamic control sections: fully automatic compressor, manually controlled compressor, expander and peak limiter. Precision performance and sound quality are the most attractive features of this high-end, dual-channel unit. The interactive circuit design employed in the COMPOSER offers maximum flexibility combined with very simple operation. Whether you need subtle compression or a creative sound processing tool - the extensive control options in combination with the switchable external sidechain open up new dimensions for improving your sound. The COMPOSER is the ultimate dynamics processor for broadcast and TV applications, professional recording studios and live sound reinforcement systems.

IKA (Interactive Knee Adaptation) Compressor

The innovative IKA *(Interactive Knee Adaptation)* circuit succeeds in combining the "hard knee" compressor approach with "soft knee" characteristics. These variable and programme-dependent control characteristics allow for "inaudible" and musical compression of the programme material plus creative and effective dynamics processing.

The IKA function brings a new dimension to programme material compression. Even with the most extreme compression ratios or when processing difficult music material (classical music etc.), the programme material sounds natural and transparent, and is not affected by "pumping" or other side effects, common shortcomings in conventional compressor designs.

With the help of the IKA circuit, the COMPOSER is capable of producing unrivalled results both in the studio and on stage.

IRC (Interactive Ratio Control) Expander

The basic problem encountered in compressor application is the noise floor which increases during low-level passages, depending on the compression ratio set (compressor noise). Usually additional expanders or gates are used to eliminate this problem by simply fading out the noise during music pauses.

Simple expanders, however, tend to fade out the signal below the threshold quite "unnaturally", even if they are set up correctly. The transition from audio signal to noise is the point where this effect becomes audible. In extreme cases, speech on vocal tracks is cut off at the beginning or end.

The COMPOSER integrates a newly developed IRC *(Interactive Ratio Control)* expander with a ratio setting that adapts automatically to the programme material. The result is an expander which makes setting less critical and which reacts tolerantly when the level of the audio signal just exceeds the level of the background noise floor. Due to the new IRC circuit, the expander/gate section in the Behringer COMPOSER can also be used as a separate unit for general "disturbance" elimination.

IGC (Interactive Gain Control) Peak Limiter

Another outstanding feature of the Behringer COMPOSER is the IGC *(Interactive Gain Control)* Peak Limiter, which intelligently combines a Clipper and a Programme Limiter. The Clipper comes in above the adjustable threshold and heavily limits the signal level ("brickwall" limiting). However, if the signal exceeds the limiter threshold for more than a few milliseconds, the IGC circuitry activates automatically and reduces the level of the overall output signal so that audible distortion cannot be produced (programme limiter). Having dropped below the threshold, the signal level returns to the origial value. The IGC feature is invaluable in live applications (e.g., speaker protection) and in the field of digital recordings, where signals exceeding the threshold can have disastrous consequences.

The COMPOSER meets the highest standards and requirements in terms of operation, sound, specifications and workmanship.

Specifications

- IKA (Interactive Knee Adaptation) circuit interactively combines the "musicality" of the "soft knee" function with the precision of "hard knee" characteristics, thus providing subtle and "inaudible" compression of the sound and creative dynamics processing
- Attack and release times under manual control
- Auto processor allows for fully automatic control of attack and release times
- IRC (Interactive Ratio Control) expander eliminates "chatter on or around the threshold point
- IGC (Interactive Gain Control) Peak Limiter interactively combines a Clipper and a Programme Limiter, and thus aliows for "zero" attack, distortion-free limitation of signal peaks
- High-precision VCAs
- Operating level switchable from -10 dBV to +4 dBu
- Servo-balanced inputs and outputs
- Relay controlled hard-bypass with auto-bypass function during power failure (failsafe relay)
- Cut-in delay to avoid switch-on thumps
- Key Ext. and Key Listen features
- High-precision meters displaying gain reduction, input and output levels
- Jack and XLR connectors
- Behringer output transformer OT-1 can be retrofitted

For more information, please call 1-800-328-2882.

World Radio History

PRODUCT INTRODUCTIONS 1994

Further interesting products are under development in the 19" range. This page gives you a brief introduction.

MULTICOM Model MDX 2400

The Interactive Quad Compressor/Limiter

SUGGESTED RETAIL PRICE: $469.99

The MULTICOM was particularly designed for those aplications most frequently used in practice. Despite the extremely complex internal circuitry, the unit has a control surface which is clearly laid out and easy to understand. With the MULTICOM, Behringer have developed an innovative and easy-to-use dynamics processor which meets the high demands that are made on such a device both in live and studio applications. The unit's most outstanding features are the precision and flexibility of its functions.

Quad compressor/limiters are actually not a new invention. Usually, four simple compressor sections are packed into one enclosure, representing however a compromise in terms of operation and functionality. An excessive number of controls complicates the operation of the unit and a lack of control functions restricts the unit's range of application.

The Behringer MULTICOM is a unique quad compressor/limiter based on the successful Behringer Interactive Technology. Integrated AUTO processors automatically derive attack and release times from the programme material and provide you with transparent and "inaudible" compression. In 1 RU package the unit consists of four independent high-prescision compressor sections, each offering all the required controls.

Advanced Behringer Technology

The Behringer MULTICOM contains several new circuit designs which make the unit the ultimate dynamics processor: with its intelligent programme recognition circuitry, the Behringer MULTICOM represents a new generation of compressor systems.

KNEE SELECTOR Circuitry

The new "Knee Selector" circuitry successfully combines the traditional "Hard Knee" compressor concept with the "Soft Knee" feature. The "Soft Knee" mode with its "soft" control characteristics is the basis of the "inaudible" and "musical" compression of the programme material, while the "Hard Knee" function is a prerequisite both for creative and effective dynamics processing and for limiting signal peaks reliably and precisely. This function is required to protect subsequent equipment against distortion, and thus damage.

AUTO COMPRESSOR Circuitry

The response of a compressor and the quality of dynamics processing largely depend on the control times, i.e., the attack and release functions. In particular, in the field of "musical" compression of complex composite signals, programme-dependent control times are necessary. The interactive AUTO processor derives the attack and release times automatically from the programme material, a function that avoids misadjustment of the control times, which is a problem often encountered in conventional designs. In addition the AUTO processor allows for a high compression of the dynamic range without any audible side effects, such as "pumping", "breathing" etc.

Applications

With rack space at a premium both in the studio and in sound reinforcement, the MULTICOM's unique high density design and clean uncluttered layout make it a truly useful audio tool for all applications. The MULTICOM is a perfect and extremely cost-effective solution for all your multi-channel dynamic applications.

For more information, please call 1-800-328-2882.

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AUTOQUAD Model XR 2400

The Interactive Quad Expander/Gate

SUGGESTED RETAIL PRICE: $659.99

Quad gates are not a new invention. In most cases, four single gates are packed into one enclosure, which however, represents a compromise in terms of operational possibilities and functionality. If too many controls are integrated, the unit is difficult to operate, and if control functions are lacking, the operational range is restricted.

The Behringer AUTOQUAD is a quad expander/gate of maximum functionality paired with ease of operation. Intelligent and automatic functions facilitate quick and efficient processing of any kind of programme material; the number of adjustment operations are thus drastically reduced. Each of the four sections in the AUTOQUAD includes an ultra-fast gate, a programme-dependent expander featuring the new interactive technology, a key-filter section, an accurate threshold display, and an intelligent link option for the individual sections.

Auto Function

The interactive control over attack and release time is the AUTOQUAD's most outstanding feature. In Auto mode, both the attack time and the ratio characteristics of the AUTOQUAD are controlled depending on the signal's slew rate and the dynamic analysis of the input signal. The result is an interactive expander which adapts automatically to the audio signal. In this way, guitar sounds, vocals and complex composite signals can be cleaned up without any clicks, "breathing" or other side effects. Furthermore, this function reduces the necessity to set and adjust a whole number of controls.

With the function switched off, the AUTOQUAD uses an ultra-fast attack time of 10 µsec. to gate all kinds of drums and synthesizer sounds without eliminating their percussive "kick".

IHC (Interactive Hold Control) Circuit

The release time is controlled by another interactive function. By setting the RELEASE control not only the release time but also the required hold time is set. The interactive correlation between the two control times guarantees "inaudible" and musical processing of the signal envelope; additionally, the entire operation can be performed with one single control.

Key Filter Section

When several microphones are used, for instance drum set miking, crosstalk between the microphones can result in unwanted triggering of the gate. The on-board key-filter section allows for precise fading out of the triggering frequencies.

An additional Key Listen function enables the user to pre-monitor the filter and thus facilitate the acoustical adaptation of the gate to the programme material.

FlexLink System

Owing to an innovative link function, any of the four expander/gate sections can be coupled with each other.

User-Oriented Technology

In addition to the auto functions mentioned above, the AUTOQUAD offers further practical features. A 3-segment LED displays the threshold point, a RANGE switch determines the maximum attenuation of 20 or 80 dB. Hard-bypass relays provide the required reliability for live applications.

The AUTOQUAD is the perfect system for your stage and studio application.

Specifications

- 4 independent expander/gate sections
- AUTO function for expander/gate operation
- IRC (Interactive Ratio Control) expander eliminates "chatter" at or around the threshold point and allows for "inaudible" expansion
- No clicks and pops, regardless of attack speed
- High-precision VCA's
- Behringer's extremely low-noise OpAmps BE027/BE037
- Attenuation 20/80 dB, switchable
- Servo-balanced inputs and outputs
- Relay controlled hard-bypass with auto-bypass function during power failure (failsafe relay)
- Cut-in delay to avoid switch-on thumps
- High-precision filters for frequency-selective operation
- Key-Listen pre-monitoring option
- "Traffic light" display for visual indication of threshold level
- Flexible linking of master and slave channels
- Illuminated switches
- Jack and XLR connectors
- Behringer output transformer OT-1 can be retrofitted

For more information, please call 1-800-328-2882.

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can be used for a quick check on cumulative level prior to mastering an EDL to DAT or other media.

The Text EDL window gives a configurable textual display of information about the entries in the Playlist window EDL. Start and end times, fade types, fade durations, entry names and playback level can all be adjusted directly from within this window. The text EDL listing can be printed as well, though I was unable to test this feature as the review unit did not have a driver for my printer. (Driver disks would be included in a purchased system.)

The Level window provides a mixer for the stream data from the EDL to the four possible output channels. When configured for all four output masters and 8-stream mode, and with automation enabled, the Level window takes up considerable screen real estate. Each stream of sound from

Getting started is so simple that I was recording sound within two minutes of connecting the power cord.

the playlist can be independently controlled or automated, and the streams can be grouped in any combination. The group operation is proportional: If faders at different levels are grouped, they will all reach their maximum or minimum level at the same time during a fade. Each stream fader is equipped with panpot, mute and solo buttons.

Mix automation can be set to simply override all previous track levels or to track previous levels until you move a fader—either with immediate (or timed) return to previously automated level on release or with retention of new level on release. Each automation sequence is retained as a mix in a temporary mix library accessible from a Mix Management button on the Level window's automation section. Mixes can be saved to disk for future use.

One of the most interesting fea-

THINK ABOUT IT...

If microphone placement is a critical aspect of recording, why do engineers often settle for the first position they try? Because microphone positioning is guesswork. You're in the studio moving the microphone, but the sound is changing in the control room. You can't have your hands in the studio and your ears in the control room, can you?

THINK AGAIN...

The Positioner, a brand new product from Studio Techniques, is so simple yet so revolutionary that it will change forever the way you get sounds. The Positioner allows the engineer to adjust microphone orientation by remote control while listening at the mixing console. No more trial and error guesswork — *you hear the results of your positioning instantly.*

The Positioner attaches to a microphone stand, and it rotates and tilts any microphone that has a standard threaded clip or shock mount. The best part is that the remote control connects with XLRs making installation as easy as plugging in a microphone.

Experience the state of the art in microphone placement and a new level of control in your microphone technique. Contact Studio Techniques today to get the details.

NOW WHY DIDN'T SOMEONE THINK OF THAT SOONER?

Studio Techniques

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tures of SADiE is the Trim window, which allows editing of the interaction of two entries in the EDL. First, you select two entries in the playlist by dragging a "rubber-band" selection window that contacts both entries. Clicking on the Trim window icon on the main toolbar calls up a waveform display with the two selected sounds displayed in different colors. At this point, you can grab one of the waveforms and slide it into or out of the edit point, or you can drag the beginning or end of the fade

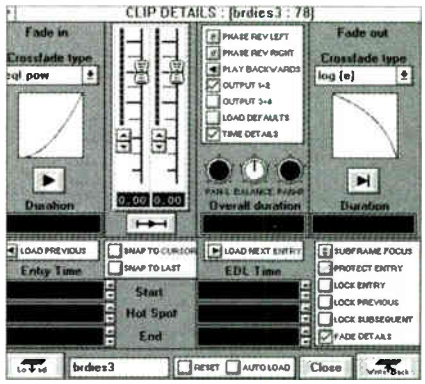

Figure 2:
The Clip Details window allows adjustment of all parameters for the selected clip.

for either or both entries, changing its begin, end or duration. As in the Edit window, Scrub mode lets you hear the sound as you slide it around.

SADiE also offers a palette of DSP functions, including compression/expansion, separate 3-band parametric EQ for each channel, noise abatement (three fixed-band expanders at 100 Hz, 1 kHz and 10 kHz), a pitch-compensating time compression/expansion utility and resampling (continuous sample rate change, digital varispeed, subsample microtiming for correction of single-channel azimuth error). You also have the option of bouncing tracks to either mono or stereo sound files, pre- or post-fader. All these functions allow real-time preview, with the intention of writing the processed sound out to a new sound file. However, some actually are able to do the processing in real time. I found the compression and the EQ quite useful, and the noise abatement was handy for removing extreme hiss from a poor recording. Bounce combined with fader automation made it very easy to pre-

DEMETER
INNOVATIVE AUDIO SYSTEMS

TUBE COMPRESSOR LIMITER VTCL-2

The Demeter VTCL-2 Tube Compressor Limiter is finally here!

The two-channel (stereo or dual-mono) VTCL-2 is a unique design by James Demeter utilizing an all-tube audio path(no transformers, ICs, or Op-amps) and analog opto-isolators to drive the compressor. Featuring previously unheard-of versatility from a tube design, the VTCL-2 easily accomplishes every compression and limiting function with a minimum of noise and distortion and no signal degradation. Brickwall limiting, over-easy, hard-knee, peak-limiting, as well as signal 'squishing' and infinite sustain with live signals are easy for the VTCL-2. The VTCL-2 has the versatility and hi-fidelity sound quality to replace any compressor available new or used, at a reasonable price. Controls are provided for input and output gain, threshold, attack and decay speeds, stereo link or dual-mono operation, and bypass (buffered through tubes.)

Also provided for ease of interface are XLR, TT, 1/4" phone jacks on all inputs and outputs as well as pin selector switches on each.

THD=.0662 @1kHz • Variable Attack Time=<.5ms to >30ms
Gain=>34dB • Variable Decay Time=<200ms to >10sec
S/N ratio= -110 EIN • Tubes=(2)12AX7A, (2)12BH7A, (1) 12AT7A
Max output=>+24dB • Size=2-19" rack spaces
Max compression=>30dB • Shipping weight=17 lbs.

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Your studio is in NYC. Your clients are in London. They need your material this morning so they can be on the air this afternoon. No Problem! The CCS CDQ2001 lets you send 20kHz stereo audio over dial-up ISDN or Switched 56 digital telephone circuits 24 hours a day, 7 days a week. Your audio arrives with the clarity and fidelity of digital transmission and you enjoy the convenience and economy of using dial-up circuits.

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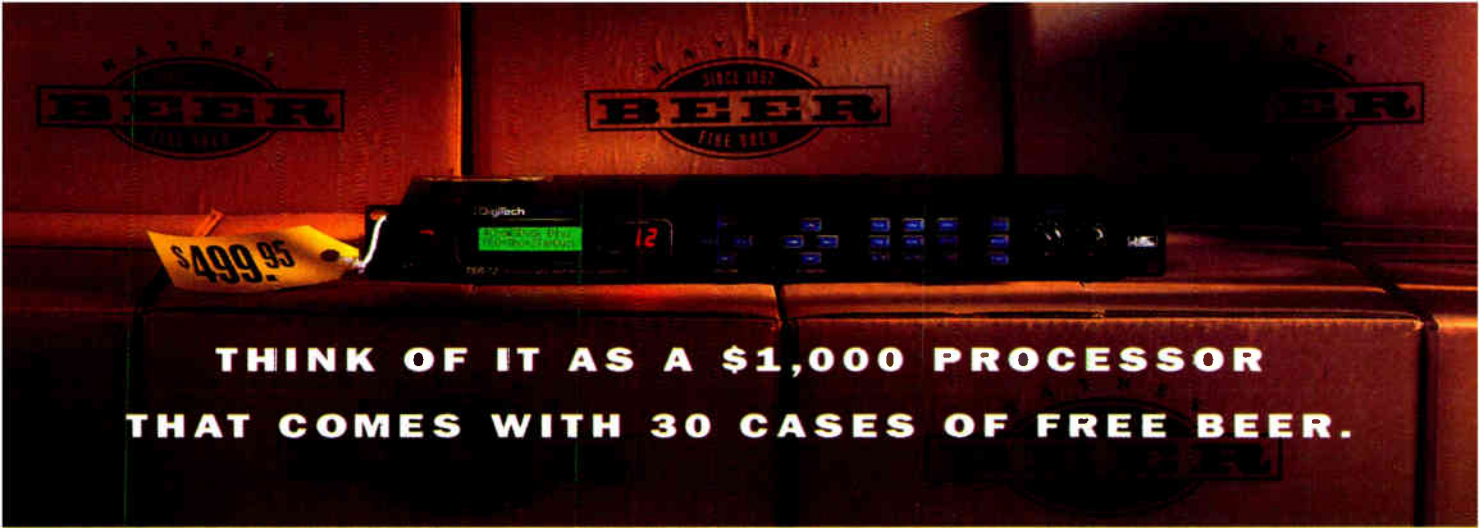

Let's talk about technology. The TSR-12 uses DigiTech's proprietary S-DISC, the most powerful digital signal processor chip designed specifically for audio applications. So it offers unheard-of specs that always deliver clean, crisp sound. Even the most expensive processors use your basic off-the-shelf chip. Which gives them your basic off-the-shelf performance.

How about noise? If you don't hear any, it's because the TSR-12 has the exclusive Silencer™ digital noise reduction system. The Silencer is so intelligent, it closes and writes digital zeros when there's no analog signal present. Higher-priced processors may offer noise gates, but they can't guarantee digital black.

