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MIX

PROFESSIONAL RECORDING · SOUND AND MUSIC PRODUCTION

Engineers' Tips On Recording Vocals

Secrets of Success In the Audio Business

Sound Effects on CD: A User's Guide

Marketing Your Project Studio



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MONITOR ONE™
STUDIO REFERENCE MONITOR

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The Truth From Left To Right

The truth...you can't expect to find it everywhere you look, or *listen*. But when mixing music, hearing the truth from your monitors will make the difference between success and failure. You'll get the truth from the **Alesis Monitor One™ Studio Reference Monitor**.

Room For Improvement

Fact: most real-world mixing rooms have severe acoustical defects, with parallel walls, floors and ceilings that reflect sound in every direction. These reflections can mislead you, making it impossible to create a mix that translates to other playback systems. But in the near field, reverberant sound waves have little impact, as shown in the illustration. The Monitor One takes advantage of this fact and is built from the ground up specifically for near field reference monitoring.



The pink area in the illustration shows where direct sound energy overpowers reflected waves in a typical mixing room. The Monitor One helps eliminate such complex acoustic problems by focusing direct sound energy toward the mixing position.

The Truth From Top To Bottom

The Monitor One's proprietary soft-dome pure silk tweeter design delivers natural, incredibly accurate frequency response while avoiding high frequency stridency and listener fatigue—typical of metal-dome tweeter designs. The Monitor One overcomes wimpy, inaccurate bass response—the sad truth about most small speakers—with our exclusive SuperPort™ speaker venting technology. The design formula of the SuperPort eliminates the choking effect of small diameter ports, typical in other speakers, enabling the Monitor One to deliver incomparable low frequency transient response in spite of its size.



Alesis SuperPort™ technology gives you the one thing that other small monitors can't: incredibly accurate bass transient response. No, the SuperPort doesn't have a blue light, but it makes the picture look cool.

The result? A fully integrated speaker system that has no competition in its class. You'll get mixes that sound punchier and translate better no matter what speakers are used for playback. The Monitor One's top-to-bottom design philosophy is a true breakthrough for the serious recording engineer.

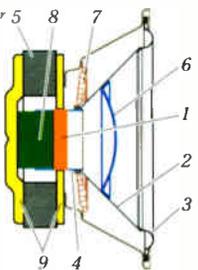
Power To The People

While most near field monitors average around 60 watt capability, the Monitor One handles 120 watts of continuous program and 200 watt peaks...over twice the power. The Monitor One provides higher output, more power handling capability, and sounds cleaner at high sound pressure levels. If you like to mix loud, you can.

The Engine

Our proprietary 6.5" low frequency driver has a special mineral-filled polypropylene cone for stability and a 1.5" voice coil wound on a high-temperature Kapton former, ensuring your woofer's longevity. Our highly durable 1" diameter high frequency driver is ferrofluid cooled. Combined, these two specially formulated drivers deliver an unhyped frequency response from 45 Hz to 18 kHz, ±3 dB. The five-way binding posts provide solid connection, both electronic and mechanical. We even coated the Monitor One with a rubber textured laminate so when your studio starts rockin', the speakers stay put. Plus, it's fun to touch.

A cross section of the Monitor One's proprietary Alesis-designed 6.5" low frequency driver.



1. 1.5" voice coil.
2. Mineral-filled polypropylene cone.
3. Damped linear rubber surround.
4. Kapton former.
5. Ceramic magnet.
6. Dust cap.
7. Spider.
8. Pole piece.
9. Front and back plates.

The New Alesis Monitor One™

You don't design good speakers by trying hard. It takes years and years of experience and special talents that only a few possess. Our acoustic engineers are the best in the business. With over forty years of combined experience, they've been responsible for some of the biggest breakthroughs in loudspeaker and system design. The Monitor One could be their crowning achievement. They're the only speakers we recommend to sit on top of the Alesis Dream Studio™.

See your Authorized Alesis Dealer and pick up a pair of Monitor Ones. Left to right, top to bottom, they're the only speakers you want in your field.

For more information about the Monitor Ones and the Alesis Monitoring System, see your Authorized Alesis Dealer or call 1-800-5-ALESIS. Monitor One, SuperPort, and the Alesis Dream Studio are trademarks of Alesis Corporation. ® Alesis is a registered trademark of Alesis Corporation.

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World Radio History

Hollywood Goes Digital!



Scenaria 1



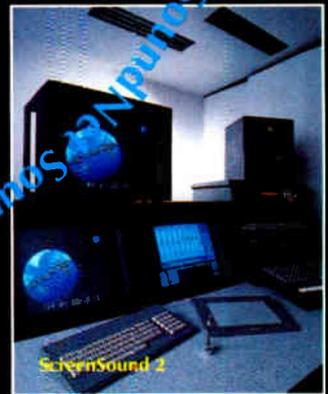
ScreenSound 1



Scenaria 2



Machine Room



ScreenSound 2

"Opening Hollywood's first *entirely digital* post-production facility was a long-standing dream for my partners and I. When we saw Scenaria, with its combination of digital audio and video, we loved the concept. It represented exactly what we are trying to do here. **It's proving to be one of the most profitable decisions that we have made.**"

Bill Burnsed, CEO, Hollywood Digital

HollywoodDigital

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The More Sophisticated Woofer & Tweeter

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

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

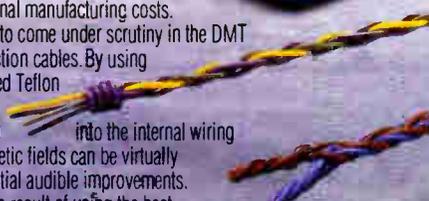
vibrations experienced within a loudspeaker cabinet, can improve overall system bass and midrange resolution. Consequently, within the DMT II crossover, Tannoy used coils vacuum impregnated with a resin selected to reduce vibration

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

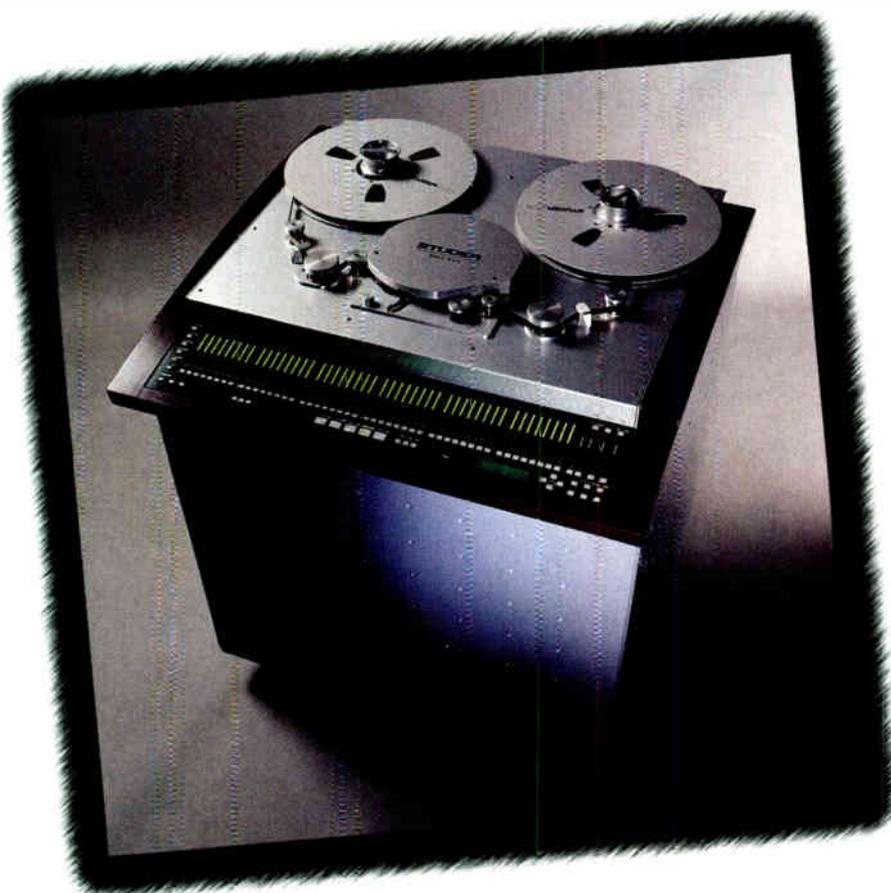
The final components to come under scrutiny in the DMT system were internal connection cables. By using custom manufactured braided Teflon Kimber Kable, unwanted signals ordinarily induced into the internal wiring from within static and magnetic fields can be virtually eliminated, yielding substantial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

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

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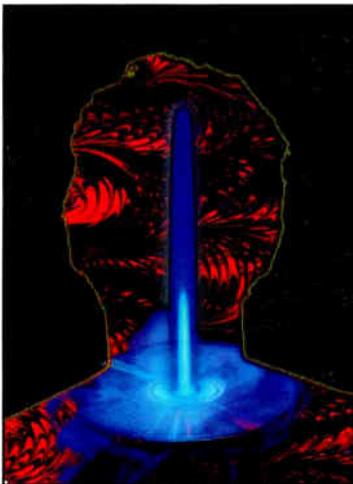
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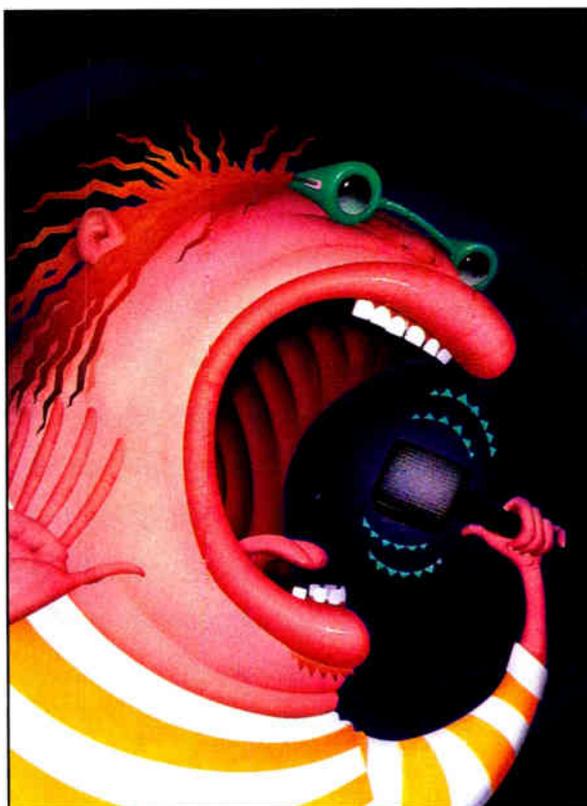
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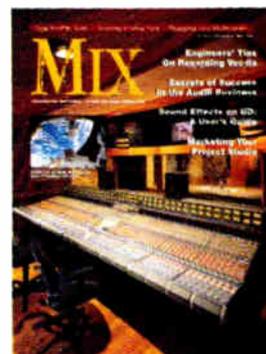
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Cover: BearTracks Recording Studio (Suffern, NY) recently installed a 72-input Focusrite Studio console with Flying Faders automation, the first one of its kind in North America. The facility is located in a converted stone barn on the border of 43,000-acre Harriman State Park, only 30 minutes from Manhattan. Additional featured equipment includes two Studer A820 24-tracks with Dalby SR, custom George Augspurger monitors, an artist-controlled headphone system and vintage outboard equipment by Fairchild and Pultec. **Photo:** Michael Parentino. **Inset Photo:** Courtesy of NASA.



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FROM THE EDITOR

“W

are no longer recording studios,” says contributing editor Chris Stone in this month’s article on “Secrets to Success in the Recording Studio Business.” “We have become professional audio service centers.” His analysis is partly based on his most recent survey of leading recording operations in the U.S. and in London. It is also based on his own observations of the recording industry for the past 30 years, most of which he spent in the Record Plant chain of studios in New York, Los Angeles and Sausalito.

Operators who have weathered the long recession and the technological revolution that has armed studio clients with their own professional recording tools have found niches, new sources of business and quality services that more than compensate for their losses to a bad economy or artists who record at home.

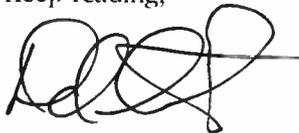
Where are these new opportunities? Certainly, sound for picture has taken up the slack for much of the lost record business. Associate editor Tom Kenny looks into the film-scoring business in New York to see who is doing what and how Gotham studios have repositioned themselves to take advantage of the emphasis filmmakers have been placing on quality sound.

Media and mastering editor Phil De Lancia continues to explore new business sources with a visit to Northeastern Digital Recording, a mastering studio that now dedicates one of its three rooms exclusively to CD-ROM premastering. “A mastering studio facility can very easily be responsible for larger areas than just audio,” says NDR owner Toby Mountain, “handling any additional information that might be on a release, such as graphics and text.”

The omnipresent Dan Daley checks in with the project studios this month to see how these operations are marketing and selling their services. He finds that a project studio owner is really selling his or her talents, the studio being considered an extension of that person.

Today’s leading recording entrepreneurs pride themselves on maintaining well-organized, well-equipped facilities with skilled staff members who are ready for anything. These operators also keep their eyes wide open for new opportunities in the rapidly expanding business of media production. For those who stay prepared there are always opportunities for new business.

Keep reading,



David Schwartz
Editor-in-Chief

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Mix magazine is published at 6400 Hollis St., #12, Emeryville, CA 94608 and is ©1994 by Cardinal Business Media, Inc. Mix (ISSN 0164-9957) is published monthly. Subscriptions are available for \$46.00 per year. Single copy price is \$4.95, back issues \$6.00. Missed issues within the U.S. must be claimed within 45 days of publication date and abroad, within 90 days. Send subscription applications, subscription inquiries and changes of address to Mix magazine, PO Box 41525, Nashville, TN 37204 or call (800) 888-5139. Outside U.S., call (615) 377-3322. POSTMASTER: Send address changes to Mix magazine, PO Box 41525, Nashville, TN 37204. Address all other correspondence to Mix magazine, 6400 Hollis St., #12, Emeryville, CA 94608; (510) 863-3307. Fax: (510) 653-5142. Second class postage paid at Oakland, CA, and additional mailing offices. Editeur Responsable (Belgique), Christian Desmet, Vuurgatstraat 92, 3090 Overijse, Belgique. This publication may not be reproduced or quoted in whole or in part by printed or electronic means without written permission of the publishers. Printed in the USA.

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DISPLAY

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

YOU ALREADY KNOW HOW TO OPERATE IT

Unlike other digital multitrack decks, the DA-88 works logically and is simple to operate. Like your analog deck. All functions are familiar and easily operated from the front of the deck.

s Machine



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

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

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

No matter which way you choose, your punch-in and out is seamless and glitch free due to TASCAM's sophisticated variable digital crossfade technology.

That's not all, you also can set your pitch ($\pm 6\%$), sample rates (44.1 or 48K), as well as crossfade and track delay times. All from the front of the DA-88.

COMPLETE SYNCHRONICITY

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

A DIGITAL RECORDING SYSTEM THAT GROWS WITH YOU

The DA-88 is truly part of a digital recording system. Start with 8 tracks today — add more tomorrow.

Adding tracks is as simple as adding machines — up to 16 for a total of 128 tracks. They interconnect with one simple cable, and no matter how many DA-88s you have, they'll all lock up in less than 2 seconds.

Controlling multiple machines is made simple with the optional RC-848 remote. With it you can auto locate and catch 99 cue points on the fly. It comes complete with shuttle wheel, jog dial, RS-422 and parallel ports, and it controls other digital and analog machines, too.

LISTEN TO THE REST

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

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



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CURRENT

NAB 1994: TECHNOLOGY, POLITICS AND PRODUCTS

A record-breaking crowd of 70,000-plus broadcast and production professionals made their annual pilgrimage to Las Vegas for the 1994 convention of the National Association of Broadcasters.

The big story at NAB was behind-the-scenes politicking, as



companies announced "strategic alliances," especially in the area of networking schemes. Claims of "my network can beat up your network" could be heard just about everywhere, and it will be interesting to watch further developments in this area.

Even for convention veterans, the sheer scale of the NAB show can be overwhelming, with more than 500,000 feet of exhibit space—the equivalent of over ten football fields. It would be impossible to cover even a small portion of the show's new products in this space, but here are ten new arrivals that caught my attention.

1. Otari Radar: Probably the most talked-about audio product at the show. Otari has acquired the worldwide marketing and distribution rights to the Creation Technologies RADAR system. This stand-alone 8-, 16- or 24-track

disk-based recording/editing system offers simple operation with pro features such as track slipping, varispeed, instant undo, nondestructive editing, jog/shuttle control and 99-cue-point autolocation. Price for a 24-track system with remote is under \$23,000.

2. Newtek Video Toaster Flyer: Having taken the desktop video switcher/special effects generator market by storm with its Video Toaster, Newtek unveiled Flyer, a \$3,995 accessory that adds nonlinear video editing capabilities to the system.

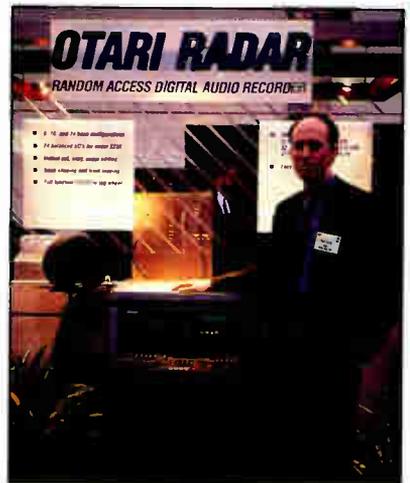
3. Tektronix Profile Disk Recorder: Not exactly a new name in the field of measurement products and television systems, Tektronix unveiled Profile, a disk-based audio/video recorder with up to four channels of real-time video, 16 audio channels and onboard 32x32 audio/video routing, mix effects and both analog and serial digital component I/O. Picture quality is comparable to Betacam SP running metal tape.

4. PrismSound MR-2024T 20/24-bit Interface: Sprocket Digital of Burbank is distributing this British-made device that uses a Tascam DA-88 to store six channels of 20-bit or four channels of 24-bit audio. Connect your high-bit outboard ADCs and DACs to the interface's eight AES/EBU I/O ports and start recording. An ADAT version is slated for release later this year. Price is \$2,395.

5. Panasonic AU-Z2123 Multi Audio Processor: If you've ever needed more audio tracks on a digital VTR, this rack box can compress four or eight tracks of audio using high-quality apt-X

compression and store it on one or two 48kHz/AES inputs. One MAP unit provides two normal (uncompressed) PCM tracks and eight compressed tracks, or two MAPs can be combined for 16 tracks from one VTR! Lots of applications for this come to mind—*real* surround sound, anyone???

6. Fostex D-30 Time Code DAT: Finally debuting its replacement of the D-20B, Fostex showed its high-end D-30 model. Retailing at \$10,995, the D-30 is a 4-head studio machine packed with standard features: 16MB RAM buffer for instant starts and insert editing, two



PHOTOS: LEE PARS

RS-422 ports for VTR emulation, onboard chase synchronizer, jog/shuttle scrubbing, a huge 4x5-inch LCD status readout, pull-up/pull-down modes and support of all SMPTE time code formats.

7. Panasonic SV-4100 DAT: In what may be one of the most unassuming product launches in history, Panasonic showed its new top-of-the-line studio deck. No hype, no hoopla. Just a new recorder tucked into the corner of their booth. The SV-4100 offers in-

—CONTINUED ON PAGE 16

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



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



A mixing system that and digital at the



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

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

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

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

*Analog is still music to many
artists' ears.*

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

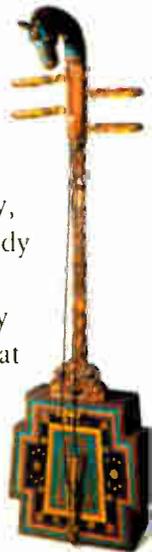
The great thing about the DISQ System is that it supports analog lovers while giving them the option of evolving to digital.



*Others are really
digging digital.*

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

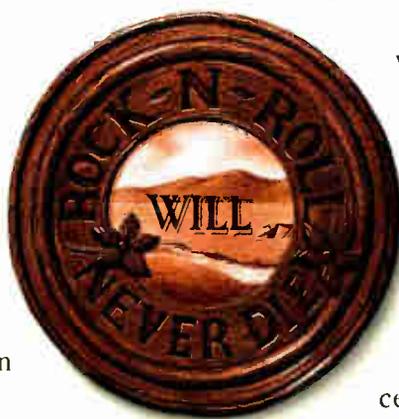
The bottom line? The DISQ System lets you cater to the exact tastes of any client.



*Adding digital by adding to your
analog system.*

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

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



can be analog same time.



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

Spend half as much to do twice as much.

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

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

Add other stuff anytime down the line.

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

Typically, all it takes is new software.

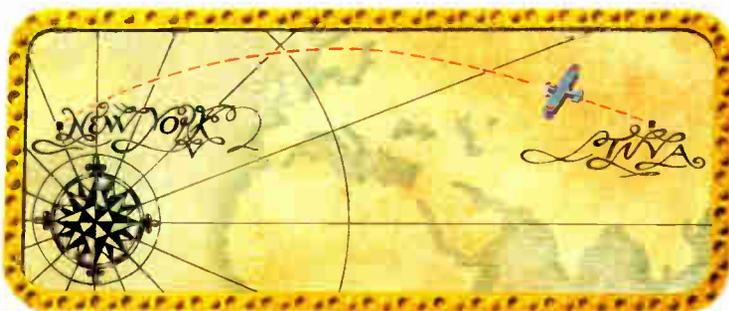
In fact, the DISQ System is so flexible that mixing board functions can be changed with a mere tweak.



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

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

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



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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INDUSTRY NOTES

New company Adams-Smith Inc. (Hudson, MA) acquired the assets of Adams-Smith from the Stypher Corporation Inc. The sale transferred control of the Adams-Smith brand name along with research and development, manufacturing and marketing operations to Adams-Smith executive VP and general manager Walter Hickman and an investment group. Adams-Smith will continue to manufacture its current products and is embarking on new product development plans...AT&T Digital Studio Systems (Greensboro, NC) and Harrison by GLW (Nashville) recently entered into a strategic alliance for development, manufacturing and marketing of digital products for pro audio, including development of an interface between GLW's digitally controlled work surfaces and the AT&T DISQ™ Digital Mixer Core...Crown International (Elkhart, IN) named Terry Hammond president and COO of the company, while Clyde Moore was appointed chairman of the board and CEO...Steve Smith joined Vista, CA-based TimeLine Vista Inc. as VP of sales and marketing...Edward Hobson joined Graham-Patten Systems (Grass Valley, CA) as VP of marketing and sales. Hobson replaces Tim Prouty, who joined Im-Mix, also in Grass Valley, as market development manager for Europe, Africa and the Middle East...Responding to large sales growth and a need for increased production capacity, Spectral Synthesis recently moved to quarters twice the size of its former building. The new address is 18800 142nd Ave. NE, Ste. 4A, Woodinville, WA, 98072. Phone and fax remain the same...New sales reps for Nevada City, CA-based NVision: Shoreline is handling the Los Angeles area, Snader is responsible for San Francisco, and Harris Allied is providing a nationwide sales channel for the broadcast radio market with its existing network of regional offices...AudioTechniques, distributor of Tube-Tech products in

the U.S., announced that engineers Frank Filipetti, Kooster McAllister and David Hewitt have signed on as official endorsers of Tube-Tech signal processors...Euphonix (North Hollywood, CA) recently added systems specialist Greg Laney to its sales staff...AKG Acoustics Inc. (San Leandro, CA) appointed Shel Gunther as its new product manager for wireless microphone systems...Berkeley, CA-based Meyer Sound appointed Joe Rimstidt to the position of customer service manager...Sequoia Electronics of San Jose, CA, recently acquired all the assets of Ampro/Scully and is supplying parts and service for all Ampro/Scully products...Aphex Systems (Sun Valley, CA) hired Denny McLane as product specialist...Fault Line Marketing recently joined the network of reps for Bag End Loudspeaker Systems (Barrington, IL), representing the company in Northern California and Northern Nevada...Tim Engelhardt was appointed eastern regional sales manager of University Sound (Sylmar, CA)...ARX Systems (Melbourne, Australia) appointed John Root to the position of sales and marketing manager for North America. Root is based out of ARX's new U.S. office at 612 Garfield Dr., Petaluma, CA, 94954; Phone (800) 279-7978, fax (707) 766-8431...RSP Technologies (Rochester Hills, MI) appointed Bill Rowe as its new sales manager...Thorburn Associates (Castro Valley, CA) hired Herman K. Lee as a project engineer...The sixth annual SPARS DAW Conference will be held May 21-22 at the Beverly Garland Holiday Inn in Los Angeles. Exhibitors include AMS-Neve, Avid, Digidesign, Fairlight, MTU, Orban, Otari, Roland Pro Sonic Solutions, Studer, Spectral Synthesis and TimeLine Vista. For more information call (800) 771-7727...The AES is proposing an international conference on the Computer Control of Sound Systems, to be held in Dallas December 1-4. For more information, call (212) 661-8528. ■

—FROM PAGE 12, CURRENT

stant start capability, AES/EBU and consumer digital I/O, large shuttle wheel, video reference input, word clock sync, enhanced system diagnostics and 18-bit DACs.

8. NVision "Digital Audio Tool Box": Not the biggest splash at the show, but this is one very useful collection of tools that could make anyone's life easier. Basically, it's a compact rack system holding any combination of modules, including a 4-channel sample rate converter; 4-channel digital audio (AES) mixer/router, with optional remote control; and a 2-channel digital delay (330 ms or 20 video fields) with AES digital I/O.

9. Avid Media Recorder Telecine: This may not exactly spell the end of videotape, but Media Recorder Telecine automatically reads, captures and stores all data (such as edge numbers, KeyCode information and time code) along with the image that's going from film onto videotape or directly to disk.

10. Sennheiser HDC451 Noise-Gard Headphones: Sennheiser has taken the technology of its \$950 noise-canceling headphones and scaled it down into a \$249 package for location recordists, sound reinforcement engineers or air travelers exposed to high ambient noise levels. The phones provide active attenuation of 10 dB of background noise and have an external input for connecting to any audio source—tape recorder, CD player, etc.

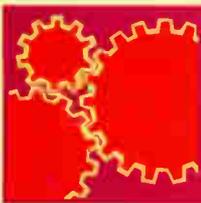
Of course, there were plenty of other cool products at NAB, and we'll be covering those in the months to come. But the most interesting trend to watch for is system integration, as various pieces of the puzzle—such as disk-based audio and video systems from different manufacturers—come together under common file-sharing and networking environments, both on a local and world level.

—George Petersen

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Introducing Internal Mixing and Random Access Video for DAWN. These features add a new dimension to its wide variety of applications.

Auto Conform—



"EDLs are loaded into the DAWN, then sorted by reel. We either record the reels manually or automatically by having the DAWN control the source machine, as deemed necessary. Edits are then generated by the DAWN and placed to match the original imported EDL."

—ROB (RADAR) HEGEDUS
FOR
SOUND INTERCHANGE
TORONTO, CANADA

Dialogue—



"Because most of the dialog work I get is cut on film, there's no EDL to auto load from, so I re-sync from the dailies one cue at a time. The DAWN streamlines this process so effectively that I have more time to be an editor—which helps everybody right through the mix."

—DAVID A. COHEN
FOR
TEKNIFILM LABS
PORTLAND, OREGON

Music—



"The live orchestral score is recorded directly into the DAWN with a time code reference. I edit and lay multi-track music stems, then playback locked to the dubbing stage for the final mix. I achieve all of this sometimes within an hour."

—LORI ESCHLER,
MUSIC EDITOR FOR
SEAQUEST DSV
STUDIO CITY,
CALIFORNIA

Sound Effects—



"We get an EDL from the editing house and import it into the DAWN. Software 4 creates empty edits, automatically, with Ins and Outs for each sound effect that has been spotted. Then we 'fill in' the blanks with SFX from our library."

—CHARLIE RYCHWALSKI
FOR
SILHOUETTE SOUND
BURBANK, CALIFORNIA

Mixing—



"ADR is spotted, then recorded and cut on the DAWN. Other DAWN stations record and edit dialog, music, foley and production effects. All the elements from different stations are then combined at the dubbing stage and mixed off a 48 track DAWN installation."

—JOHN ROSS
FOR
DIGITAL SOUND AND
PICTURE
LOS ANGELES,
CALIFORNIA



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by Stephen St.Croix

GO IN PEACE

I usually live in Maryland. There were several earthquakes in Pennsylvania, so I thought I would go to the West Coast. Besides, NAMM was coming up soon, and there was way too much ice in Maryland for me and the Harley. Ha. Silly me.

So I went to NAMM again. The world's first Trembling Trade Show. The first convention to be a ride. A hands-on test of CD player tracking ability or the effectiveness of some new mic mount's LF isolation in a real-world situation: the Earthquake NAMM.

Okay. NAMM. Stream of consciousness report: Nobody was too thrilled with the subwoofer demos; too much like the real thing. Parker is finally shipping his guitar, through Korg. There was one Japanese guy all alone in a booth in the basement selling guitar picks he had invented. His English was quite sparse, and I don't think NAMM was quite as he had envisioned it. He kept putting these exotic little black chromed spring steel picks out on the table for people to see, but American people see things best in their pockets, so they kept taking them. As he would leave his booth to try to catch the latest NAMM-ster who'd stolen his product, 30 more picks would go into the pocket of the next guy to come along. No, this wasn't at all what the guy thought it was going to be like.