TSR-12 FEATURES

- Full bandwidth effects (20 Hz to 20 kHz)
- 32 algorithms
- 24-bit signal path, 48-bit internal data transmission
- Digital noise reduction
- Instant module and parameter access
- Integrated MIDI processor
- Built-in MIDI merging
- MIDI controlled "morphing" effects

And now a word about effects, since that's probably why you're reading this. The TSR-12 includes 128 factory-fresh presets and 32 effect algorithms. Built-in memory lets you program 128 of your own multi-effect sounds. And one of those more expensive processors? Just 100 presets and 9 algorithms. If you're lucky.

At $499,* the DigiTech TSR-12 isn't some watered-down version of a $1,000 sound processor. So try an A-B test with anything else out there. You'll find the TSR-12 gives you everything you want from a processor. For less. Try one at your local DigiTech dealer today. Or call or write for more information.

DigiTech

H A Harman International Company

Multiple dynamic effects. *Program and store 128 of your own presets.* *All effects and parameters available for MIDI-continuous control.* *Two inputs/two outputs for stereo processing.*

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*U.S. price only

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pare a stereo effects track from an 8-stream composition. The time compression/expansion tool was less useful, though for very small (5% to 6%) changes in simple material it worked well. Its range of operation is from 50% speed to 200% speed, an ambitious range for "scrunching" any complex signal.

I was very impressed with this system from the moment I turned it on. It seems as if it would require a slightly longer learning curve than some editors I've worked with to get to full capability, but that is because of the flexible and feature-rich environment of the software. This is very much an "everything-in-one-box" system, including basic editing, strong mixer automation, external machine control, PQ editing for CD mastering, solid handling of SMPTE and MIDI Time Code operation (including continuous resync or chase-lock to, and generation of, SMPTE LTC), and DSP functions. I especially appreciated the flexibility of the text edit decision list and the ability to select from more than 20 fade profiles, with separately selected in and out profiles for crossfades. Multiple-level undo/redo capability, along with well-implemented help screens, allow the novice to jump right into editing.

Overall, there is a great deal to recommend with this system. The flexible configuration and the ease of defining edit points, together with the considerable advantage of actually being able to edit while sound is being recorded, make it one of the fastest editors I've used. It amazed me in terms of how fast the display and processing operations were handled on the 486/33 included in the turnkey system. Users I've talked to have all said that the system has met their needs, and that the support both from Studio Audio and Video Limited in the UK and from SADiE Incorporated in the U.S. has been exceptional.

SADiE Inc., 1808 West End Avenue, Suite 1119, Nashville, TN 37203; (615) 327-1140, fax (615) 327-1699; Compuserve 74204,1407. ■

Dave Tosti-Lane is a theatrical-sound designer currently serving as chairman of the Performance Production Department at Cornish College of the Arts in Seattle.

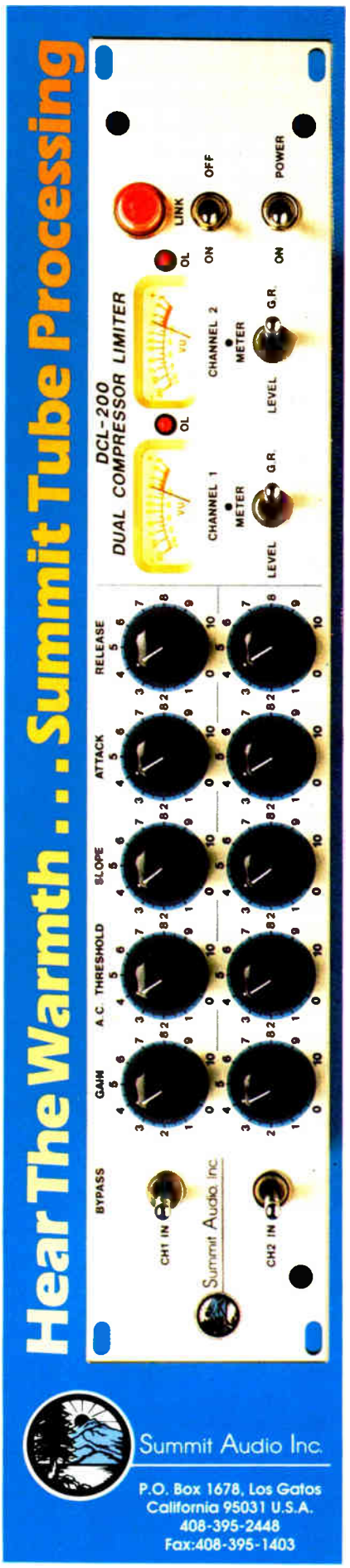
Hardware Configurations and Costs

At $9,995, a turnkey system includes:

- 486/33 DX computer (4MB DRAM, 256k cache) running Windows for Workgroups 3.11, a 200MB IDE system drive, and a 1.2GB Fast SCSI-2 drive.
- 14-inch, high-resolution color monitor, three-button mouse and keyboard.
- 2-in, 4-out X-ACT Card, which provides the 16-bit A/D and D/A converters, utilizing 64-times oversampling sigma-delta conversion, two channels of analog input and either two or four channels of analog output, SMPTE reader and generator, and MIDI Time Code reader/generator (18-, 20-, and 24-bit recording is available on all systems with the addition of external converters).
- 2-in, 4-out X-S Floating Point Digital Audio Processing Card using AT&T DSP32C floating-point DSP, onboard SCSI interface, and connections for the X-ACT card and external digital interconnects.
- Breakout Box—a 1U rack-mount interface with all system access connections mounted on the face. It includes one AES/EBU balanced input with two outputs, two XLR balanced +4 dBu analog audio inputs, four XLR balanced +4dBu analog outputs, ¼-inch TRS LTC input and output for SMPTE LTC, a BNC type connector for video black burst sync, and 5-pin DIN connectors for MIDI in, thru and out.

Additional options:

- A 2-in, 4-out subsystem for installation in an existing computer is available at $6,995, including software and the X-S and X-ACT cards (minus the Breakout Box).
- A 2-in, 4-out Digital Only subsystem for installation in an existing computer is available at $5,995, including software and the X-S card only (no A/D or D/A converters included).
- The Breakout Box is available separately at $349.
- A Quadtech dual RS-422 interface (DS200 with FIFO buffers) is available for 9-pin machine control at $595.



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2:00 a.m. The band just found the sound they've been looking for. Everyone's rockin'. Except you. **You're figuring out how to tell them the HIGH OUTPUT master you were using just "crapped out."**

Of course, you wouldn't be having this anxiety attack if you used new **BASF 900 *maxima*** High Output Mastering Tape. With 3 dB more output and 2 dB less noise than standard analogue mastering tapes, it is identical to the MOL and the signal–to–noise ratios of other high output masters. But it has the reel–to–reel reliability and consistency of BASF 911. Low rub off. Precision–manufactured. It's classic BASF. The kind of BASF tape studios have been relying on since 1934. As you turn to face the band (gulp), you make a vow. If you survive the next ten minutes, the first thing you'll do is contact BASF, 1–800–225–4350 (Fax:1–800–446–BASF); Canada 1–800–661–8273.

DEMAND IT.

BASF

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World Radio History

by Mark Frink

APHEX ST SERIES

SERIOUS TOOLS FOR SIGNAL PROCESSING

My last stop at the recent NSCA show in Anaheim was the Aphex booth, where the three signal processors in the new ST (Serious Tools) Series were being displayed. The 104 is the Aural Exciter Type C2, which has been out for a couple of years and has been joined by the new 106 Easyrider 4-channel compressor and the new 105 4-channel logic-assisted gate.

Denny McLane, who recently joined Aphex as a product specialist, has toured as a live sound engineer and is currently the sound designer for the Los Angeles Shakespeare Festival. I asked him about the ST product line and was immediately offered the three units to take back to Seattle, to use and judge for myself.

The main drawback of these products is their reliance on "wall wart" power supplies. This out-of-chassis PSU offers obvious manufacturing economy, and price is a significant feature of this line, with the combined list price being less than $1,250 for four gates, four compressors and two channels of Aural Exciter. Unlike many similarly positioned products, these use 24-volt supplies, which might be an indication of how they compare sonically to other budget-oriented signal processors, and they use the same VCA 1001 found in Aphex's high-end products for managing gain reduction.

The 106 Easyrider compressor takes an old-fashioned, staightforward approach to design and operation. Each channel has a fixed threshold—there is no threshold adjustment per se. There are two knobs and two switches per channel. The first knob sets the gain going into the compressor and is used to bring the signal into or out of compression. The amount of gain reduction can be seen on the green ten-segment LED meter, which shows up to 20 dB in 2dB increments. Going beyond 20 dB dims the meter. The second knob is used to set the output level after the desired amount of compression has been applied.

This compressor is not to be confused with "easy-over" or "soft-knee" compressors, which reach a particular compression ratio past a certain point and stay at that ratio. As the signal increases above the threshold, the Easyrider's compression gradually increases from a 1.1:1 ratio to more than 5:1 at 20 dB of gain reduction, working harder on higher-level signals than lower ones. Switching the channel off provides hard-wire bypass. The other switch is labeled Fast/Slow, and I recommend fast for more punch, such as on kick drum. The

World Radio History

106 is transparent at fairly high levels of gain reduction, and its variable ratio makes it easy to forget about so you can concentrate on mixing. The detector circuit is a program-dependent processor, adjusting attack and release times automatically.

The 105 has four knobs per channel for adjusting threshold, attack, hold and release, which is more than you'd expect on a quad gate in this price range. There's no key filter, but you can gain access to the detector from a jack on the back that automatically swaps that signal for the input when you plug in. The unit's logic-assisted circuit makes it easy to set the threshold, but there's no substitute for the performance of a filtered key. The range of gain reduction is only switchable between 90 dB or 6 dB, but these are the two settings for drums or vocal/instrument gating that will be most useful, and I found it worked well on both.

The 104 Aural Exciter is an affordable enhancement of the company's founding technology. The unit adds the characteristic sparkle to its signal by adding harmonic content. It will not make a bad input sound better—only stand out more—but it can make a good sound source seem great. Big Bottom, a feature not present in previous Aural Exciters, has adjustments for "overhang" and "girth," and it adds low-end content without adding volume. This is not a low-frequency synthesizer; it adds an adjustable resonance at low frequencies. The Aural Exciter was inserted on an acoustic guitar input for a live gig, and it really helped bring it out of the mix, with the rest of the electric band blasting in the background.

Although it is recommended by the manufacturer as an in-line processor for the entire mix bus, I found the 104 more useful for live work when it was inserted on the effects return subgroup. This configuration helped give those effects added clarity and definition so they could actually be added at a lower level with better results. Individual inputs can also be affected by adding them to that bus alone or in combination with other buses. You will be surprised by the quality of this entire line of affordable signal processors.

Aphex Systems, 11068 Randall St.; Sun Valley, CA 91352; (818) 767-2929; Fax (818) 767-2641. ■

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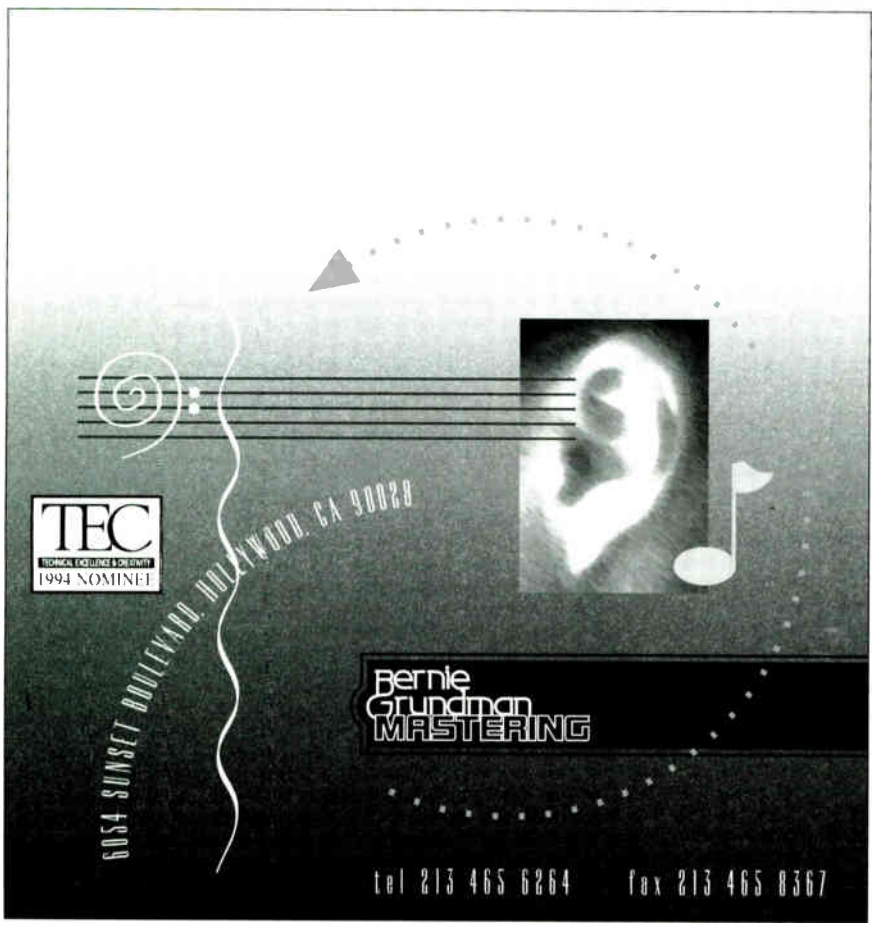

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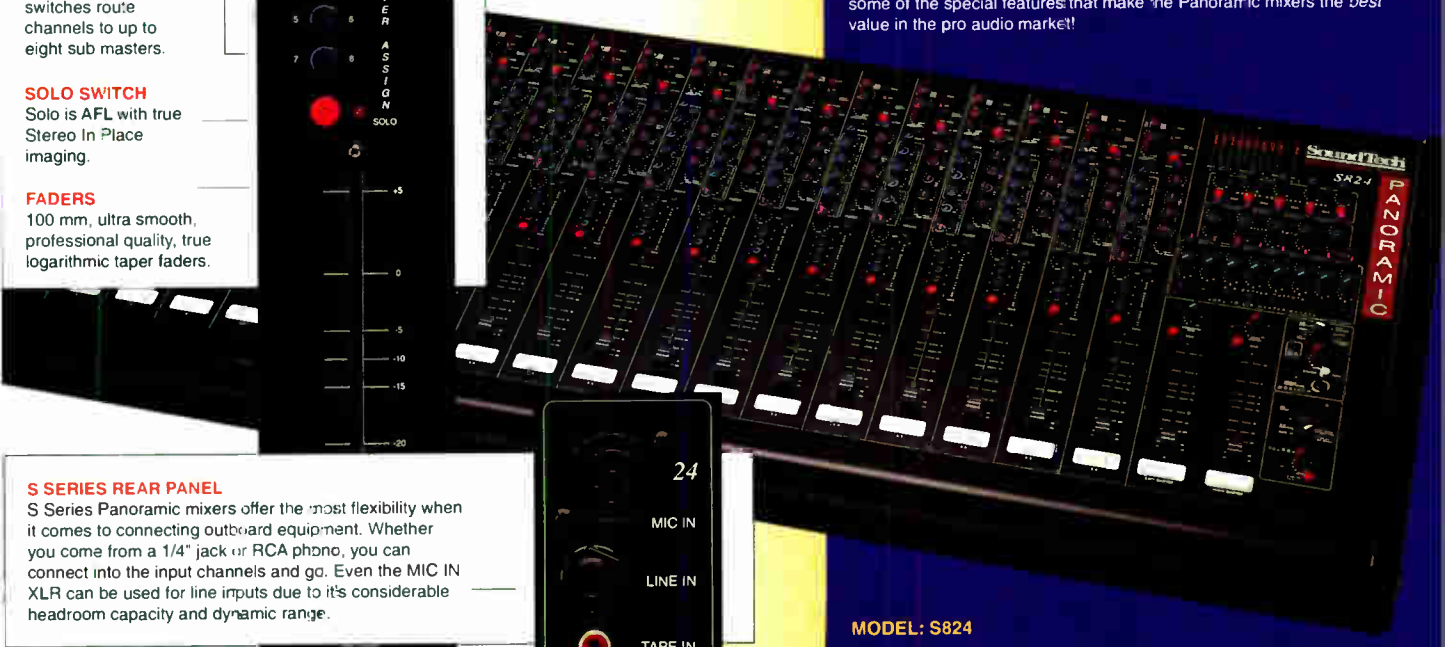

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World Radio History

by Mark Frink

SOUNDCHECK

Country phenom Wynonna toured the country over the summer, with sound reinforcement support from Roadworx.

FOH engineer John Cooper on a Yamaha PM-4000 with SPX 990s and using a D-2040 as the system processor for the company's recently upgraded, JBL-loaded, proprietary SR-2 two-box speaker system. The mid-high box in this unusual three-way system uses four tens and two 2450s with a new 50x50 waveguide, and the low box uses four custom JBL 12s, which are similar to a 2206. Other processing includes Drawmer gates and compressors, a BSS 901 and a Lexicon PCM-70. Monitor engineer Brooks Williams mixes on a Ramsa console and uses the company's new Woodworx Max 1.5M monitor, which features the same custom 12, a 60x60 waveguide and is powered by AB Systems 9620 amps, which Sarvis says they couldn't be happier with: "The quality, support and pricing we have come to expect from AB makes this amp the best option for us." Wynonna is expecting in January and is tak-

—CONTINUED ON PAGE 162

A BIG SUMMER FOR REGIONAL COMPANIES

From Alaska to Arizona to Arkansas, it's been a busy summer for live sound in North America. While some sound companies have focused on touring work and others have remained strictly in their regions, a few have managed to work comfortably in both markets, juggling tours and festivals. Our summer roundup of various companies follows.

Roadworx—with offices in Greensboro, N.C., Atlanta and Nashville—has had systems out with both Wynonna and Waylon this summer. President Hugh Sarvis reports that Wynonna used a 48-box system, mixed by

Front-of-house engineer John Cooper mixed Wynonna from a Yamaha PM 4000.

PHOTOS: STEVE J[illegible]

World Radio History

The Fillmore Rises Again

by Adam Beyda

Back in 1965, legendary concert promoter Bill Graham started putting on rock concerts at San Francisco's Fillmore Auditorium. His forte in those days was staging challenging, eclectic bills: Early scenesters were treated to a multitude of spectacles, such as Miles Davis opening for the Grateful Dead. By 1968, however, the local rock scene had outgrown the Fillmore; Graham moved his shows to larger halls, and the Fillmore closed. In 1988, Graham reopened the club, but the Loma Prieta earthquake abruptly shut the venue down in 1989.