There was another booth manned by guys in Swiss mountain garb, selling huge Alpine horns so you could make your own cough drop commercials at home. They seemed to have quite a following.

ART celebrated its tenth anniversary. THD showed a power-*absorbing* product. I love this industry—first this guy sells everybody real loud tube guitar amps, then he comes back and sells them exotic boxes to suck up all that power so they're not loud anymore. Now *this* separates the men from the boys. Anyway, these things look sort of like motorcycle

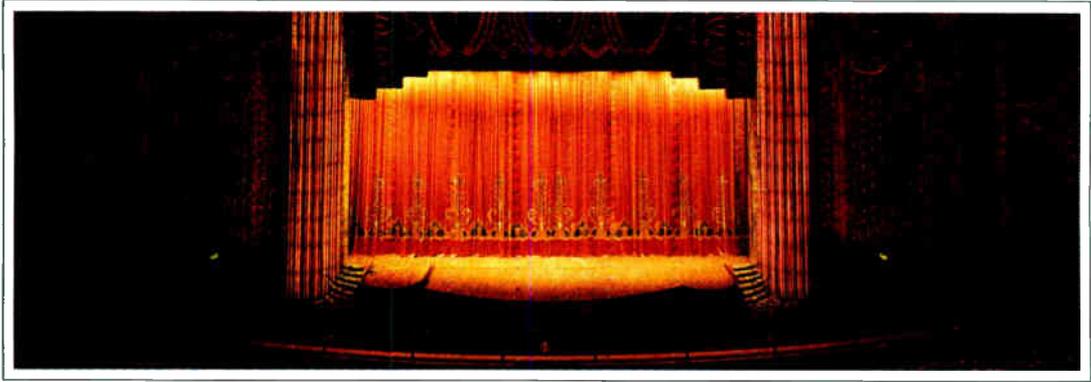
cylinder heads but come in crazed anodized colors, so they were cool. Roland gave away functional digital watches to everyone who walked in. The television show *Next Step* was there taping, so the whole show was declared cool. The Gemini booth was again staffed by nuclear scientists.

Sennheiser's NoiseGuard system. Toy Du Jour, to be sure. Noise-canceling earphones. The future is here, and it's in your ear. Thank you, Sennheiser, for making this one of my

The future is here,
and it's in your ear. Thank
you, Sennheiser, for
making this one of my
nicest flights home.

nicest flights home.

My typical detailed technical review on this product follows, but first a little history. Although at one time I flew them everywhere, I basically refuse to fly America West now, because they are stupid. Well, okay, actually, technically speaking, they are totally ignorant, then they are dumb. They have a total ban on CD players. Kneejerk, reactionary stupidity that I reject empirically. I got in a huge fight with one of the attendants, then the co-pilot, then the captain, then the local authorities upon landing—all over this ridiculous rule. The ignorant stew said it was an FAA ruling. I emphatically rejected that fabrication with sufficient expedition and commitment to cause her to become visibly alarmed. Good. I did it right. I told her to produce the FAA book, and if it was in there in any form at all, no matter how



The AUDIENCE forked over \$125 a seat to be *here*.

The LEAD is demanding \$12,000 a *performance*.

The PRODUCER put up \$4 mil of his own *money*.

The REVIEWER is in one pissar of a *mood*.

So, what kind of WIRELESS MIC was that *again?*



The WMS 900.

The only wireless with the sound and quality of an AKG.

AKG. The most foolproof wireless systems in the world.



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World Radio History

garbled, I would gladly remove the earphones, turn off the CD player, take out the batteries, completely disassemble and then destroy the machine, scratch and break each of the 40 CDs I had with me, give up the music industry, tear up my pilot's license (big deal, it hasn't been current since 1916) and perform ground-crew service for their planes free-of-charge for one full year; and I wouldn't even wear gloves in the winter!

Lucky for me, she was just another spaced lemming, and there was, in fact, absolutely no mention of such a ruling whatsoever in the pilot's beautiful, black, leatherbound FAA reference manual. Just blind luck? Well, maybe. On the other hand, *my* FAA book has no mention of such a ruling either. So then she sez (and I *love* it when this happens): "Okay, sir, it's the company policy." Well, in the words of Joe Pesky, "Okay, okay, wait a minute." So I sez: "So it's *not* an FAA ruling, it's only company policy, right?" Stew sez: "It's the same thing, *sir!*" This, by the way, was the last time she called me "sir."

There was no warning on the ticket, no sign posted anywhere in the boarding area or ticket counter area, no mention of any of this in the pre-flight "How to Die in Case of Trouble"

**The drop in midrange
noise is so surprising
that I feel an increase
in all remaining
frequencies—a perfect
Mr. Wizard science demo.**

speech, nothing. The flight attendant couldn't even figure out what those shiny little discs I had were; it had taken another passenger's panic call to notify her that there was such a dire technical threat aboard. I mean, get this: Some woman on the plane saw me and was so concerned at my

appearance (so far, this is actually kind of understandable) that she took it upon herself, as sort of a public service, to scrutinize my every move. When I produced the CD player, she found herself faced with the horrible dilemma of somehow intrinsically knowing that I had brought aboard an instrument of unbridled death and destruction, without having the education or street knowledge to identify what it actually *was*. You know: "Sony—Number One in terrorist hardware."

So she asked other passengers until she found one who felt reasonably confident that he knew what I had somehow smuggled aboard. He told her it was in fact a CD player, and she found a little two-paragraph story in the in-flight magazine about how all CD players instantly grow 44.1kHz digital umbilicals, which, through some disgusting semisexual coupling mutation, link with the aircraft's 44.1kHz flight control data bus and *instantly* blow the planes up. There usually isn't even any organic tissue remaining—just one Dire Straits CD, four AA cells, an aileron or two, and a couple of nameplates that say Pratt & Whitney, or maybe GE. Any-

OPTIFILE Tetra[♦] redefines console automation with the introduction of the **MOVE** status.

MOVE

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Tetra's dedicated computer with **open architecture** allows you to **customize** the system to your needs **and budget**. Add up to five custom modules at any time you choose—powerful features such as Off-line Mixing, Machine Control, Local Status Selection / Drop in, Turboram...

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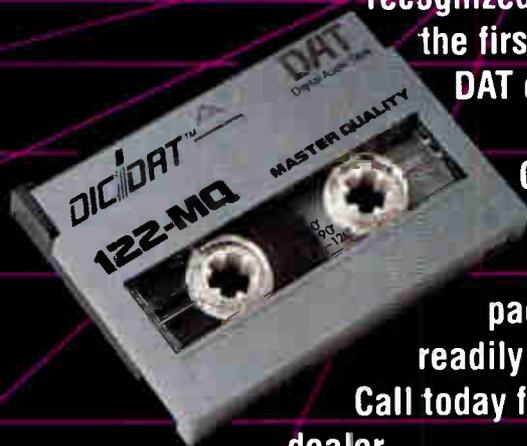
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way, once the passenger had identified the weapon, she called the stew, and the rest is history, as they say. At least it's on my record.

Oh, did I mention that it is totally cool with them if you use a ten-year-old portable PC that sprays digital artifacts out the ports with enough broadband power to bleach the color out of your Levi's?

So now I am flying United, the friendly skies (they are only stupid for ten minutes during take-off and landing). I am sitting on the plane, and though all precautions have been taken (seat 2D, which years of research has shown to be the quietest), it's *loud!* It's a jet, so it's loud. It's always loud. I always have to turn the CD player up so loud that I am fatigued by the time I land just to overcome the roar of a few thousand horsepower 20 feet away. And, of course, that doesn't do anything for dynamic range, so I land never having heard the nuances, with a headache from the crescendos (or was it the chicken?).

And now I fly with Sennheiser. As soon as the ten-minute dumb period

ends, I put on the unassuming set of open, lightweight cans that look like something from *Deep Space Nine*, plug them into a little box that looks like it was made in 1949, turn on the little bat handle switch from 1969 and am instantly surrounded by a roaring, artificial *silence* that I didn't expect to experience until at least 1999. This thing works! Now it's not a drop-to-your-knees, try-to-clear-your-ears silence, but it is a fairly broadband, 10dB improvement. The noise reduction is midband, so hiss and rumble remain. In fact, an interesting, subjective reaction is that the extreme LF rumble of the jets actually gets *louder*. Of course, it doesn't, but the drop in midrange noise is so surprising that I feel an increase in all remaining frequencies—a perfect Mr. Wizard science demo.

Once I landed, I realized that the silence was so much fun that I never even got around to plugging in my famous Deadly Killer CD Player, so I can't tell you how the music was. I *can* tell you, however, that you don't want to put your hands over the ear-phones like producers used to do in the '70s when they wanted to im-

press somebody by showing that they were "really listening closely." The little microphones that listen to the outside noise are there, and the result is a dose of Hendrix that just ain't the same as the real thing.

There is a sort of mildly distracting phase shift at the edges, and a few other minor artifacts exist, but the overall results are so cool that you easily forgive them.

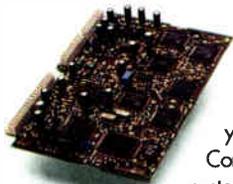
Remember when I said these things were not a drop-to-your-knees, try-to-clear-your-ears silence? Well, Sennheiser makes a *closed cup* version that *is*. They simply make the world go away when you turn them on. I guess they give you about 30 dB, and the bandwidth is much wider. Cool shoes, both. Get some. I did.

So the THD guy has a product that makes guitar amps less loud, and Sennheiser has a product that makes the *world* less loud. A brave new world of Anti-Audio Products?

So now you know just how technical my reviews are. ■

Stephen St. Croix can't bear you and won't be able to until the battery goes dead.

**WITH DCC TECHNOLOGY, EVEN AUDIOPHILES
WILL BE MAKING TRACKS FOR YOUR PRODUCT.**

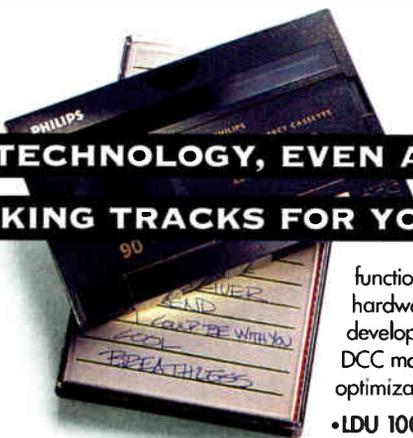


Even the most discerning ears will perk up when they hear your new Digital Compact Cassette systems. DCC delivers unequalled sound quality, track after track.

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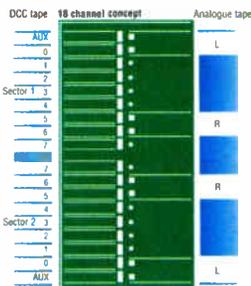
functional systems, including hardware and software development tools. Philips DCC modules take your system to audio optimization!

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It's Time

PHILIPS

GUILTY.

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

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



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

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

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

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

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



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

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

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

by Walter Sear



THE VACUUM TUBE RIDES AGAIN

The renewed interest in vacuum tube technology seems to be a reversal of Gresham's Law, a law of economics that says that bad money will drive out good money. An example of this is when our government decided to mint non-silver quarters. The silver quarters disappeared overnight.

During the past 25 years or so, we have witnessed a deterioration of the art of the recorded sound, as smaller, lighter, cheaper and easier-to-manage tools and technologies have driven better-sounding technologies to the brink of extinction. How often have I heard salesmen of a "new" technology say that, with their product, the home basement studio can sound as good as a \$300-an-hour professional studio. Unfortunately, many times they are right.

It isn't really that the home or project studios sound so good; usually it is because so many professional studios sound so bad. If the professional studio records on the same \$1,000 DAT recorder that the

home studio is using, it is hard to make it sound much better. We have been talked into the idea that digital recording is perfect, and so we are



forced into recording masters on a failed consumer format. It is lighter, cheaper, easier to learn to operate and maintain, and it follows my the-

Walter Sear at Sear Sound, Manhattan

PHOTOS BY NIK

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.

The Sonic Pro Audio System Sets the Standard

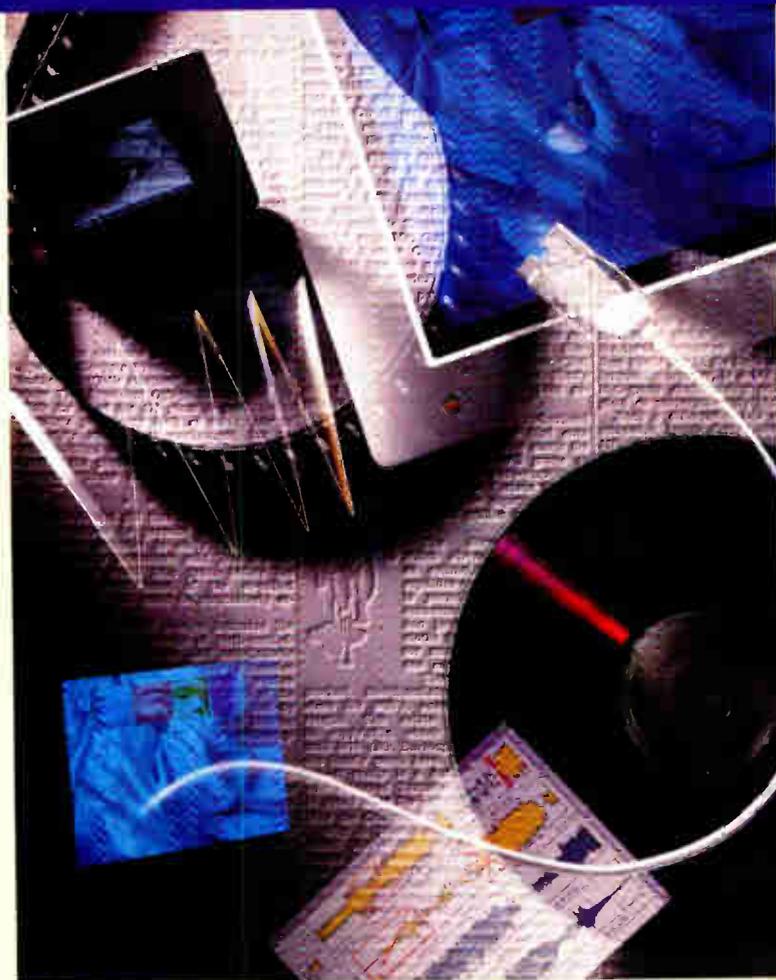
No other audio workstation delivers the breadth of features, the easy expansion, and the affordability of the Sonic System. Around the world, Sonic systems are at work in audio post production for film and video, radio production, music editing and CD prep.

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.

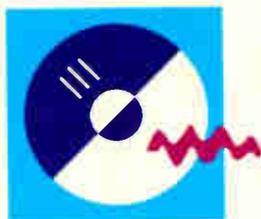
MediaNet is an open network compatible with all standard Macintosh (and Power PC) applications. And MediaNet will soon support the Networked File System ("NFS") standard to link your Macintoshes and UNIX systems (such as those from Silicon Graphics) with transparent, full-bandwidth network performance. 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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World Radio History

sis that the recorded sound quality has undergone a steady deterioration throughout the past 25 years.

What is a professional recordist to do? The vacuum tube rides again to the rescue! After hiding in the closet for many years, many senior engineers admit that their home audio equipment is based on the vacuum tube. Those old Marantz and McIntosh amps are still cooking away. Most audiophiles—the golden ear people who put their money where their mouth is—would never consider anything other than vacuum tube equipment and LP recordings. Certainly, most electric guitar players would never consider anything other than a vacuum tube amp.

Tube technology is more than 100 years old. Thomas Edison, in an attempt to extend the life of the filaments in his light bulb, introduced a positively charged "plate." Though it did not extend the life of the filament, he did note that when AC current was applied to the tube, it was rectified to DC: the first diode electronic tube.

Much has happened since. Tube technology continues to be developed and improved. The American and, especially, the Russian military establishments have continued to develop tube technology, their strategy being that in the event of a nuclear holocaust, tube equipment would remain unaffected by high levels of radiation.

After the invention of the transistor, transistorized audio equipment began to appear almost immediately. The early transistorized equipment sounded awful, but just as people believed the RCA advertisements around the First World War that featured Enrico Caruso posed with a mechanical phonograph saying, "I couldn't tell it from my own voice," people were sold on the idea that solid-state state-of-the-art had to be better than the old tube equipment. They forgot one of the most important tests for new equipment: to listen to it and to A/B it with known equipment. Much has happened to solid-state equipment since then, but for quite a number of technical reasons, transistors never equaled the musically acceptable sound of the

vacuum tube. We at Sear Sound did some research into this and published our results in the Audio Engineering Society Journal in May 1973.

Among other things, we found that, in recording, instantaneous peaks arriving at the preamp of the console were as much as 39 dB above the overload point of the preamp. Tubes distorted by generating mostly second harmonics (the octave) and even harmonics in general. Transistors produced odd and spurious harmonics often unrelated to the fundamental pitch. Tubes are voltage amplifiers. They go into distortion on a gradual, exponential curve. Transistors, when overloaded, saturate and simply clip when overdriven, producing these odd and unrelated harmonics, which are certainly more unpleasant to the ear. Ask any organ builder.

Along comes digital recording. Again, we are told that we finally have achieved perfection in the recording art, just as we were told that the transistor and the RCA "hill and dale" mechanical records were perfect. In combination, the transistor and digital recording have gotten so far away from a satisfying musical

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

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

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

It sounds a lot better.

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

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

And as you might expect from the company that brought

you the legendary SPX90, the first affordable digital effect processor, everything

about the new Yamaha SPX990 has been designed to silence other effect processors in its price range.

For starters, we've enhanced our algorithms to produce



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

THERE'S NOTHING WRONG WITH YOUR LAST



sound, that some "fix" was sought.

No matter what is done to digitize a musical signal—oversampling, bit-mapping and all of the other remedies—sooner or later, we are stuck with a 44.1kHz sampling rate. Good engineering practice dictates that the minimum sampling rate to get a close emulation of a signal is at five times the highest frequency. If we assume that the highest frequency is 20 kHz, then we should be sampling at 100 kHz.

Next comes the question, what is the highest musical frequency that we perceive? Well, it isn't 20 kHz. Try 200 kHz. As Rupert Neve and others have pointed out, many people can hear the difference between a sine and square wave at 15 kHz, which means they are hearing the first harmonic, at least of the square wave, well above what is considered the upper limit of hearing. Vacuum tubes love to work at high frequencies. Much of the "classic" studio equipment generally was designed to go out to 22 kHz with a 3dB rolloff, and then to fall off gradually to 50 or 60 kHz.

By selecting too low a sampling frequency, we are condemned to

eternal grainy digital sound; just as when the 525-line standard was adopted for television scan lines in 1947, we have been condemned to grainy TV pictures ever since. This was a commercial decision. The economic need of consumer electronics giants to find a replacement for everyone's hi-fi equipment led to the development of digital technology, which would render the world's turntables obsolete. Indeed, CDs have many advantages. They are smaller, easier to store, and less prone to physical damage and abuse. And they made it possible for the record companies of the world to take old, dead library material and to re-release it in the new format. This saved them a lot of money, since the actual musical production costs were nil.

However, if you take a new digital re-release and play it next to the original LP and compare, there is usually an astounding world of difference; most of the musical life has gone out of the music on the CD. This is especially true of music that was recorded on 35-millimeter magnetic film, by far the best magnetic recording format. Sorry, but the laws

of physics don't change: The thicker the base, the wider the track and the faster the speed—the better the recorded sound.

Along these lines, this format was abandoned because the 35mm stock was considered too expensive, and the recording equipment was considered too cumbersome. For the same reason, 16-track, 2-inch recording was abandoned in favor of 24-track recording. With more than 40% less track area to record on, sonic quality was sacrificed to convenience. It is interesting to note that in the 1960s, when we went to 8-track, 1-inch tape, a 12-track machine was introduced. It was almost immediately rejected because engineers heard the denigration in sound quality. We still have three 16-track, 2-inch machines in operation at Sear Sound, and we are happy to report that more and more producers are going back to this format. It sounds better, and if you need more than 16 tracks, we can slave two machines together.

The reawakening interest in vacuum tube equipment is a result of the musical sound deterioration that we have witnessed. *Radio World*, a broad-

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

But there's more to it than that.

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

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

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

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

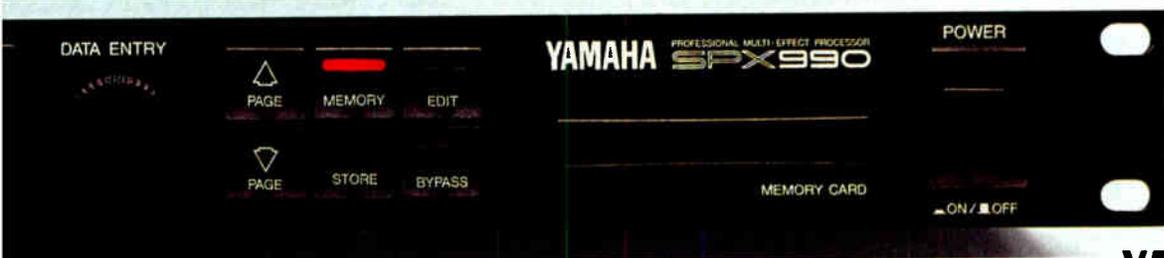
Stop by your nearest Yamaha dealer and check out the SPX990 today. For more information, call 1-800-937-7171 Ext. 310.

Your next mix will thank you for it.



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

MIX THAT A LITTLE MORE INPUT COULDN'T HELP.



How To Understand All The Ins & Outs Of The Studio Business.



Brother P-Touch electronic labeling systems present the easy way to get your facility to look as professional as it sounds.

OK, the client wants a little compression on the kick drum – or wants to find that B roll of the exteriors you shot, no problem -- providing of course, you can read the handwriting of the engineer on the last session and see what patch bay number or tape you need.

Of course, if you had your equipment labeled with a crisp, smudgeproof P-Touch label, you'd be able to find everything in a flash.

And chances are, once you're done with the control room, you'll quickly be moving into your offices and supply rooms -- in short, anywhere and on anything that needs to look professional and organized.

In a business where time is money, nothing saves you more of both like the Brother P-Touch -- for the look that's always in.



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cast-industry publication, now runs a bimonthly page entitled "Tube Talk." Vintage tube equipment prices are going through the roof. Longtime microphone manufacturers are offering reruns of the old, classic tube mics; new manufacturers are offering all kinds of new vacuum tube gear.

Maybe we are beginning to listen again. In my studio, the preferred mastering machine is an Ampex 300 ½-inch vacuum tube machine (at least 30 years old), which we rebuilt to run at 30 ips. Whenever we have done A/B tests with other machines, DAT recorders, solid-state ½-inch machines and ADATs, the ancient Ampex wins hands down. The sound is described as "airy," "realistic" and "musical."

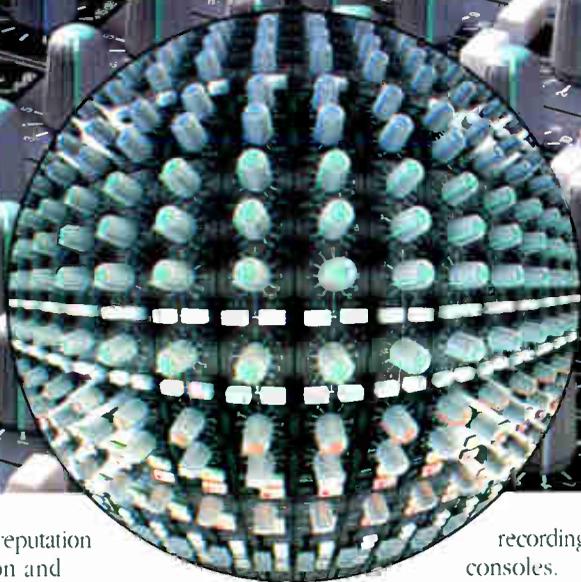
I feel that we have been dealing with The Emperor's New Clothes syndrome. We have believed a lot of hype about new technologies, and we have read spurious spec sheets about how good the new equipment is. Some of the digital technology is superb, but a lot of digital equipment leaves much to be desired as far as critical listening tests. The key word that we have forgotten is "listening."

Some of the myths that have grown up around vacuum tubes should be summarily dismissed. The first is that they burn out frequently. A lot of the equipment in my studio has worked every day for thirty years. Although it might be considered good engineering practice to replace them every generation, I haven't, and the equipment continues to work just fine. Another myth is that tubes are hard to find. Yes, certain German tubes from World War II are getting rare, but tubes are still being produced in this country, Russia, China and many other nations. Matter of fact, tube prices haven't gone up very much. Recently, I was restoring a 1929 RCA Theremin and I needed a tube. It was easily located and cost \$5!

I think that vacuum tube equipment has returned to favor because it warms up the cold, precise digital sound. It sounds better, and it always has. ■

Walter Sear helped introduce the Moog Synthesizer and had one of the first commercial electronic music studios. For the past 30 years, he has operated Sear Sound in New York City, which is still primarily a vacuum tube studio.

YEARS OF BUILDING LARGE STUDIO CONSOLES HAVE HELPED US FOCUS ON WHAT YOU NEED IN AN 8-BUS BOARD.



TOPAZ. Our reputation for innovation and excellence in high-end multitrack consoles affords us a singular perspective on the art of recording and mixdown.

Insights gleaned over the years have led to Topaz 24, a 48-input in-line console designed with the sonic integrity and smooth, responsive operation of our most prestigious

recording consoles.

MORE EQ. Others may claim to offer "British EQ," but we deliver the real thing, and more of it. Not only Soundtracs' world-class 4-band EQ with dual swept mids, but also dedicated EQ on all tape monitors without compromising your primary equalization.

MORE CONTROL. In addition to

a logical, fully implemented control surface, Topaz includes SOLO and MUTE functions on all tape monitors, a critical feature in cutting through the mix to isolate problems, something our competitors may have overlooked.

MORE FLEXIBILITY. Our "Floating Bus" design enables you to route Topaz's 8 group outputs to all 24 inputs of your tape

machine(s) without repatching. A comprehensive meter bridge is also available as an option for both the 24- and 32-channel Topaz.

MORE AUTOMATION. When it's time to automate, we give you the professional option of 12-bit, high-resolution VCA Mute automation with 4.0% increments on each fader to eliminate "zipper noise."

Topaz from Soundtracs. Our

track record with big boards allowed us to design the first 8-bus console with everything you need. For more information, call (516) 932-3810 or fax to (516) 932-3815.

**TOPAZ BY
SOUNDTRACS** PLC
Surbiton, Surrey, England

Suggested list price for Topaz 24-channel: \$3,995; Topaz 32-channel: \$4,995. Soundtracs is exclusively distributed in the U.S. by Samson Technologies Corp., P.O. Box 9068, Hicksville, NY 11802-9068. ©1994 SAMSON

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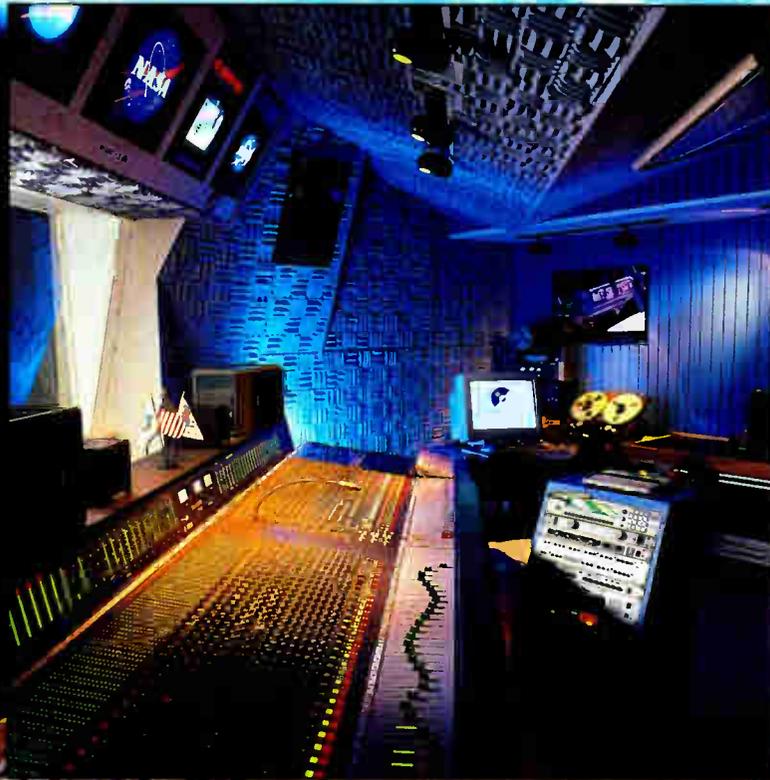
NASA'S MARSHALL SPACE FLIGHT CENTER

Audio Excellence



STUDIO PHOTOS: DENNIS KEIM

Above: Senior audio specialist Jeff Everett. Right: The control room at Marshall's Audio Visual Services Department.