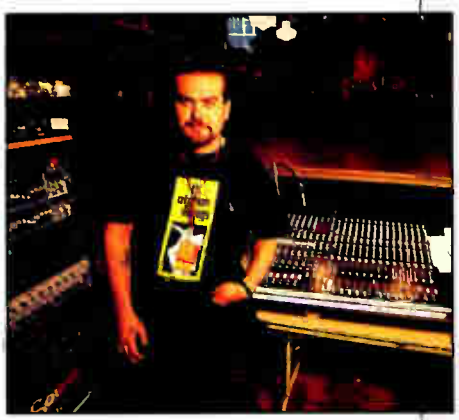
To get the Fillmore back up and running was one of Graham's last projects before his death in 1991, and this past April, his dream was realized. His company, Bill Graham Presents, brought the Fillmore back in style, kick-starting things with a rollicking opening night gig by headliners Smashing Pumpkins and following up with a month of high-profile gigs by the likes of Counting Crows, Michelle Shocked, Queen Latifah and the Afghan Wigs.

Alex Chilton onstage with Big Star

BGP invested in a million dollar-plus renovation of the 1,149-capacity venue, spending the majority of the money seismically reinforcing the structure. When it came time to install the house system, BGP production manager Paul Majeski hired Fillmore house engineer and chief audio tech Chris Charucki, who helped Marin County, California-based company Ultra Sound with the retrofit. "Paul really wanted to have an install guy who was going to be the engineer here," Charucki says. "He wanted the continuity of having someone who knew what was going on from day one."

Charucki says that after the '89 earthquake, much of the Fillmore's P.A., including six Meyer Sound MSL-3s, was moved over to BGP's larger venue, the Warfield Theatre. Now those stacks, in addition to a new pair of MSL-3s, are again in the front of house at the Fillmore. The FOH console, located on a built-in mix position at the center-rear of the room, is a Crest Century

—CONTINUED ON PAGE 162



House engineer Chris Charucki

PHOTOS: STEVE JENNINGS

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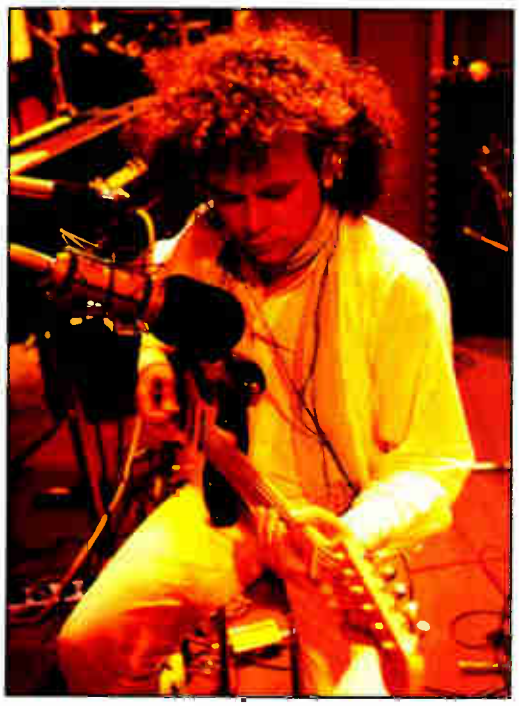
Andreas Vollenweider Live



Andreas Vollenweider

by Mark Frink

I recently caught the Andreas Vollenweider show at the Paramount Theater in Seattle. You may remember him as the smiling electric harp player who brought new age music to public awareness many years ago with his soothing instrumentals. This time out, Vollenweider was on tour with Audio Rent of Basel, Switzerland, and the company's engineers brought their entire sound system over from Europe in one 40-foot container. Kurt Ernst, the band's monitor engineer, gave me a tour of the stage while the harp mechanic was working on the "main axe" prior to soundcheck.

The entire system runs on 220 volts, so they brought their own isolation transformer and a separate isolator and stabilizer for the backline power. Ernst's monitor console was a Ramsa with EMO graphics from England. Most of the floor monitors were Clair 12AM with BGW GTA bi-amps, fitted with a switch to convert from 12AM over to LP115 wedges. The fans on these amps were a little noisy, and they had to put the rack in the back hallway. A Lexicon PCM-70 and two Yamaha SPX-900s were used for effects on the sax and vocals.

Vollenweider had his own Allen & Heath rack-mount submixer for his rig and monitors. Its inputs included the harp, which had pickups for five different sections, as well as a Midi-bass MIDI module, a Zoom 9200 for pitch-shifting, a Yamaha SPX for reverb, and a Paradis octave divider for the low strings. There was a pair of dbx 263 compressors

Andreas Vollenweider's house engineer Thomas Gfeller

on the high-mid and high string pickups. Vollenweider's harp riser had a "quad" monitor arrangement, with two JBL 1202 wedges at the front and two Clair LP115 wedges at the rear, also powered with BGW amps. Vollenweider also plays a Chinese instrument, called a cheng, which has a custom pickup on each string. A KMX-122 line

Elvis on Tour

PHOTO: JANA

Elvis Costello & The Attractions toured together this summer for the first time in eight years. One of their first stops was the Concord Pavilion in Concord, Calif. For this show, Electrotec supplemented the Pavilion's JBL Concert Series system with Electrotec Lab-Qstacks and brought in Gamble EX56 house and Midas XL3 monitor consoles. Concord's production manager, Bill Keithlin, says that "the Pavilion's three-quarters-around-the-stage configuration and low overhang make the venue a challenge to mix," but Costello's engineer, David Zammit, says minimizing the weight of the lighting load allowed them to hang stacks from the roof and point enough speakers at the mix position.

World Radio History

mixer is used to mix it down to two channels; an Alesis QuadraVerb is used for pitch-shifts.

Thomas Gfeller was the FOH engineer, and he mixed the show on a highly modified Soundcraft 800/32 with a 13-channel extender and various additions, including eight stereo returns. The console also had a built-in phase-meter LED ladder on the control room bus, with 0 to 90 degrees as green and 90 to 180 as red LEDs. Gfeller said it is a very useful tool and is common in Europe. He added that "a lot of engineers don't know that many reverbs have programs that are out-of-phase."

Gfeller's effects included two Lexicon PCM-70s, used for short snare and large overall drum sounds. Vocal effects were a Roland SDE-3000, Lexicon PCM-42 and a 300. A Lexicon 480 was used on the harp and the flutes. A Digi-Tech IPS 33B was used as a pitch-shifter on the harp. Also used on the harp was a dbx 160x for the bass section and a BSS 402 for the high-mid and high sections. A Behringer parametric, BSS 402 as a de-esser and a Summit Audio tube leveler were used on the vocals. Aphex gates were used on the toms, and dbx 903 compressors were used on the guitar, keyboards and accordion, with a dbx 166 used on flute and sax.

The main P.A. consisted of Clair R-4 arrays left and right, in two rows of four, flown fairly high, just upstage of the proscenium. They were powered by BGW GTB amps, equalized with an EMO (from England) stereo graphic and crossed-over with a BSS FDS-360. On the deck were two double-18 subs per side, which were actually S-4s without the mid-high section; they were powered by BGW GTC amps, as were the two small Clair P-2 boxes that were used for front fill at the extreme sides of the theater.

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The P-2s had a Klark-Teknik DN30/30 and a TC Electronic 1280 on them. On the inside of the subs on the stage were three Clair P-4 Pistons per side for inside front-fill, powered by BGW tri-amps.

The most unusual thing about the main P.A. was the use of a single compression driver on a 90-degree radial horn, hung center on the downstage lighting truss. "It's something I've been doing for years," Gfeller says. "It is the best and easiest way to fill in the missing information to the center of the stereo mix. Otherwise, you end up with a hole in the middle of the image."

A striking addition to past Vollenweider concerts was Eliza Gilkyson on acoustic guitar and vocals, playing a Takamine guitar with a Passac preamp and singing into a Shure Beta 87, as was Vollenweider. Backing vocals used AKG 535s. Other microphones onstage included a Shure SM91 on kick, 57s on snare, timbales and electric guitar; Ramsa S-5s on toms, and AKG 451s for overheads.

One novel device was an infrared sensor that gates the mic on the large gong tom by sensing when the mallet is on the head, so it can be played at low volumes. This device is made by Hanspeter Ehrsam, the original FOH engineer, and his Swiss company is Sensoritecknik AG. An award for creative use of existing technology goes to the deployment of an extremely directional, parabolic dish microphone—you know, the kind used on the sidelines at football games—20 feet up, mounted on the midstage lighting truss and focused on the snare drum. It added an incredible open, transparent sound to the drum mix. Sound for the entire show was amazingly clear and crisp, and the general effect was that of being immersed in a soothing hot-tub. ■

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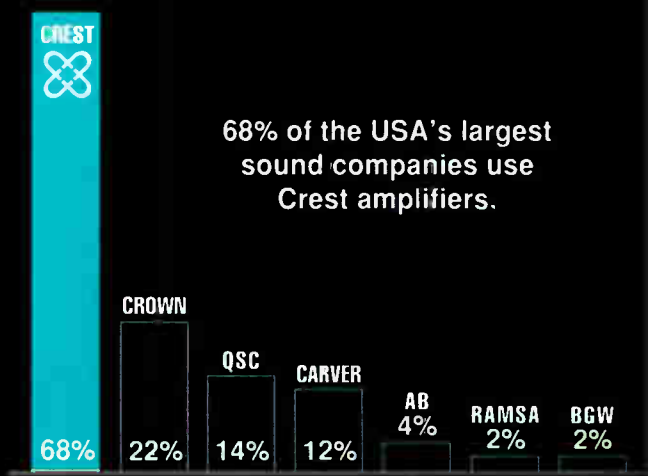

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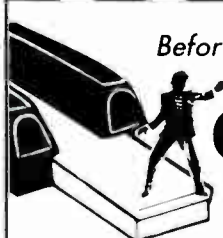

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—FROM PAGE 157, THE FILLMORE

GT 40x8x3. A Century LF 40x12 is stage-right for monitors, usually manned by Nathan Harlow, the Fillmore's in-house monitor engineer.

Charucki, who previously worked at the Warfield and for Ultra Sound, adds that "for the Fillmore's monitor system, we also took a lot of stuff that we had at the Warfield. The actual boxes are S.O.S. KBs, 15 and a 1-inch. My drum fill is an S.O.S. Cutlass cabinet, which is an 18, a 12 and a 2-inch horn. For sidefills we go back to MSL-3s."

The monitors and FOH stacks are powered by Crest. The MSL-3s have a 4000 on each stack. A Meyer UPA (powered by 3501s) is hung under the MSL-3s on each side as a downfill to take care of what Charucki says is an open pocket right in front of the stage. "I've got it configured so that I can send just the vocals to those," he says, "just whatever needs to fill in that pocket can go into those speakers." The Meyer subs are powered by Crest 8001s.

Outboard gear includes two Yamaha SPX 90s, a Roland SDE-1000, two dbx 160 and four 166 compressors and eight gates—a quad gate by Aphex, and quad gate by Klark-Teknik. Mics include the ubiquitous Shure SM58s and 57s, along with Shure Beta 58s and 57s, a pair of Sennheiser MD-409s, eight MD-421s and an EV RE20 because, Charucki says, everybody asks for it.

Two unusual configurations at the club pertain to the snake and to load-in/out. The snake, Charucki says, "runs up through the booth above me, across the attic and comes back down to the stage behind the curtain. It's a good 200-foot run, which was a bitch to put in, pulling snake through the attic, walking along rafters. But it's through there, as well as my return snake, and it's working for us."

Load-in and load-out happens through a side door stage-left. This wouldn't be unusual, but the club is on the second floor, and the door opens into midair, two and a half stories up. "The gear comes onto a forklift," Charuki says, "and it's lifted up to the second floor. That's something that can be dangerous if you don't know what you're doing, and it's a real pain in the ass. We try not to open our side doors while the P.A. is on, just because we don't want to have problems with the neighbors. That's one of those little clubland things you have to deal with." ■

—FROM PAGE 156, SOUNDCHECK

ing time off until next spring; everyone at *MIX* wishes her well. Other summer work for Roadworx included the Summer Lights in Nashville and shows at Dollywood and Riverbend.

Jason Sound of North Vancouver was on tour in Europe with Bryan Adams this past July and August doing outdoor festivals for capacity crowds of 30,000 to 50,000, with a 120-box, Carver-powered proprietary J63, J62 and J61 horn-loaded speaker system and a Soundcraft Europa console. The company began the summer by purchasing 20 Carver PT-2400 and 24 PT-1201 amplifiers to expand its FOH speaker inventory. The five-way, three-box system has a four-foot-square mid-high box with four horn-loaded 12s, three JBL 2445s and four JBL 2402 tweeters, and a low-mid box with four JBL 15s in a folded horn in another enclosure the same size. The sub-box has four JBL 18s in a folded-horn enclosure that is the same width, but shorter and deeper. The system was designed by Canadian renaissance man, technical director and co-owner Jeff Barryman.

Co-owner Jeff Lilly reports that Adams' larger European festivals were mixed from extreme side-stage by FOH engineer Jody Perpick, similar to how Journey used to do large shows years ago, eliminating the usual FOH setup and open-

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—FROM PAGE 162, SOUNDCHECK

ing up space for thousands of fans to see and hear the show better, with spotlights run from extensions on the roof. Jason Sound has faithfully provided services to Adams for years to the exclusion of other tours and only recently assembled a second system. *Mix* will follow up on this tour in later months. Jason's other tour this year has been Canadian artist Sarah McLachlan, in clubs and soft-seaters throughout North America. System engineer Gord Reddy has four J63 high-mids and eight of Jason's new J31 "push-pull," dual-18 direct radiators, which are housed in enclosures half the size of the J63—measuring 2'x4'. Gary Stokes mixes the show on a Crest Century GT 32. Monitor chores are performed by Dave Pallett on a new 40-channel Soundcraft SM-16. Lilly says that the console's power supply has been holding up just fine and that the company took delivery of a Soundcraft SM-24 over the summer, as well. Other projects included last month's Commonwealth Games in Victoria, which were sponsored by JBL.

Here in Seattle, Dave Stevens of Proshow reports that, due to the sudden cancellation of Nirvana's tour, Proshow USA has been doing more out-of-town shows with its Crown-powered EV MT-4 rigs. Last spring, the company moved a system to Alaska that included 32 MT-4 boxes, a PM 3000 and a Ramsa console, and effects ranging from an SPX 90 to a Lexicon 480. Crew chief Alan Bagley says shows there have included the Doobie Brothers, Chicago, Dr. Hook, Doug Stone, and the Alaskan Festival, featuring Blood, Sweat & Tears and Tommy James. Proshow's office in San Antonio continued to provide services for San Antonio's Alamo Dome system, as well as a house system for Bronco Bill's —a Texas-sized club with a capacity of 2,000. Other shows in Texas this summer included the Sunken Gardens festival, which used 16 MT-4s and Ramsas for the house and monitor consoles.

Back in Washington State, Morgan Sound of Seattle, with its supply of JBL Concert Series speakers, has picked up the St. Michelle Winery concert series (Woodinville, Wash.), which features appearances by the Manhattan Transfer, Art Garfunkel, Willie Nelson and Tony Bennett, as well as other shows taking place at the Moore Theater and at the Bumbershoot Festival.

A-1 Audio of Hollywood, Calif., unveiled its refurbished, digitally controlled Harwell G2 system for Fanfest '94 at the Los Angeles Fairgrounds early this summer. Fanfest featured 100 country music artists in three days. The 60-stack (180-box) system, originally designed by Roger Harvey and Tom Boswell, is powered by Crown PSA-2s and Crest amplifiers. This 3-box, four-way system has newly released, heavy-duty JBL 15s in a 12-foot, folded-horn sub-box; a horn-loaded, low-mid cabinet with two EV 12s; a high-mid box with two JBL 2445s on a Harwell

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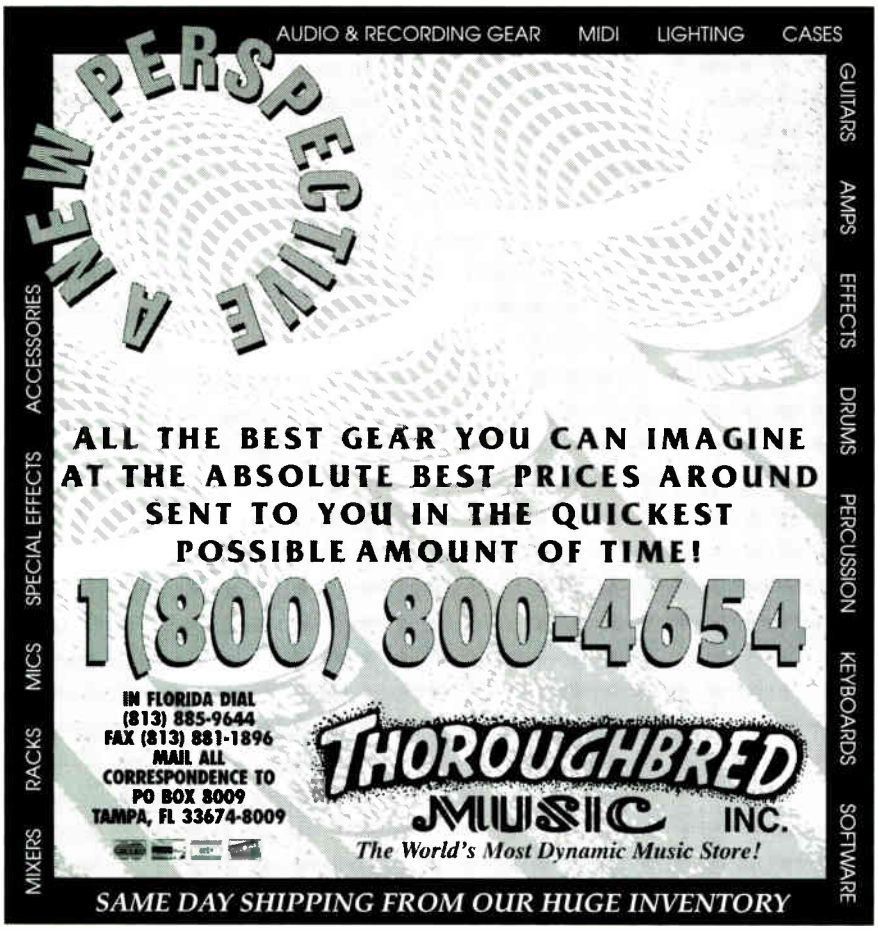

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horn; plus four JBL 2402/5 tweeters. The system, made famous by many of the regular touring accounts of Tasco, was acquired when the company sold its assets to A-1 last year.