SPACE PHOTOS
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**STORY BY
GEORGE PETERSEN**

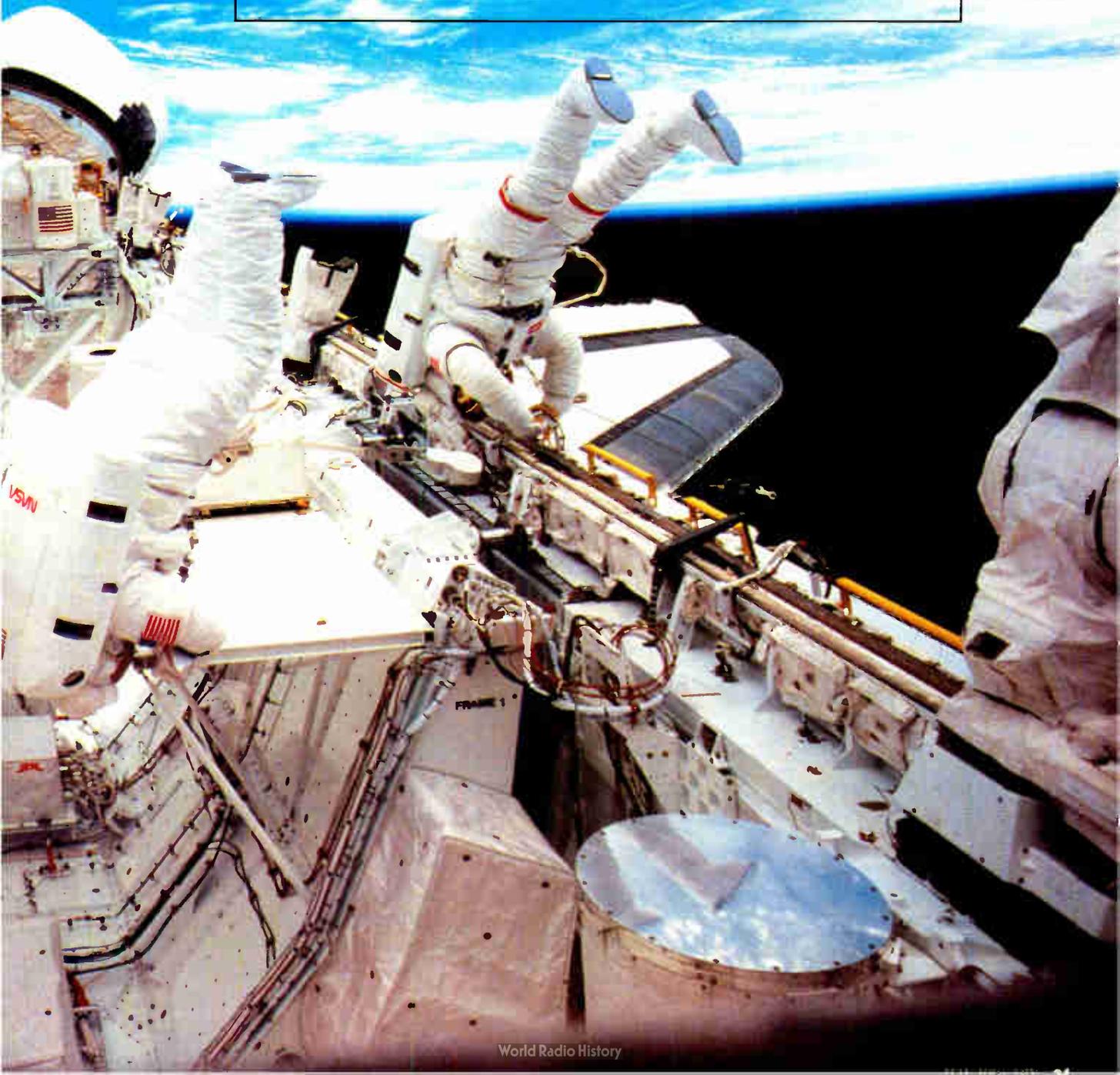


Four-thirty a.m.: Several hours before a space shuttle launch, yet hundreds of miles from the Kennedy Space Center in Florida, NASA professionals around the country are checking every detail to make sure that everything is A-okay.

The Marshall Space Flight Center in Huntsville, Ala., was established in 1960 to support America's growing space program. In fact, one of Marshall's first projects was the development of the Saturn rocket, which

sent the Apollo 11 spacecraft to the moon on July 16, 1969. More recently, the Center has played a major role in the development of Skylab, the Space Shuttle Program and the Space Station, a permanent, orbiting facility planned for the late-1990s. But the Marshall Center's role in NASA missions goes well beyond R&D activities. For example, since 1990 all but one Spacelab mission have been controlled from NASA's Spacelab Mission Operations Control Center in Huntsville.

Within the Marshall Space Flight



Center (managed by Boeing Computer) is the Audio Visual Services Department, with 25 employees handling audio and video services during most of the Spacelab shuttle flights and other NASA missions, as well as television production. "What we do on a day-to-day basis is television—anything from training to documentation—as a basic post-production facility," says Jeff Everett, the department's senior audio specialist. "We also do live events, which we uplink to NASA Select [TV programming available on SpaceNET-2 Transponder-5] or put out as training tapes, informing students and teachers about space and NASA. But during a Spacelab mission, where the shuttle's payload bay is a laboratory, we turn into a mission-support facility."

The flow of the video and air-ground voice system (AGVS) from the shuttle is a complex web of satellite and landline (telco) communications. To ensure constant contact with Mission Control in Houston and other terrestrial facilities, two track-

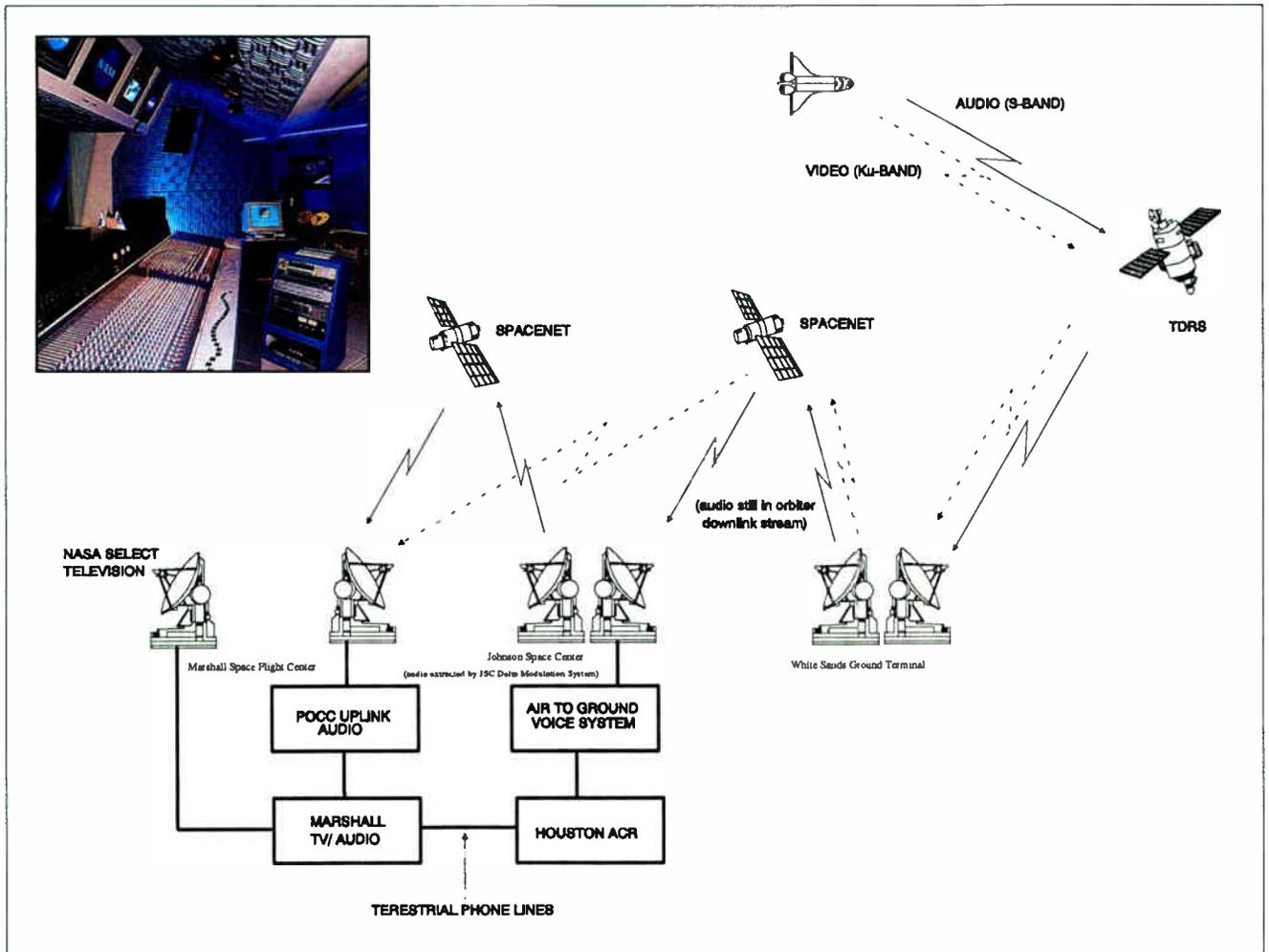


Orbiting 325 miles above Earth on the remote arm of the Endeavour are Astronauts Musgrave and Hoffman. Below: The audio/video configuration for NASA SELECT coverage of Spacelab missions.

ing data-relay satellites (TDRS) are maintained in high-altitude, geosynchronous orbits on opposite sides of the Earth. So wherever the shuttle is positioned, it's usually within range of the TDRS units, which relay signals from the shuttle to the tracking station in White Sands, N.M. From White Sands, the video is uplinked to another satellite, received by Houston and the Marshall Center in Huntsville. Audio is sent over landlines, first to Houston and then on to Huntsville.

This sharing of data between the facilities not only provides redundancy in the event of system problems, but also allows flexibility in setting up production schedules. "Either of us is set up so they can switch the satellite feed back and forth between us for broadcast programs," Everett explains. "We also have air-to-ground uplinks from the Payload Operations Control Center that go through our console here to Houston, and they mix that in with their program."

Whenever satellite downlinks are



THE STUFF THAT LEGENDS ARE MADE OF.

**Talent. Hard work. A little luck.
And the right equipment. That's the
stuff that legends are made of.**

Legendary musician, producer, engineer, arranger and songwriter Alan Parsons knows what makes a legend. So we asked Alan to test the new Audio-Technica AT4050/CM5 multi-pattern, large diaphragm studio capacitor microphone.

"To say that the CM5 is a serious microphone would be an understatement," says Parsons. "It's up there with the very best. It gives me a realistic, warm and true representation in the studio."

"My experience with the CM5 and other mikes in the 40 Series has convinced me that Audio-Technica now ranks as one of the very best manufacturers of high quality microphones. The clincher is that the CM5 offers incredible performance for much less than its competition."

Symmetrical direct-coupled electronics in the AT4050/CM5 provide excellent transient response and low distortion.

Featuring three switchable polar patterns (cardioid, omni and figure-of-eight), the CM5 combines warmth and transparency with super-high SPL capability.

Find out for yourself what Alan Parsons has found in the new AT4050/CM5. Write, call or fax for more information. Audio-Technica U.S., Inc., 1221 Commerce Drive, Stow, Ohio 44224 (216) 686-2600 Fax: (216) 686-0719.



**Alan Parsons and
the new AT4050/CM5**



Alan Parsons will be using Audio-Technica microphones exclusively on his upcoming world tour to promote his latest Arista Records release "Try Anything Once." (CD 07822-18741-2)

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!

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 (44.1k-Hz) 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.

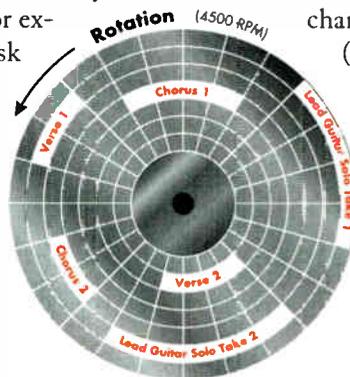
You can instantly move to 108 memorized locations at the touch of a button, and these locate points may be entered manually or on-the-fly. It's also simple to set up **seamlessly looping** repeat sections, so it's easy to jam over tracks. No more wasting time on rewinding tape!

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 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.

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!

DR4d

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DIGITAL

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USE READER SERVICE CARD FOR MORE INFO World Radio History

Intro

Verse 1

Chorus 1

Lead Solo
Verse 2

AquaDamping And Launch Acoustics

From an audio standpoint, one interesting fact about space flight concerns the water that is sprayed around the rockets from the gantry during the launch. It's not for coolant: The constant mist of airborne droplets create a dampening field that reduces the acoustic pressure on the launchpad, to keep the noise from vibrating the shuttle to pieces. And all the "smoke" you see is actually steam, created as the water spray is vaporized by the heat from the rockets. The maximum sound pressure level during the launch—175 dB—occurs at an altitude of 150 feet, due to the reflected sound off the Earth. Forget about deafness at this point—such sound pressure levels could easily kill a person by inducing hemorrhaging. On a more positive note, studio control rooms may someday include aqua-diffusion systems as standard equipment. And "give me a little more of that 5kHz spray" could become as common a phrase as "more monitor."
—GP

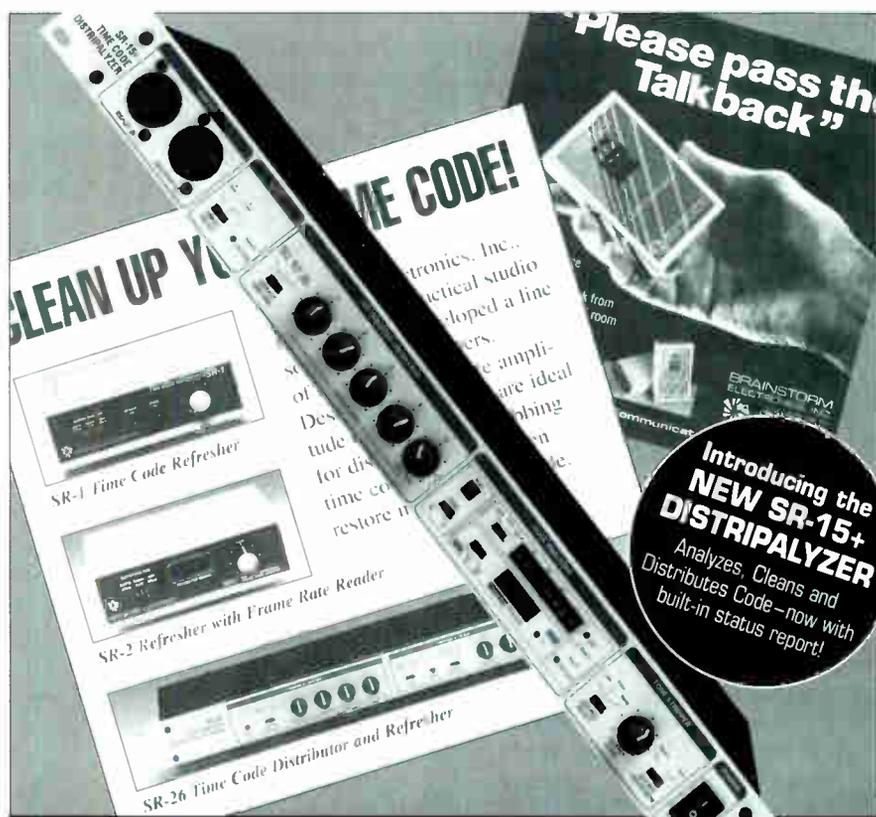
combined with telco communications, things can become complicated, according to Everett. "We are constantly dealing with time delays, and we use Lexicon delays for the audio and Tektronix 118 automated delays that follow the frame-sync delays. If the video is delayed for, say, 15 to 25 milliseconds, the 118 will delay the audio so lip sync is maintained. But for standard satellite hops, we use Lexicons—mostly PCM-12s—and just dial in what we need: 256 ms is the typical delay on a hop. The audio accompanying the video arrives in lip sync at New Mexico, and the video then goes up to another satellite. The audio then goes to Houston direct, over landlines. We are going over to FTS-2000, and everything will be bunched up on T1 circuits. These

aren't dial-up lines—they're in place and available 24 hours a day. From Houston, we get about 9 ms of delay, which is no problem in terms of lip sync.

"We have two air-to-ground channels," he continues. "These are for the crew or scientists that are communicating with ground. Or there may be special events, like CNN live to the shuttle. They call a phone line here or in Houston, we patch it through a hybrid into the console, and it is uplinked to the shuttle. It's the same with press conferences here in the studio. We use a lot of automated gates and mutes

for that to keep any delays from getting back into the circuits.

"If we're making the television program here that CNN might use in their broadcast, our commentator is full-bandwidth; if Houston's commentator wants to talk, he would be telephone-quality, so we use the Comrex [Acton, Mass.] Frequency Expander System," Everett explains. "It takes the full-bandwidth voice, encodes it into a system that splits it out into a high- and a low-band signal, which are sent over two telephone lines. I decode it and get 8kHz bandwidth—virtually AM-radio quality. It really maintains some sort



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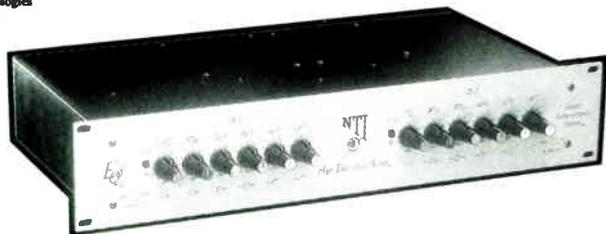
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of quality in these situations where you have to intermingle full- and telephone-bandwidth sources."

One useful technique employed by Everett involves filtering the extreme low- and high-frequency components of full-bandwidth signals before routing them over telco lines, particularly standard 3kHz lines. This results in cleaner audio and more level. "We're actually degrading the audio to make it sound good," Everett states with some irony.

NASA's Vibration Test Lab

Also at the Marshall Space Flight Center is a facility that handles sonic testing of equipment before it goes into the shuttle. The Vibration Test Lab includes separate rooms for acoustic pressure tests and vibration testing. In the acoustic section, a massive compressed air horn (about the size of a door) generates extremely high sound pressure levels. The room is built for emulating the sonic pressure level of the inside of a shuttle bay during a launch. To give you an idea of what those SPLs are like, empty Coke cans placed in the room will splinter into hundreds of pieces as they are hit with 170 dB of white noise.

NASA has recorded payload-bay SPLs of 140 dB during launches, so if the equipment doesn't disintegrate during the sound pressure test, it advances to the vibration testing. Equipment is placed onto a shaker arm—basically a huge voice coil on a rig the size of a Volkswagen, attached to an arm that is driven by an audio amplifier. However, the shaker arm needs a bit more power than your typical stereo setup, requiring about 375,000 watts of power (!), built into racks and racks of gear. The "speaker" cable connecting the amp to the shaker is about six inches in diameter.

—GP

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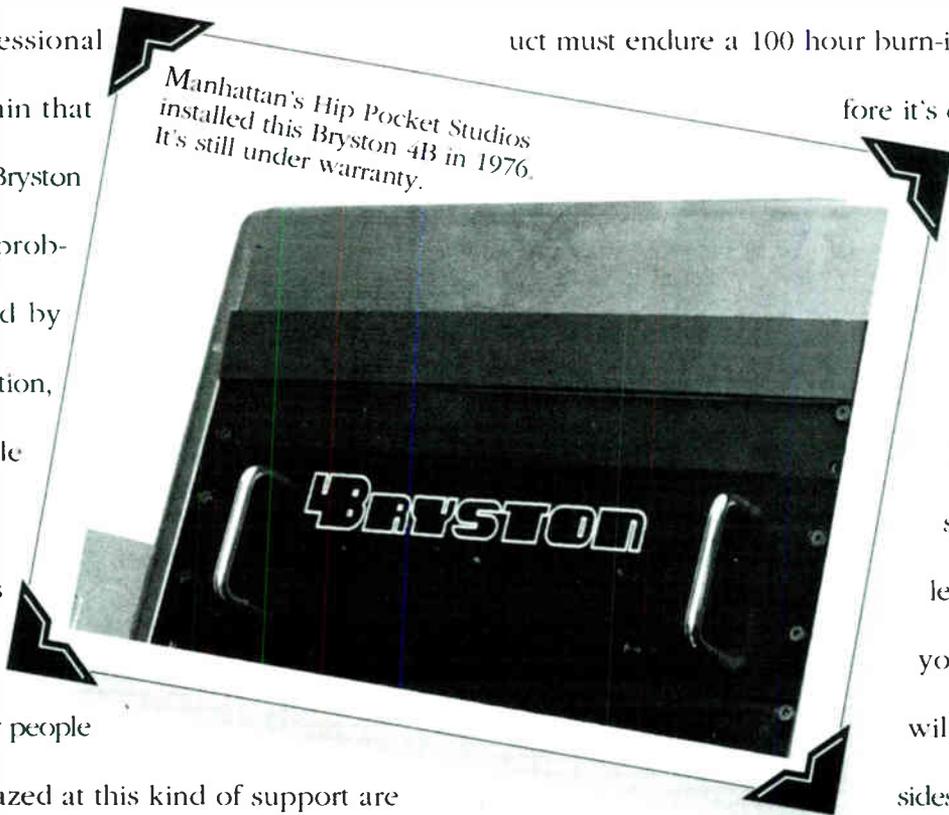


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"NASA used to design a lot of custom audio gear, but today there's plenty of good equipment out there that does the job," Everett adds. "For example, we use mostly off-the-shelf gear, such as Klark-Teknik expander/gates for ducking. It's already tried-and-true, and there's no prototyping involved."

The audio studio at the Marshall facility is centered around a Soundcraft 3200 console, in a 32x32 configuration. One major feature that helped Everett decide on this particular console is the mixer's onboard noise gates on every input channel. "We're constantly dealing with a lot

of line noise, and the noise gates are invaluable," notes Everett, who also was impressed with Soundcraft's willingness to work with him in creating custom input metering, placed next to the faders. "You've got to work fast here, and these meters really help," he says, adding that the console is used unconventionally during missions. "The whole thing becomes a huge matrix switcher—instead of sending sources out to multitrack, we're sending feeds all over the country. We have what is called a Support Audio Network, with phone lines tied into all of the NASA centers—it carries the voice

for mix-minus during press conferences. So anyone at any NASA center can ask questions."

The control room was designed by Everett, who with other NASA staffers came up with the basic design, and collaborated with an on-site NASA architect to work out the details. "I grew up in the music industry," Everett says, "and I laid out the general plan for the control room, which is as a post-production room with floating floor, floating walls, double glass—it's a variation of a Live End/Dead End approach, and it's acoustically sound."

The front wall is covered with Sonex foam, while the back wall uses wooden-slat resonators to achieve a diffuse field behind the listening position. The room's floating floor sits atop a forced-air-cooled space, and removable floor sections can be replaced with open grilles to provide cooling in various areas, such as into the outboard racks and into the console chimney. By incorporating prefabricated elements, such as Acoustic Systems voice-over booths in the design, the budget for the room (construction, wiring, acoustical treatment and equipment) was kept within a relatively modest \$250,000.

The new audio studio went online about a year and a half ago, and based on its success, Houston—which has been doing audio production since the days of the Apollo program—is currently upgrading its facility, which will be outfitted similarly to Marshall Audio. "We're also talking about networking our computers," Everett says. "They've got a Sonic System workstation in Houston, and I have a Sonic System here, and we are planning to network across T1s that we have in place. There are a lot of people talking about networking systems within a building, but we'll be networking across three states."

Perhaps the overall attitude about audio at NASA is summed up by the equation " $E = MC^2 \pm 3 \text{ dB}$ " that is stencilled on the front wall of the control room at Marshall Audio. "It's the Jeff Everett theory of audio relativity," he explains. "Audio, like everything else in the universe, is relative. We've got to be on our toes. There are no chances for a second take here. You can't just call up the shuttle and ask them for a mic check."

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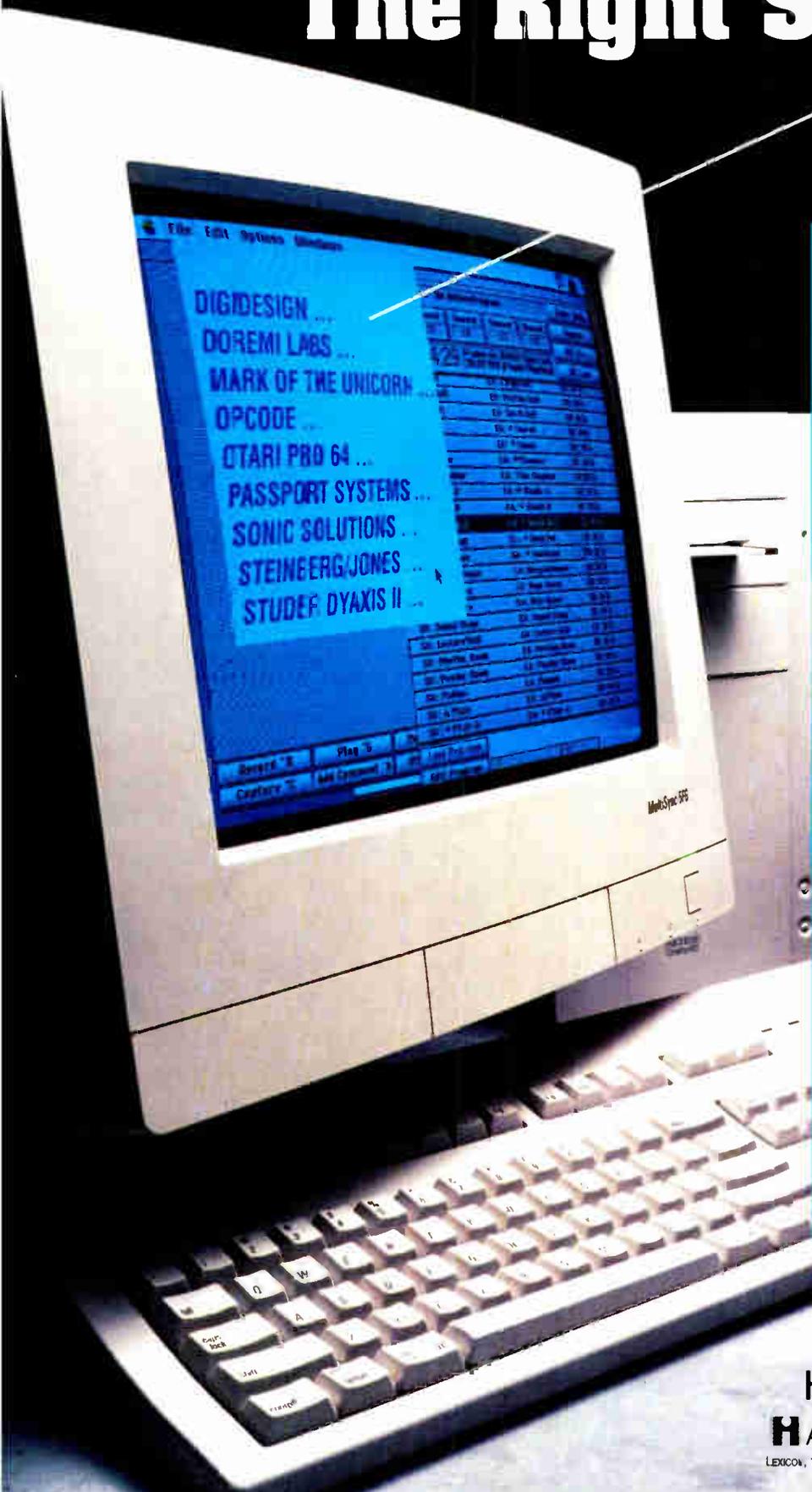
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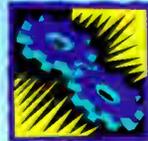
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RECORDING

BY JOHN LA GROU

VOCALS

Easily the predominant force behind record sales, the human voice stands front and center on a majority of modern recordings. And though every audio engineer develops a personal working method, there are many common, effective techniques for recording vocals. As we shall see from interviews with

sors. Engineers' tastes for compressors vary almost as much as preferences for microphones. And sometimes even a simple, low-cost compressor can offer a beautifully sculpted vocal, as can low-cost microphones.

These days, though, old tube microphones are in vogue for recording vocals.

“The singers need to feel like they can give the greatest performance of their life, and the engineer needs to create an environment where this can happen.”
—Dave Reitzas

seven top recordists, the process of recording vocals is also an art among artists.

Customary vocal-recording techniques include the use of iso-mounts and sheer materials to prevent plosions, sibilants and floor noise; optimized distance, angle and aim from singer to mic; removal of reflective materials near the mic; the proper matching of mic and signal path to the individual vocalist and arrangement; and more.

Engineers learn early the tendency among vocalists to move and groove as they sing. Some singers have a hard time maintaining consistent levels. And many professional singers possess a dynamic range that won't quit. It's for these reasons, among others, that engineers often rely on their trusty compres-

And often, that old C-37A or M49 can sound remarkable. But don't think that an old tube unit will somehow magically bestow Gold. Engineers would do well to experiment with unconventional alternatives. Take time and listen critically to mics you normally wouldn't consider for a vocal session (see sidebar on selecting a vocal mic).

.....
ILLUSTRATION BY BILL MAYER



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Some engineers comment that tube microphones sound better for vocals when hung upside down. Because large diaphragms hate temperature swings, and since tubes generate rising heat, an upside down tube mic may naturally keep the diaphragm a bit cooler. Moreover, some older, large-diaphragm mics cannot handle wetness (read: spit) and must be protected carefully. In any case, if one opts for a classic mic

“When we do vocals, we bring in carpet and gobos until the standing waves and reflections are just right. And ‘just right’ is when the vocalist feels best.”
—Bill Dooley

on vocals, it’s advised to keep a similar-sounding spare close by.

To maintain the benefits of great mics and outboard gear, more engineers are bypassing the console when recording critical signals, especially vocals. Outboard mic preamps are indeed the right approach for maintaining vocal integrity. Again, mic selection, vocalist, and program material will all determine the choice of preamp.

In our own vocal recordings at Millenia Media in Sacramento, Calif., we often chose the most sonically accurate preamps—selecting a microphone with appropriate coloration (or lack of). Others desire the rounded-off sound of various tube preamplifiers. Still others rely on the aggressive nature of Rupert Neve’s early mic amps or similar designs. Working engineers and producers are taking advantage of a wonderfully broad spectrum of color; especially in vocal recording.

Technical considerations aside, the act of singing for posterity can

be a deeply personal, emotive event in which engineer and producer alternately must assume the role of cheerleader, psychologist, parent or mediator. Moreover, defining a well-recorded vocal can be like discussing the taste of ice cream—it’s hard to describe, but you know when it’s right. Some of the industry’s top engineers and artists share with us their experience and techniques in defining the art of vocal recording.

BILL DOOLEY

Originally conceived as a client room for Freddy De Mann (Madonna, etc.), Brooklyn Recording Studios recently has seen up to 90% of its business from outsiders. Ex-Atlantic Records chief engineer Bill Dooley now heads up the technical activities at Brooklyn.

“The most important thing is keeping the vocalist comfortable,” Dooley says. “If the room reflections are wrong, or the cue sounds funny, or whatever, the singer can’t perform at his or her best. Our room is very live—about 20 by 25 feet with a 17-foot tiered ceiling. When we do vocals, we bring in carpet and gobos until the standing waves and reflections are just right. And ‘just right’ is when the vocalist feels best.

“Shelly Yakus helped build this room and specified much of the equipment, including old tube mics and outboard gear. When we’re setting up for a vocalist, we usually grab some of the old standbys, such as a Neumann U47, Telefunken ELAM-250 and AKG C12. During listening tests, we’ll run the mics through the Neve 8078 without processing to tape.

“I sometimes tell the singer to stretch out their thumb and little finger horizontally with the thumb at the lips and the pinkie just touching the mic,” shares Dooley. “That way, we can maintain consistency during tests and takes. But as you know, singers don’t always cooperate.”

To compensate for off-mic movement and level variations, Dooley tends to grab a few tried-and-true pieces of outboard gear. “We really like the tube stuff here. My first choice compressor is the LA-2A. I sometimes feed this into a Pultec EQP-1A3. When we need something with less tube color, the GML EQ does a nice job. We recently did a record for Connie Stevens and her

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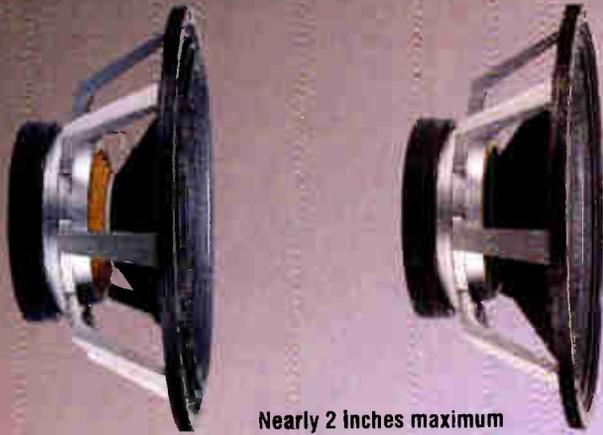
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spot in the L.A. studio scene. He's forged a seven-year relationship with producer David Foster and worked with a number of top vocalists, including Barbra Streisand, Tammy Wynette, Whitney Houston, Wynonna, Frank Sinatra, Sheena Easton, Michael Bolton, Peabo Bryson, Tom Jones, Peter Cetera, Tony Bennett, BeBe and CeCe Peniston and many others.

A recent addition to the Reitzas resume is the vocal group Take 6. Yours truly was on hand at L.A.'s Rumbo Recorders for a Reitzas session with Take 6. In the latest Random House dictionary under the

word "a cappella" is a line drawing of these guys. Trust me.

For the session, a stylized remake of the old Ambrosia tune "Biggest Part of Me," Reitzas had a Sony 48-track digital machine on hand, fed by GML preamps and EQs on each vocalist. Microphones hand-picked from L.A.'s best sources were arrayed in a horseshoe pattern for ensemble visibility and included a Telefunken 251, Neumann 47 and 49, Stephen Paul 67, and two stock 87s. All mics were fronted by stocking screens, and each singer was placed approximately eight inches from the diaphragm. No other proc-

essing was used, save for the quick hands of Reitzas on the Sony remote.

Reitzas says, "My highest priority is making sure the talent remains comfortable. The singers need to feel like they can give the greatest performance of their life, and the engineer needs to create an environment where this can happen. It's true that first takes are often the most magical, so I try to be ready even from the first mic check to get usable material.

"Microphone selection is determined by the quality of each voice. For instance, after experimenting, Streisand sounded best on a Neumann M49 from Design FX. Michael Bolton did well on a C12 through an LA-2A compressor. Tammy Wynette really sounded right with a Paul-modified U67. And so forth. We'll always try a number of mics and signal paths until we find a combination that sounds most attractive for the music and vocalist.

"Rarely do I worry about sibilants," Reitzas continues. "Besides, I sometimes like the way sibilants plays on reverb. And with analog tape, sibilants seems to take care of itself as the tape sits in the vault for a few weeks. But if it's just too much, my first choice for de-essing is the dbx 902."

When beginning a session, Reitzas likes to make the talent feel at home. He says, "I might bring some plants, perhaps a table, some candles, and so on—whatever is necessary to create a good working atmosphere. And there's always an open mic at all times. We keep in constant communication with the singer.

"There's also a device I use for comping vocals called a Vocal Splicer built by Ian Eales at Studio City Sound Corporation. It has eight inputs and one output with an A/B fader. We mult the inputs from up to eight different takes and select the right combination into a ninth track while smoothly fading between tracks."

During the Take 6 sessions, however, Reitzas made full use of the editing capabilities of the Sony 48-track. Each vocal was carefully sung and resung for just the right nuance, and then stacked again for thickening. Add six-part harmony, with stacking, plus stacked counterpoint harmonies, nuances and fills—the

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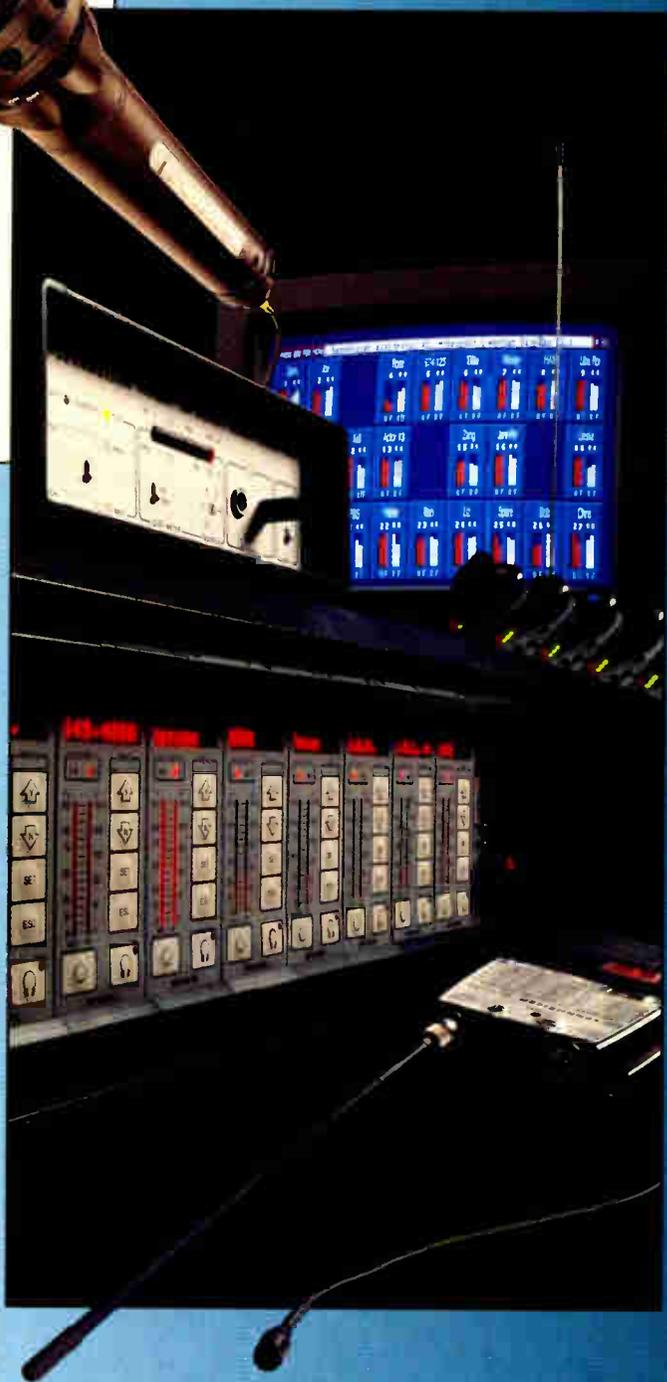
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“Stay off the talkback as much as possible. Singers are generally into a groove, and too much chatter can be distracting.” —Ed Cherney

tracks add up fast.

Reitzas confides that “even the best singers sometimes need a little pitch correction in the mix. Normally, I’ll write the offending segment to another track advanced by about 40 ms. Then, I’ll run the new track through the pitch shifter, an AMS usually, which has an inherent 40ms delay. When the pitch is corrected, it goes back to tape at the right location.” Take 6, however, required no pitch correction.

ED CHERNEY

With career mentors like Bruce Swedien, it’s little surprise that Ed Cherney has been landing engineering dates with the likes of Bonnie Raitt, Eric Clapton, Jackson Browne, Elton John, Ringo Starr and Bob Dylan. Cherney spoke to *Mix* from his home in Venice, Calif.

“Voice is the hardest thing to record, in my opinion,” Cherney says. “The voice is one of the most dynamic instruments, and it sits only inches from the microphone. Vocals are out in front of everything, and if the vocals aren’t right, it’s the first thing people notice.

“What’s worse, the best vocal performances are often the first takes. To make sure I don’t miss anything, I always try to plan ahead and be ready from the beginning of any vocal session. Once the practice vocals start hitting tape, I try not to make adjustments to level, EQ and so on. It’s easier to make adjustments in post when the basic tracks are consistent.”

Cherney says that an engineer can make or break the vibe of a vocal session. Pressed for advice, he says, “Don’t let the singer get cold. If they wait around for you, you’re not doing your job. Be ready for anything and be prepared. Stay off the talkback as much as possible. Singers are generally into a groove, and too much chatter can be distracting. And try to make the technology invisible to the talent. A good

headphone feed is also important; I always send a stereo cue and work the cue mix until the singer is happy.”

As for processing, Cherney says he maintains a “minimalist approach

to tracking vocals. You can always add more processing, but it’s very difficult to take it away once printed. My first choice signal path is the Neve 1073 preamp module into a dbx 160 compressor, though the compressor is used to protect the tape, not necessarily to squish the vocals.

“I don’t have any particular vocal microphone that I use religiously, though the C12 is certainly one of my first choices. On Bonnie’s new record [*Longing in Their Hearts*], we tried all kinds of great tube condensers, but none really sounded right. After a long series of listening

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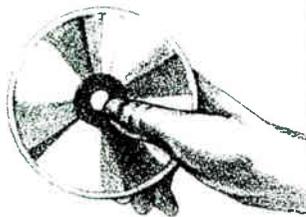
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"The audience or congregational response is paramount to the gospel experience. See, it's not really a concert—it's church."

—Jerry Masters

sessions, we found that the Electro-Voice RE20 sounded surprisingly good for Bonnie's voice. Don Was and I even staged a blind microphone listening test and picked the RE20.

"For vocals and most everything else, I really prefer 30 ips analog using 996 at +6 without noise reduction. Digital just doesn't do it for the sound I'm after, though I'm waiting for the day it does!

"On background vocal sessions, I generally record in mono using one mic, and physically adjust the singers' position for balance. This approach seems to fit better into a typical mix. If the room is right, it's really surprising how good a mono signal can sound. When comping vocals, I typically use the Vocal Splicer [see Dave Reitzas' interview] or computerize the process with GML fader automation on the console. Both methods work well; it just depends on the project requirements."

JERRY MASTERS

One look at *Billboard's* Gospel chart and it's clear that Mississippi-based Malaco/Savoy is the top gospel label. And with nearly 300 gospel records to his credit, Malaco's Jerry Masters can undoubtedly be called the world's top gospel-recording engineer. His 25-year track record also includes Muscle Shoals engineering dates with Rod Stewart, Bob Seger, Paul Simon and others. He shared his vocal-recording techniques with us from Mississippi.

"Recording gospel singers is unlike anything else," Masters explains. "Most gospel directors aren't interested in the technical aspects of the recording; they just want the spirit of the event to be conveyed on record.

"Now, virtually all gospel choir events are recorded live on location. This is because the audience or congregational response is paramount to the gospel experience. See, it's not really a concert—it's church. Of course, this makes my job really dif-

ficult. We have mics everywhere, and leakage is coming at me from all directions. I'm expected to engineer the event and maintain a sense of spiritual presence in the recording.

"We like AKG 414 mics over the choir. They're reliable and consistent from mic to mic. They also have a hyper pattern that is useful for isolating the choir from the instruments and congregation. Sometimes the choir is well over 200 voices. With this size group, I'll fly up to 12 choir mics—six in front, six in back, about 10 feet high. We'll also surround parts of the rhythm section with Plexiglas to prevent leakage.

"Usually," Masters adds, "there are a number of solo vocalists, as well. We've tried various solo mics, but most of the singers are used to a hand-held mic. The [Shure] SM58 has excellent hand isolation, and the singers are used to their sound, so we go with 58s most of the time. We keep the monitors down as low as possible.

"On the congregation, we'll start with a pair of Sennheiser long shot-guns pointing away from the stage. Then we'll add up to six PZMs on the side walls. In gospel music, the congregation is free to sing and play instruments; the PZMs can help highlight a particularly good audience section. All mics are fed to multitrack uncompressed at 15 ips on 996 +8 over 200 without noise reduction. We then mix on the Muscle Shoals Neve 8078 to SR analog with DAT backup."

DAVID BOULTON

Recording vocals doesn't necessarily mean recording singers. As New York's largest ADR house can attest, the work of spoken voice recording is alive and well in films, video, television and radio. Having engineered dialog replacement for Disney, Spike Lee, Oliver Stone, Jonathan Demme, Martin Scorsese and on any number of top films, Sound One's David Boulton has a wealth of experience

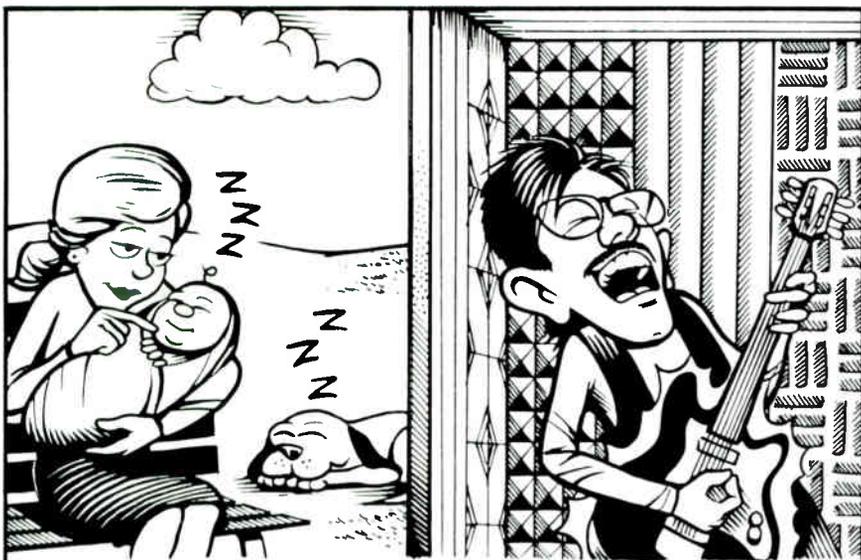
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to draw upon.

"Actually, the process of automatic dialog replacement is somewhat less than automatic!" Boulton says. "It's come a long way from the old tape loop inserts, but the engineer still plays an influential creative role in the process.

"There's a stream of fine actors who come in for dialog work. Some enjoy the process, most tolerate it, a few hate it. Al Pacino, for instance, loves ADR and sees it as an art form. He'll do dozens of takes on numerous lines—trying to achieve the perfect nuances. Annabella Sciorra, on the other hand, was less comfortable with plugging in words on *Jungle Fever*. She was happy when it was over.

"Usually," Boulton adds, "the director tags along for the sessions and has quite a bit to say. It's my job to make sure everybody feels like they get what they want. It's also important to manage the pace at a comfortable level for all involved. Some like to work fast, others slow. I adapt rather than impose my own bias.

"In any movie or television show, the raw location audio is usually of inconsistent quality. Timbre and levels can change frequently, background noise can often make audio unusable, and many other problems are all common. We're asked to re-make the dialog with high-quality and consistent results that enhance the visuals.

"To achieve this, the talent wears AKG 240 headphones while watching the scene. It may take many attempts to finally say the lines exactly in-sync with the picture. We'll keep going over the scene until the talent and director are satisfied.

Regarding equipment used for ADR, Boulton explains, "we select the recording gear to best match the original sound of each film. We like to match the microphones with those used in the field. These days, it seems like the most popular film mics are the Schoeps MK-41 and Sennheiser 416. We also keep various Neumanns, AKGs and others on hand just in case. The mics are fed to Millennia preamps and compressed through Drawmer 241s to prevent tape saturation. Dialog is virtually always recorded dry."

John La Grou is an engineer, musician and inventor.



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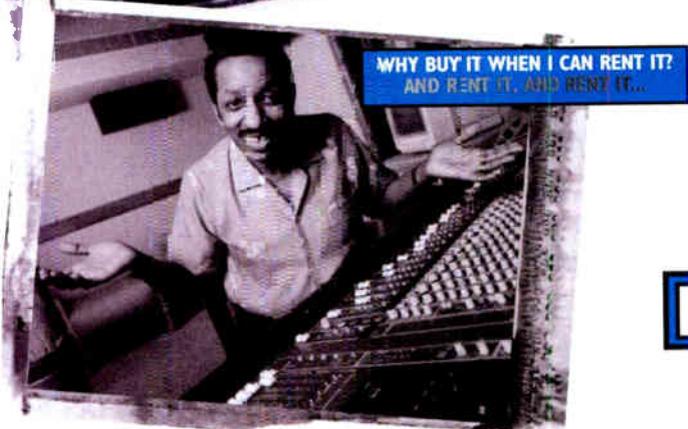
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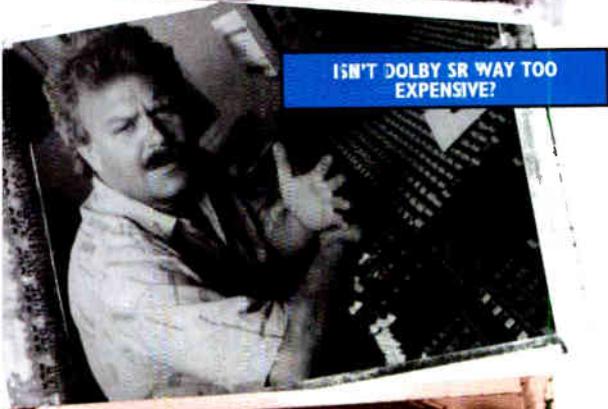




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by Paul Potyén

PLUGGING IN TO MULTIMEDIA

INDUSTRY ORGANIZATIONS TO GET YOU UP TO SPEED



Whether you are a forward-thinking independent audio producer, a recording facility owner looking for new markets or an audio software manufacturer thinking about expanding into multimedia, you may be wondering how to find your own on-ramp to the information superhighway. (Oh God, I can't believe I really said that. I'm so sorry.) Where can you turn to find resources, feedback, market analysis and other information you need about this rapidly developing technology? There are several organizations that are designed to show you the way. This month, we talked to three of them to get a better idea of the services they provide, and who belongs to them.

IICS

The International Interactive Communications Society was formed in 1983 by early developers of interactive laserdisc applications. Its charter was to create an environment where newcomers to multimedia could learn more about the technology, and professionals could share their experience and vision about the future of this industry in an open forum.

Today the IICS is the largest multimedia organization, with more than 4,000 members in 30 chapters in the U.S. and around the world. The San Francisco chapter is the largest, with a membership of more than 1,000, although the New York and Los Angeles chapters are also very active.

Jeanine Parker is president elect of the IICS, and former president of the Los Angeles chapter. When she's not wearing her IICS hat, Parker is involved in mainstream motion picture and television production. She is

also an interactive multimedia consultant, and she teaches a course in Interactive Multimedia Basics at the UCLA extension. Before getting into the world of multimedia, she was a singer/songwriter and producer.

Can you give me a profile of a typical IICS member?

There's no such thing. The IICS is a very broad-based organization for individuals who are interested in interactive art and technologies. It's a nexus for the artists and technologists—as well as those on the business side—to communicate with each other. Anyone who is interested in interactive multimedia can join. We have a lot of lawyers and doctors, many people from music, film and television, a lot of people from the computer industry—software engineers and programmers—and, of course, the interactive multimedia professionals, who do in fact make up the bulk of our membership.

Our emphasis is on networking and education of our members. The best way to think about the IICS is that it's a vast global "thinktank."

Does each chapter establish its own agenda? To what extent are the activities guided or coordinated by the National Office?

Chapters do form their own agendas. The headquarters encourage the sharing of information between chapters. They are very much independent. The headquarters functions mainly as an information clearing house. We provide membership information, services and benefits. The strength of the organization is in the chapters.

For example, in Los Angeles we have a lot of Special Interest Groups:

a virtual reality SIG, entertainment software development SIG, multimedia audio technologies SIG, multimedia law SIG, interactive fiction SIG, CD technologies SIG, Macintosh multimedia SIG, marketing SIG, Hollywood SIG and an interactive museum and theme park SIG. We also have a local chapter BBS, which is very successful.

How do you foresee the ICS evolving over the next three to five years?

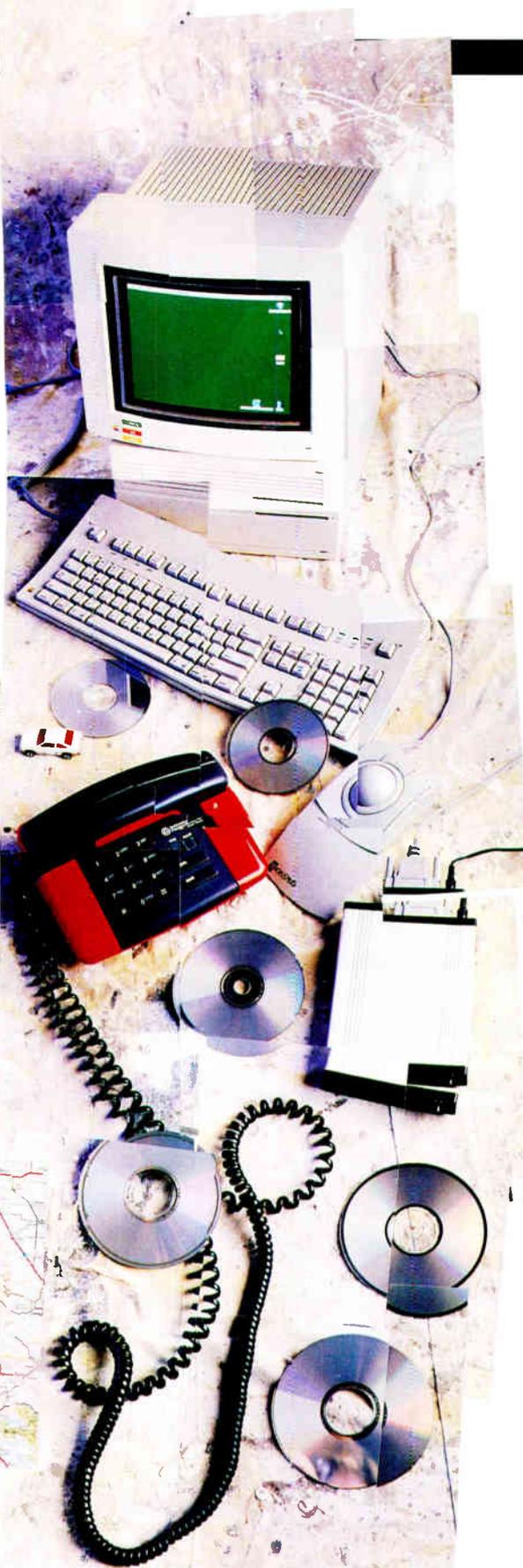
We intend to form an educational, nonprofit arm that will enable us to launch our own educational programs and attract some grants. We don't want to become a corporate organization. We see a tremendous need for training, so I'm building an infrastructure that will make that happen.

We will be moving online internationally, expanding what we have done in L.A. with video teleconferencing. We want to develop high-bandwidth links between the ICS chapters, so we won't be bound to phone, fax and print. Today you can find us on the Internet, CompuServe and America Online. But an electronic ICS will come into existence this year. We'll have a place in cyberspace where people can find us, and we want to expand from there into wider bandwidth ways of communicating with each other, including ISDN and other possibilities. There is no other organization that has the content for switched network multimedia.

For those readers who may be interested in joining the ICS, what other benefits are available to members?

We have discounts on conferences and trade shows, such as Intermedia, Digital World, New Media Expo, etc., as well as discounts for multimedia-related hardware, software and publications. And of course, there are the monthly chapter meetings and chapter newsletters.

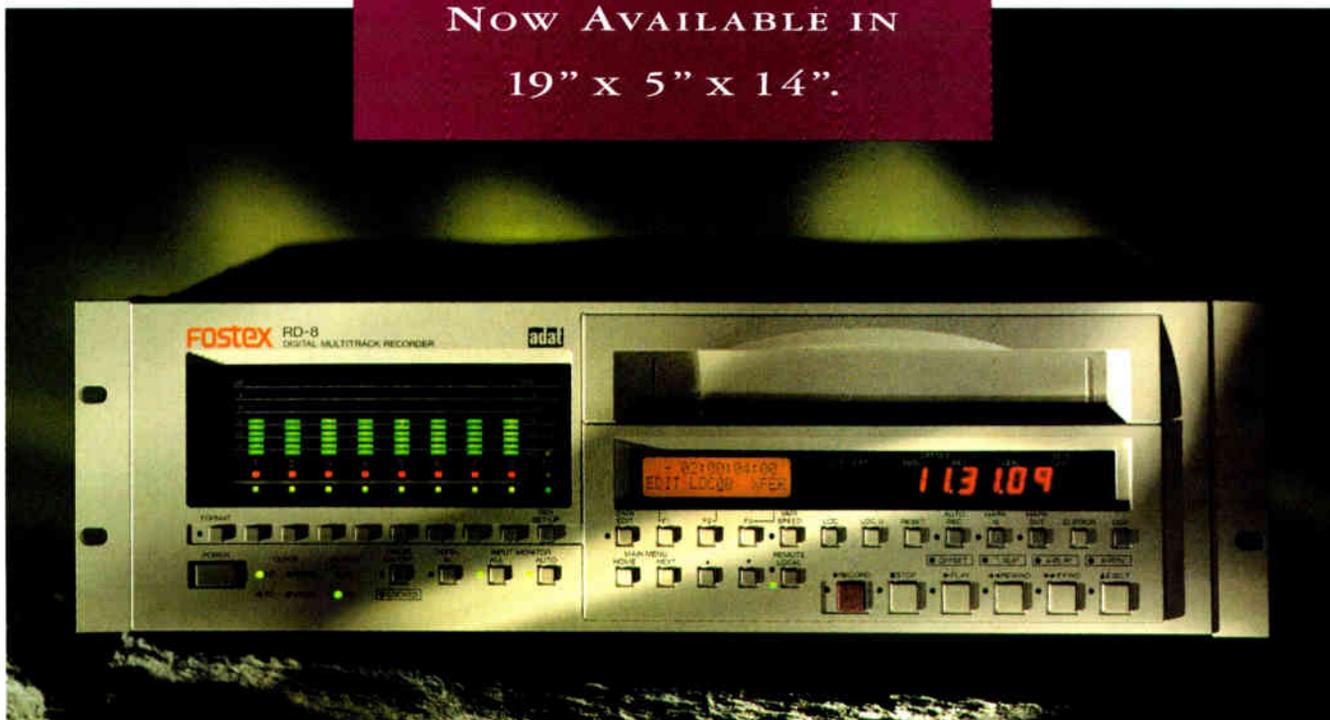
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THE IMA

Ken Christie is the new director of marketing and communications at the Interactive Multimedia Association. He has been involved as a volunteer since 1988, when it grew out of the IICS.

When and by whom was the IMA formed?

It was formed originally as the In-

teractive Video Association, with several dozen companies. We needed something that represented the interests of companies. We function much as a traditional trade association, representing corporate interests. The sole mission was to promote the widespread use of interactive technologies. Although the mission has never changed, the specific activities seem to mutate every year along with the industry.

Is it accurate to say that the IMA consists largely of companies, as opposed to the IICS, whose membership generally consists of individuals?

Yes. We're pushing 300 compa-

software program.

The company plans to complete both products in 1994 under the direction of three former Digital F/X software engineers who have joined Aldus subsequent to the acquisition. Also included in the acquisition were two existing hardware products: Video F/X, a dedicated turnkey video editing system; and TitleMan, a PostScript-based title generator. Aldus intends to divest both products and is currently looking for a suitable buyer.