Stage Sound of Phoenix started the summer with the Telluride Bluegrass Festival, mixing the show on two Yamaha PM 3000 consoles and a Ramsa onstage. Mitch Hodge reports that the main speaker system consisted of six Meyer MSL-10s, with five MSL-3s per side for near-throw and six UPAs for front fill. Twelve 650s and ten USW subs were also used. Fifteen more MSL-3s were used for delayed fill, with the entire system optimized using a Meyer SIM™ package. Other Stage Sound work included PolyGram Records' annual international meeting, the Jazz on the Rocks Series and both stages at the Colorado State Fair.

Blake Dewberry reports that Crossroads Audio in Dallas started the summer with a concert by the band La Mafia at Reunion Arena in Dallas in conjunction with World Cup Soccer in June. The company also provided services for the Freedom Festival in Austin last July, with a lineup that included Fleetwood Mac, REO Speedwagon and Mark Chestnut. The company uses Ramsa and Yamaha consoles onstage and at FOH respectively. The main speaker system was 48 compact P.A.S. RS-2C full-range speakers with 16 CB-2 dual-18 subs, all powered by QSC amplifiers. The RS-2C uses a coaxially mounted JBL 2450 on a model CXL-2580C 15-inch driver, which runs full range. The other 15-inch in the box is the HL-2580C, which has a passive, 6dB-per-octave lowpass network above 100 Hz.

Phillips Pro Audio of Oklahoma City had a strong summer, continuing to provide services for Restless Heart and working with up-and-coming

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comedian Rob Becker, who carries full production for a fairly technical show. Ken Phillips purchased a 40-channel Crest Century LM 8+4 monitor console and put a GT 40x8 into a local installation. "We wanted to get into that price range and still satisfy national acts. The board that I'm totally in love with is the TAC SR 6000," Phillips says. "We just bought a second SR 6000. The first one has done over 200 shows, and we haven't had a failure yet. If I was going to predict, I'd say that the SR 6000 and the Crest monitor board are going to replace the PM 3000 and the Ramsa at the level we're at." Phillips' other summer shows included the Oklahoma City Symphony and the Tulsa Philharmonic, as well as several festivals and conventions.

Sound Services of Little Rock, Ark., provided country music's Shenandoah with monitor services for a 100-show tour, which came on the heels of two Top 10 hits for the band. Bryan "Hot Dog" Tate handled the 12-mix system on a Ramsa console and provided in-the-ear monitoring for half of the six-piece band. Each of the company's floor monitors is loaded with one Electro-Voice N/DYM 116 compression driver and two DL 12Ws, which owner Richard Thornton calls "the best-sounding 12 made commercially. It is relatively new and has power-handling at least as good as the JBL, with higher fidelity." The monitors are powered by Crown 36x12 amplifiers with PIP AMCB cards providing vented EQ and CD horn curves

From left to right: Carl Taylor, president of Crystal Taylor systems, with chief systems engineer Chris Sullivan and audio consultant Bob Spangler at the Creation Festival

World Radio History

as well as bandpass. "We have two versions of that wedge," Thornton adds. "You have your choice of either a small 80-by-60 rectangular horn or the JBL 2311 if you want it more in-your-face, which I've heard the MSI guys call brain darts."

Sound Services has three different monitor rigs: a 12-mix TC Electronic 1128, an eight-mix Klark-Teknik 3600 and an eight-mix Ashly. "We like the programmable EQ rigs for festivals," Thornton notes. "The Klark is $1,000-a-mix less. They don't have a fancy remote yet, but they're a little easier to get around on and sound a little cleaner, although they don't have that search-and-destroy function that the TC does." Sound Services relies on Crown-powered Electro-Voice MT-4, MT-2 and Deltamax speakers for mains and has the Crown IQ system installed and running on a Macintosh computer. The company's many outdoor festivals included the Gospel Tent at the New Orleans Jazz & Heritage Festival and the Arkansas River Blues Festival.

Lori Cole reports that her Chicago Sound has been busy doing a wide variety of local corporate and festival shows, including gigs at Planet Hollywood and the Skyline Theater, World Cup events, the entire Grant Park series, City of Chicago events and the Panasonic booth for the CES show. "I like to think we're a medium-sized sound company, but we're not interested in touring," Cole says. "Anywhere within an eight-hour drive of Chicago in our truck, we're able to do it, and my vision is that's where we want to stay. We can do any venue in Chicago up to Poplar Creek, or the [Rosemont] Horizon, and we did the WNUA Jazz show at the World Theater at the beginning of the summer. We have enough equipment and staff to do a large show, but I don't choose to be a touring company."

Though Chicago Sound has only been around since 1991, it can field four Apogee 3x3 systems on any given day. Starting out with a couple of 3x3 speakers and a half-dozen AE-6 monitors, the company now has more than two dozen of each, as well as 16 Apogee XP-14 subwoofers, 18 AE-5 speakers and six each of the AE-3 and AE-2s2 speakers. Other acquisitions include a 12-channel Beyer RR7000 UHF wireless system, which vice president Ian Hunt calls "highly successful and bulletproof. We've been able to use this system in venues that have been notoriously problematic in the past." They've also added a wide variety of Klark-Teknik equipment, including the DN 3600 programmable graphic equalizer and the new DN 3601 slave. Other KT purchases include the 504, the 514, the 780 reverb and the 728 digital delay. New console purchases by Chicago Sound this year included a Crest Century GT 44x8 and a TAC 28x8 Bullet.

Eighth Day Sound of Cleveland began the summer by hiring Scott Rodgers as director of touring services and opening an office in Laguna Beach, Calif.

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Rodgers, a native of Glasgow, Scotland, was manager of the recent Tears for Fears tour. "The opening of the new West Coast office allows us to step up efforts in touring services while raising our profile in the entertainment industry overall," states Eighth Day's Tom Arko. The company also took delivery of more than 200 new Turbosound speakers, including 72 Flashlights, 24 Floodlights, 96 low boxes and 12 pairs of "underhung" boxes, which Jack Boessneck explains are actually Floodlights cut in half. "The 12 is in one box, and the six-and-a-half and driver are in the other box," he says. "It's a 50-degree dispersion, and you hang them under two 25-degree [Flashlight] cabinets. Britannia Row started using these with [Peter] Gabriel." Half of this inventory is out with Meat Loaf this summer, for whom Scorpio Sound of Massachusetts provided services for the previous five years. Kevin Pruce is the band's monitor engineer, and George Wehrlin (formerly with Scorpio) has moved from mixing monitors to FOH. Both engineers are using Yamaha PM 4000 consoles. Jason Polansky is the system tech, Steve McClimans is the monitor tech, and Mike Rodgers is the fly tech. Other work this summer included shows with Tom Jones, with Scott Godwin mixing house and Ed Ehrbar on monitors.

"Southern Thunder is planning on buying a small EAW KF 850 system this summer," says Todd Miller. The Minneapolis sound company has been doing a mix of conventions and festivals this summer, including the NRA convention and the We Festival in Detroit Lakes, Minn. "We're primarily a regional company, and we don't actively look for tours, but we had a system out with the Thrill Kill Kult last winter," Miller notes. "This past spring, we had a system out with The Breeders, who have been on Lollapalooza this summer, and we expect to work with them again this fall." For The Breeders, Southern Thunder used a 40-channel Soundcraft 8000 and a Ramsa console, and the wedges have Crest-powered, Electro-Voice 150X speakers with JBL 2445 compression drivers. "We use the octal-socket crossovers," Miller adds. "They're cheap, and they sound good." Southern Thunder has been cross-wiring 850 tops and using them with its horn-loaded subs, which have four EV 150X speakers and are powered with Crest 8001 amps. The company is also providing services for the Minnesota State Fair through the end of this month.

Philadelphia's Crystal Taylor repackaged and upgraded its systems this summer, purchasing 48 pairs of Floodlight boxes. Turbosound relaxed the requirement of using BSS amplifiers for the Floodlight, and the new inventory is powered by QSC EX 4000, 2500 and 1600 amplifiers. "Though [it's] not currently implemented, we are prepared to install MediaLink in the future," says president Carl Taylor. All front-of-house effects have been standardized to one Lexicon PCM-70 and three Yamaha SPX 990 effects units as part of an effort to cut down the company's prep time requirements for the local one-offs that represent the core of their business. The company also acquired a Yamaha PM 4000 to add to its collection of PM 3000 and XL-3 consoles. Shows this summer included the Creation Festival with 50 Christian acts performing for 60,000 people, the City of Philadelphia's "Welcome America" festival with Melissa Manchester, and the Philly Pops with Michael Feinstein and Smokey Robinson.

Rainbow Sound and Lights of Hampstead, N.H., is again working the Cape Cod Music Circus and the South Shore Melody Tent after successfully doing so last summer. The two installations are designed as nearly identical packages, since many acts on this circuit do both venues. The highlights include Soundcraft Venue II consoles, Klark-Teknik equalizers, Crown power, and EAW

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speakers and monitors. Rainbow also provided sound and lights for the Hampton Beach Casino for the ninth season. The bulk of the company's other summer work was festival-oriented, including Stratton Mountain, Vt., Waterville Valley, the Rib Festival in Manchester and at Boston's Fan Pier, the Seaport Festival at the site of the USS Constitution in Charlestown and a stadium show in Foxboro for WCLD-FM, with Wynonna headlining in one of her last shows of the year. Later this month, Rainbow will do the Manchester Riverfest. In addition to equipment purchases to support these efforts, Rainbow opened a new warehouse and added a case-building department.

Snow Sound of Middlefield, Conn., is again out with Vermont phenom Phish, using the company's proprietary Eagle speakers, which have two 12s, and a 2-inch and a companion double-18 subwoofer. The tour carries a Crest Century GT 52 console and is using a BSS Varicurve system at FOH. An LM 40 is used for monitors. They also have been busy with corporate and festival work for a variety of southern New England events.

SPL of New Jersey has been providing services at Great Adventure of Jackson, N.J., for acts such as Little Texas, Waylon Jennings, BS&T, Three Dog Night, Loverboy, America and Restless Heart. Steve and Robin Ponzetto upgraded their monitor system with JBL 2226s and 2450s on DDS 251 horns, new Crown 24x6 amps and Klark-Teknik DN 360 equalizers. SPL has also been providing sound services and occasional rentals of its Yamaha PM 4000 to various casinos in nearby Atlantic City.

Rock 'N' Road Audio of Atlanta has been providing sound services for Travis Tritt and Hank Williams Jr. Owner Roy Drunkenmiller tells us that, as an endorser, Tritt uses all Shure mics, including a Beta 87 for his vocal. FOH engineer Jid O'Brien mixes the show on a Yamaha PM 4000 with a PM 3000 available for the support act. Monitor engineer Barry Foy mixes on a Soundcraft Series 4 monitor console and uses Future Sonics Ear Monitors for Tritt, with the rest of the band on double-12 wedges, a double-15 on the drums and a single-15 for the bass player. System technician Bob Sheckell puts up the three-way O.A.P. DP-1810 speakers and double 18 O.A.P. subs, which are powered by Crest 8001 and QSC 3800 and 3500 amplifiers. Johnny Watson has been mixing Williams on the company's new EAW two-box 852 system, which is supplemented by eight KF 850's and Tech 7 Servodrive subs, and is powered by Crown 3600 and 1200 amplifiers. Jon Armstrong is Williams' monitor engineer, and Billy Lindsey is the system technician. ■

Sound reinforcement editor Mark Frink can be reached 4050 Admiral Way #305, West Seattle, WA 98116; BBS (206) 933-8478.

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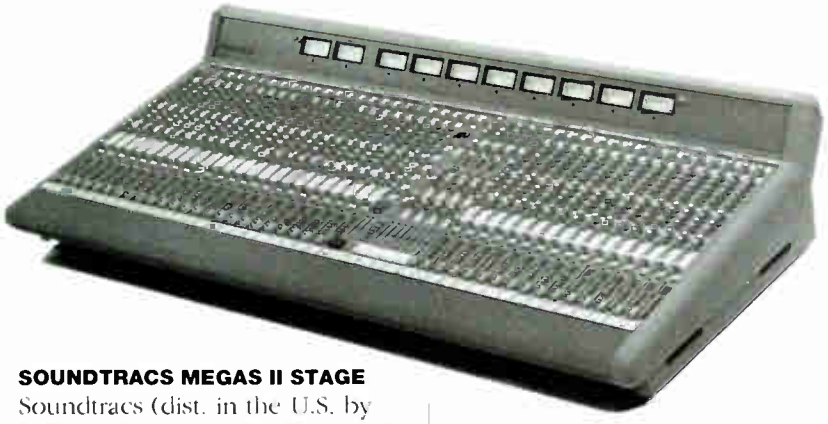

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Soundtracs (dist. in the U.S. by Samson Technologies, Hicksville, NY) launched the Megas II Stage console, designed for touring and fixed-installation applications. Available in four frame sizes (30, 38, 46 and 54 modules), the console can be configured with mono and/or stereo input modules, and up to four matrix modules (for 11x8 matrix capability) and four dual-group modules for eight subgroups. Standard features include six mute groups, LED input channel metering and large VU meters on the groups and masters.

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New from BSS (dist. by JBL Professional, Northridge, CA) is the MSR-604 II, an active signal splitter providing several feeds to different users from a single source. The unit features front panel gain and mic/line controls; a choice of several configurations (4 channels of 1-in, 4-out, 2 channels of 2-in, 4-out or 1-in, 16-out); phantom power to each mic input; a discrete mic preamp; and multilevel I/O, such as mic-to-line, mic-to-mic, line-to-mic or line-to-line. In addition to house/monitor splits, the unit is also suitable for broadcast or press feeds during concert events, translator feeds and teleconferencing.

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ELECTRO-VOICE PI SERIES

From Electro-Voice (Buchanan, MI) comes the PI Series, a line of high-performance modular loudspeakers offering a wide range of customization for the fixed installation market. The series includes three full-range, three-way systems with different coverage angles (60°x40°, 60°x60° and 90°x40°), in trapezoidal enclosures of identical size. Three two-ways (mid-bass/high-frequency) in slightly smaller cabinets are also available, along with a separate woofer box housing an EVX-150A 15-inch driver. The mid-bass and HF horns in all cabinets are coaxially mounted and rotatable, allowing vertical and horizontal coverage patterns to be interchanged as necessary. The PI Series systems are housed in multilayer plywood cabinets with eight integral flying points, four Ancra locking fittings and protective metal grilles.

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HORIZON EXPANDS ARENA SERIES

Horizon Music (Cape Girardeau, MO) has expanded its Arena Series with two new monitors and four FOH cabinets. The monitor models ARM-112T ($193.98) and ARM-115T ($259.98) combine a 12- or 15-inch woofer with a piezo tweeter for high-end response out to 20 kHz. The ARP-110T ($215.98), ARP-112T ($215.98) and ARP-115T ($279.98) systems combine a 10-, 12- or 15-inch woofer with piezo tweeter, while the ARP-110H ($275.98) uses a 10-inch woofer/diffraction horn combo. Power handling ranges from 120 to 170 watts RMS. All feature black carpet covering and recessed handles.

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ATLAS DMS SERIES
New from Atlas/Soundolier (Fenton, MO) is the PB11XE mini boom. Intended for close-in miking of percussion, string players, guitar amps and seated performers, the models DMS-7E (height adjustable from eight to 13 inches) and the DMS-10E (14.5 to 26 inches) feature an oversized 10-inch cast base for stability. The PB11XE mini boom extends from 16 to 24.5 inches and has a fixed 12-ounce counterweight.

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World Radio History

by Philip De Lancie

REPLITECH '94

SPEAKERS DOWNPLAY SUPERHIGHWAY THREAT

With the much ballyhooed "information superhighway" so prominent in the news these days, one might conclude that the future looks grim for those who make physical storage media such as tapes and discs. But the mood was far from glum at the third annual Replitech conference and exhibition in Santa Clara, Calif., in mid-June. Instead, signs were everywhere of a healthy duplication and replication industry that continues to grow. Attendance was up at the show, as was the number of exhibitors, many of whom were AES refugees pleased to be out of the shadow of pro audio and into a show all their own.

The upbeat mood was not simply the noble bravado of an industry staring extinction in the face. In fact, present conditions in many segments of the magnetic and optical media markets are actually quite good, especially for those whose production efficiency allows them to maintain decent margins despite downward price pressure. As for the future, the message from the conference podium was more of reassurance than alarm. Electronic delivery will come, but the prevailing view was that adoption would be gradual and that existing technologies would continue to play an important role for a decade or more.

The message from the conference podium was more of reassurance than alarm. Electronic delivery will come, but the prevailing view was that adoption would be gradual and that existing technologies would continue to play an important role for a decade or more.

UNITS UP, PRICES DOWN

Leading the chorus of soothing voices at the opening session was Elliot Minsker, chairman of conference producer Knowledge Industries Publications. Minsker pointed out that the total number of CDs, tapes (audio and video) and floppy diskettes sold in the U.S. was 2.8 billion in 1993, up from 2.5 billion the prior year. Optical disc units were the fastest growing category, up 31%. Audio tape grew much more slowly (2%), but grew nonetheless, with strong growth in spoken word offsetting continued erosion of market share in music.

Next at the mic was outgoing ITA executive VP Henry Brief, who gave an overview of sales statistics for blank magnetic media as reported to the ITA by its members. In almost every category, Brief said, the picture was the same: gains in unit sales but

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declines in revenues on those sales. Overall units were up to 1.179 billion, but revenues were off 5% to 1.616 billion. Blank audio cassettes did better than average as far as holding their value; units were even with 1992 while value slipped only 0.5%. Pointing to a total blank cassette market of 437 million units, Brief declared that "there is still a large market for the audio cassette."

Regarding the potential threat of electronic delivery, Brief noted that "mixed emotions used to be described as being told that your mother-in-law had driven off the road in your new Cadillac." But for those in media manufacturing, he said, mixed emotions now refers to "being told of a future that is so wonderful that it will put you out of business." Infohighway notwithstanding, however, Brief maintained that there is "still plenty of life left in tape formats."

Among the reasons that Minsker and Brief urged calm in assessing the future, consumer response to new technology is perhaps most important. Following Brief to the podium, Robert Pfannkuch of Telefuture Partners offered a roundup of various trends in entertainment and information markets, and raised the possibility that consumers may not respond as expected by the predictors of rapid change. In fact, too much change may overwhelm consumers and turn them off. Faced with so many new formats and possibilities, many consumers may buy nothing at all, opting instead to stick with the formats they already know.

The most obvious evidence in favor of this theory is the response so far to the new audio formats. DCC, said Pfannkuch, has essentially "disappeared," with one large (unnamed) duplicator who invested heavily in DCC capacity having already written off the outlay as a loss. MiniDisc, meanwhile, "isn't exactly a barn burner," he said, though Sony is hoping to breathe life into the format this summer with new, smaller portables.

Other reasons Pfannkuch cited in support of the slow adoption theory for electronic delivery include increased government regulation of cable, which reduces that industry's available capital for expansion, and political concerns about the "telcos" diverting profits from existing telephone services to pay for multimedia-capable networks into the home.

Some of these same concerns were raised by Pfannkuch's fellow speaker Richard Kelly of the research firm Cambridge Associates. A host of technical, regulatory and interface issues are currently unresolved, Kelly said. Assuming that these can be satisfactorily settled, he estimated that the cost of bringing a new electronic delivery network online will be enormous, probably in the range of $60 billion just to reach half of America's households. In order for those who fund this investment to achieve revenues of $15 to $21 billion per year by 2004, consumers who now pay an average of $30 per month will be paying $50 to $70 for the new services.

Will they pay? Kelly cited studies showing that five channels are watched each week in the average home without cable, and just twelve channels in cable households, many of which currently have access to up to 50 channels. The question of how many more channels they would watch if they had access to 500 has yet to be determined, he said.

Even if enough consumers do find the new services worth paying more for, Kelly made a convincing case for the gradualist view of the future. People tend to forget, he said, how long it takes for new technologies to become widely used. Five years after their respective introductions as consumer products, for instance, CD players were found in just 5% of U.S. households, VCRs and personal computers in 4%, and cable TV in a mere 1%. The five-year average for a variety of products he studied was 5%.

Ten years out, those technologies that survive are pretty well-established. But even in that period, few achieve anywhere close to the near universality of telephones or television sets. At their tenth birthdays, Kelly said, VCRs were in 45% of households, CDs in 42% and PCs in 32%.

The point of the statistics is that change is at once more slow and less predictable than expected. The view from the Replitech podium was that existing formats tend to have tremendous inertia (the case of the LP notwithstanding), and that new technologies tend to ease in gradually rather than suddenly wipe out all pre-existing formats. For the Replitech audience, there was real comfort in that message. ■

World Radio History

by Philip De Lancie

TAPE & DISC NEWS

WORLD DUPE MARKET EXPANDING

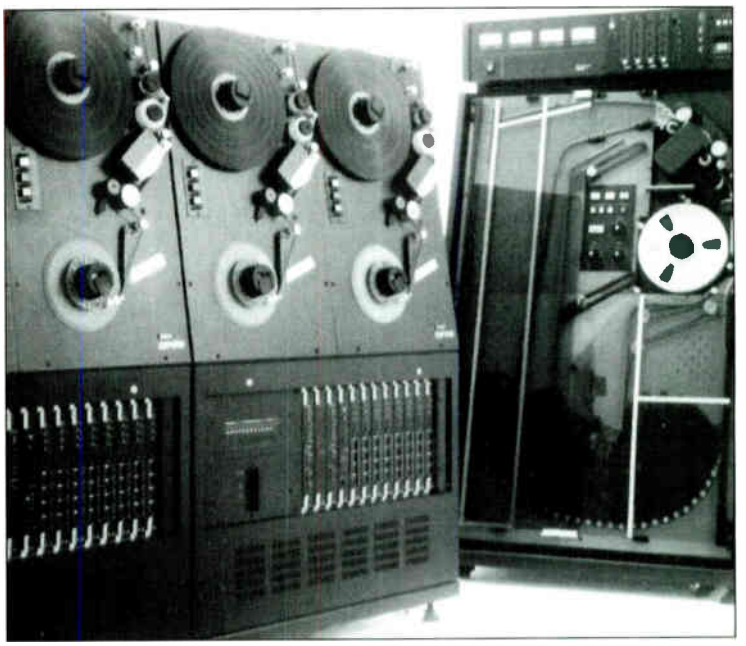
Vendors of audio and video cassette duplication gear are reporting continued strong interest in their products from duplicators overseas. Versadyne International, for instance, says it has seen increased interest in both its premium 1500 Series and its modestly priced 1000 Series. The company has recently delivered five new complete systems, as well as additional slaves to existing customers who are expanding their systems.

Among the hottest areas for growth are Latin and South America. In Mexico, Musindustrial of Mexico City and B.P. Balderrama of Cordoba have purchased complete systems, with Musindustrial also adding slaves to an existing 1000 Series line. In Argentina, meanwhile, Daniel Rojas y Cia SRL of Buenos Aires has also added 1000 Series slaves. Versadyne also reports system sales to Shunde Jixin Industry in China and Silver & Ballard of Sydney, Australia.

International sales have also become increasingly important to Gauss. The company cites sales to nine duplicators since it began overseas distribution of the Model CD 9002 loader. Machines have gone to both Europe (Russia, Poland, Lithuania, England) and Asia (India, China, Thailand).

1994 ITA DIRECTORY

The ITA is now distributing the 1994 edition of its International Source Directory, a 60-page listing of all member companies describing the products and services they offer to the audio, video and data industries. The directory is available free of charge in the U.S., Canada and Mexico by faxing a request on company letterhead to the ITA at (212) 643-0624. The ITA also announced plans to initiate a statistical program to chart the replication in the U.S. of CDs in all audio, data, entertainment and game formats.



Otari's new DP-75 high-speed audio cassette duplicator

OTARI BOWS NEW DUPE GEAR

Otari Corporation introduced several new products for audio duplication at Replitech. The MTR-15H2/4XM is a ½-inch, 4-track, 2-channel mastering recorder for bin loop masters. It features automated record alignment and Dolby HX Pro. The DP-76BR, a reproducer for quality control inspections of recorded pancakes, uses a bidirectional transport and includes two sets of repro EQ per channel as well as built-in speakers.

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Otari has also put the finishing touches on its DP-70 Series audio duplication line. To the DP-75D twin vertical slave unit (first shown at last fall's AES) the company has added the DP-73CD bin loop master. The machine, largely based on the DP-93, features ratios of 64:1, 80:1 and 128:1 and three EQ presets per channel. The ZA-97V-S playback monitor amplifier was also introduced to allow signal monitoring during recording on DP-75 slaves. A single unit may be moved from slave to slave for setting up an entire line.

HMG TO MERGE WITH ALLIED

Duplicators Allied Film Laboratory and HMG Digital Technologies agreed to merge their operations into a new holding company named Allied Digital Technologies. HMG, a major independent in audio cassette duplication with substantial video presence as well, recently announced the opening of CD-Audio and CD-ROM replication facilities. The company's entertainment-industry-oriented customer base complements that of Allied, whose strongest video duplication penetration is in the business, education and special interest markets.

SPLICES

Mitsui Toatsu Chemicals (MTC America, New York, NY) announced the introduction of a new surface coating for its recordable CDs. The Data Shield Surface (DSS) process is designed to protect against abrasion, scratches and peeling...**Koch Digitaldisc** showed its new Time Base Error analysis option for the CDCS-4 CD QC system at Replitech. The company has also changed its U.S. distribution from Studer Editech to **Data CD** of Woodland Hills, CA...**Sonic Solutions** (San Rafael, CA) is porting its entire line of digital audio workstation products to the Indy and Indigo2 workstations from **Silicon Graphics**...**DB Plus** (New York, NY) reports mastering activity by Herbie Hancock for PolyGram, Don Pullen for Blue Note and Wynard Harper for Epic. ■

Send your Tape & Disc News to Philip De Lancie, c/o Mix, *6400 Hollis St. #12, Emeryville, CA 94608.*

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COAST To

L.A. GRAPEVINE

by Maureen Droney

Sunset Boulevard waves goodbye to L.A. and moves on to Broadway. Amid flying rumors about replacement-lead Faye Dunaway's vocal prowess, Andrew Lloyd Webber's production of the classic story has closed in Los Angeles and is moving to New York with its current star, Glenn Close, intact. *Mix* toured the sound setup before the production at the Schubert Theatre closed. A

—CONTINUED ON PAGE 182

***Sound mixer Kurt Fischer and assistant Billy Holmes backstage at the Schubert Theatre before the production of* Sunset Boulevard**

PHOTO: MAUREEN DRONEY

SESSIONS & STUDIO NEWS

by Jeff Forlenza

NORTHEAST

Extreme were at Boston's Sound Techniques tracking their fourth album, *Waiting for the Punch Line*, for A&M Records. Bob St. John engineered/co-produced the rocking tracks with Chris Nix assisting...At Philly's Studio 4 Recording, Joe and Phil Nicolo (a.k.a., the Butcher Bros.) were tracking the Mighty Mighty Bosstones' latest release for PolyGram...New York's Metropolitan Opera (conducted by James Levine) went into the spacious Grand Ballroom at Manhattan Center Studios to record Wagner's *The Flying Dutchman* for Sony Classical. The sessions

PHOTO: TED CAMERON

Johnny Cash performed a live concert at Manhattan Center Studios' Grand Ballroom in support of his new album,* American Recordings. *The concert aired on VH1 and featured numerous star appearances, from Pavarotti to David Bowie. Engineer Jim Scott recorded the music from Studio 7 with assistant Roy Clark. Cash is seen here with lead guitarist Bob Wootton.

were produced by Michel Glotz and engineered by Christian Constantinov...Former Scruffy the Cat singer/songwriter Charlie Chesterman was at Zippah Recording (Brookline, MA) working with co-producer Pete Weiss on a solo CD, *From the Book of Flames*, for the Slow River label...Singer/songwriter Jim Malone (formerly of Left Exit) recorded his solo debut for Safety Net Entertainment at Beanland Studios, Colonia, NJ, with engineer Bruce Tunkel. Malone co-produced the CD, *Stronger Than Silence*, with Tunkel and executive producer Rob Roth...At Third Story Recording in Philadelphia, the Idle Wilds and Zen

—CONTINUED ON PAGE 186

World Radio History

COAST

PHOTO: JOHN ABBOTT

Eastern Rebellion at The Village Vanguard: (from left) Cedar Walton, Ralph Moore, David Williams and Billy Higgins

SESSION SPOTLIGHT

by Jeff Forlenza

DIGITAL DOMAIN TRACKS EASTERN REBELLION: Live at The Village Vanguard

Recording engineer Bob Katz of New York City's Digital Domain recently traveled to the Village Vanguard to record one of today's hottest jazz combos, Eastern Rebellion, for a MusicMasters Jazz release. Led by pianist/founder Cedar Walton and drummer Billy Higgins, Eastern Rebellion's history dates back three decades, and its current lineup includes bassist David Williams and saxophonist Ralph Moore.

Regarding the high level of their musicianship, Katz says, "The rapport between Billy Higgins and Cedar Walton is so telepathic, when Cedar makes a rhythmic change in his piano part, Billy is right there to play a complementary drum part. And the other two musicians, bassist David Williams and tenor/soprano saxophonist Ralph Moore, are of equal caliber."

Katz brought some self-designed gear to the historic jazz club in downtown Manhattan for the live-to-2-track sessions: a customized console that features high-quality mic preamps

—CONTINUED ON PAGE 190

NY METRO REPORT

by Dan Daley

Contrary to what I reported last month, Penny Lane Studios will close down. Margie Flaum, widow of the late Penny Lane founder Harley Flaum, originally decided to continue the operations of the studio and the production company, Radio Band of America. In late June, she decided to close down both entities, said Penny Lane studio president Alan Varner, who stopped accepting bookings as of late June. While they would prefer to sell the studio whole, an equipment list

—CONTINUED ON PAGE 190

Jazz pianist Ahmad Jamal was at New York City's Clinton Recording working on his latest release for Telarc Records. In Clinton's Control Room A are (from left) Telarc VP and chief engineer Jack Renner, Ahmad Jamal and producer John Snyder.

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—FROM PAGE 180, L.A. GRAPEVINE

suggestion: If you've been too busy in the studio to get out to see a musical stage production for the past few years, or if, like me, you got turned off by the harsh midrange assault of the first wave of theatrical-use wireless mics, check out this production when you are in the Big Apple. You'll be pleasantly surprised.

Sound mixer Kurt Fischer and his assistant, Billy Holmes, showed us the ropes of the L.A. production. FOH speakers are a hybrid mix of Tannoy, Meyer UPA-1s, Bose subwoofers, JBL Control 5s, and little satellite Bose AM 5s. Fischer told us that the production's sound designer, Martin Levan, chooses components for their individual qualities and speaks in terms of coloration instead of specs.

But what's really unusual in the *Sunset* setup is that it uses a dual speaker system. When two singers are onstage, one is often in one system with the other in the second. It's an A/B system that eliminates phasing problems: System A is the Tannoys; B is the Meyers. "We might put two different actors, or two different musical instruments, in two different speaker systems," Fischer says, "like the saxophone might sound better in the Tannoys or the flute might sound better in the Meyers. The Tannoys tend to be more transparent; the Meyers tend to have more coloration. The Meyers might work better for synths, or they might not. It's totally subjective."

The production uses 26 wireless mics along with two spares. Piles of batteries backstage ("Help yourself," said Holmes), attest to the diligence of the crew in using replacements. Holmes described the finer points of mic placement. In a show like this, mics are usually placed in the center of the actors' foreheads, he says, leading to much negotiation between the sound department, hairdressers, makeup and costume designers.

According to Fischer, those wireless mics are the biggest advancement in the history of theatrical sound; they've literally changed the way musical theater is staged. *A Chorus Line* was probably the last show to use foot mics, and in that show all the performers come downstage to sing. Now, as you'll see, they can be anywhere.

A note to live mixers: There are no onstage monitors. "It would be completely impossible," Fischer explains, "with all these wireless mics. Also, there are no monitor positions. And it would just have too big an effect on the sound of the house. There are stage monitor speakers, but they're just orchestra foldback. The other speakers on stage are for sound effects."

Fischer uses a Cadac console, which he calls fairly standard—no automated faders. "Everything is mixed live," he says. "It's enough to deal with the 26 wireless mics! The idea here is that we have a pretty set mix, and if we have problems, we believe it's a problem down there [in the orchestra pit], either a substitute musician or someone who has changed position. Or, they are leaning forward into the mic too much, or maybe the keyboard player is just playing too loud. Therefore, we tend to deal with those kinds of problems through the conductor. Because of the way we set up in initial re-

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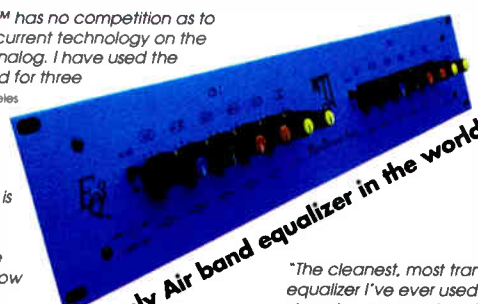

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hearsals, if it's right [in the pit], it's right out here, except for minor adjustments." *Mix* watched in awe during the show as Fischer quickly isolated the one mic out of 16 that was crackling in the chorus!

The Cadac console is automated in the sense that VCA assigns and MIDI changes to delay units, reverbs and "go" cues to the CD sound effects are programmed. Otherwise, Fischer manually advances the computer, starts sound effects, mutes and unmutes faders, and assigns to the VCAs. A nice feature of the board is its progammable routing buses, allowing automated assignment to any subgroups or matrices. Delay times from 12 to 20 milliseconds are used to help with imaging, to impart naturalness to actor positions upstage or downstage, and to time-align delay for the orchestra and chorus.

"Wait a minute," I asked, anticipating the need for SMPTE somewhere, "what's controlling the automation?"

"Oh, I am." answered Fischer. "Basically, I just hit 'next!' I mix, and I hit 'next.'"

A typical production might have three weeks of tech rehearsal and 14 previews, with rehearsals on the day of previews. Long days, and according to Fischer, who enjoys this part, "It gets hairy, with Andrew Lloyd Webber here, Trevor Nunn the director, actors in all shapes and sizes, and I deal directly, as a mixer, with all these people, in ensemble and one on one."

Asked what was the biggest part of the job, Fischer responded, "I'd say the biggest part is establishing trust. Performers often want to have control, and sound is one of the things that they can get instant feedback on—you can't change the lights or the set so easily. They need to trust you and know that you are on their side."

Musicians take control of the board...American Federation of Musicians Los Angeles Chapter Local 47 has become the first musicians' union chapter in the U.S. to open an in-house studio. Christened "Studio 47," the operation includes a 32x16 TAC Scorpion console, three linked Alesis ADAT 8-track recorders and a wide assortment of signal processors, including gear by Lexicon, BBE and dbx. Mics are AKG and Sennheiser.

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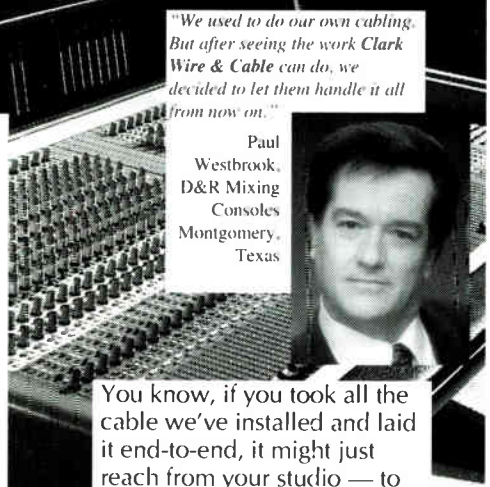

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The 60x90-foot studio was designed originally in the '50s as a live radio broadcast room and can hold a complete 60-piece orchestra. It features a Baldwin 8-foot grand piano, an orchestral timpani and a drum kit. Future plans for the operation include the opening of a reasonably priced video production facility, scheduled to be complete by early 1995.

A caveat: Only AFM member musicians are eligible to use the room, with low rates used as an inducement to nonmembers to join the union. Administrator/chief engineer Joseph Armillas Lecuona tells us that plans are in discussion for an associate member union rate as further encouragement for young musicians to join.

Besides Armillas Lecuona, the staff at Studio 47 consists of recording engineers Vince Tividad, Stu Simone, Aaron Loo and Wayne Peet. Bookings are handled by Armillas Lecouna and studio manager Barbara Markay.

What's hot in rentals? Steve De Gennaro of Design FX Audio tells us that Sony PCM-3348s have been working all over town. "Like the Energizer bunny," he says, "they keep on going and going. Also constantly out are the Sony 7030 time code DATs and the Dolby XP SR racks. Just as hot are the Tascam DA-88s and Alesis ADATs." And, of course, tube mics, of which they've just added another Neumann M49, U67 and Sony C800G. Also new is the Sony PCM-9000 2-channel digital magneto-optical recorder, which De Gennaro says is the hot new mix format. And Design FX recently acquired a Spatializer, an NTI EQ³ sound enhancement system and a TC Electronic M5000 Digital Audio Mainframe, which De Gennaro calls a "sweet unit" with reverb, delay, pitch shift and digital compression.

Over at Audio Affects, Mark Napier says their hottest item is also the Sony PCM-3348: "We've got ten and it's not enough! They are busy all over the country: Seattle, Florida, even New York City!" At Audio Affects, the Sony time code DATs are also hot, along with the Tascam DA-88s. The other busiest items fall into the category of vintage gear: Fairchild limiters, tube mics, Neve 1081 and 1073 modules and EMT plate reverbs.