TORONTO TO HOST FIRST INTERNATIONAL CAMAS AWARDS

The Canadian Academy of Multimedia Arts & Sciences announced the first Canadian-hosted International new media awards show: the CAMAS Awards, to be held May 27 at the Ryerson Theatre in Toronto. The event will be held in conjunction with the MULTIMEDIA 94 Exposition and Forum during the Toronto Culture Technology Convergence Week '94, May 22-28. Contact CAMAS at (416) 340-8070 for further information.

MORPH'S OUTPOST PRESENTS ART TECO '94

Multimedia developers will converge on San Francisco's South-of-Market district for Art Teco '94, a conference presented by *Morph's Outpost on the Digital Frontier*, the technical publication for multimedia pioneers. The three-day event will feature seminars, panel sessions and hands-on interactive labs on June 16-18 at Cyberlab 7 in San Francisco. For more information, contact Tim Bigoness at (510) 238-4547.

Multimedia Industry News

FIFTH ANNUAL SEYBOLD DIGITAL WORLD CONFERENCE & EXPO

In response to the explosive growth of the emerging digital entertainment and technology industry, this year's Digital World Conference & Expo will take place at the Los Angeles Convention Center June 6-8, 1994. The event will feature more than 150 exhibitors and more than 50,000 square feet of exhibits. Digital World, which attracts more than 20,000 attendees every year, was previously held at the Beverly Hilton.

Digital World is the first and largest industry-independent event focused on the applications and implications of digital technology, as represented by the converging worlds of broadcast, computers, consumer electronics, entertainment, publishing and telecommunications. Premiering at this year's event will be the Interactive Media Festival, an internationally juried competition, and a gallery and performances of interactive media and art. For more information, call (800) 488-2883.

ALDUS ACQUIRES DIGITAL F/X DESKTOP VIDEO LINE

Aldus Corporation (Seattle, WA) acquired a line of desktop video software products from the former desktop division of Digital F/X Inc. of Mountain View, Calif. Among the products acquired were two unreleased products: Hitchcock, a non-linear video-editing software solution for the Macintosh; and TitleSoft, a Mac-based PostScript rendering and video title generation

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nies, and they range from large system platform providers to independent title producers, to information providers, to cable companies, to publishers, to distributors, to infrastructure providers. And the membership crosses a wide variety of industries, from education and corporate training, to promotion and advertising applications. They're really all over the map.

There are probably more producers and developers than platform providers. Our 12 sponsor organizations that provide us with hefty funding include IBM, Apple, Hewlett Packard, DEC, Kodak and Microsoft.

The IMA played a significant role in last year's NAB Multimedia World Conference and Exhibition. How will this year's NAB event be different from last year?

It's expanded and more clearly focused. We have three tracks this time: One track is called "Making Money in Multimedia," and it's broken down into various industries. We'll be demonstrating examples of existing business models that you can tap into to have an ongoing multimedia business.

And then we have a two-part workshop that focuses on intellectual property issues—a very hot topic in the light of the Compton's New Media patent controversy. The other hot topic this year is that of set-top protocol. We'll have speakers who will explore the underlying technology behind cable-based and other set-top devices that will be needed to use the information superhighway. There are a lot of questions about how the standards will be set for two-way communication using this technology.

Besides the NAB event, what other inter-industry joint ventures is the IMA involved in?

There's only one we can talk about at this point. It's in the publishing/entertainment industry. We'll be cosponsoring a couple of executive-oriented, one-day conferences with Prentice-Hall Law and Business called "Publishing and Entertainment in Transition." Those are coming up in April and May; one in Los Angeles and one in New York. The speakers will focus on how traditional entertainment and publishing companies can sort out the various issues of licensing, copyright and access to the digital highway.

A lot of different groups want us to participate in their conferences, and we're trying to determine which ones make the most sense for us. It looks like traditional book and magazine publishing will be the next area.

Another area that the IMA addresses is intellectual property issues. Can you give me an example or two of current activity in that area? Who is involved in these projects?

Certainly at the forefront now is the controversy concerning overly broad patents that have been issued recently. It was triggered by Compton's, but there were others before that. [In November, Compton's New Media announced that the U.S. Patent Office had issued a patent licensing a broad range of multimedia techniques to that company. As this issue went to press, the U.S. Patent Office announced its decision to overturn all 41 claims of the Compton's patent.] Our concerns fall into two areas: One relates to the specific processes and policies of the Patent Office; we feel that the patent examiners need to be better trained in the area of multimedia and that the software prior art database that they use to make their determinations is less than complete.

The other area relates to the impact on commerce and on the First Amendment right to free expression that overly broad patents can cause. When you have something like the Compton's patent that basically states that a method for expression of ideas is patentable, that tells multimedia developers that they can't do anything without infringing on this patent.

The Patent Office invited us, as well as others, to comment in public hearings on this issue in San Jose on January 27, and Crystal City, Va., on February 10. I was at the San Jose hearings, where about 50 people delivered testimony.

What is the current status of the IMA Compatibility Project?

We have issued a set of "Recommended Practices for Enhancing Digital Audio Compatibility in Multimedia Systems." This document, which was completed at the end of 1992 and has received broad market acceptance, defines a set of digital audio data types and sampling rates for desktop computer systems, as well as technical requirements to help vendors meet those recommendations.

The process itself is one of the keys to its success: It is open to anyone, whether member or nonmem-

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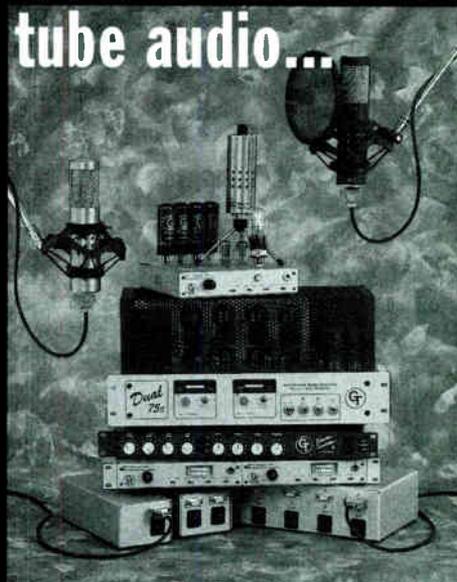
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ber. That project continues to evolve into other areas.

I understand the IMA has created a number of forums and SIGs.

Most of them are in the Compatibility Project. The major other forum is the Convergence Forum. It addresses the issues that come up when previously unrelated industries converge as a result of digital technology. In many cases, these groups don't even speak the same languages. There are areas where they can work together to solve business issues of mutual concern, but in many cases, even identifying those areas is difficult. The basic goal of the Convergence Forum is to bring those groups together to see what can be addressed jointly.

How do members participate in these forums, and how is it determined who participates?

It's a combination of electronic communication and face-to-face conferences and meetings. In the Compatibility Project, there's a lot of online forum activity via Internet. In fact, we are trying to get an Internet node set up specifically for this purpose.

Participation in the forums is totally open. Anyone—members and nonmembers alike—is welcome to participate. Our hope is that anybody who wants to get involved will eventually want to become a member. On the other hand, we don't want to restrict participation in any way. We have two constituencies: One is our members; the other is everybody else who is trying to figure out what multimedia means to them.

What other benefits are available to members?

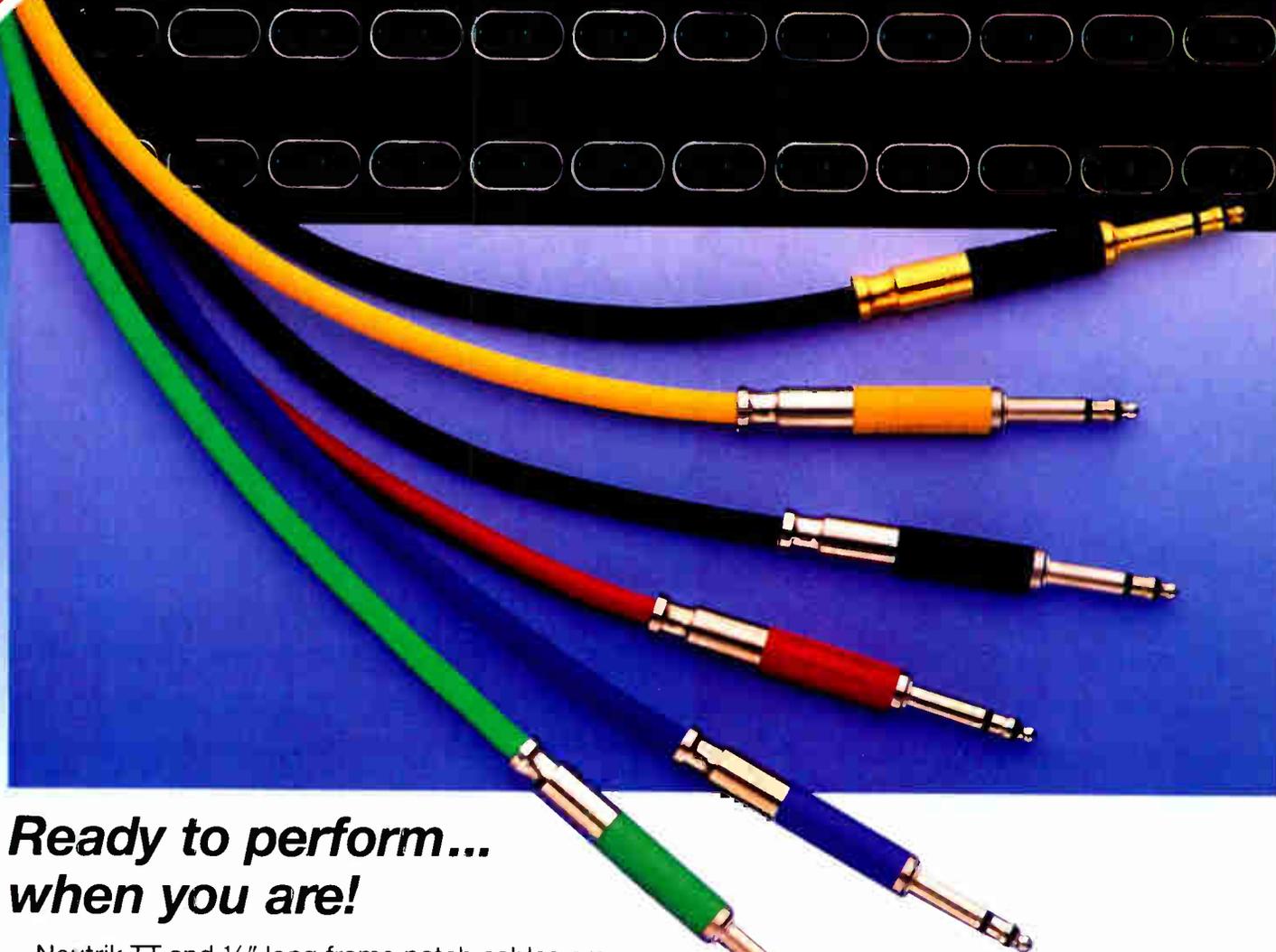
Besides the forums and projects, there is a bimonthly journal that keeps you up-to-date on these issues. We conduct ad campaigns on behalf of our industry. And if someone is interested in using multimedia for their company, we can put them in contact with members who can develop projects for them. We run a job bank for people looking for companies and vice versa. We offer discounts for exhibiting at trade shows and attending workshops. You get a full-page listing in our annual member directory that goes to the media and to libraries, etc.

For more information about the IMA, or to order a copy of the Recommended Practices for Enhancing

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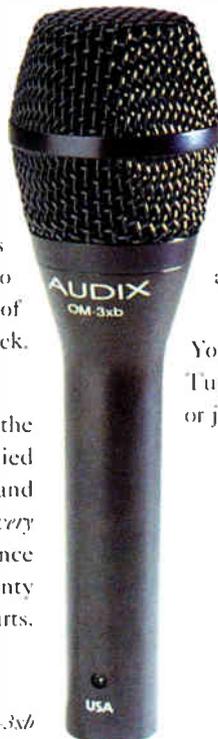
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MDG

Tim Boyle is executive director of the Multimedia Development Group. He is also a member of the San Francisco chapter of the IICS. He holds an MBA in marketing and finance. Boyle has a background in banking, as well as microcomputers and multimedia, including such companies as Republic Bank, BusinessLand and the Hypermedia Group.

Given that there was already an organization for companies in the IMA, why was the MDG formed?

I represented the IICS to the San Francisco Board of Supervisors in hearings about jobs in 1993. And from that hearing, it was suggested by one of the supervisors that we introduce a resolution to foster the growth of the industry. I took on that task and shepherded it through the process. The IICS provided \$1,000 to underwrite the SFMDG, which was referenced in the resolution as an umbrella organization that would coordinate activities in the Bay Area.

The IMA originally represented hardware interests in this industry and chose Washington, D.C., as its locale because it perceived itself as a lobbying or regulatory body. MDG was formed because the IMA was not a market development-oriented trade association. And there was a clear need for an entity to organize the assets to help develop the industry. The IMA has since taken on a marketing person—because of the growth of this organization, the IMA has become aware of the need to provide those kinds of services to its members.

The IICS is a nice group of people. I applaud the work they've done, but they've had no impact on market development on the West Coast, and they're generally not perceived as representing developers' interests.

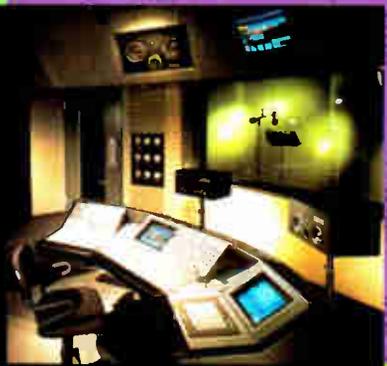
Is the MDG still regionally focused?

We dropped the SF from the MDG because there was confusion about our intent. Was it to develop San Francisco as the "Capitol of Multimedia," or was it to assist communities to address the needs of, as well as to facilitate interaction between, people and communities who were developing funding, servicing, selling and regu-

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lating. Our primary goal is the latter.

What is the nature of the current membership of the MDG?

At present, there are 450 companies. Approximately 250 are developers. Another 150 are service providers: 26 law firms, 15 accounting firms, marketing firms, etc. And there are about 50 technology companies, such as IBM, Intel, Microsoft and Apple. We also have 30 sources of capital and 20 universities and governmental agencies.

What projects and programs is the MDG currently working on, and what else do you have planned?

We have sponsored two major trade shows: Multimedia Expo and Digital Hollywood. We have also put on two major seminars: Publishing and Distribution last November, and Sources of Capital for Multimedia in August. Both had close to 600 people.

Then there are a lot of smaller events, such the ISDN Primer, Digital Video Workshop, Affiliate Labels Breakfasts. The trade shows and other events are all open to the public; however, MDG members can participate at a discount. We have a seminar planned for March entitled "The Idea is Everything; Owning and Protecting Your Multimedia Content," and another content-oriented seminar in April.

The geographical location continues to be based in the Bay Area, although you no longer claim to be a regional organization.

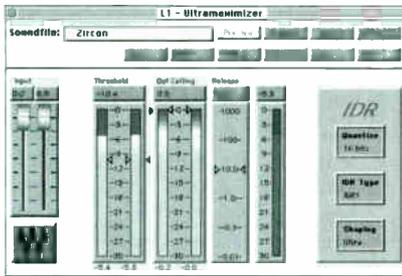
Right. Our purpose is to foster the growth of this business. Because of our work in group communications, we are developing a competitive advantage for the Bay Area. And as soon as we have adequate resources, we want to extend these face-to-face services to Los Angeles and San Diego.

We also plan to have a database on the Internet for people who want, for example, to find local legal help, or specific kinds of developers, or hotlines to technology companies.

For more information on the Multimedia Development Group call (415) 553-2300. MDG can also be reached at internet:info@mdg.org. ■

Paul Potyen is a Mix associate editor. He has not yet gotten so lost on the information superhighway that he has had to stop and ask for directions. He can be located at 71033.1523@compuserve.com and potyen@aol.com.

MULTIMEDIA CHIP SHOTS



Waves L1-Ultramaximizer

WAVES L1-ULTRAMAXIMIZER

The L1-Ultramaximizer from Waves Ltd. (Knoxville, TN), a plug-in for Digidesign's Sound Designer II and TDM systems, incorporates a digital limiter and implementation of Increased Digital Resolution dithering technology options. Use of the IDR technology in conjunction with the limiter is said to result in an 18dB improvement when converting from 20- or 24-bit masters to 16-bit files. A separate IDR setting is optimized for quantization to very low-bit resolutions (8- and 12-bit) used for multimedia applications. Functions include Threshold, Out Ceiling, Release, Quantize, IDR type, Noise shaping and input level trim. Price TBA, the L1 was expected to be available in March.

Circle #201 on Reader Service Card

OSC DECK II 2.1

Now available from OSC (San Francisco) is Version 2.1 of DECK, a Mac-based multitrack hard disk recording software package. It features six tracks on any Macintosh 660AV (eight tracks on an 840AV) computer with no audio card required. In addition, DECK II works with any Mac containing a Digidesign Audiome- dia, Sound Tools II, Pro Tools, RasterOps MediaTime or Spectral Innovations NuMedia card. DECK II can play back eight simultaneous tracks of audio on a single Pro Tools system with its new 8-TRACK TOOL, an extension to DECK II. DECK II 2.1 retails for \$399; 8-TRACK TOOL is available for \$129.

Circle #202 on Reader Service Card

GLYPH SCSI STORAGE PRODUCTS

Glyph Technologies (Ithaca, NY) recently introduced a line of SCSI

storage devices for the recording and multimedia production markets. The rack-mount units include a dual-speed CD-ROM drive; five hard disk units (248 MB to 2.9 GB); and a 3.5-inch, 128MB rewritable MO drive. The CD-ROM drive including Direct Sample software, facilitating digital sampling from any CD audio disc, is priced at \$895. The hard drive prices range from \$995 for the 248MB model to \$4,795 for the 2.9GB unit. All units can be adapted for Macintosh or PC.

Circle #203 on Reader Service Card



Mark of the Unicorn Digital Time Piece

MARK OF THE UNICORN DIGITAL TIME PIECE

Mark of the Unicorn Inc. (Cambridge, MA) announced the first full-featured desktop digital audio synchronizer. The single-rackspace Digital Time Piece provides conversion of digital audio synchronization formats as well as MIDI Machine Control and SMPTE time code. Digital Time Piece can convert any format SMPTE LTC input to Word Clock and has an internal time base that can simultaneously generate SMPTE, MMC and Word Clock. It allows multiple digital audio products to lock together with sample-accurate resolution. Sample rate is selectable between 44.1 kHz and 48 kHz. MMC is supported by and may be routed via Macintosh serial ports, ADAT, Sony 9-pin and MIDI. Suggested retail price is \$995.

Circle #204 on Reader Service Card

PARSONS BBS

Parsons Audio (Wellesley, MA) instituted a BBS service for Mac and PC users, offering a variety of resources to the New England pro audio community. Resources on the BBS include product information, purchasing advice, technical reference material, marketplaces for equipment and open forums in areas such as recording/production, sound for picture, CD prep, MIDI and sound

reinforcement. The service is free to preregistered customers. The BBS number is (617) 431-8463.

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MORNING STAR SOLUTIONS MACWAVEMAKER

The MacWaveMaker from Morning Star Solutions (Westford, MA) is a MIDI NuBus card that brings the full set of Kurzweil K-2000 and Mark 10 sounds to the Macintosh and provides independent MIDI In and Out ports. MacWaveMaker features 357 CD-quality melodic instrument

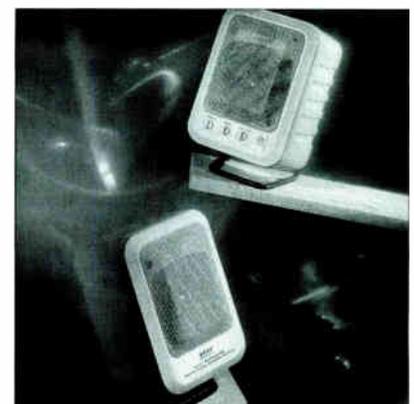
sounds, 15 drum kits with more than 400 percussion sounds, and true 32-voice polyphony. Priced at \$695, MacWaveMaker was expected to be available this month.

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AUDIO-TECHNICA ATUS MULTIMEDIA SPEAKER SYSTEMS

Two new magnetically shielded, powered multimedia speaker systems were introduced by Audio Technica (Stow, OH). The MMS 557 (\$149.95) features 10 watts/channel; the MMS 337 (\$99.95) is rated at 3.75 W/ch. Both systems use line power rather than wall transformers or batteries. Frequency response for the MMS 557 is 80 to 20k Hz; 100 to 18k Hz for the MMS 337.

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Audio-Technica Atus

by Philip De Lancie

CD-ROM AT NDR

NEW OPPORTUNITIES IN CD PREMASTERING

F

or most in the music industry, multimedia remains a buzz word, surrounded by hype, with little direct impact on their working lives. But a few pioneers are discovering a viable market in the field, one with real clients and real revenues. Among these early birds is Northeastern Digital Recording, a facility known, among other things, for its remastering work on the David Bowie and Frank Zappa series of reissues for Rykodisc.

For the last couple of years, NDR has been actively pursuing the business of premastering CD-ROMs. It has been a learning experience for company president Toby Mountain, who says he has found the CD-ROM business "energizing." To find out more about NDR's leap into multimedia mastering, I reached Mountain at the company's Southborough, Mass., facility, which he is in the process

of immortalizing in an interactive studio tour on CD-ROM.

Mix: *How long has NDR been offering CD-ROM services?*

Toby Mountain: We started in the spring of 1992. At that point, it was pretty meager. Nobody was really doing much. We were just getting things going and learning about it. It



Figure 1: Screen captures from *Dr. T's Sing-A-Long*, which NDR recently worked on.

took about six months before we were doing ongoing projects on a regular basis. And it seems to have escalated, so now we have a full-fledged room dedicated to that work. It is not nearly as busy as our two audio rooms, but it has gotten to the point where it is consistently busy.

What was the initial inspiration for getting involved in this area?

We have been using a Sonic Solutions system since 1989, and using the Macintosh for three or four years before that for regular office stuff. So we were pretty familiar with a lot of the different capabilities of computers. I've always been interested in those areas, and I've kept track of the CD-ROM situation since it came along, which was soon after the audio CD.

After we got our CD recorder for the Sonic system, we realized that we could record CD-ROMs with the same equipment. We looked around and discovered Optical Media International in Los Gatos, California. They had a product called MacTopix, which we bought. It has since evolved into QuickTopix.

The first thing we did was to make a CD-ROM for ourselves, taking every

file we had ever created on a computer and writing it to CD-ROM. And we soon realized that this is a great archive medium. So we just sort of dove in, realizing that this could potentially be a good market. And it has been steadily accelerating since then.

Why did you think that CD-ROM work, as opposed to something oriented more to the recording industry, would fit in well with the work you were already doing?

Because I have an idea about where mastering is going. If you look at the history of mastering over the past ten years, you can see that it has encroached into the areas of some of the other post-production-type processes. And I think that will continue, and it will grow into the multimedia market. Our business services the CD. And if you look to see where the CD is going in terms of its role in the entertainment industry, you have to admit that it is going to encompass all sorts of media.

I doubt very much that the CD-Audio disc as we know it will exist in five years to ten years. I think it will all be mixed-mode discs or some form of extended-architecture disc.

[A mixed-mode CD is essentially a CD-Audio disc on which one track is used for a multimedia program playable in a CD-ROM drive, while up to 98 remaining audio tracks play on any regular CD-Audio player.]

What that means is that a mastering facility can very easily be responsible for larger areas than just audio. Any additional information that might be put on a release, such as graphics and text. And because I see the CD moving in that direction, I felt very strongly that that was something that we needed to learn about.

How important is your audio expertise to your CD-ROM clients? Do you play it up, or do you handle it as two separate businesses under the same roof?

We use our audio expertise to promote our CD-ROM services. At first we thought maybe we should hide the fact that we are a "recording studio." But we quickly found that our clients are very comfortable with our long history of working with the CD. They know that we understand the format, what it does and how it operates. We understand CD replication and glass mastering.

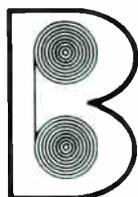
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As far as the skill sets involved, where do you see the common areas between premastering for CD-Audio and the work you are doing on CD-ROMs? Is it easier for you to get into this area than someone who has never done audio premastering, or is there really not much connection?

There is a generic connection in that you need to be very meticulous in your work. You need to follow the right steps when you are loading data and when you go to create your write-once disc. As with digital audio,

there are a lot of pitfalls to avoid.

For example, when you go to create a partition on a hard drive to hold someone's data, you need to make it quite a bit bigger than the size of the



"We are getting to see a new medium develop and creative stuff start to happen. It's been fun..."

—Toby Mountain

data, because every device stores its data in different-sized allocation blocks. So you could have something that the customer says is only 600 megabytes, and by the time you put

it in your partition, it comes out to 640 MB, but you only partitioned the drive for 600 MB. So there are all those little things that you learn, and every day something new comes up.

In terms of specific skills, the obvious ones are related to working on the computer, understanding how computers work and how SCSI works, and understanding all the ins and outs of the various platforms such as Macs and PCs. Those are things I learned using the Sonic System and Sound Tools.

As far as the actual tasks you perform on the computer, though, are the two operations quite different? Or were you well-prepared when you got into it with a specific set of things that you already knew how to do?

When we bought MacTopix, we had to learn it completely. I wouldn't say that there are many specific skills that are the same, but the mindset is the same.

How about the gear that you use? Are you using the same systems for both applications, or are the setups customized enough that you leave a system dedicated to CD-ROM?

—CONTINUED ON PAGE 174

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"Z" DEBUT



Tucked away in the industrial zone of North Hollywood is the infamous creative center known as Joe's Garage. It is here that Ahmet and Dweezil Zappa created *Shampoo Horn*, the first album from the band "Z." The project began in February of 1992. After laying down 54 numbers, the whittled-down final selection of choice instrumental excursions and "songs" defies description in the great tradition of their papa, Frank Zappa. (A "shampoo horn" is a hair trick done with suds.)

Twenty-four-year-old elder brother Dweezil has previously released three throbbing solo trips, *Havin' a Bad Day* (1986), *My Guitar Wants to Kill Your Mama* (1988) and *Confes-*

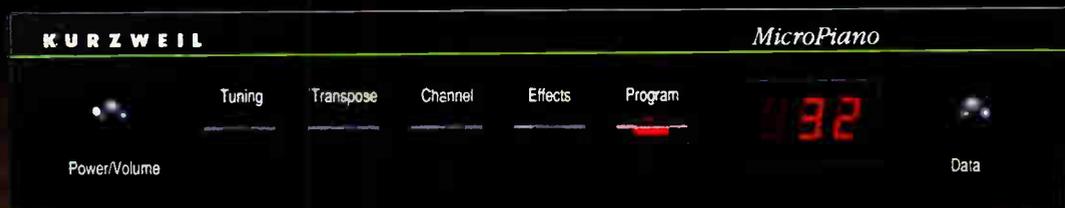
sions (1991). Nineteen-year-old Ahmet has been honing his vocal chords in anticipation of this first glorious assault on the sleepy ears of the world. Contributing to this treasure trove of bold thought, tough rock, mixed nuts and human concern are Mike Keneally ("piano abuse," guitars and vocals), Scott Thunes ("low-sounding instrument"), and drummers Terry Bozzio, Toss Panos, Tal Bergman, Mark Craney, Morgan Agren and Keith Knudsen.

As I awaited the Zappa brothers, I kicked back in Joe's Lounge and reclined on pillows covered with various T-shirts from the vast Zappa concerts and album history. On the wall is a photo of father Zappa scribbling



PHOTO MR BONZAI

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onstage. "Writing out the set list before a show," explains resident engineer Marque Coy, who has taken care of sonic duties for the last 15 years. "We never knew until the last minute what was going to happen." In Joe's Bathroom is the historic poster of Frank on the throne. The basic package at the studio includes a Harrison 4832C console, Ampex MM-1200 24-track, Tannoy DM-12 monitors, Neumann U87s, AKG 414s, RCA DX-77s and Marshall guitar amps, plus other hand-picked items too numerous to mention.

Ahmet arrived in a 4x4 festooned with flames and introduced me to little sister Diva. Dweezil had just finished directing and editing the video for the song "In My Mind." He pops it into the VCR, and together we watch the rough cut. He drives his guitar mercilessly while Ahmet vocalizes. We retire to the control room and try to make as little common sense as possible. After all, it's the Zappa Way.

Bonzai: Is this the first in a series of albums stretching far into the unknown?

Dweezil: You betcha. It was my first total production job, and I learned many things along the way, especially since the studio was being built as we recorded it.

Bonzai: But isn't Joe's Garage a venerable old institution [immortalized in Frank Zappa album titles]?

Dweezil: Well, this facility really didn't become Joe's Garage until about four years ago. The studio has only been up and running for about two years. Before that it was a nice rehearsal space, the warehouse where Frank rehearsed for 15 years.

Bonzai: Was that so the neighbors weren't disturbed?

Dweezil: Well, we don't actually live around here, so we wouldn't care if we disturbed the neighbors. Frank just needed a big space for a big band, and so this whole building was one space that stored the equipment when it came in off the road. To rehearse, he would set up a big stage in the middle. The way it sounded was *brutal*, but we've taken care of that. And I think it's still one of the best rehearsal spaces in Los Angeles.

Bonzai: Do you guys live together?

Dweezil: Yes, in the same house we've lived in for our entire lives.