Fax L.A. news to Maureen Droney at (310) 472-8223. ■

World Radio History

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*Source: Music Trades (8/93), Inc. Magazine (10/93), Music Inc. (5/94)

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—FROM PAGE 180, SESSIONS & STUDIO NEWS

Guerrilla were working with engineer/producer **Scott Herzog**...

SOUTHERN CALIFORNIA

Continuum recording artist **Bobby Womack** was at Burbank's **Encore Studios** self-producing and mixing his latest CD on the SSL G 4080 console in Studio A. Womack started sessions with master engineer **Barney Perkins**, who recently passed away, and finshed with engineer **Elliott Peters**. Guest musicians on the guitarist/singer/songwriter's new album include members of the **Rolling Stones, Stevie Wonder** and **Ronald Isley**...Latest in the line of hot rappers out of Long Beach is an MC known as **Domino**. The Outburst Recording artist was at L.A.'s **Skip Saylor** tracking and mixing the song "Business of Love" for the new Jim Carrey film, *The Mask*. Phil Roy produced the tune, engineering by **Sean Freehill**...**Power Station** (the rock group) was at **Ocean Studios/Burbank** with producer **Bernard Edwards** working on their latest release. **Stan Katayama** engineered the sessions from Ocean's 56-input Neve 8108...**Bruce Hornsby** was at L.A.'s **Studio Masters** laying vocal and guitar tracks for his upcoming RCA release with engineer **Thomas Mahn** at the board...Famed producer **Arif Mardin** was at Hollywood's **Conway Recording** working on two projects, **Manhattan Transfer** and **Bette Midler**, both for Atlantic Records. Engineers **Jack Joseph Puig** and **Michael O'Reilly** handled tracking and overdubs on the sessions...

NORTH CENTRAL

Chicago's **Seagrape Recording** had alternative act **Baby M** in working with producer **Mike Comstock** and engineer **Tom Haban**; and rap group **Blahze Blah** came into Seagrape to record with producer **Peter Black** and engineer **Tom White** for Island Records...Also in Chicago, **Sparrow Sound Design** had tenor saxman **Von Freeman** in producing a jazz CD for his brother, guitarist **George Freeman**. Von added piano tracks to the direct-to-digital sessions engineered by **Bradley Parker-Sparrow**...While touring with *The Sound of Music* in Cleveland, **Marie Osmond** stopped in at **Beachwood Studios** to record vocal tracks for her upcoming album. Osmond worked with her husband/producer **Brian Blossil** and Beachwood engineer **Michael**

World Radio History

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Kohler...At Pachyderm Studio (Cannon Falls, MN), producer Michael Ivey and engineer Michael Koppelman were working on Basehead's Imago Records release with assistant Pat Burkholder...Up near Toronto, Metalworks Studios (Mississauga, Ontario) had April Wine in mixing their second album for FRE Records, and the Philosopher Kings were mixing with engineer Lenny Derose...

SOUTHEAST

R.E.M. returned to Miami's Criteria Recording Studios to track tunes for their latest Warner Bros. release. R.E.M. co-produced the sessions with producer Scott Litt, while Pat McCarthy engineered with assistance from Mark Gruber...Country act Little Texas was at Nashville's Masterfonics mixing their new Warner Bros. CD with producers Doug Grau and Christy D'Napoli and engineer John Hampton...Rapper Tupac Shakur was at Musiplex/Atlanta cutting vocals and mixing tracks for his latest release with the production team of Bread & Water and engineer Anthony Jenkins...Also in Atlanta, MCA artist Pebbles was tracking her new song "It's My World" with engineers Bryan Frye and Neal Pogue at Doppler Studios...Sandy Bull recorded his latest release for Timeless Recording, *Steel Tears*, at Strip Center Sound in Franklin, TN, with guest musicians Jerry Douglas and Sam Phillips...

NORTHWEST

Surf guitar godfather Dick Dale was back in the studio recording the follow-up to his critically acclaimed Hightone Records release, *Tribal Thunder*. Dale co-produced the new album with drummer/producer Scott Matthews and engineer Allen Sudduth at Prairie Sun Recording in Cotati, CA...At Northern Lights Recording (Petaluma, CA) engineer/studio co-owner Arron Johnson tracked and mixed the latest release from the Martinez Latin Band...Producer Ray Woods was at Phantasy Studio (Portland, OR) recording The Tree Frogs for an upcoming release on Northwest indie label Rainforest Records...At Triad Studios in Redmond, WA, electric-folksters Motherlode completed their fourth album with producer Linda Waterfall and engineer Larry Nefzger...A&M recording artists The Innocence Mission were at Bad Animals/Seattle tracking and mixing their latest release with producer Dennis Herring and engineer Chris Fuhrman...

SOUTHWEST

At Sound Arts Recording Studio in Houston, studio owner/engineer Jeff Wells was tracking numerous sessions including R&B artist Mel Waiters and funk/rock group Beat Temple; also at Sound Arts, engineer Brian Baker worked with dance group Acacia and speed metal group Metal X...In Tempe, AZ, Phase Four Studios had MCA recording artist Patti LaBelle in mixing a cut off her latest album. LaBelle mixed "Our World" on Phase Four's Neve VR 72 console with producer Bud Wilson and engineer Jay Lean...

STUDIO NEWS

Up in Tacoma, WA, Room One Recording recently opened a 16-track, 1-inch, Otari/Soundcraft-equipped facility. The room was designed and built by the owners, John Atten and Brian Parker, with technical assistance from David King...Overture Productions (Novi, MI) recently expanded its Michigan-based facility with the opening of a new B room designed specifically for scoring video and film. New gear at

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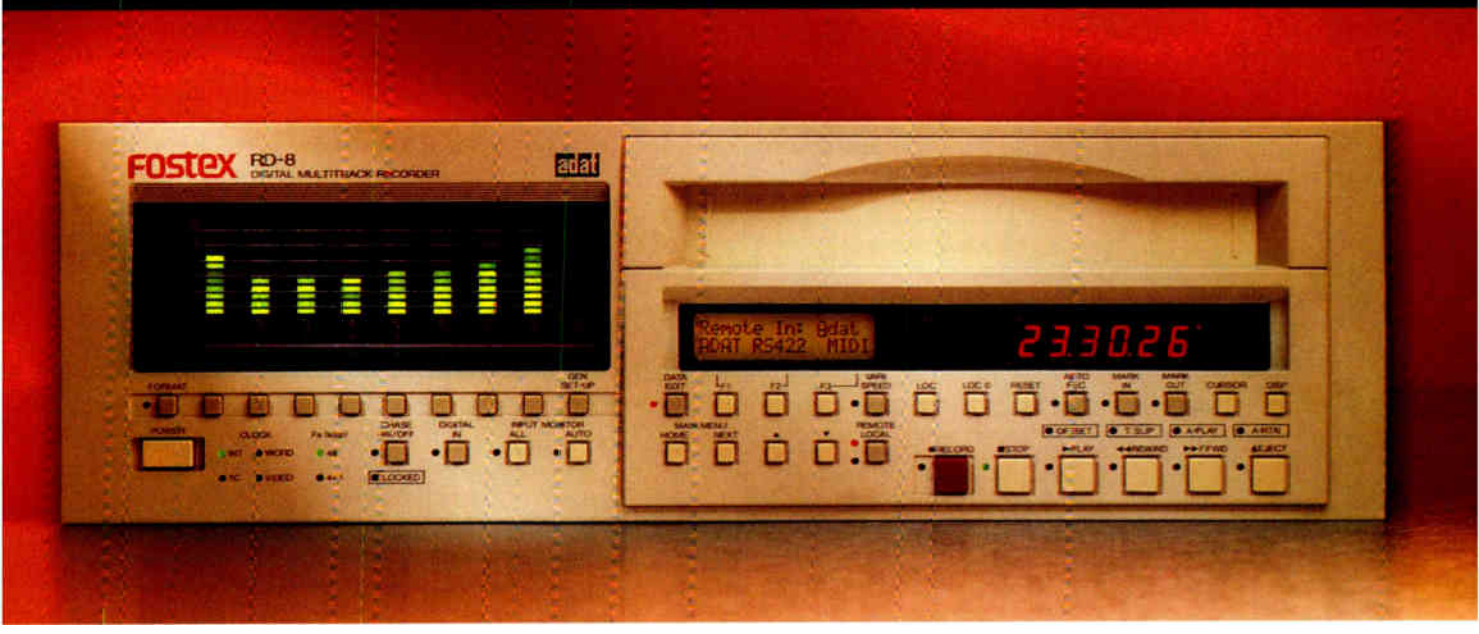

Audio for Video Projects

Chris Taylor–Crossroads Studios

It can be sync'd to a 24-track for extra tracks; it can stand on its own for 8-track digital recording, as in our audio for video suite; it can be stacked with other RD-8s or ADATs™ for multitrack digital recording—and all without any extra hardware

Post Production Projects

Brando Triantafillou–Editel, Chicago

We use it as the master machine with two ADATs for Post Scoring and Composition for commercial TV productions. I also like the fact that the Fostex RD-8 can act as a stand-alone digital recorder; it has the balanced time code inputs and outputs that I use with automation, and it has a really good layout of the front panel controls.

MIDI Projects

Frank Becker–Frank Becker Music

The computer sequencer and the RD-8 can be synchronized either by SMPTE with the RD-8 as master, or by MIDI Machine Control with the computer sequencer acting as master.

Location Projects

Paul Freeman–Audio by the Bay

We rolled twenty-eight 120 minute tapes of full field audio on the RD-8 in more dirt, more heat and more cows, for 18 days, with grime and a river, and the RD-8 never had a hiccup.

Composing Projects

Christopher Hoag–Composer

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Overture includes MOTU's Digital Performer and a vast array of MIDI equipment...**SF Audio Sound & Recording Studios** recently added a digital editing/mastering suite to its facility in Anaheim, CA. The new Digital Edit Suite features a Sonic Solutions Quattro workstation, Macintosh Quadra 950 computer and KRK 9000B monitors powered by a Hafler 5000B power amp...**Barry Bongiovi** (formerly with the Power Station and Sony Classical recording studios) recently became general manager of The Hit Factory in New York City...In other personnel news, **Katheryn Ridgley** was named general manager of Lawson Productions, which operates Bad Animals/Seattle...**Cecco Music** installed an SSL 4064 G Plus console with Ultimation and Total Recall into its one-room facility in New York City. ■

Send nationwide sessions and studio news to Jeff Forlenza, c/o Mix, 6400 Hollis St. #12, Emeryville, CA 94608.

—FROM PAGE 181, SESSION SPOTLIGHT

and a proprietary A/D converter. Stereo outputs were fed to standard DAT recorders. Katz stresses that "the preamps have extremely high headroom, and that really made a difference." Mics included a pair of Microtech Gefell UM-92 tubes and various AKG, Schoeps and Josephsons.

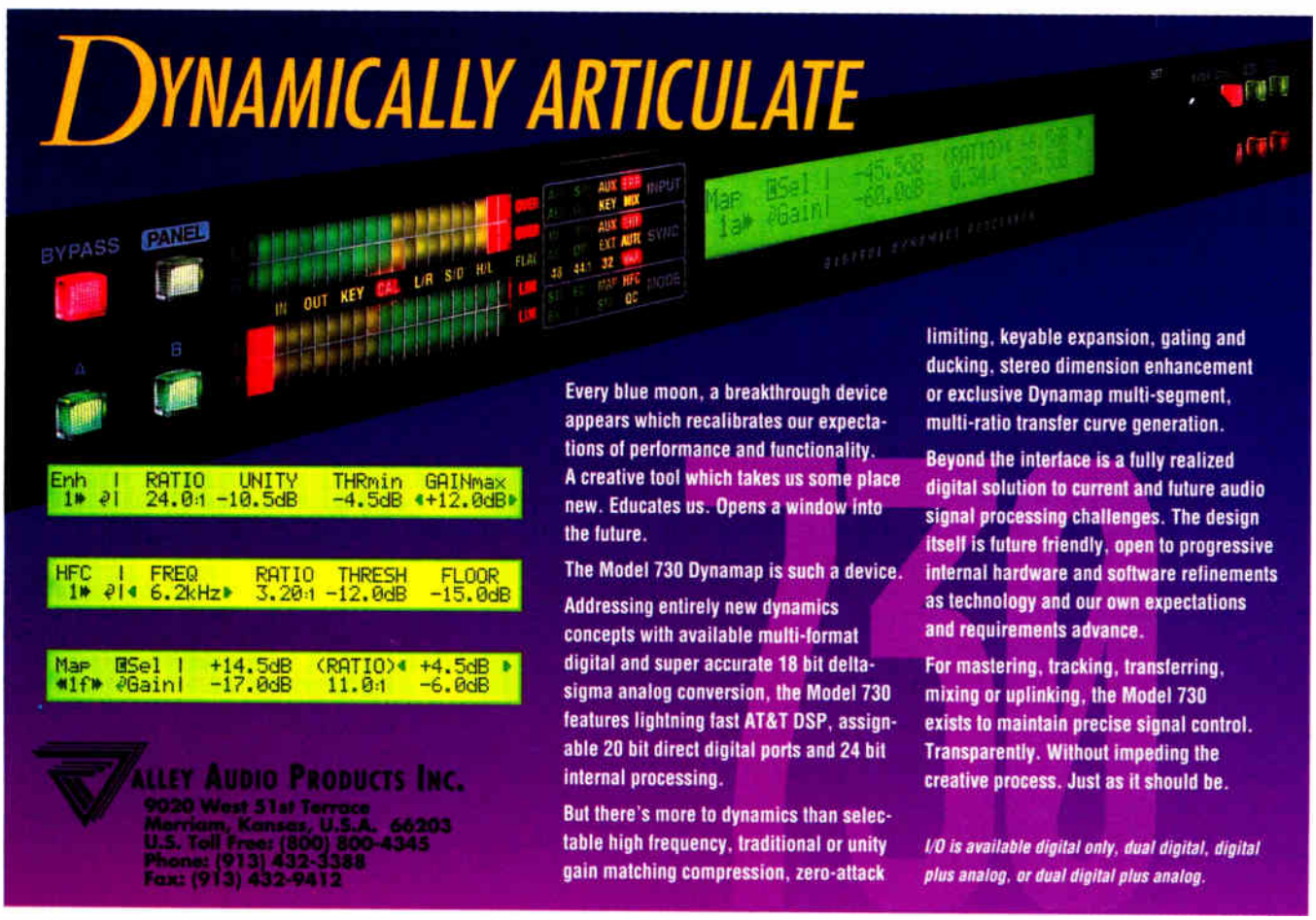
"I always record with an attempt to capture the natural sound of the instruments in a space," Katz explains. "The amazing thing is that despite the close surroundings at The Vanguard, I was able to capture the feeling of a live jazz combo onstage just by placement of the mics and judicious use of ambient mics." Katz normally doesn't use artificial reverb, but a Lexicon PCM70 mixed subtly with the ambient mics deftly re-created a natural room sound.

Recording over two nights, Katz took the best of four sets of music and edited it down to 70 minutes on a Sonic Solutions system. His philosophy in mastering the CD was to create a continuous flow of music to give the feel of a live concert. Producers James Browne and Martha Baratz (of Baratz & Browne Inc.) were more than pleased with the results. According to Baratz, "Bob did a great job of capturing the talent of the quartet onstage and the ambience of the room." ■

—FROM PAGE 181, NEW YORK METRO

is circulating in the area, listing, among other things, Penny Lane's Trident Series 80 and TSM consoles, as well as a pair of Otari MTR-90 multitracks and several MTR-12 2-track decks.

Mastersound Astoria has recovered from a flood that damaged its control room in late May. A pipe burst in the Kauffman soundstage above the independent recording studio, and running water did substantial damage to Mastersound's Neve V3, monitors, and assorted outboard and ancillary gear, according to director of post-production David Browning.



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The damage was pretty much repaired by June, and the studio was expected to be completely restored by mid-summer.

The former Record Plant Studio C on West 44th Street has been restored to the form it had when it was built to record Jimi Hendrix's *Electric Ladyland* album in 1968. The room is now Rocket Music Inc., a jingle and music project studio for Phil Ashley (who's played keys with Mick Jagger and Joe Satriani) and partners Kevin Joy and Jon Grindstaff. They brought in the original studio designer, Jim Falconer, to restore the room, which until about a year ago had been 321 Sound, run by former Record Plant chief engineer Roy Cicala. The latest incarnation sports an Amek Big by Langley console and an Otari MTR-90 MkII multitrack. Two MIDI suites were also constructed.

Greene Street Recording's year-old experience with the new all-discrete API Legacy has been good, according to studio manager David Harrington. "We'd been getting a lot of people who were curious about it," he said of the first installed Legacy. "Most of them have been coming back." Greene Street is now considering a console to replace the APC 1000 in the B room; Harrington said the search has been narrowed to the new Amek 9098 or another API. "You want to serve the market that's coming back, the live tracking market," he said. "But at the same time, the budgets are down. So you want a console that's not going to cost a half-million dollars—or be so old as to require constant maintenance—and that will still deliver the vintage sound."

Digital audio/video facility Blank Productions in Stamford, Conn., has added a Philips CDD521 CD recorder and Digidesign's MasterList software package, with the intention of adding CD-format variants, including Photo-CD, to their list of studio services. And in yet another example of the correlation between the New York area and Nashville, Blank is now doing the promo spots for both the TNN and CMT networks on the facility's Avid Media Composer.

Hot dance/R&B engineer/producer Walter Taieb has been working with L.A. architects studio bau:ton on the redesign of his Manhattan-based WT Studios. Taieb installed a Euphonix console as the centerpiece of the upgrade, and he plans to put the board to good use on dance remixes and multimedia work. Recent clients at WT included Me'Shell NdegeOcello tracking for Madonna's Maverick Records label.

Manhattan Beach Recording is solidifying its status as one of the best live rooms in town with an impressive list of jazz sessions: Milt Hinton, Valerie Capers, Wynton Marsalis and Paquito D'Rivera all tracked there recently. And pianist Marian McPartland records her weekly *Piano Jazz* NPR program from the Baldwin Conservatory grand piano in Studio A.

Console news: BearTracks recently installed a 72-input Focusrite studio console with Flying Faders automation, the first such equipped Focusrite on the East Coast, according to studio manager Chris Bubacz. Meanwhile, Pie Studio added GML moving fader automation to its vintage Neve 8078 console.

Fax NY stories to Dan Daley at (212) 685-4783. ■

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—FROM PAGE 24, GREENING OF THE INDUSTRY

have. Every day we read about polluted lakes and rivers, about unsafe air alerts in Los Angeles, about toxic waste dumps contaminating drinking water, about increasing skin cancer rates from ozone depletion. Without change, it will get worse. And it will directly affect you.

So what does all this gloom and doom have to do with audio? Well, as the man said, "If you ain't part of the solution, you're part of the problem." To save our lives and our children's lives, it is not enough to send a check to Friends of the Earth. We must change the way we do things *everywhere*. We must stop as much pollution and resource depletion as we can, and that means we all must contribute. So, is the audio industry a polluting and depleting one? Are there things we can do in our profession to change the impact we have on our planet? Will the meager contributions of one small industry in an educated and aware country make any difference?

Professor Will Moylan at the University of Massachusetts Center for Recording Arts, Technology and Industry asked some of these questions of Earth Day president Bruce Anderson. In April, the University of Massachusetts at Lowell hosted the first conference on environmental responsibility in the audio industry, with Anderson as keynote speaker and Moylan presiding. Entitled "Preparing the Recording Industry to Adopt Environmentally Responsible Production, Packaging, Consumption and Manufacturing Practices, and to Support the 25th Anniversary Observance of Earth Day," the meeting included representatives from the scientific community, manufacturing, production facilities and "record" companies.

This "Environmental Task Force" began formulating a plan for examining the pro audio industry from the perspective of environmental impact. The objectives of the meeting were to begin the process of identifying environmental issues related to the recording industry; to establish a core working group to solicit the involvement of the entire industry; to seek out leaders and role models; to engage in studies and planning for an open-invitation working conference on "Environmentally Responsible Production, Packaging and Manufacturing Practices for the Recording Industry"; and to cultivate industry-wide support for Earth Day 1995.

That April meeting, held in a famous old-mill town symbolic of the industrial heyday and environmental ignorance of this nation, brought to light some interesting issues.

What do we as purchasers of electronic equipment know about the environmental practices of the manufacturers from whom we buy? Do they use new fluxless solders, or are they still washing PC boards with CFC solvents? What about the health and safety practices of their manufacturing facilities and those of their subcontractors? With so much of electronics manufacturing done overseas, what can we do to encourage environmental responsibility?

Do we really need Styrofoam spacers and peanuts in our packaging? Some manufacturers have replaced such materials with recyclable and degradable cellulose-based materials. BASF has developed an entirely reusable packaging system that results in zero packaging waste. Can this be a model for other manufacturers?

What about the energy we consume in studios, with literally dozens of power supplies and computers? And what about the resulting increase in air conditioning loads? This is largely energy supplied by utilities that use nonrenewable fuel sources such as coal and oil, or already taxed hydropower. Craig Anderton shared with the task force the wonderfully encouraging story of a performing arts venue in Northern California that has been able to generate all of its own power through a new-technology solar generating system.

And what about *sound*? Are we environmentally responsible in the ways we audio professionals deal with sound? Are we careful about our own and our colleagues' hearing? Are we concerned about noise pollution? Do we have sufficient and accurate knowledge about the dangers and risks of exposure to various kinds of sound environments? Do we have the necessary tools for measuring such exposure? Do we have the practices in place to use such tools? What do we know of the long-term physical and psychological effects of exposure to unnaturally high ambient noise levels?

In addition to exploring potential issues of concern, the task force also heard from several representatives of

World Radio History

the scientific and engineering community—particularly the University of Massachusetts Center for Environmentally Appropriate Materials, Center for Industrial Competitiveness and Toxic Use Reduction Institute—on the wide range of new materials and methods available to our industry to dramatically improve environmental performance.

On November 13, the 1994 AES Convention will present a panel entitled "Environmental Responsibility and the Recording Industry" as part of its regular program schedule. A number of the task force members will be present, and several will serve as panelists. The broad aspects of this topic will be discussed, and the panel will offer some practical solutions and actions you can undertake immediately to improve your own environmental report card. And there will be information on the proper disposal of a variety of recording by-products, such as old tape, junk equipment, solvents and other chemical substances. Attendance will be open to all convention participants, and active participation is encouraged!

The AES panel foreshadows the Bay Area meeting of the Recording Industry Environmental Task Force on Monday, November 14, a major gathering of all interested individuals and organizations of the audio industry. At this meeting, the task force will formally launch its plans for the observance of Earth Day 1995 and begin traveling the long road toward an environmentally green audio industry by the year 2000!

Major audio industry figures, performing artists, manufacturers and businesses will lend their brains, brawn and heart to greening our little patch of the Earth as soon as possible, so we can move on to the next chapter in the global struggle to save the planet from destruction. Earth Day's Bruce Anderson will attend this meeting to offer insight and perspective on how our industry fits in the global environmental problem. Information on the time and location of the November 14 meeting will be available at the UMass-Lowell booth in the AES Convention exhibit area.

The Recording Industry Environmental Task Force needs your help. It needs your ideas to find better, nonharmful ways of doing the things we do in audio. It needs your time and energy to help spread the word, educate our colleagues and share the means of improving our industry. It needs your connections and influence in the right places to help launch the programs and build the alliances necessary to make environmental progress on a large scale. And it needs your commitment to personally run your business and your life in as environmentally responsible a fashion as possible. Remember, no earth = no people = no audio industry.

For information on the Recording Industry Environmental Task Force, contact Task Force coordinator Barbara Blezard at (508) 934-3850, or Dr. William Moylan, Director, Center for Recording Arts, Technology and Industry, University of Massachusetts at Lowell (508) 934-3850. You can also obtain information by calling SPARS, the Society of Professional Audio Recording Services at (407) 641-6648. ■

Bruce Merley is general manager of Howard Schwartz Recording in New York City and a past president and board member of SPARS.

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—FROM PAGE 18, WRITE OR WRONG

incorrect" translations for you to keep in mind when reading product reviews:

1) "Good choice for an entry-level user" or "Nice effort." This often really means something between "the product is basically just a toy" and "stay away from it like the plague." One or more of the following flaws probably exist: lacks fundamental concept, poorly thought out implementation, slow, cumbersome, underpowered, crashes, noisy or otherwise audibly inferior.

In some cases, the only thing that justifies the existence of these products, whether they be hardware or software, is that they are inexpensive in addition to being cheap. For example, an ugly, simple little Mac program that does a job that you need, but only *barely* accomplishes this task—perhaps with considerable inconvenience and instability—may be totally unacceptable at $599, but you might not complain at all for $49.95. As long as it actually got the job done, and the crashes didn't leave open wounds or broken bones, you would clench your teeth and use it when you had to.

> Remember what your mother said: "If you can't say something nice, don't say anything at all."

2) "It was a little difficult to reach customer support." This might mean that 416 calls over a period of 33 days never got a single human response or callback, and the author's last three days of freedom were spent acquiring a fully automatic AR-16 and a plane ticket to the city where the company that invented voice mail operates. Don't buy this product.

3) "Sounds surprisingly good for the price." You know this one, don't you? It sounds pretty bad, but it is so cheap that you forgive it.

REVIEW ETIQUETTE

When a reviewer gets his hands on a horrible piece of gear, it is a problem for everybody. Publishers insist that people don't like to read negative reviews. So what to do? Well, the magazine could simply pull the review if it starts to look like the piece of gear is crap. Remember what your mother said: "If you can't say something nice, don't say anything at all." Or they can dance around it if its not *too* bad and try to find whatever positive points they can. And this is exactly what they do. Both of these. So you rarely see a really *bad* review. What a system!

Oh, yes, one more tip. I check the bios of guest writers *before* I read the piece. That way I know to completely discount the content of a technical article if the author happens to work for the company that makes the equipment used as the "example" in that article.

WHY I LIVE HERE

When I first checked out *Mix* many years ago, they seemed to be pretty good about this stuff, so I moved in. I remained because they make an effort to stay honest, and in all these years, we have only disagreed on such things a few times (other magazines that I have written for have hit that number each *month*!).

BACK TO THE FEATURE

Well, there you go, a Classic Fast Lane column: maligning, insightful and totally devoid of actual industry-relevant content. No, wait, it's not complete until I talk about cars. Here we go.

One of my "sport vehicles" is known to have some pretty serious aquaplaning potential, which I tested a few weeks ago in a *major* storm. Here's how it's done. Mix two inches of rain in 20 minutes with hail big enough to dent an aluminum body, a heavily crowned road, and an attempted lane change. Boil for three seconds, get sideways with one large Chevy van directly behind you, drift smoothly toward the curb, wait. I did this. I saw it all coming, braced for the impact, and...Nothing. The car magically straightened out. I blinked a couple times, and drove home.

AN AUDIO ALLUSION AFTER ALL, AN AUTOMOTIVE ADMISSION, ALBEIT ABSURD

Only later did I discover the truth, that I *had* in fact slammed the curb. Had I known, I certainly would have stopped, gotten out to check the

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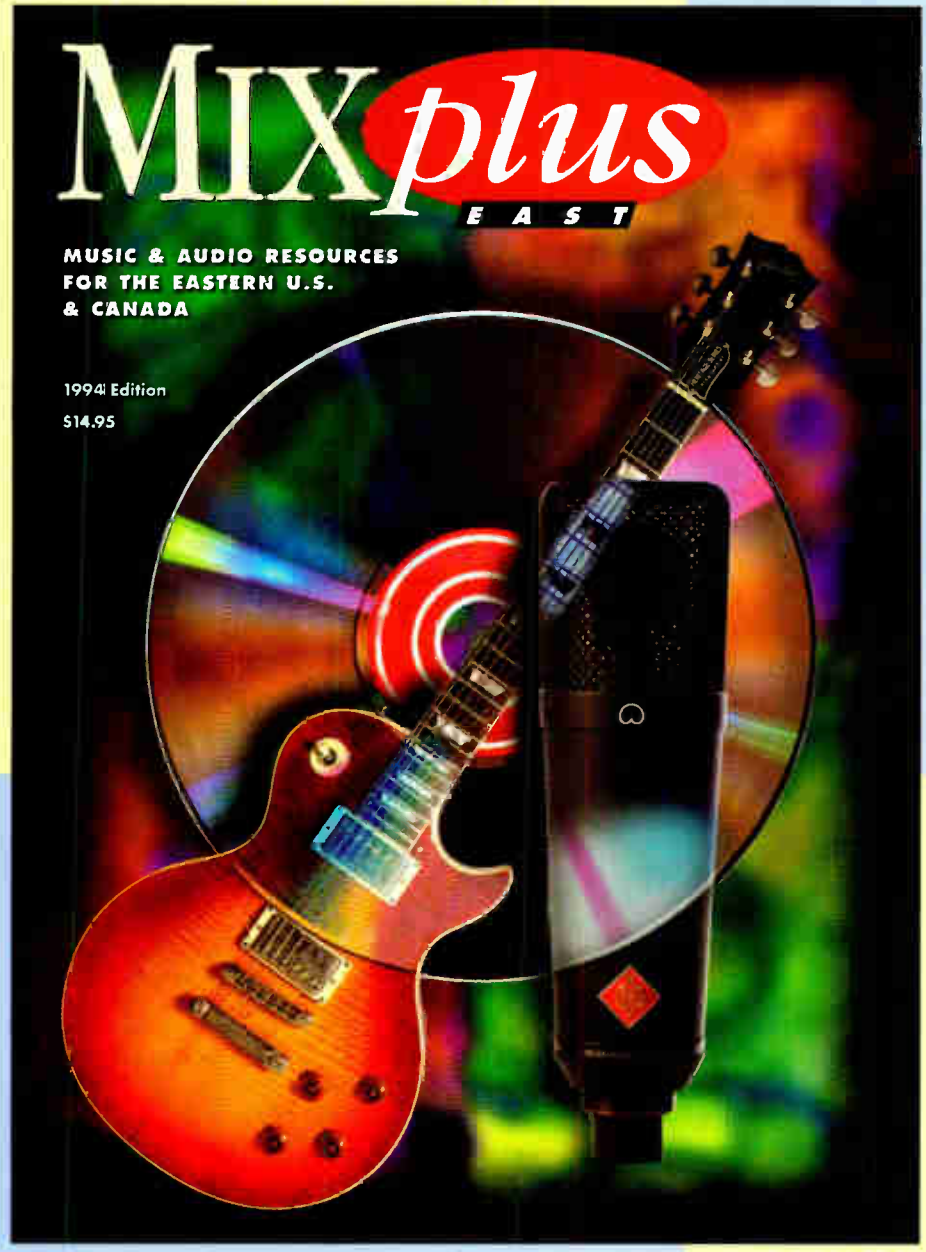

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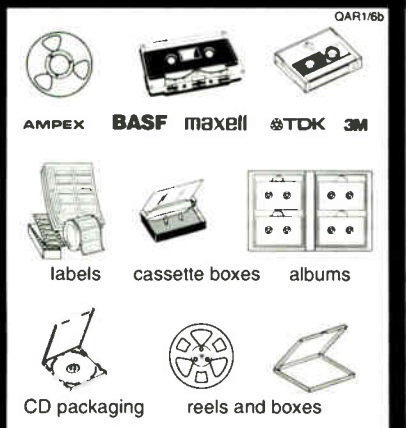

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FAST LANE

damage, received a severe soaking and hail-hammering, spent the next hour talking to the local authorities, and been late for the series finale of *Star Trek*. But I was saved from that fate by the James Gang. It seems that "Funk 49," played at the proper volume with the proper half-kilowatt subwoofer system, can do an impressive job of masking certain road impacts. All you have to do is make sure that you hit the wall on the downbeat.

Okay, so now we have an audio reference, a story of how music can improve the quality of life, how it can shelter a person from harsh reality. Now, boys and girls, who can name the entire decade when music held reality at bay for a million freaks? Here is a hint: The decade that immediately followed produced no music whatsoever. Did I mention that the ultimate Fast Lane must also be *opinionated?* ■

Mr. St.Croix is a Mix *consulting editor. Come on now, you didn't expect a clever bio, did you?*

LUNCHING WITH BONZAI

—FROM PAGE 119, RUSS TITELMAN

half months from start to finish, great songs, a real camaraderie in the studio. We all felt that we were doing something special. We brainstormed to figure out what cover we could do and we came up with "How Sweet It Is."

Bonzai: Is there more pressure now to guarantee a hit? You know—make the record and stick to the budget.

Titelman: It may be so at a lot of companies, but at Warner Bros. you don't feel that there is that pressure. That's the great thing about Mo Ostin and Lenny Waronker. But the pressure comes from within: Everyone wants a hit; everybody wants to get their record out and have it heard; and you want people to love it and buy it. That's the point, after all; it is "popular music." It may not be the point for everybody, but it is for most.

Bonzai: Are you personally having a good time?

Titelman: Absolutely. I love what I do. With an artist like Eric Clapton, you almost have to forget about getting a hit record, because he's very pure in his point of view. When we first got together, our first conversations were, "Wouldn't it be great to make a blues album? Or should we start with a studio record?"

So we made *Journeyman*, which included some of those ideas—we did "Hard Times" and "Before You Accuse Me." So it was a blues-oriented record, but it covered a lot of ground —from "Pretending" to "Hard Times" to "Hound Dog." Harking back to those things while still being modern. It allowed him a chance to do a lot of different things.

It all started because I went to see him at The Ritz. I had never seen anything like it. Just a quartet: Greg Phillinganes, Steve Ferrone, Nathan East and Eric. I was absolutely blown away. He was singing and playing better than I had ever heard him. So, I called Mo and Lenny and his manager, Roger Forester. I said, "Why aren't we putting live records out on this guy? How come this isn't getting out to the people?"

As it turned out, *Unplugged* is a live record, and that's what people love. And here we are five years later and we're making the blues record, doing exactly what he wants to do. You are going to hear performances, singing and playing that you have never heard from him before: It's just astounding. It's called *From the Cradle*, which is Eric's title.

Bonzai: Don't you think that a lot of the old live albums had the spirit, but the audio was a bit iffy?

Titelman: That may be true, but my favorite live album is *Ray Charles in Person*, and legend has it that it was taken off a single microphone from someone in the audience with a good machine. But I know what you're saying. We are recording this blues record digitally, but we're not letting that get in the way. We listen to the original records and, for instance, sometimes Eric will overload the microphone while singing—so the sound is raw, real tough-sounding stuff, but very clean. No tape noise. I defy anyone to say that digital recording is hurting this project.

Bonzai: Trackwise, how far back do you go?

Titelman: Three-track, and when I got to New York I think we were even making 2-to-2 records, bouncing back and forth.

Bonzai: How has the evolution of recording affected your creative work?

Titelman: On *Journeyman*, we did some computer stuff, where we had

World Radio History

drum programs that they could play to, with some synth overdubs. Technical problems can break the flow and with somebody like Eric, you don't want to do that. Occasionally, I would have to excuse myself and tell him it would take an hour to get things set up. He was always real cool about it, but he's someone who wants to go *now*. Working on this blues record has been paradise. Everybody goes in and plays, and they play it until they get it.

In some ways, the technology can get in the way if the artist wants to proceed and he has to wait. If it breaks the creative flow, it can be a problem. I'm comfortable both ways—it doesn't get in my way really, unless you're mixing and the computer starts to fool with you.

Bonzai: Let's talk about Steve Winwood: I hesitate to use the word "comeback"...

Titelman: Well, it was a comeback record—*Back in the High Life* got three Grammys and "Higher Love" was his first Number One single in the U.S. Steve hadn't really had a hit since 1980's *Arc of a Diver*, a phenomenal record. Great songs like "Spanish Dancer," "While You See a Chance, Take It," and on and on. He did it by himself, and it was not that great-sounding a record, but the material was so strong that it didn't really matter.

Bonzai: I see your eyes light up when you say great songs. What does that do for you?

Titelman: To me, and maybe it's just because of my generation, the song is always the most important thing. The song and the performance, but the song first. Winwood's a great songwriter. All the people we're talking about here are great songwriters: Randy Newman, James Taylor, Rickie Lee Jones, Eric Clapton. Eric may not be all that prolific, but every time he writes a song, it's a great song.

Bonzai: Do you know immediately or do they grow on you?

Titelman: That happens, but sometimes you just hear a song and go "Wow." I had met Steve a few times, first when I produced George Harrison in 1978, and we had Steve play and sing backups. He just comes in and does the right things. That little solo on "Love Comes to Everyone"; so identifiable, the sound and the way he plays.

Bonzai: As a musician who has guided such historic works, do you ever miss being the star of the show?

Titelman: Well, I never was the star of the show. I was the back-up guy, playing rhythm guitar, playing on sessions and working in Cooder's band for a short time.

Bonzai: Is it almost like being a coach now?

Titelman: Well, yeah, a producer is a lot of things—an editor, an objective ear—depends on what's going on. Sometimes you're an arranger, sometimes you just back off and are there to be a support. Working with Eric, you have to be knowledgeable about what he's doing.