Bonzai: Is this the Harrison console

that used to be up at the home studio?
Dweezil: Yes, a holdover from the Utility Muffin Research Kitchen.

Bonzai: Were there any surprises working here on the album?

Ahmet: We discovered that you couldn't punch in with this machine.

Dweezil: Actually, *sometimes* you couldn't punch in, but you always knew you could not punch out. If you punched in, you had to go to the end of the song. If you punched out, it would go "pffffffft." We thought we had a crazy magnetic problem, and we never got it really figured out. Eventually the machine had to be completely dismantled and totally rebuilt.

Bonzai: Did these technological challenges perhaps enhance the finished record?

Ahmet: Sometimes it was a bitch, but luckily I am so talented that we never have to punch in for vocals.

Dweezil: Ahmet's a first-take-performance kind of guy.

Ahmet: I just booze it up and go right in there—not a problem.

Dweezil: He's so toxic that by the time he goes in...

Ahmet: I can't even stand. I have a wheelchair next to me when I'm recording.

Dweezil: Through the whole process of recording this record, we used video communication because there is no window from the control room. The only way you can see into the recording rooms is with video, and we taped a lot of the action. But we could never see back into the control room, so we have all kinds of things that were going wrong from the beginning. We worked on one track for about 45 minutes to get it down, and then we recorded it fresh. Terry Bozzio's playing drums, and we go, "Let's check it out." We're waiting and waiting and waiting to hear it back in the headphones. I say, "Marque, what's the problem?" He comes back with, "Oh, I thought you said you wanted to record over that." He had erased what we thought we had just recorded.

The other process that was highly entertaining was the changes that Ahmet went through. When we started the record, he had long hair, but it kept getting shorter and shorter until it was actually shaved off. And when he sings, he strips down to his boxer shorts and holds a buck knife. He mutated during the project.

Ahmet: Well, you have to defend yourself when you're in there, be-

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Bonzai: On "Rubberband," how did you get such an amazing sound?

Dweezil: That's a fretless guitar that I had just gotten that day and was goofing around with, first day of recording. I called it "Rubberband" because there are some weird things happening with time, with a real elastic quality. Plus the fretless nature of the guitar means that nothing is a hundred percent in tune. To have perfect intonation, you have to play right on the fretline, and that's not possible when you're doing chords and other stuff. There is a wavering tonality that added to the tension of the rubberband concept.

Bonzai: You have some great drummers on this album, including Keith Knudsen of the Doobie Brothers.

Dweezil: I did a tour with him in Japan, playing with Eikichi Yazawa—he's like the most popular Japanese entertainer of all time. We did 14 nights at Budokan. He could do three nights at Tokyo Dome. Keith and [ex-Doobie] John McFee have been in his band for the last ten years.

Bonzai: Did you like Japan?

Dweezil: I was there for three months, and I love it there. We want to go back with this new band. The stuff we do on stage has so much detail, which the Japanese like. We do a medley of 200 songs from the '70s in only 20 minutes. A musical time machine. I don't think there is another band who could play it, or would *want* to play it.

Bonzai: What about this song on the new record, "Mountains on the Moon"?

Dweezil: I broke the recorder on that one. You could actually see the discoloration of the tape because I was going insane. It was the last solo on the record, and I had a very specific idea in my mind, but when I wasn't able to do that with my hands it was pissing me off. I couldn't be satisfied with anything but what I was hearing in my head, and I didn't get that until I had worked for three days and done 1,500 takes—nothing but playing that solo over and over again. I didn't want to do any punches. I just wanted to play it. I wouldn't punch in, and I wouldn't save any of them. Sometimes I would just play one note and stop—"No, it's not right!" I had a specific idea of how I wanted the pick to attack the string. No one could hear it, just me. Finally I got it. Now I can play the song.

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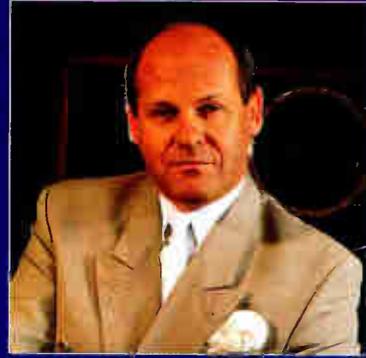
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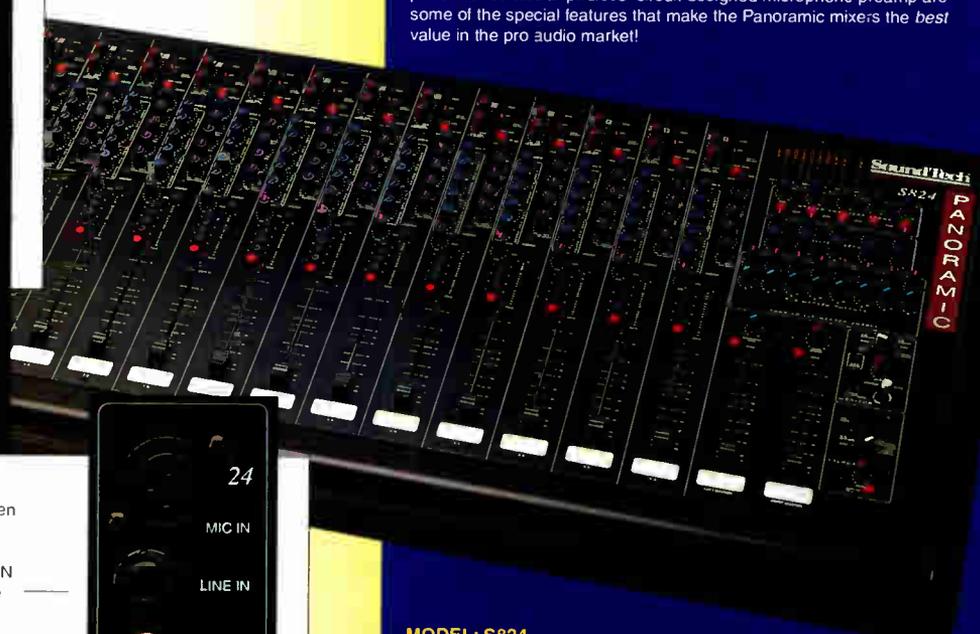
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play the solo, without a care in the world. But for a while, I was struggling with the dragon.

Bonzai: What did the rest of the guys do during this ordeal?

Dweezil: They were just laughing at me.

Ahmet: He would spend whole days in here on the solo, and then recording with him afterward, he was the biggest asshole in the world, because he was still chained to his mind.

Bonzai: How many guitars do you have, Dweezil?

Dweezil: Seventy-seven. I need to have 300 before I am willing to call it quits.

Bonzai: Ahmet, do you play any instrument?

Ahmet: I play every single instrument—but it doesn't sound good. I can't actually play a tune.

Bonzai: What about "My Beef Mailbox"?

Ahmet: It's a song about writing love letters to your loved one on a piece of beef...

Dweezil: And sending it through the U.S. Postal Service. Like on a filet mignon, a T-bone. For upcoming records, we are planning "My Pork Mailbox" and "Chicken Mailbox." It's gonna keep coming back.

Bonzai: Tell me about "Shampoo Horn," the title track of the album.

Dweezil: I'd love to record that song with an orchestra one day. The melodies and the harmonies are quite nice. I think it would benefit from a different incarnation. Some of my dad's music sounds amazing when done like that: He wrote and recorded with an electric band, and then had some of the songs done classical, like "Dog Breath Variations" on *The Yellow Shark*, and "G Spot Tornado" is amazing.

Bonzai: What was the first music you can remember hearing?

Dweezil: It would have to be Frank's music.

Ahmet: I loved Frank's music, and the Muppet song.

Dweezil: I loved "Peaches in Regalia" from *Hot Rats*.

Bonzai: I love that one too—and I can hear something akin on your record. By the way, do you guys have any business tricks that you could share with aspiring musicians?

Dweezil: I'd love to say that we do, but since we haven't achieved a level of success that we're comfortable

with, I wouldn't say that our advice would be worth much.

Ahmet: Try to do as much as you want to do.

Dweezil: In the work that you do, make it your best work. Make it work that you are happy with. Ultimately, you can achieve happiness through that. If you are trying every little gimmick to advance your career, and sacrificing what you do...

Ahmet: It may work, but we don't know how to do that.

Dweezil: It may work, but you may not even enjoy the result in the long run. There are tons of bands that be-

come popular for five minutes—here today, gone later today kind of bands. That's not what we're doing this for.

Bonzai: Do you think that Z will have a long and robust life?

Dweezil: We hope so.

Ahmet: We are going to steal the Grateful Dead audience away.

Dweezil: The Grateful Z.

Ahmet: The Great and All Powerful Z. ■

Contrary to popular legend, roving editor Mr. Bonzai was not the human model for the cover of the Mothers album Weasels Ripped My Flesh.

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by Dan Daley

ON WALDEN GREEN

The technology that has enabled project studios to flourish has a “soft” side, as befits its alter-ego designation of “personal recording,” a term often used as a euphemism when trying to avoid commercial overtones. This soft side usually materializes when project studios run up against the exigencies of real-world zoning laws, maintenance costs and light-sleeping neighbors. The human side of project studios manifests itself in any number of ways, from socks

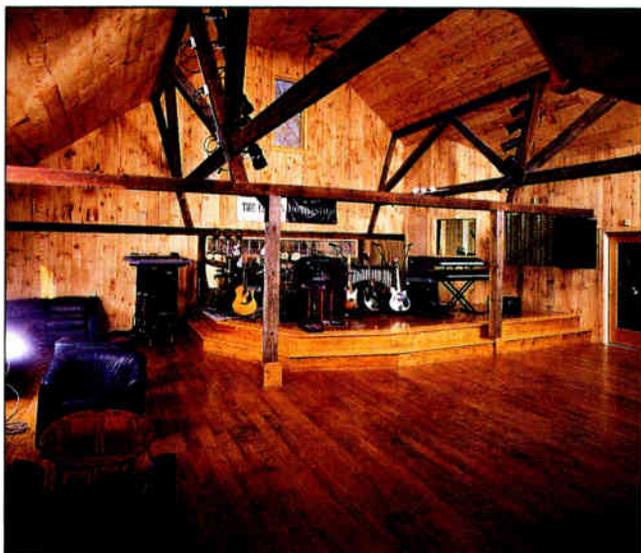
or cats on the console to the kids’ drawings on the outboard rack instead of on the kitchen refrigerator. When the client is not around—and that is usually the case—project recording becomes an intensely intimate affair: just you and the equipment and one or two musicians at a time.

That sort of intimacy is the basis for a mostly altruistic endeavor set in Massachusetts, in an appropriately called corner of Lincoln named Walden Green. Although Henry David Thoreau might have looked askance at the blinking lights of delays and reverbs, he would have understood that Walden Green’s version of doing well by doing good represents the essence of the American Protestant work ethic.

Walden Green is the work of Dr. Watson Reid, a physician and psychiatrist with a more than passing interest in the performing arts. But rather than limiting his affections to a hi-fi CD changer and a Bose stereo system, he built a recording studio in a barn on his property with the philosophy that no money would change hands in the course of its musical transactions. And if any of the proj-



Dr. Watson Reid at the Allen & Heath console in Walden Green.

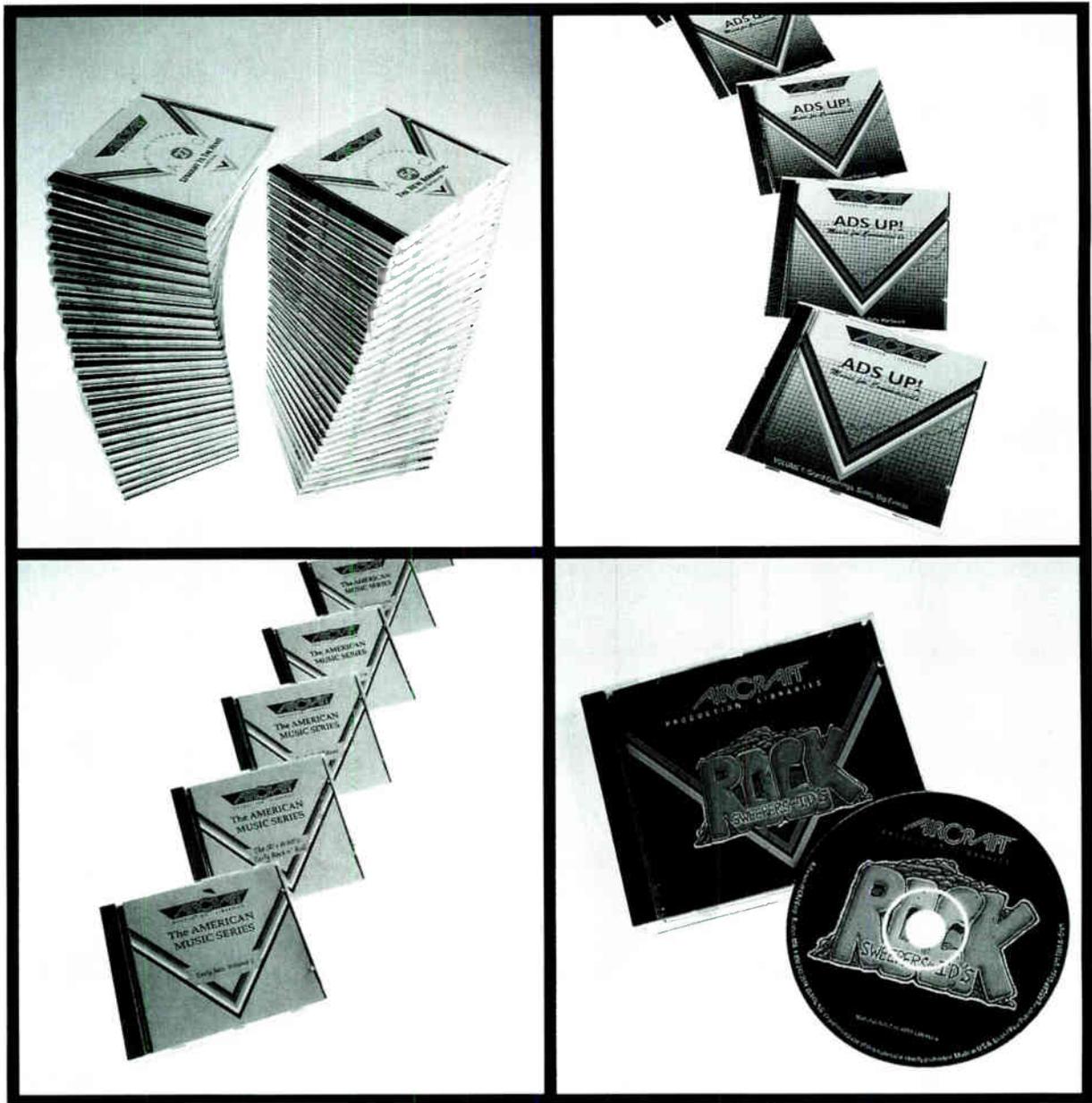


Built into a pine-paneled barn, Walden Green’s recording space can hold as many as 100 musicians.

ects do generate profits, he stipulates that a royalty be assigned to the local Broughton Charitable Foundation, which among other things, funds the Lincoln Day Care Center. Users of the studio compensate Dr. Reid by contributing their talents to his own

PHOTOS: PETER DREYER

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projects in a sort of communal approach to music that fits comfortably into the socialized artistry that has long been a part of Arlo Guthrie territory: You can get anything you want at Alice's Project Studio.

The equipment at Walden Green is definitely not the soup-kitchen variety. The console is a 32-input Allen & Heath Saber with MIDI muting. Storage is handled by two ADATs with a BRC remote and a DAT deck. There is a respectable selection of microphones and outboard gear, and MIDI is well-represented by Kurzweil and Roland synths, a Mac II with a 20-inch monitor and Opcode and Passport sequencing and editing software. Monitoring is handled by Westlake and Tannoy speakers.

The space was designed by Rosati Acoustics in a pine-paneled barn built in 1906. A heavy STC restriction in the insulation contains sound levels up to 110 dB. The 32x44-foot space can hold as many as 100 people and has its own Ashly and Klipsch P.A. for performances. MIDI, cue, line-level and mic-level signals can be sent in

any combination to and from the stage, iso booth and control room patch bays, via custom patch panels designed by Rosati. A bar and a pool table seem to make the place instantly convertible into a comfortable redneck joint on a moment's notice.

But Dr. Reid is hardly a redneck. He's had a few career changes in his life, from internal medicine to psychiatry to psychopharmacology. As a guitarist, he's part of a long tradition of musical medicos (or medically inclined musicians, depending upon your point of view) and he's quick to point out that the Greek god Apollo was the patron of both healing and music. Reid formed a local band, the Lincoln Continentals, in 1991. It was a group of doctors, lawyers and a couple of Berklee grads playing country rock for benefits. Reid began acquiring P.A. equipment that soon threatened to take over his living room, prompting him to convert the barn into a rehearsal and performance space.

In the summer of 1992, Reid met Rob Rosati, of Rosati Acoustics in Boston, an acoustician and studio designer who had worked with Tom

Scholz and who had designed the audio/visual components of the Kennedy Library in Boston. "He got me thinking about developing the barn into something more than just rehearsal space," Reid recalls. "That's when I first started thinking about a recording studio."

Since the conversion from barn to studio, Reid has done a few projects, including a reciprocal arrangement with local producer and engineer Bob Kempf, who worked on one of Reid's recording sessions with blues artist Peter Parcek, after which Kempf produced Parcek at Walden Green. Reid has also done a similar reciprocal project with Boston jazz band Ribs.

"The thing about this setup is that no one thought about money," Reid explains. "I was able to provide space and equipment, and they were able to teach me something about music. That's the real benefit of Walden Green: that it provides an opportunity for people to interact."

In terms of equipment, Reid chose the ADATs himself based on what he'd read and heard about them. "I was one of the first people on the waiting list for them before they

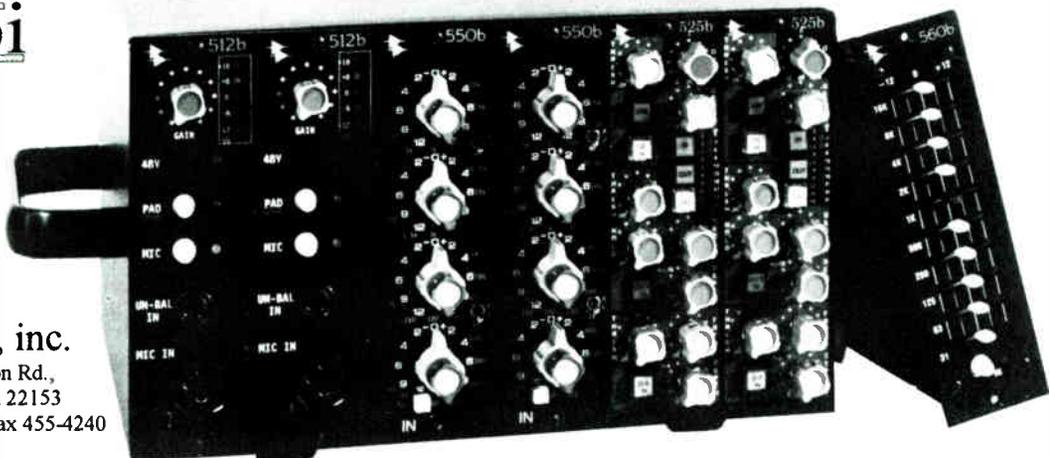
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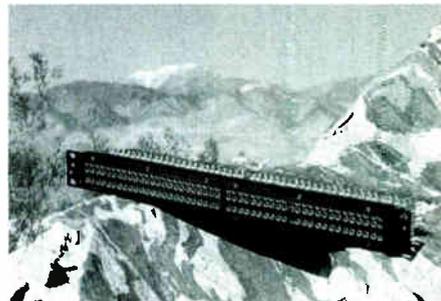
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came out," he says. Rob Rosati made the console choices (there's also a Soundcraft P.A. mixer out in the room), as well as designing the studio's layout with an elevated control room looking down on the recording room.

As far as the charitable intentions are concerned, nothing done at the studio so far has generated any profits, but things are aligning themselves in that direction. There is a children's record project in the discussion stage, and a local AM radio station, 1120 Walden Radio, is talking about broadcasting concerts from the barn intended to benefit a local children's aid society. A benefit for the New England Conservatory, upon whose board Reid sits, is planned for the spring. Ultimately, Reid plans to do his own album, recorded with a local rock band with whom he'll exchange studio time for their musical contributions. And several staff engineers from Decca Records in London have been over to look at the studio as a possible site for recording Handel and Hayden chamber ensembles.

Reid has hired a full-time consultant, Berklee graduate Kevin Driscoll, to manage the studio and its projects. All this has led Reid to give up his private medical practice and his spot on the staff of a local hospital in favor of pursuing a musical and recording career.

"It's all definitely changed my life," he says reflectively. "As the studio evolved from a rehearsal space into a full-blown recording environment, I realized that I was more interested in what the studio could provide to me in life. Not only with the technology, but with the exposure and interaction with musicians and the creative process."

And that could easily be the legacy of the project studio: as personal and introspective as it allows people to be, the concept has also brought people together in ways that traditional studio environments never could, given their commercial considerations. Though not everyone has the luxury of ditching well-paying careers in favor of music, the project studio concept is a flexible one, and it's waiting at home for people who have to do other things for money. It's easy to concentrate on the technology, but it's also nice to remember now and then that it's ultimately about music. ■



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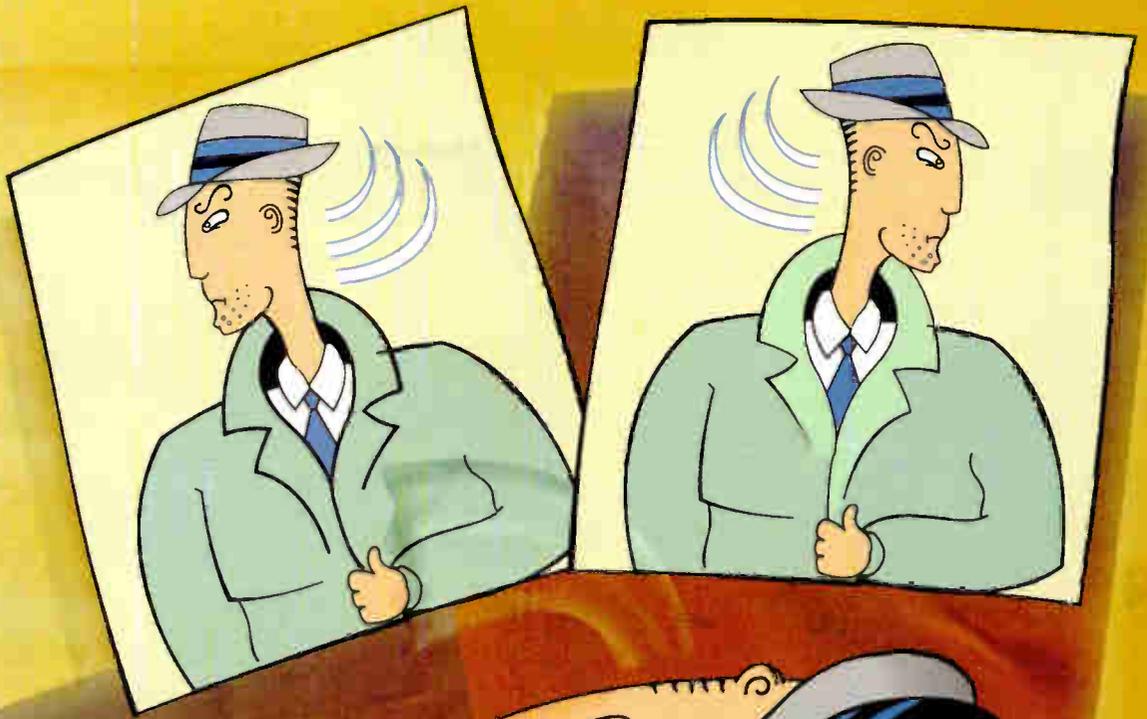
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Secrets **OF** Success

In The Recording Studio Business

BY CHRIS STONE

ILLUSTRATION BY JACK MORTENSBAK

The recording industry today offers a cornucopia of opportunities, challenges and mystery—not to mention pitfalls. Unlike years past, today's world business environment is an unfamiliar road map. We are no longer recording studios. We have become professional audio service centers. Where are we going? How do we get there? What is the next trend? Okay, if we don't know that, then what should we do? What are the secrets of survival? Once we know that, maybe we can make a decent profit!

Generalizations abound. Diversify or Die! (I said that ten years ago.) Audio and video are coming together. Niche marketing is the only answer. Motherships and satellites. But what about the individual problems of your situation? What is going to work for you?

To find out how large and small successful operations do it, I spoke to studio

owners involved in post and music in the U.S. and London: producers, engineers, managers, A&R people, and even a curmudgeonly U.K. pro audio journalist who knows and does almost everything. All of these winners have been in the industry for at least ten years. In my eyes, that qualifies each of them as a survivor.

From the business point of view, Howie Schwartz of Howard Schwartz Recording in New York City (and current president of SPARS) said it best: "Client services, marketing and mixing are the three main components of a successful studio. As the CEO, you can't do all three. Those hats just don't all fit the same guy. If you are a mixer, find somebody to replace you or find somebody to take care of business. You can't collect money from behind the console."

I agree. Record Plant worked from the beginning because I was business and my

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World Radio History

Ocean Way, Sherman Oaks, CA

partner, Gary Kellgren, was creative. He did the mixing and made all of those decisions, and I found a way for us to pay for what he decided we had to have and do in the studio and control room to stay ahead of the competition. That meant I played the role of the tough guy to make sure our clients paid for the services we furnished.

One of our first successful rules was that Gary never said "No" to anyone. He had to get along with the clients and make each of them feel special. If he could not say "Yes," he would tell them they would have to talk to me. I was the only one allowed to say "No" to a client, to discover who was real and who was a flake, because I was not involved in the creative process of making the music. My job was to make all of the decisions concerning money—to provide the grease to make the creative end-product better, and then to market our services and promote our success stories to show that we had the reputation of doing it better than our competition.

Important Axiom: find partners who do what you don't do and listen to them, trust them, and let them do

what you don't do so you can do what you do better.

Jim Mandell, president of Interlok Audio Post in L.A. and author of *The Studio Business Book*, says, "For our new edition, I have just spoken in detail to 21 studios in North America about how they manage their businesses successfully. The results are surprisingly similar: To be successful today, you have to align yourself with picture. Picture is now an essential part of sound. Unless you are an artist/composer yourself, and your own main client, recording just music today is a real uphill battle. It is no longer simple to get into this business. Today you must take one of two paths: Invest heavily and become multifaceted, or pick a niche in your market and exploit it to become the most noticeable and the best at it. Also, become an expert in the used-equipment market. Never be the first person in your area to own a new type of equipment, because the price will seriously drop after the first year as other manufacturers compete; or it will just disappear."

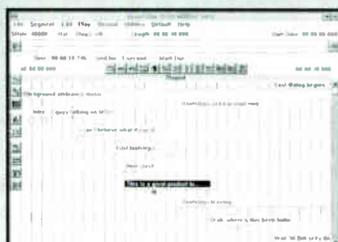
But what about the clients? How do they feel, and what turns them

on? We asked producer/engineers Eddie Kramer and Ed Cherney, producer/engineer manager Jim Phelan, and VP of A&R for A&M Records Larry Hamby to tell us what attracts them to a particular studio. They agreed about almost everything.

"What attracts me is cleanliness," Cherney says, "that everything works, and a friendly, considerate, articulate staff. It starts when you call to book time. You want to talk to someone who is knowledgeable, can confirm the room and the rate to you, and is going to be able to handle whatever your setup is. You want people who know what you are talking about and can commit to fulfilling your needs. Many times, you have to talk to people who are just put behind the desk and aren't knowledgeable about your request. That's a bummer. If the studio isn't taken care of cosmetically, then you wonder about the reliability of the equipment. You want to work in a place where everybody takes pride in working there, not with people who are just putting in their time or who are burnt out. The assistant is the representative of the facility when you are

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in the studio, whose attitude makes or breaks the studio's reputation with the musicians on the street."

Kramer, who has worked with Jimi Hendrix, Led Zeppelin, Kiss and many others, adds, "The atmosphere of a studio is really important, from the nonsnooty attitude of the owners to the lounge area for the artists and a separate office for the producer. How is it lit? Is it the proper environment so you are always comfortable and have nothing to complain about? So you have no excuse but to create the best music [you can]. It's got to be like home."

Hamby and Phelan, speaking from the point of view of protecting the various creative people they each represent, agree about the importance of "the right vibe—if you have to ask what that means, you don't have it. It is the difference between Spandex and flannel. Less glitz and more comfort. That is what's important today. There are a lot of trappings that used to go along with recording that are now less interesting to the alternative bands that have become the mainstream. Today, it is much more difficult to tell what equipment was used on a record once it is finished. More

and more of the artists are setting up home situations to record at least some part of a project there and then take it to a professional studio and transfer it to whatever format they want. The days of uncontrolled spending are over for most acts. Even the artists who can demand the higher budgets because of their sales are spending their money more carefully. Today, the artist who does not have some kind of home facility is the exception. To stay successful, I believe you have to accept that as fact and adapt your professional audio service center accordingly."

We decided to test these theories in London, that exotic studio market across the Atlantic where several of the world's most famous consoles are made, and where a great number of today's popular sounds and effects were formulated in the '60s and '70s. To compare the British and American markets, we called upon Neville Farmer. Farmer describes himself as "well-known in the industry as an incisive and controversial writer and industry commentator, who also has many other strings to his bow." He has probably been in every decent studio in Europe and elsewhere, knows artists and producers everywhere and is a highly respected European music industry analyst.

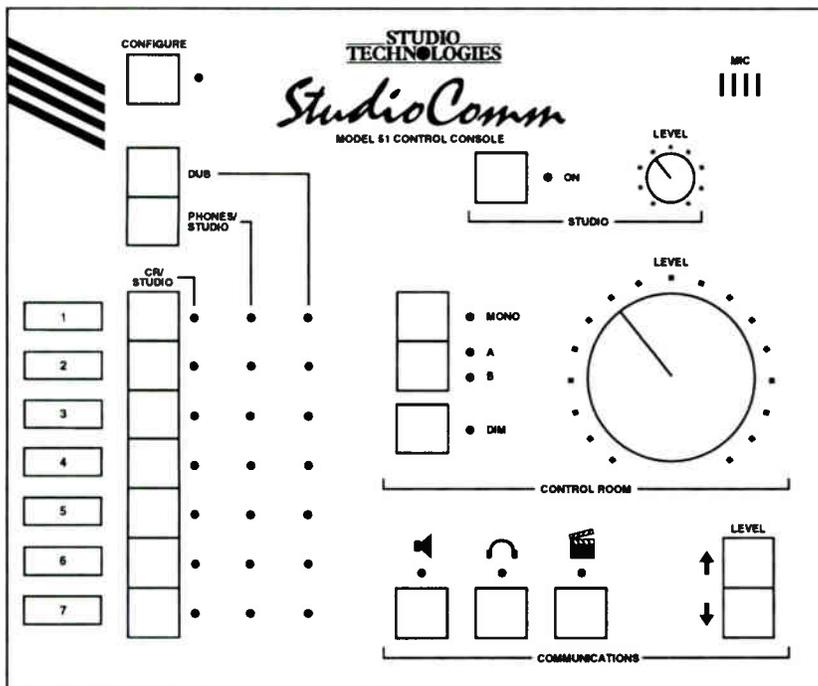
Farmer says, "As artists are given private production setups as part of their advance, their increased involvement in the production role, combined with the need to cut costs, means that working in commercial studios for overdubbing and mixing is more likely to involve the house engineer. This is great news, because the previous prominence of freelance superstar engineers and mixers had dissuaded studios from training their own, and Britain, in particular, has depleted its crop of quality young engineers."

"For the future, the days of the super studio are by no means over. London can probably maintain ten or 15 \$1,500-per-day rooms, but it currently has around 50. The remainder need to be able to operate profitably at a more modest level of between \$500 and \$1,000 per day." Sound familiar? The global village of recording has the same equipment and the same economic problem of oversupply. Perhaps if we continue to join forces, we can mutually share information and help each other solve noncompetitive problems.

So, where are we going, and what

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is the quickest way to get there? Diversification seems to be a pat answer, but it works. John Fry, owner of Ardent Studios in Memphis, is an excellent example. Twenty-eight years in our business and still on the leading edge of almost every trend, Ardent is not only a world-class music recording facility; it also has its own record label, publishing company, manages producers and engineers, has been involved in video and film for ten years, and has made a serious commitment to interactive multimedia over the past year, after studying that market and its potential for two years.

Fry contends that Ardent's secret to success is its people. "They are either going to make you shine or keep you kind of ordinary. Anybody with a big checkbook can buy hardware, but they can't necessarily do something beneficial with it. We try to help our folks grow. We try to pick out new employees who have a genuine interest in other people and what is happening to them, and who care about what they are doing. You are not going to change a person's personality in a dramatically positive

way after you have hired them. They have to show you they are that way in the beginning and that they have potential in your environment.

"We have one person who is now a Platinum record producer, who started out answering the telephone at night and has grown with the company over ten or 12 years," Fry adds. "We have tried to find good people who have the capacity to grow and then have given them an environment where they could achieve that growth without having to move on to another organization or another city. This is one of the main things that has led us into so many areas. Giving them a voice in their future, I think, is much more important than a better incentive plan. That, and treating our clients the way we do because they are important to us as people rather than someone who is passing through and only represents a certain amount of business.

"My crystal ball isn't any more clear than anyone else's," he continues, "but one thing we always try to do in this service industry is try to get ourselves into situations that will increase the net worth of our business. That is

why we are involved in production and publishing and our record label. We have the production capacity in terms of time available in our studios and try to use that asset effectively in order to build additional equity in our business. We try to think of additional ways to use all of our assets, people and hardware to enhance our reputation, which will give our business the most possible value.

"We spent two years studying interactive multimedia and started hiring people and investing in hardware and software for that area over a year ago," Fry says. "We just felt it was a new market we had to become involved in—an opportunity where we needed to be on the front end of the learning curve because of its potential for the future. We are already producing interactive media programs for various types of clients, using our new-found knowledge and skills as an extension to the film and video business we have been in for over ten years.

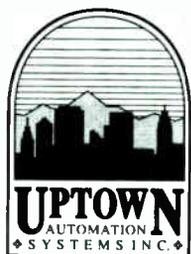
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and point-of-sale information," he adds. "We are also working on some home entertainment projects, even though there are still many questions to be resolved about which delivery systems will be the most popular. I don't think there is any question that interactive presentations of various kinds are going to play a bigger and bigger role in entertainment. The last time video had a big impact on the music business was roughly ten years ago when MTV started up. Everyone then thought there would be a big home market for some software format of that product, and they were

wrong. With interactive applications, I think we have a chance to try again. If somebody can come up with the creative concepts that will work in CD-ROM or some other area that is entertaining, I think you are going to see a new medium of expression that is valid for artists and that is going to create a significant new market for our services. I think the potential exists for this to become a major part of our business. I don't think it is for all studios, because there is a range of special skills that are necessary in order to compete, which are probably not part of the knowledge of

'music recording only' studios."

Those same beliefs are repeated by Nomis Studios in London. Owner David Panton, with six rehearsal rooms plus a world-class studio, has learned how to better use what he already has. He recently concluded a partnership arrangement with The Sanctuary Group PLC, which manages Iron Maiden among other groups, and with them has started a new record label with veteran UK A&R man Dave Ambrose.

When we asked Panton what he thought the future was for multimedia, his usual enthusiasm was abundant. "Vital! Multimedia is beginning to be the next boom market for the entertainment industry, especially in Europe," he says. "Music studios that have the relevant technology in-house will dovetail with the multimedia companies to provide a full one-stop service. We are already in discussions to house a major international multimedia company at Nomis. The reason they want to do it with us is because of our extensive technical facilities, our location in London and their desire to open up in a major way in Europe."

Dallas Sound Labs owner Russell Whitaker, who started his studio in his Austin, Texas, bedroom, doing demos with Stevie Ray Vaughan, almost got put out of business by a famous artist with his own studio who started giving away studio time just to take care of his friends. Now, Russell has one of the most flexible facilities around. He figured that he'd better be ready for anything. Now he does everything from heavy metal to interactive multimedia to enhancing phone taps for local law enforcement agencies. He feels that the future lies in interactive and in audio-for-visual. His favorite new client is a toy manufacturer in the area. He helped them with the audio for the computer chip in a sleeping Santa that actually snores! Russell says this about the future: "Our main business will still be video post and radio commercials, but I see us using that same equipment to expand into whatever new area comes along."

Maybe the secret is that you have to be ready for anything, and hope that what comes along is what you are ready for. ■

Chris Stone is a world traveler who convinces his friends to reveal their secrets.

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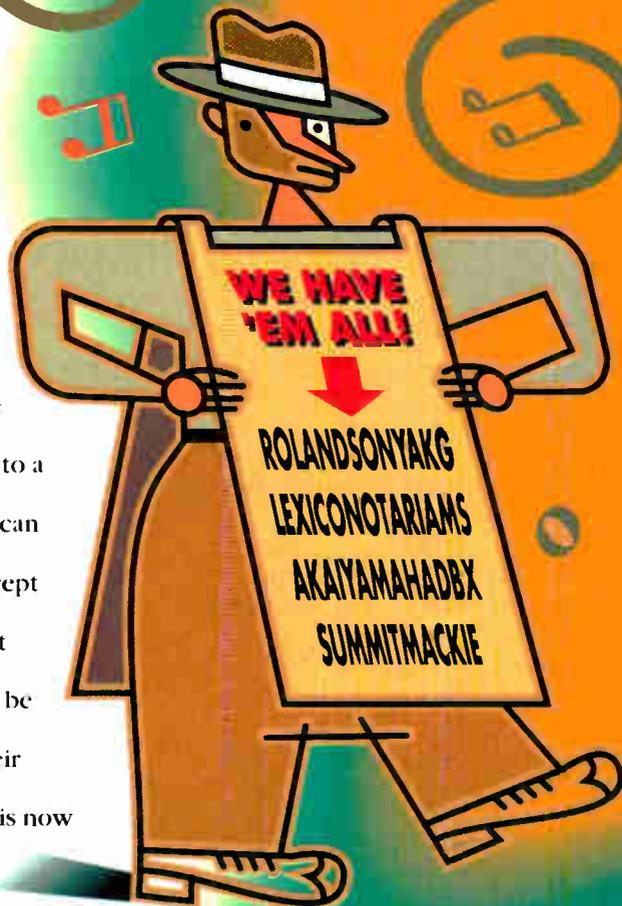
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by **Dan Daley**





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TAKING IT TO MARKET

In querying a range of project studio owners about the issue of marketing—or non-issue, as it is for some of them—a few general truths emerged. The first is that there is very little client interaction with the facility itself. Thus, the studio is not a selling (i.e., marketing) point in and of itself. That's certainly not the case for Power Station or Ocean Way or any of a number of other facilities that know they need to look as good as they sound. The corollary to this nugget is that those clients also couldn't care less about what equipment a project studio uses; all they care about is that what's handed to them at the end of the project is what they wanted and expected, again a very different experience from traditional studios, which make a point of using certain types of equipment—from vintage to exotic—as a marketing lure.

There are plenty of traditional studio owners who've learned that certain clients and market segments want certain consoles/tape decks/monitoring, etc., whether they know why or not. It's not as true as it once was, but there was a period in New York in the 1980s when, if you wanted major advertising agency work, you'd better have had an SSL on your equipment list, a demand often made by people who asked engineers, in all seriousness, "Can I hear that an octave faster?" This has given project studio owners an unheard-of luxury: to be able to pick and choose equipment based solely on personal preference and/or price, something the pro audio manufacturing community has learned.

If items like equipment and neatness are non-issues as far as project studio marketing is concerned, what are the things that project owners are addressing when it comes to selling themselves? The key element is the core of the studio—its owner. Basically, a project studio owner is selling his or her talents, and the studio is simply an extension of that person.

"I started as a musician, and that's how I still market myself, even as a studio owner," says David Peacock, who runs the ADAT-based Cutting Edge Productions in the Riverdale section of the Bronx. Peacock is aiming at two distinct markets: music and jingles. Each requires very dif-

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TAKING IT TO MARKET

ferent marketing approaches, he's found. A recent project with Clapton *Unplugged* mixer Steve Boyer came about via the most common project studio marketing tactic: word-of-mouth, which is how Peacock gets virtually all his music work at his studio. Boyer had given him demo projects to do, which led eventually to record work. The relative unimportance of equipment types is underscored here.

"Boyer gives me a DAT with a rough mix on one track and time code on the other," explains Peacock. "I'll go ahead and build a MIDI arrangement around that. What equipment I use to do it is immaterial to him." Marketing himself and, by extension, his studio, to music clients is done the same way he did it when he was simply a musician. "It's all word-of-mouth, especially in New York," he says. "There's very much a scene here, and you have to keep yourself in that loop to pick up work."

As far as jingles go, Peacock has found that the market in New York is more receptive to more traditional marketing ploys. He has sent one mailing out already and plans another for sometime this year, a simple postcard-type flyer that says who he is and what he's done. The mailing list of advertising agencies and music houses is gleaned from the Yellow Pages, abetted by some phone calls to find out the names of the people in music departments he wants the cards to get to. The next step is a follow-up phone call, which often is followed by a request for a demo reel. "This approach minimizes the number of reels you send out blindly," he says.

To some project studio owners, marketing is completely a non-issue. Steve Horelick, owner of Oasis in Hastings-On-Hudson in New York, says he's simply too busy to worry about it, a problem any type of studio would like to have. Horelick scores for television, with PBS as an anchor client. "When someone gives you 40 episodes, you've got work for 24 months," he says, "so you tend not to think about adding more work." Horelick echoes the equipment equation, saying that, "They're hiring me, not the studio," allowing him to shop price and personal preference when it comes to equipment purchases.

"The only thing I've given consideration to in terms of marketing is perhaps getting an agent. I have a friend for whom that's worked well for his project studio."

That friend is Gary Chang, a film score composer/producer/synthesist in the Los Angeles area whose credits include *Under Siege* and *Sniper*. Chang retained the services of Milander, Schleussner & Kaufman, an agency that specializes in representing film scorers. They take a percentage of Chang's work on a sliding scale that averages around ten percent, but Chang says that includes expenses and legal fees. "It's cheaper than if you tried to do all of this yourself with a lawyer," he says. "It's the only way to go, at least for this market. If you want a Warner Bros. film score, you'd better have an agent."

The studio, as substantial as it is with an NED Synclavier, doesn't exist as far as clients are concerned, he says. "It's transparent to the client. I don't charge for the studio; I charge for my time and talent. So everything I'm doing from a marketing point of view is done based on that, not on marketing the studio." Interestingly, Chang's situation puts more emphasis on equipment: He needs Dolby Surround for his scores, and his clients need to know that he has that capability.

The contrast between the situations and responses of Peacock and Chang are interesting in the context of marketing. New York remains a very interpersonally based, word-of-mouth town if there ever was one, especially in the areas of music and jingles. (Even the engineers are jumping into the networking thing: The Allied Pool Corp. is not a chlorine provider but a tweakster network recently set up in New York to connect engineers with clients. The emphasis is on dance and urban/contemporary, fertile ground for project studios in that region.) Los Angeles, on the other hand, prefers to keep the principals connected via middlemen—the legendary agents of Hollywood—not surprising considering that no talent ever can truly adequately represent themselves in Tinseltown, film scorers, actors or directors. Local industry traditions are something to keep in mind when looking at marketing.

Other traditional components of marketing take on minimalist aspects in the project studio realm. No one I spoke with advertises, simply because there's no venue through which

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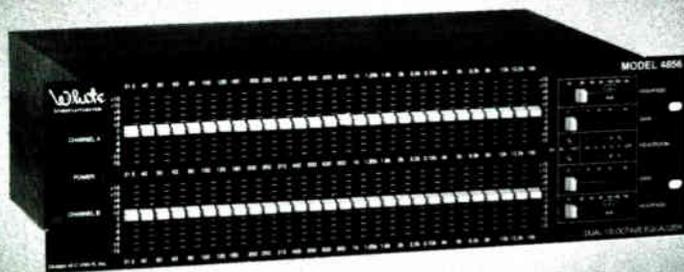
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TAKING IT TO MARKET

to do it. Trade publications are national in scope and not considered cost-effective for targeting regional and local markets on this level. There are some area guidebooks for cities like New York, Los Angeles and Nashville, but most project studio owners are either unaware of them or feel that they'd be overshadowed by the larger, traditional facilities listed. "I'd rather spend the money on equipment than advertising," says David Peacock.

As for media relations, the number of press releases coming across this desk regarding project studios is increasing. But the key here again is that the emphasis of these dispatches is on the person, not the studio. On average, I'd say the equipment lists are at least the third paragraph down, with the leads focusing on the accomplishments of the project studio operator. This is probably the most cost-effective area of marketing for project studio people to look at, and unless there's something preternaturally special about the facility itself, it makes sense to follow the herd at this stage and accentuate the human factor over the technology in press releases.

As far as comparative pricing, usually there's no rate card to use as a jumping-off point for price negotiations or comparisons among project studios. Thus, prices are set by a combination of free-market fluidity and nosing around to see what other people are getting for similar projects.

What it all boils down to is guerilla marketing for project studios. This industry segment is so unique that, while the fundamentals of marketing apply, they need adaptation in their application. In simple terms, analyze the aspects of the markets you're going after and see what approaches have worked in the past for those markets in your area. Marketing in Los Angeles may mean researching agents and reps, while in New York it may mean finding the right 6 p.m. watering hole. As fluid as the situation may be, marketing is something that project studios need to begin thinking about. And based on the press releases, some of them already have. ■

Dan Daley is a contributing editor to Mix.



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A User's Guide

How many times have you heard this studio adage? "This place would sure make a lot more money if only we had a _____" (fill in the blank with whatever "gotta-have-it" box that's popular this week). Yet, with few exceptions, that hot item rarely does the trick and often won't even pay for itself in terms of increased bookings. However, if you're in the right market, a sound effects library is an investment that may be an exception to the rule.

Let me recount a specific case where having a sound effects library paid off handsomely for a certain studio. About four or five years ago, my studio got a call from the GM of a local radio station, which was expanding into long-form (one-hour), English-language radio documen-

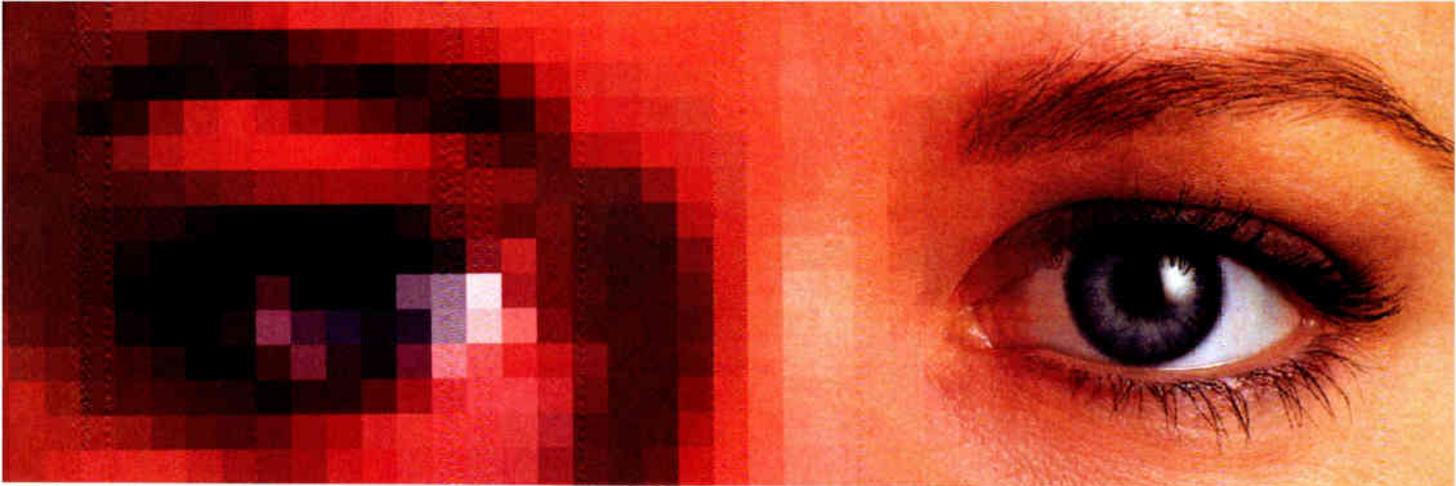
taries for foreign distribution. The only specifics he asked were whether we could do custom scores, whether we had EV RE20 mics for the voice talent and whether we had a sound effects library. The answers to all three were affirmative, but as a studio owner who usually caters to the musician market, I was surprised that this producer wasn't obsessed with consoles, vintage mics or out-board gear. To make a long story short, having a sound effects library led to years of monthly block bookings with a great client who paid bills on time and never complained about the studio's lack of a Jacuzzi.

To quote another adage, "your mileage may vary." Don't get the idea that buying a sound effects library will suddenly catapult you into

BY GEORGE PETERSEN



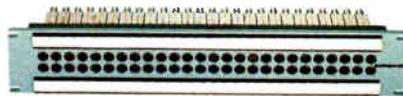
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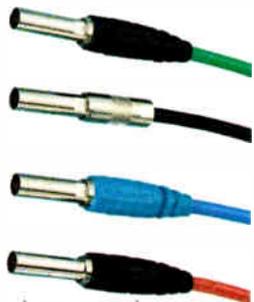
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Creative Support Services	213/666-7968; 800/468-6874	"E-EFX"	Electronic Effects	2	\$199
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The Hollywood Edge	213/466-6723; 800/292-3755	"Cartoon Trax"	Cartoon Effects	5	\$395
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The Hollywood Edge	213/466-6723; 800/292-3755	"Science Fiction Library"	Science Fiction Effects	3	\$295
Manhattan Production Music	212/333-5766; 800/227-1954	"Audiophile Sound Effects Series"	General Effects	5	\$395
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Sound Ideas	905/886-5000; 800/387-3030	"Universal Studios Library"	General Effects	5	\$495
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Sound Ideas	905/886-5000; 800/387-3030	"Hanna-Barbera Library"	Cartoon Effects	4	\$495
TRF Production Music	914/356-0800; 800/899-6874	Folkways Sound Effects Library	General Effects	14	\$65/each
Valentino Inc.	914/347-7878; 800/223-6278	Valentino Sound Effects Library	General Effects	46	\$1,200

Note: This chart of libraries lists the primary suppliers for sound effects on audio CDs; effects available on CD-ROM, sampling disks and other formats are not included. It should be noted that

several of the libraries listed here—such as Sound Ideas and The Hollywood Edge—may also be available through audio dealers and/or through companies that offer production music libraries.

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exotic new markets. A sound effects library is just a tool that may help you dip into new financial avenues. Looking beyond the confines of the commercial production and audio-for-film/video post-production realms, an increasing number of music projects these days involve adding sound effects to the mix, either for ambience or as musical elements.

The convenience of having sound effects in the CD format brings all sorts of advantages—such as instantaneous cueing for auditioning sounds or firing off effects during the mix. Additionally, punching in a track change command on a CD player is a lot easier than counting the bands on an LP and hoping the tone arm drops straight into the groove. Other obvious advantages are the disc's relative imperviousness to physical damage and the high fidelity of the reproduction, both in terms of frequency response and dynamic range. The latter two attributes are particularly important in sound effects production, whether capturing the crack of an M-1 carbine at close range or reproducing the spectral extremes of rolling thunder or shattering glass.

CD players are inexpensive, and amenities such as wireless remote controls do much to simplify the production process. However, if you're considering using a consumer CD player for sound effects applications, make sure the unit provides keypad access to tracks! Some players have track buttons for only the first 20 tracks, and accessing higher numbers—such as the 99 tracks frequently encountered on many SFX discs—requires pushing the track advance control once for each track.

After you've tried this routine a few times and pressed that button 78 times to reach track #98, you'll appreciate having a keypad for track entry. Another vital feature is the ability to access various index points within a track, as most CD libraries include sub-index data for precise cueing and control.

Of course, if more control is needed, sound effects from a CD can be loaded into a sampler. This approach offers several distinct advantages. Once the sound is sampled, effects can be synched to occur at precise SMPTE time code locations, via a simple SMPTE-to-MIDI converter. Samplers also provide a means of getting around that constant problem of what to do when you need to access two sound effects simultaneously from the same CD, such as "foghorn" and "seaside ambience," which invariably are placed on adjacent tracks on the disc.

By multisampling from different parts of the keyboard, different sounds can be auditioned, combined or blended to generate new sounds. The sampler's keyboard also simplifies the process for electronic Foley. Load in the appropriate footsteps, body falls, door slams, kick starts, etc., and matching screen action is a snap. Another plus that sampling offers is the ability to loop segments to create longer sounds, such as lengthening background walla and atmospheres.

Once sounds have been loaded into a sampler or digital workstation, the fun really starts. Chopping, flopping and cropping can yield nearly every sound imaginable (or unimaginable). Using a sound effects set as

a starting point, the attack of one sound could be merged into the decay of another to create a new effect that bears little resemblance to the original.

Pitch shifting—whether done via sampler, workstation, outboard device (such as an Eventide UltraHarmonizer) or simply VSO'd (or half/double-speed playback) on a tape recorder—offers plenty of creative options. I once searched for a windmill effect without success, but a door creak, looped and pitch-shifted down an octave, provided a superb simulation.

One drawback of buying a sound effects library is that the process can be addictive. You start out with one and pretty soon you're sure to want more. There are plenty of libraries out there to choose from, and now there's a trend toward "mini" libraries, usually consisting of a few discs that focus on a particular genre, such as The Hollywood Edge's "Science Fiction Library" or Sound Idea's "Hanna-Barbera Library." Such mini-libraries can be an excellent adjunct to a main library and may even provide a new source of creative inspiration.

Should your sound effects collection become too large or unwieldy to easily manage, a number of companies, such as Leonardo Software (Los Angeles), Gefen Systems (Woodland Hills, Calif.) and Sonic Science (Toronto) offer integrated software packages for indexing, controlling and cross-referencing large effects libraries with large multi-CD changers. Speaking of the latter, new and larger CD changers from Denon, NSM, Sony and Pioneer have the capacity for handling hundreds of CDs in a single unit. This new generation of mega-changers also includes such amenities as fast disc access (typically under ten seconds), RS-232 control ports and analog and digital outputs.

As for the future, look for more libraries, with greater selection, better audio quality (with the older analog libraries phased out) and a blending of technologies as new media become an integral part of audio production. One thing's for certain: Life in the SFX lane will become a lot more interesting. ■

Mix senior editor *George Petersen* is the author of *Modular Digital Multi-tracks: A Power User's Guide*, available through *Mix Bookshelf*.

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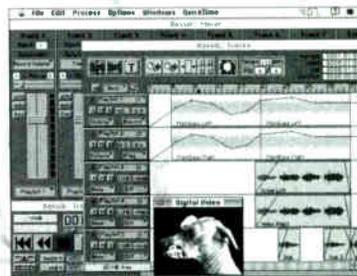
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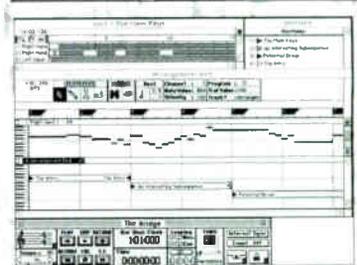
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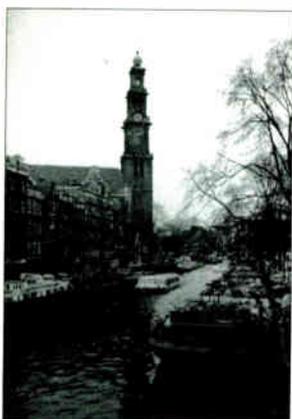


PHOTO: GEORGE PETERSEN

by George Petersen

For a variety of reasons, recent European Audio Engineering Society conventions have lacked the luster and excitement of their U.S. counterparts. However, this was certainly not the case of the 96th Convention. Held from February 26 to March 1, 1994 in Amsterdam, it proved to be one of the best AES shows in years.

First, the RAI Centre is an excellent venue, providing ample space for the 300 exhibitors within a single room. The host city, Amsterdam, has much to offer: The Dutch people are friendly (and most speak English), ho-

tels in every price range are plentiful, and there is no shortage of fine restaurants throughout the city. In terms of nightlife, Amsterdam has diversions of every kind, ranging from jazz and blues clubs to the city's wild and notorious "Red Light" district, where anything goes. In fact, I witnessed a large number of conventioners in that seedy section after hours—I, of course, was merely there as a journalistic observer.

The first day of the show included a presentation on the 30-year history of the Compact Cassette. Ironically, this Philips milestone was given a fairly low-key approach by this Dutch-based electronics giant, despite the fact that the cassette is the most important consumer tape format in history. Yet on the show floor, duplication technology had a high profile, and the AES provided numerous forums and seminars covering duplication and repli-

cation issues.

Microphone developments were plentiful. Audio-Technica brought on Alan Parsons (who is using only A-T mics on his new tour) as a spokesman to mark the world debut of its new AT-4050 CM5, a large-diaphragm, multipattern studio condenser mic priced at \$995, including shock



Audio-Technica AT-4050 CM5

mount. AKG announced the C12 VR, the "Vintage Revival" of its classic tube mic, including the original 6072 tube element. The \$3,999 C12 VR comes

in a flight case and includes shock mount, 30-foot cable, windscreen and power supply/controller. The latter allows the remote selection of bass roll-off or nine polar patterns. And Bruel & Kjaer unveiled the 4035, a high-performance condenser headset microphone with a 40 to 40k Hz bandwidth and extremely low self-noise.

On the workstation front, Akai showed an early prototype of the DR8, an 8-track version of its DR4d 4-track disk-based digital recorder/editor. Slated for delivery late this year, the DR8 will also include digital mixing (via an optional controller) and MIDI/SMPTE sync. Also new from Akai is the DD1500, a follow-up to the successful DD1000 optical recorder/editor. Designed for post-production applications, the DD1500 records up to 16 tracks on removable Sony 1.3GB magneto-optical discs and offers digital mixing and signal processing, SMPTE or Sony 9-pin sync, and timestretch, autoconforming, networking and other post-friend-

ly features.

SoundStation Gold from DAR combines the power of the company's flagship workstation with an assignable mix controller, edit control console and enhanced processing unit with hard disk and optical disc storage. Eight- and 16-track versions are available, with on-board DSP and dynamic automation as standard features. Options include autoconvert and Wordfit ADR packages.

Six months after acquiring the Wave-Frame product line, TimeLine announced its next-generation workstation, the Studioframe DAW-80. Based on an Intel/Windows platform, Studioframe offers eight tracks of recording/editing, expandable to 32 tracks. Designed by a synchronizer-oriented parent company, it's not surprising that Studioframe provides sophisticated machine control and sync capabilities.