It's also being a casting director, choosing who to bring in and play. A key ingredient with Winwood was bringing him to New York City, getting him out of his country house. He had to deal with the city, and also we had all these musicians available. We had Nile Rodgers come in and play on "Higher Love" and "Judgment Day." John Robinson came in and played drums, Mickey Curry played. We got a lot of input from other musicians, and I think it really sparked that record and made it exciting. Steve had to play off all this new input.

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Same thing with Eric when we did *Journeyman*. In addition to Eric's band, Richard Tee came in, Robert Cray, Jim Keltner—and now he's the drummer on this blues album. The chemistry between the two of them is great, and everyone is playing his best.

Bonzai: How do you feel about your work with Brian Wilson?

Titelman: It's interesting. I think that the record I worked on with Brian Wilson could have been a great record if Dr. Landy [Wilson's controversial 24-hours-a-day therapist for several years] hadn't been there. It seemed that Landy interfered in every creative endeavor, every moment of creativity. Whatever his reason was, he got in the way of Brian's creativity. There were moments when Brian was just sailing, coming up with these great ideas and there would be a phone call: "Don't work on that song."

Bonzai: Of your producer colleagues, whom do you respect?

Titelman: Arif Mardin is the greatest. There are some really good people working these days: The names that first come to mind are Don Was and Tony Brown.

Bonzai: What about engineers?

Titelman: Well, I've worked with a lot of great recordists, starting with the first demos of the Spector Records with Larry Levine. And then Lee Herschberg—a tremendous talent, from the Sinatra records, to Rickie Lee Jones, James Taylor. Randy Newman used to call him the "crusty old veteran." [Laughs] Let's see...Dave O'Donnell recorded a lot of the *Journeyman* record. Actually, I don't have one person that I work with. I wish that I could find someone who was around all the time and didn't go on to become a producer. Tom Lord-Alge is a very creative person, and so is Ed Cherney. Rob Eaton, who does the Pat Metheny records, mixed "Pretending," "Running on Faith," and "Run So Far" [on *Journeyman*] in *two* days—complicated records, and he nailed them. He just understood the way it was supposed to sound. Right now we're working with Alan Douglas on Eric's album, and the sound is very live and so *real*.

Bonzai: Regarding multimedia, do you have any ideas of where the record business is going to be in the coming years?

Titelman: I really don't know what the future holds. You hear all of these broad statements from corporate executives about ensuring that the quality of life will be greater because of all these cable channels and interactive stuff. We've been told that the level of quality would be raised, human intelligence would grow and we would be able to get all this value. Now there are more and more channels, but how many shows can you watch, how much good stuff is there?

The interactive aspect is interesting, to think that you could go in and play around with the parts and the performances. Fine, if that's what you want to do. But I don't really think you can improve on *Anna Karenina*. You could mess around, but it wouldn't be what Tolstoy had in mind. In fact, yesterday I went to the shareholder's meeting, and the Time Warner CEO said that no matter what technology we have, no machine will ever be able to figure out how to make an audience laugh or cry.

I'm of a different generation, but I think that the music that we loved—and still love to this day—is timeless. People will probably be listening to Eric Clapton records in 30 years, 50 years. Bonnie Raitt's records are sure to touch people deeply for a long time to come. I don't know if some of these younger bands are going to be around that long. Irving Berlin, Jerome Kern, Richard Rodgers—"Carousel" is a hit again. Amazing feat. You go to a classical concert, and the music is 200 years old. Beethoven is still a hit. Puccini is going to live a long time.

Bonzai: So, what's your next project?

Titelman: I don't really know. You remember that line from Arthur Miller's *The Misfits*? The Montgomery Clift character tells a story about his father being shot by hunters, his mother marries a guy, and then he's offered wages on his own family's ranch. He's asking what you can count on. She says, "I don't know—maybe just the next thing." So, maybe that's what's in store for me.

Bonzai: Is the music industry still good for you?

Titelman: Well, it's music. It's changed tremendously because of corporate stuff, but it's still music and there are still great artists. It's still fun to go in and make records—and, lucky for me, I really don't know how to do anything else. ■

Roving editor Mr. Bonzai nostalgically laments the days when people could openly admit they inhaled.

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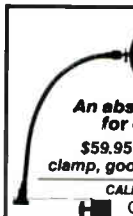

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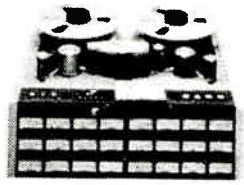

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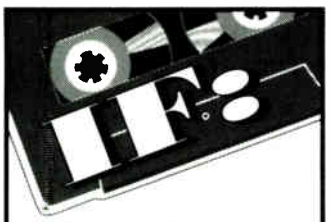

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FEEDBACK

NEUMANN PARTS: AN ENDANGERED SPECIES?

It's been three years since Sennheiser acquired Neumann. At the time, Dr. Sennheiser pledged to let the Neumann tradition continue as an independent entity within his company. The skeptics were incredulous: How much would Sennheiser really care and invest to keep alive one of the most illustrious names in the history of recording microphones? Or was this just another case of getting rid of the competition through acquisition?

Three years after Neumann's ownership change, it's not so easy to ignore the skeptics' voices anymore. The current situation is hard to believe, but the facts are irrefutable: More than one year ago, my company ordered replacement capsules for the U87, one of Neumann's most popular mics and all-time best-sellers. They still have not arrived. My Neumann service colleagues report similar situations: Delivery of essential parts for Neumann microphones, particularly for recently discontinued models, has either dried up completely, or the meager trickle of parts is rationed and must be shared among the three independent Neumann service providers in the U.S. For more than a year, I have waited patiently and listened to the company's changing reasons given for the delays: the move from Berlin, sabotage, training of new personnel, etc.

The entire staff at Neumann USA seems entirely blameless in this fiasco and could not have been more helpful to their U.S. customers despite their own frustration over the lack of service parts getting into the country. No, the finger points directly at Sennheiser in Wedemark, Germany, and no satisfying answers have been given as of yet.

Most of my customers need their Neumanns as essential tools, which they use to make a daily living. They are getting increasingly irate and are beginning to question their loyalty to a brand that until recently used to be synonymous with excellence. My loyalty to the name Neumann is still rooted in appreciation. I marvel every day at the ingenuity of design and craftsmanship, at the incredible commitment to quality, which makes every Neumann mic produced over the last 45 years still a top recording choice today. But a reputation for quality gained over decades can be lost quickly.

I will not stand by idly watching this respected name die or fade away because of neglect or intent. I implore Dr. Sennheiser to realize that he did not just acquire a company name but an institution of historic significance, revered in our industry for its contributions to the art of recording. And I implore the recording community—studio owners, producers, artists and engineers—to remind Professor Sennheiser and his company to live up to these responsibilities or pass the torch on to someone who will.

Klaus Heyne
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PROF. DR. JÖRG SENNHEISER REPLIES

We at Sennheiser are painfully aware of the hardship we have inflicted upon our customers by not being able to provide them with sufficient Neumann replacement parts in a timely fashion.

In acquiring Neumann in 1990, our goal was to unify two of the most venerated names in microphone manufacturing. However, we were beset from the start by many adverse circumstances that have hampered our production efforts.

I would like to take this opportunity to earnestly assure you that in the interim all of the shortcomings hampering our manufacturing process have been identified and necessary measures have been initiated to correct these inadequacies. We feel that we are well on our way to solving the problem of replacement parts scarcity.

Last but not least, may I extend to all professional Neumann users my humble apologies for the frustrations we have burdened them with, due to our temporary inability to satisfy their requirements, along with my most emphatic assurances that our efficiency is gradually improving and that positive results are at hand.

May all Neumann microphone users, wherever they are, be the judges of our ongoing efforts to solve these problems.

Prof. Dr. Jörg Sennheiser
Sennheiser Electronics
Wedemark, Germany

DON'T DIS DAT

I always like seeing articles on real-world production sound issues. They are too few and too far between, so I appreciated Larry Blake's ["Sound for Film"] column in the July *Mix*. I'm one of the few (but fortunately growing number) of location mixers who switched over to DAT. I started with the StellaDAT (that's another issue) and now use the PD-2, and I've been at it for two years now. To date, I have never had a problem with the format, but I have had tons of problems with post houses not knowing the format, and even worse, seemingly unwilling to learn. So the main issue has been one of education.

For me and for most producers (once they learn), the benefits of field recording on DAT are immense. The two-hour run times and quick tape changes are a nice convenience on features and commercials and have saved many a sequence on documentaries. The ability to record true "record run" time code eliminates the pre-roll problems, and the greater dynamic range greatly improves our ability to record an accu-

World Radio History

rate soundtrack. In short, in most situations, DAT gives us a better tool to do our jobs with.

What I take exception to is Blake's blanket statement, "Do not use a DAT for playback." Both the DAT and the Nagra IV-S TC are effective playback machines. Both will do the job, but both have to be handled by professionals. If you know what you are doing and know the specs of the job, the DAT is quicker, easier, more flexible and safer (safer because by setting the record inhibit on the tape, it's much harder to accidentally record over a playback tape) than the Nagra.

The main issue in sync playback for productions shot on film for transfer to tape is the 30/29.97 pulldown. DAT tapes for playback are recorded at a sampling rate of 44.056 kHz. The playback deck is set at 44.1 (most decks will automatically default to 44.1). The slight shift in the sampling rate has the identical effect as cross-resolving 29.97 to 30 fps time code.

For instance, I was in Jamaica working on a music video for Shinehead. The producer was nervous about DAT (because of many articles like yours?) and insisted on using a Nagra. I asked him as a backup—when he had his ¼-inch playback tapes made at Sync Sound in New York—to also have them run off a backup DAT. I threw one of my non-time code consumer DATs (the Aiwa/HHB machine) into my kit, just in case.

As it turned out, many of the shots consisted of long tracking shots while Shinehead walked or ran through the countryside or along the beach. Instead of trying to run around in hand-held mode with a Nagra, a resolver, a time code stripper, a time code transmitter and a 30-pound Anchor battery-powered speaker, I decided to use the DAT instead. Sync Sound had prepared the playback DAT with audio (sampled at 44.056) on the left channel and the time code both imbedded for use with a pro-machine and recorded on the right channel for use with consumer machines. I fed the left channel to the Anchor and the right channel to the Comtex transmitter (to send the time code to the Denecke Slate). I had one small, easy-to-cue package and spent three days running around Jamaica with it.

My long-winded point is this: Please cut back on the anti-DAT statements. DAT can be used very effectively, but it is not a Nagra. There are differences, and these differences must be learned. But once they are, everyone benefits: The post house because DAT cues faster, and there are fewer reel changes; the producer because she/he gets a higher-quality track at lower tape cost (they also often get an inexpensive backup because it is very easy to run a second consumer DAT as a backup while it is very inconvenient to run a second Nagra); the editor because he/she gets a time-coded tape that is easy to autoconform down the road; and finally the sound mixer gets a smaller, lighter, more convenient machine that lets him or her record higher-quality sound.

William Sarokin
Mt. Kisco, NY

BUGGED BY 4-TRACKS

I am a recent subscriber to *Mix*, and I am prompted to respond to the July issue. It was a pleasure to read the

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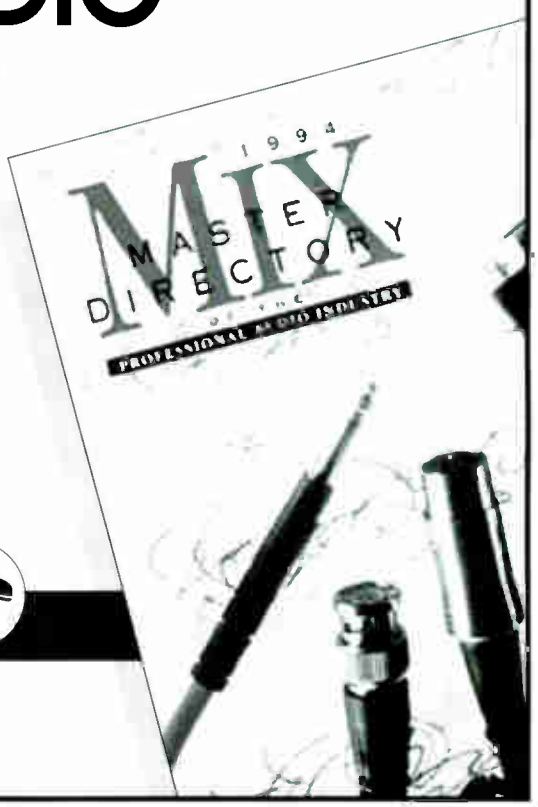

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interview with Ray Benson. He is a class act and a pioneer in his own way. No doubt, he's a guy who is in touch with his equipment.

Thanks also for the article on Nashville recording studios. With the recent explosion in country music, highlighting the studios was well-warranted. The unprecedented commercial surge of country music alone makes it seem that the music and recording techniques of this style belong in every issue of your magazine.

Please keep information coming on the MDMs. The sheer sonic quality of these new-generation digital machines makes their sometimes limited tracks (when compared to the big studios) less important to the project or home studios. Anyone who is accustomed to generation loss from bouncing tracks will be set free of their chains with even the most basic MDM. I, for one, am ready for hard disk systems and MDMs to stomp out old analog 4-tracks like a bug on the sidewalk! The complaints of thin sound and brittleness of digital will be cured in time. We must go forward.

Robert L. Langford
Roving Studios
Bryan, Texas

IT'S A JAZZ THANG, BRIAN...

Thanks for the article on recording the acoustic combo [June *Mix*]. I especially liked imagining bassist Ray Brown towering over pianist Oscar Peterson while playing on a "ten-foot-high iso riser." Ray's a great musician and a very nice guy, but did he insist on special insurance for the session? Ten inches sounds more like it.

Brian Sanders
Senior Producer
KNPR-FM, Las Vegas

YESTERDAY, TODAY AND TOMORROW

Stephen St.Croix's dissertation on virtual reality and its future implications to our race [*Mix*, July '94] was certainly interesting and amusing, but flawed in a number of conclusions reached.

Throughout history, contemporary writings illustrate that man genuinely believed that the final threshold was imminent. From the discovery of perspective, astronomy and Newton's laws of physics to the chrome-plated domestic robots of the World's Fair, we have all believed that our time was penultimate to the "big breakthrough." This presumption did not, of course, survive beyond the the next breakthrough. What did survive, however, were the articles created by the real talents of the era—the artists. Art in all its forms has endured long after the technology spin doctors' predictions had become irrelevant or even humorous.

Photography did not make painting obsolete, moving pictures did not replace still photography, video in all its forms is still just moving pictures. CD-ROM may replace books, but it cannot replace literature. Our age will be remembered as the dawn of technology amalgamation, where motion, sound and text could be blended and manipulated as one entity. Perhaps the future will address some of our other equally important senses.

Where I'm leading is this: Without artistic input, creation just becomes technological junk interesting only for what tricks the technology can deliver and valid only as long as those tricks are current. After this time, the product will join its companions in the technological landfill—brimming over with 3-D movies, Penny Westerns, high-rise housing and thousands of forgotten writers, painters, directors, songwriters, composers, singers, dancers...

What will we do while these evolutionary changes pass through? Exactly as we have always done—master them, ignore them, fumble with them; knowing full well that the next, latest, ultimate development will be here momentarily. Unless, of course, you live in the other three-fifths of the world, in which case you can starve as usual.

Philip Barrett
Grapevine, TX

CORRECTION

In our June '94 interview with producer Nick Martinelli, we incorrectly attributed the authorship of the songs "Love Under New Management" and "I Feel Good All Over" to Martinelli. In fact, those songs were written by Gabriel S. Hardeman and Annette Hardeman. Our apologies! ■

Please address all correspondence to "Feedback," c/o Mix *magazine, 6400 Hollis St., Suite 12, Emeryville, CA 94608.*

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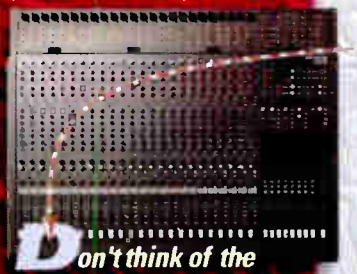
Mackie 24•8 console, $3995*
(Not shown actual size)



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It features the same glutton-for-hot-inputs mix amplifier architecture and high-output headphone amp as our industry standard CR-1604 Mic/Line mixer.

And naturally the MicroSeries 1202 also has the better-than-compact-disc dynamic range, incredibly low noise specifications and sheer musicality that have won our larger mixers a place in major recording and broadcast facilities worldwide.

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Microphone preamplifiers *so good that they are regularly used for direct-to-DAT audiophile classical recordings. In fact, many engineers prefer them to the mic pre's on ultra-expensive, big-studio consoles.*

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Two-band equalization *at useful points: Low EQ at 80Hz (instead of the usual 100Hz), high EQ at 12kHz (instead of 10kHz).*

Trim controls. *Set these controls once per session and then forget about 'em thanks to the MS1202's forgiving, UnityPlus gain structure.*

Four bal./unbal. mono ***line inputs.***

No hum-inducing, outlet-eating power supply "wall wart!" The MS1202 has a ***built-in power supply*** *and uses a standard IEC line cord.*

Two stereo ***effects returns.***

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Solid steel chassis*...and a "footprint" of less than one square foot.*

Horizontal, *double-sided thru-holed plated* ***fiberglass circuit board*** *design, brass standoffs and special* ***shock-absorbing knob design*** *makes the MS1202 incredibly resistant to frontal impacts.*

Big console specifications: *–129dBm mic E.I.N., 90dB working signal-to-noise ratio, 116dB internal dynamic range (that's 26dB better than compact discs) and 300K bandwidth.*

For a very impressive, current example of just how good the MS1202's mic preamps sound, check out acoustic guitarist Edward Gerhard's CD, ***"Luna"****, on the Virtue label (VRD 1921). It was recorded direct to DAT via a* ***MicroSeries 1202*** *and a stereo pair of Neumann KM 140 microphones.*

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"This little mixer has the same electronics as Mackie's incredibly popular CR-1604. The MS1202 is billed as a ***'low noise, high headroom mic/line mixer,'*** *and certainly lives up to its word. The whole thing is laid out extremely logically, clearly and ergonomically. The gain has been structured to actually work in the real world."*
Recording (formerly Home & Studio Recording) Magazine

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R.N., Cincinnati, OH (recent MS1202 registration card)

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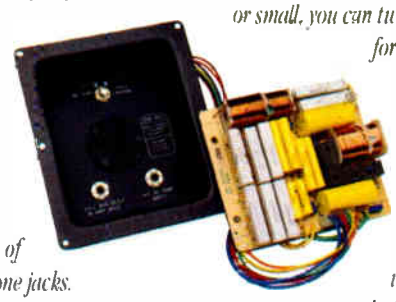

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