Fairlight demoed its upgraded MFX3 12/24-track workstation, but with a twist—in addition to AES/EBU and S/PDIF I/O, a Yamaha-format interface permits connection of the MFX3 to Yamaha's DMC1000 digital console, bringing the all-digital studio from a lofty dream to an affordable reality.

The large-scale digital console remains a major area of interest among AES attendees. Lawo, of Rastatt, Germany, demoed its MC 80, a modular digital console design with up to 120 inputs, 32 auxiliaries, 32 masters and moving fader automation with instantaneous resetability of all console parameters; inputs/outputs can be analog, digital or MADi. DSP functions

include delay, -100dB notch filtering, 4-band parametric EQ and dly-



AKG C12 VR Tube Mic

namics (limiting/compression/gating). The first console is slated to be installed at German Television 2 this month, pricing begins in the \$500,000 range.

Designed for use with its D827 48-channel DASH recorder, Studer's new D940 digital console is available with up to 160 input channels. Eight mono and two stereo aux sends are standard, as are 48 monitor channels for tape sends/returns. The mixer also features one or two central assignable control panels displaying all parameters of any selected channel. An integrated matrix replaces patch cords with a programmable routing system.

Analog consoles were not ignored at AES: D&R launched Merlin, an in-line, 24-bus design with 12 aux sends, VCA snapshot automation, onboard dynamics and an Advanced Routing Matrix that digitally controls all console routings. Deliveries will begin in July. Tascam debuted the in-line M-5000, offering a 40-module frame with 24-group routing, three mute

groups, eight aux sends and integrated patch bay. VCA automation will be optional.

Speaking of automation, AD Systems offered a sneak peak of a retrofit automation board for owners of MCI 500 and 600 Series (as well as some Sound Workshop and Amek 2520 consoles) to upgrade to Optifile Tetra or LC automation. The process occurs via a simple plug-in board swap (one board for each 16 channels). According to a company representative, the install takes place in a "lunch hour." This should be good news for owners of problematic vintage automation systems and may put new life into old consoles.

Ready for a new DAT format? Audio Digital Technology of Teddington, UK, showed a 24-bit DAT machine, based on

by many to be among the best reverbs ever made. The new QRS 2401 uses a modular design in a single-rackspace chassis and offers table entry, bar graph or curve editing modes. Two AES/EBU input/output pairs are standard (2-in, 5-out optional), and 24-bit operation is supported.

Transferring high-quality audio over long distances is nothing new, but Dolby has simplified the process with its DolbyFax system. Comprising a Dolby AC-2 encoder/decoder at either end of an ISDN phone line, along with an Ascend Multiband Plus ISDN terminal adapter, the system makes the transmission of audio over phone lines as simple as operating a fax machine. Bravo, Dolby, for putting it all together!

Overall, the 96th AES convention was a success



the Pioneer D-07 double-speed 96kHz DAT deck (also shown during AES). The modified ADT recorder can function at 96/48/44.1 kHz in 16-bit mode or 48 kHz with 24-bit resolution. The ultimate solution? Probably not, but certainly a step in the right direction.

Quantec, of Munich, Germany, previewed the long-awaited update to its legendary 1982 Room Simulator, still considered

on every level. Convention chairman Han Tendeloo and his crew did a fine job, and I hope AES returns to Amsterdam soon. Of course, there's something very refined about an audio show where exhibitors incorporate a bar or cafe into their booths, and I'm looking forward to the next European show, February 28 through March 3, 1995, in Paris. See you there. ■

By Mel Lambert

DOREMI LABS DAWN II

POST-PRODUCTION EDITOR

Audio professionals prefer to buy from well-established firms, and users are notoriously conservative in their buying decisions. Put another way, new technologies from newly formed companies take a respectable amount of time to be evaluated and then (with luck) accepted.

While some workstation manufacturers have forged ahead with new and updated versions of their operating software and I/O hardware, and added more sophisticated signal processing—sometimes with mixed success—Doremi Labs, formed in 1990, has continued its modest enhancement program, all the while attracting a loyal user base. The company continues to sell product to radio, post-production and editorial facilities, so they must be doing something right!

Last year's AES convention in New York saw the introduction of a MkII version of Doremi's Digital Audio Workstation Nucleus system. With DAWN II, Doremi has focused its development skills on producing a system that is easy to master, with a software design familiar to targeted users, including powerful graphics and database features. Doremi recognizes that few customers will accept a new development that forces them to radically change their usual way of working; the most successful innovations, in just about every facet of our lives, are based on simple rather than dramatic advances. DAWN II also puts a remarkable amount of power into a compact, user-friendly package, one that will continue to develop during the next 12 months.

MODULAR SYSTEM DESIGN

DAWN II retains a similar hardware configuration to its predecessors' but adds new, enhanced software, Ver-

sion 4. The modular DAWN II Audio Processor rack is a 3U' unit that houses the various A-to-D converters, D-to-A converters, and audio and control interfaces. Each unit accommodates up to eight analog and/or digital I/Os, via AES/EBU or S/PDIF (co-ax and optical connectors). Up to six Audio Processors can be linked to form a 48-channel system with 48 analog and digital inputs.

The modular design allows circuit





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boards to be replaced without removing the unit from its 19-inch rack. Data storage is provided on standard SCSI-capable media, including fixed and removable hard drives, removable magneto-optical disks (3.5- and 5.25-inch), Exabyte, DataDAT and similar devices. Up to six SCSI-capable storage devices can be connected to a single audio processor, providing a maximum online capacity of 36 track-hours. The system handles ISO-format 650MB MO cartridges and 1GB Tahiti cartridges, in addition to the newer ISO 1.3GB cartridges. Under favorable conditions, eight tracks of digitized audio can be replayed in real time from a single 5.25-inch MO cartridge. MIDI In/Out also is provided for connection to MIDI Time Code devices.

Systems also can be interconnected using standard Ethernet or FDDI (Fiber Distributed Data Interface) networks, allowing sound files to be exchanged between workstations. Future enhancements include a high-speed network that will allow edit suites to play and record directly

from shared storage systems. Such developments will remove the need to download and upload sound files when edited production audio must be moved from offline editorial suites, for example, to an online dubbing theater. Networked workstations will be able to gain direct access to centralized audio files.

MACINTOSH GRAPHICS DISPLAY AND CONTROLLER

A companion Apple Macintosh connects to the Audio Processor via a simple RS-422 serial link; the Mac provides a familiar icon-based graphical user interface. Doremi recommends a Quadra 700, 610 or 650 as a suitable controller, with at least 8 MB of system RAM and a 17- or 19-inch color monitor. External control of audio and video transports can be implemented from the Mac serial ports via standard 9-pin protocols. Multiple devices can be controlled simultaneously using optional Applied Engineering QuadraLink interface cards. Also, for large systems that need to handle mixed transport types, with comprehensive time code offset manipulation, the Mac can communicate direct-

ly via dedicated software modules to TimeLine Lynx II modules and MotionWorks MotionWorker units, as well as Panasonic SV-3900 Pro DATs.

BASIC SYSTEM FUNCTIONS

Doremi promotes DAWN II primarily as a multitrack digital recorder. Once sound elements have been recorded to hard disk or MO and assigned to a time code-based sync point—either by direct recording into the system from analog/digital ports at the Now Line or, more likely, selected from an existing library of sound cues—the operator can use familiar Move, Edit and Crossfade functions.

Having assigned a cue to a channel output, its relative position and relationships to other cues (crossfade profiles, for example) can be modified against time code sync positions. On playback—and the entire system is controlled from button icons that resemble the familiar stop, start, FFW, REW, Go-to-Cue controls on a tape machine remote—the direct output of each track gets routed to the corresponding rear-panel output, and hence to an analog or digital console for mixing. For automated

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mixing, the channel outputs can be routed via a MIDI-capable mixer, with the DAWN II software taking care of the recording and playback of MIDI level-control data in sync with the time code data.

All these manipulations are achieved from a well-organized Mixview window, which can be viewed horizontally or vertically. The Vertical mode more closely mimics the look of an electronic film track sheet; the Horizontal mode is more appropriate for editing. Each track in Mixview represents an audio channel with a dedicated I/O within the audio processor. Each track can be labeled, featuring a status panel that controls monitoring (input or off-disk playback, for example), record-enable, solo and mute buttons. The screen is uncluttered and extremely easy to manipulate. A Display mode can be selected for printing track sheets for use during subsequent mix-to-picture sessions. Each cue is listed by name, with In/Out times, a dialog line and crossfade information.

The Now Line can either be nailed in the center of the screen, with the graphic representation of the multi-channel material scrolling behind it, or the entire window scrolling from left to right. For added flexibility, any onscreen cue can be displayed as a modulation profile or an alphanumeric label. Scrub editing is extremely easy to master—using the Mac's mouse or trackball—and makes edit location and adjustment exceedingly simple. Sections of cues can be modified in Delete or Cut-and-Fill modes, or inserted into another cue. Crossfades can be selected from a pop-up menu (a choice of linear, logarithmic and cosine profiles) or via graphic handles at the start or end of each selected cue. In addition, two overlapping cues can be selected and then an equal-amplitude profile can be implemented across the chosen edit point. The edited track also can be re-recorded as a composite cue.

Time-stamped mono or multichannel audio can be recorded directly into Mixview, where it can be displayed as a block or as an amplitude waveform, or the audio can be recorded as a "wild track" to Mixview's Transfer Bin, where it can be edited and stored for subsequent use. Any number of cues can be grouped together and slipped in time or across tracks while retaining their relative sync and track positions. Cues or cue

groups can be dragged off the track sheet into the Transfer Bin and retrieved at any time to the same sync position, providing an easy way to create alternative cues for the same time code location then compare them to make a final production decision.

Individual or group tracks can be color-coded. System defaults are red for music tracks, blue for dialog, green for sound effects and magenta for backgrounds; any or all of these designations can be modified using the standard Apple color picker.

Slipping single or grouped cues is fast and intuitive. As each selected cue is dragged up/down or left/right, the track moves with its new start position being displayed, thereby permitting fast and accurate repositioning. Cues can be "nudged" forward or backward in whole- or quarter-frame increments, allowing dialog or effects tracks to be cued tightly to a sync point. Once assigned, selected cues can be locked to prevent any changes; if a cue is slipped accidentally, it can be returned immediately to its original sync position.

Scene descriptions with start and end points can be placed alongside the track sheet, and markers can be added to the track layout during recording or playback. In this way, sync points or any other relevant time code position can be logged during inload or when spotting the worktape. Markers can be named and used to reposition cues and serve as additional autolocate points. And, when printing out a hard-copy Track Sheet, markers and scene descriptions are printed in the left-hand column.

ALTERNATIVE CONTROLLER DESIGNS

Although some DAWN II users will opt to use a standard mouse, trackball or graphics tablet/pen combination as system controller, post-production and radio users might be interested in the optional ADX Controller. Having the look and feel of a conventional tape-machine remote—and allowing DAWN II to be operated without a keyboard or mouse—the ADX Controller features a jog/shuttle wheel for scrubbing audio and video, time code display, plus a transport panel with the full autolocate and punch-in/out. The jog/shuttle wheel also can be used to program cue automation, or as a data-entry fader.

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audio tracks, as well as any serially controlled transports. A separate Editing Section features dedicated controls for often-used edit functions, including undo (32 levels) and save.

MIX-TO-PICTURE

For sound and music editorial, as well as dialog and ADR editing, tight sync to picture is essential. The DAWN II system can be phase-locked to all familiar time code types and frame rates, including MIDI Time Code, and used to drive most serial-capable transports. In addition, the software can control QuickTime movies that have been recorded to hard disk, providing a cost-effective alternative to other nonlinear video playback formats. The use of QuickTime also allows sound and picture to be recorded simultaneously and then accessed randomly, jogged and shuttled while maintaining perfect sync. Video editing operations, including the insertion or deletion of frames, also can be implemented.

DAWN II's Version 4 software will run on any Mac without a DAWN processor, for offline ADR or Foley spotting, for example. Events can be entered manually through the Mac keyboard (Doremi recommends a PowerBook as particularly suitable for such applications), or In/Out times can be captured from a video workprint using an inexpensive time code reader. The annotated sequence, complete with time code values, scene descriptions, character names, etc., can then be loaded into a full-function DAWN system for recording and editing.

More usefully, basic editing and track-laying can be performed offline while viewing the sound cue's graphical waveform, without needing access to hard drives or large-screen monitors.

AUTO-CONFORM FUNCTIONALITY

DAWN II's auto-conform facility enables CMX- and Sony-format edit decision lists to be imported and used to conform the original source material according to EDL information. The process is entirely automatic. First, the DAWN system remotely locates the desired take from the selected time code position; it then records the cue at the correct point against a video or work track. EDLs can be sorted by event, reel or running time, depending on the operator's specific

—CONTINUED ON PAGE 169

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STUDIOMASTER P7

MIXING CONSOLE

Studiomaster has been a major player in the small-console market for years, earning a reputation for delivering solid, gutsy products with an enviable performance/price ratio. Some years ago, I reviewed the Studiomaster 16-8-16, an 8-bus console that was competitively priced and sounded great. Now, this UK-based company offers the P7, which offers more inputs, greater flexibility and onboard MIDI muting automation—at a lower price than its predecessor. More for less? This requires some investigation!

Starting with the basics, the P7 has models available in 16-, 24-, 32- or 40-channel versions. As the board is an in-line design, each of the channels has two inputs, thus doubling the number of available inputs during mix operations. The 4-band equalizers have

sweepable mids, and the shelving LF and HF bands can be routed to the tape monitor path—if desired. Each channel has balanced mic inputs (with switchable 48V phantom power); long-throw 100mm faders; fader reverse switching; in-place soloing; 1/4-inch TRS send/return insert points; and unbalanced tape and line inputs.

By following a simple modification outlined in the manual, the -10 dBV operating levels of the tape inputs and outputs can be changed to +4dBu. However easy the modification (removing some resistors and soldering jumper wires) may seem, this may void the unit's warranty unless done at an authorized service center.

One nice touch is the six discrete auxiliary sends—there's none of that "four-knobs-and-a-switch to access



the other two" business here. Such a setup simplifies the fast-paced production process, as everything is right there where you would expect to find it. I also liked the *lack* of concentric controls—there's plenty of room to get your fingers in there. Four stereo effects returns (with 2-band EQ) are standard, increasing the number of inputs on a 16-channel board to an impressive 40 (or 88 on a 40-channel model).

The rack-mount power supply is a beefy-looking unit and connects to the console via a detachable ten-foot multipin cable. For some reason, on many lower-priced consoles, manufacturers like to scrimp on the length of the PS cable, so the extra length is appreciated, as it allows more flexibility in determining some out-of-the-way location for the box.

The master section of the console includes the slate, oscillator and talk-back sections and a switch for routing the control room output to feed either the "A" (main) or "B" (reference) speakers. A switch near the oscillator button provides a choice of "1kHz"

or "10kHz" tones; however, the frequencies output by the oscillator seemed a little sharp and proved to be 1,083 and 10,690 Hz, respectively.

Perhaps the one feature that sets the P7 apart from the "typical" 8-bus board is its snapshot muting feature. Up to 100 muting "scenes" can be stored and recalled manually or via MIDI program change commands. The latter permits mute events to be edited or manipulated on an external sequencer for precise control of such events. Muting presets can be stored and recalled by simply moving the up/down buttons to the desired preset and then entering either the save or recall key; alternatively, four mute bus "preset" keys allow instant access to any predetermined muting. These mute bus keys are ideal for quick-paced applications, such as live performance or broadcast.

The 4-band EQ is smooth and musical, with a fair amount of overlapping between the two sweepable bands and ± 16 dB of boost and cut—plenty of range for typical studio chores. The LF and HF shelving controls operate at 60 and 12.5k Hz, which is not marked on the console,

although it is noted in the manual, which is well-written but lacks schematics and signal flow charts. One minor quirk in Studiomaster boards is that blasted "EQ Cut" switch. The EQ is in the audio pathway when the switches are up (or out when the switch is down), which is the opposite of what I'd expect.

On the test bench, the P7 checked out as well or better than its specs. Frequency response (line input to output) from 20 to 20k Hz was flat within ± 0.1 dB (and was only 0.5 dB down at 40 kHz)—better than the published figures; and THD+N at 1 kHz measured right in at spec: 0.008%.

Overall, the Studiomaster P7 offers a lot for an affordable console: good sound, plenty of inputs and a versatile mute automation package. The consoles are priced as follows: Studiomaster P7-16, \$4,195; P7-24, \$5,820; P7-32 \$7,445; P7-40, \$9,070. So if you're in the market for a solid 8-bus board, you may just want to give P7 a test drive.

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by Michael Cooper

AKG C414B/TLII

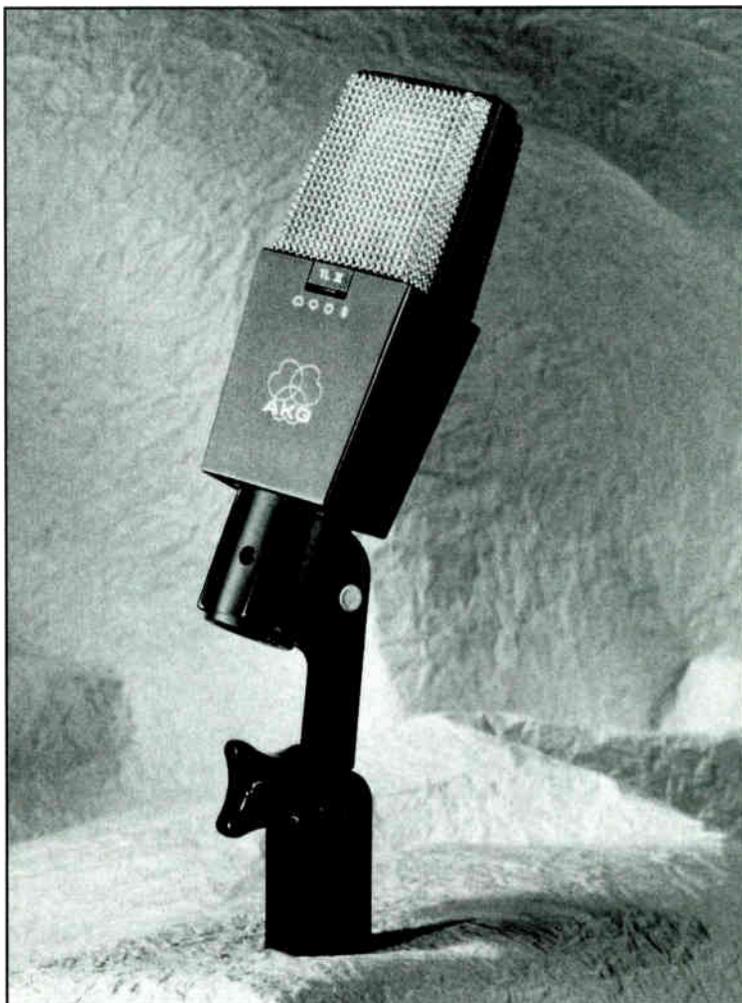
“VINTAGE TL” MICROPHONE

Considering the undying popularity of the 1950s-era AKG C12, one has to wonder why the classic tube mic was ever discontinued. Today, engineers addicted to the C12's distinctive bottom-end warmth and high-frequency sparkle must be prepared to spend up to \$6,000 on the used market for the vintage mic...that is, if they can find one for sale.

The heart of the C12, the CK12 capsule, has lived on (with some modifications) in AKG's constantly evolving line of 414 solid-state condenser microphones. But the C12's characteristic richness and trademark frequency response have seemingly fallen victim to a digital generation seeking the clean, quiet, linear performance of transformerless, solid-state designs. Now AKG has attempted to incorporate the best of both worlds into its new C414B/TLII, a transformerless, solid-state microphone that emulates the frequency response of the vintage C12. With this heritage in mind, AKG has dubbed the TLII “The Vintage TL.”

The Vintage TL replaces AKG's C414B-TL, which was essentially a transformerless version of the C414B-ULS. Aside from the gold-colored, wire-mesh grille and the gold lettering on the mic's body, the TLII looks exactly the same as the TL. Like all of its 414 Series predecessors, the Vintage TL is a multipattern, pressure-gradient condenser featuring a 1-inch, dual-diaphragm assembly. A switch on the front of the mic body selects between

cardioid, hypercardioid, omni and bidirectional patterns. Two switches at the rear of the mic allow you to pre-attenuate the mic (10 or 20 dB) and/or roll off the bass frequency response 12 dB per octave at either 75 or 150 Hz. Also familiar is the small lip that circles roughly two-thirds around the base of the mic's XLR connector housing—to keep the mic from accidentally sliding off the supplied SA18/3 stand adaptor when hung upside down. The W414 foam



windscreen and familiar, foam-lined, black plastic AKG storage case are standard accessories.

The same Ultra Linear Series pre-amp electronics used in the C414B-TL and C414B-ULS (as well as the C460B and C426B) are found in the Vintage TL. The TLII's 12.5 mV/PA sensitivity and 14dBA equivalent noise level specifications (identical to the TL) promise robust output and quiet performance. And the mic's transformerless output gives it 6dB

better SPL-handling capability than the C414B-ULS: Maximum SPL for 0.5% THD is a whopping 160dB broadband (down to 30 Hz) with the 20dB pad kicked in. You can punish this mic—it won't bark.

Though it's true that the Vintage TL shares a lot of common ground with its 414 siblings, its new CK12V capsule makes it a whole 'nother mic. According to Joey Wolpert, AKG product manager, the CK12V's two gold-sputtered mylar diaphragms are more stable and uniform than the original CK12's. The diaphragms are

tensioned by machines, not by hand as in the C12 microphone. These capsule improvements, along with the transformerless output, actually give the Vintage TL a more linear bass frequency response than the C12. But the real story lies in the tuned resonant chamber situated between the opposing capsule backplates. This is what gives the Vintage TL its idiosyncratic rise in high-frequency response above 3 kHz.

It's a frequency response you'd be hard-pressed to duplicate with active equalization, even if you could stand the resultant phase problems and added noise. Like the profile of a smoothly rolling ridgeline, the charted frequency response undulates up and down in the boosted region between 3 kHz and 15 kHz, achieving two or three peaks depending on the polar pattern chosen. While all four directional patterns reach their maximum peak between 7 kHz and 8 kHz, they each exhibit variances in response that affect the TLII's performance for specific applications.

For instance, the hypercardioid pattern manifests a stratospheric boost of 6 dB to 8 dB between 5 kHz and 9 kHz, making it the brightest pattern (at moderate distances from the source, where proximity effect is minimal). The cardioid and figure-8 patterns are successively less bright, reaching only a 6dB peak in the same region (response drops off above 7 kHz quicker for the figure-8 than for the cardioid). The omni pattern offers the "flattest" response, with a maximum 4dB boost at 7.5 kHz. Response is down 2 dB at 20 kHz for the omni and cardioid patterns, 4 dB down for the others. Below the effected regions, all directional patterns provide ruler-flat response down to 20 Hz and below.

I used a Millennia Media HV-3 mic preamp (an exceptionally clean, transformerless unit) for all my tests of the Vintage TL. A/B'ing the Vintage TL with a C414B-ULS (both in cardioid), it was immediately apparent how different the two mics sound. The Vintage TL has a warmer bottom end and a more sparkly high end—in effect, a bigger and more detailed sound.

On paper, the Vintage TL's polar patterns look as uniform as one could hope for, given the limitations imposed by the immutable laws of physics. The chart for the figure-8 pattern looked the tightest. But

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singing 360° around the mic was the real acid test.

As expected, Omni mode offered the least amount of coloration off-axis. Close-miking at 90°, the sound was slightly duller and less open than at 0° and 180°—obviously due to lack of high-frequency wrap-

**The Vintage TL is
the most versatile
and provocative
large-diaphragm
mic in its
price range.**

around to the diaphragms. Directional modes exhibited very little coloration off-axis at moderate to far distances from the mic, where it counts the most. As one would expect, off-axis response was less uniform in close to the mic with a Directional mode chosen. This can be beneficial in some instances; for example, I found that rotating the mic about 10° off-axis from the source in Hypercardioid mode mellowed the high-frequency rise. Rejection at the figure-8 pattern's 90° null points was nothing short of incredible.

Over the span of several weeks, I used the Vintage TL on a variety of vocalists and instruments. The mic in Cardioid mode is a total monster on both male and female vocals, at once providing warmth, crystal-clear transparency and a detailed and silvery high end. In a particularly memorable session, the Vintage TL faithfully captured the subtle harmonics of a throaty, Debra Winger-esque female vocalist. If there's a down side to the mic's high-frequency shimmer and detail, it's that it can sometimes exacerbate sibilants. But un-EQ'd vocal tracks can also be placed lower in a mix without losing intelligibility.

This intelligibility enhancement came in very handy when recording a Zimbabwean marimba ensemble. Placing the TLH (in Cardioid mode) on one marimba in the group, the balance between the fundamental tone, resonator buzz and knob strike

was perfect. The resulting sound cut through an ensemble of seven marimbas, hoshos and congas without sounding harsh. The Vintage TL also handled the high SPLs without distortion and rejected nearby instruments effectively.

On flute, the Vintage TL predictably provided a warm sound with a bright top end and wonderfully defined, "chiffy" breath. Mandolin sounded similarly warm and sparkly, and the mic's superb transient response delivered a remarkably detailed reproduction of the pick striking the strings.

Overdubbing a five-part cello arrangement with the Vintage TL also gave interesting results. The "flatter" Omni mode sounded best on soprano through tenor ranges—warm, with well-defined bow rasp and no upper bass/low-mid cloudiness. Although Hypercardioid mode was too buzzy and raspy up in the top register of the instrument, it was just the ticket for bowed bass passages that otherwise would have been masked by the thick arrangement. The hypercardioid pattern's presence and inherent bass proximity effect also lent themselves wonderfully for recording both pizzicato cello and acoustic jazz bass.

My final test of the TLH was on rack toms for a new age session. The 20dB pad came in handy here. Hypercardioid mode provided excellent rejection of adjacent toms and overhead cymbals—placed away from the mic's rear polar lobe. The extra proximity effect was the perfect marriage with the hefty presence rise, resulting in a warm, big sound with well-defined head strike. To not have to use any EQ on close-miked toms impressed the heck out of me.

The only negative thing I can say about the AKG Vintage TL is that the polar pattern switch is a bit difficult to move. I'll put up with it. The bottom line is that, in my opinion, the Vintage TL is the most versatile and provocative large-diaphragm mic in its price range. And at \$1,499, it's reasonably priced. When it comes to gear, it takes a lot to excite me anymore. I'm excited.

AKG Acoustics, 1525 Alvarado St., San Leandro, CA 94577; (510) 351-3500. ■

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

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NEW PRODUCTS

SASCOM OPTIFILE TETRA AUTOMATION

For moving fader emulation at VCA prices, check out the Optifile Tetra console automation system distributed by Sascom Marketing Group (Pickering, Ontario). The system dynamically detects the presence of previous moves on individual channels and automatically sets the appropriate status as you progress through the mix. The system's "hybrid" status automatically switches from "write" to "update" (and vice versa) without the need to null faders. The base system comprises a 40-channel CPU with computer keyboard; six available add-on modules include a 64-channel expansion card, extended software with cue list and offline mixing functions, and RS-232/RS-422 machine control.

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CELESTION PRO MONITORS

Studio 3 and Studio 5 have been promoted to Pro Monitor Series Two status by Celestion (Holliston, MA), and Studio 1 now joins the loudspeaker line. Housed in simulated black-ash veneer cabinets, the compact 8-ohm monitors contain a 1-inch titanium dome tweeter, ported, felted fiber-cone driver, and improved crossover design. Studio 1 (\$210/pair list) handles 50 W, providing 78-20k Hz response; Studio 3 (\$300/pair) and Studio 5 (\$420/pair) each handle 75 W, providing 62-20k Hz response.

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YORKVILLE YSM-3 STUDIO MONITOR

Fatigue-free listening was the design goal for the YSM-3 studio monitors by Yorkville (Niagara Falls, NY). Listing at \$998/pair, the YSM-3 comprises a 5.5-inch midrange driver, high-power, 12-inch, low-end driver—with a 56-oz. magnet—and 1-inch hyperbolic dome tweeter. The monitor handles 250 W of program material, offering linear phase response and smooth frequency response (35-20k Hz, ± 3 dB). New polymer materials in the midrange driver are designed to help the mixdown engineer identify flaws in the vocal range.

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SPL VITALIZER

It's smooth, it's psychoacoustic, and now it's stereo: Sound Performance Lab's Vitalizer (distributed by Beyer of Farmingdale, NY) handles EQ and signal processing for both channels through one set of knobs. Dynamic equalization, phase shift manipulation and harmonic filtering are combined in the single-rackspace unit, as is a stereo width expander that works with the psychoacoustic EQ or on its own. The Vitalizer provides balanced XLR and unbalanced 1/4-inch inputs and outputs.

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TOROID POWER TRANSFORMERS

Toroid Corp. (Salisbury, MD) offers a line of toroidal transformers featuring "zero-noise" levels for amplifier/preamp applications. Half the size and weight of conventional transformers, toroidals feature low audible noise and low electromagnetic emission. Toroid's offerings are sold with or without encapsulation, with epoxy-potted center and threaded inserts, or potted inside a metal can with or without mounting tabs. Standard hardware for vertical mounting is available.

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**SYMETRIX 602
DIGITAL PROCESSOR**

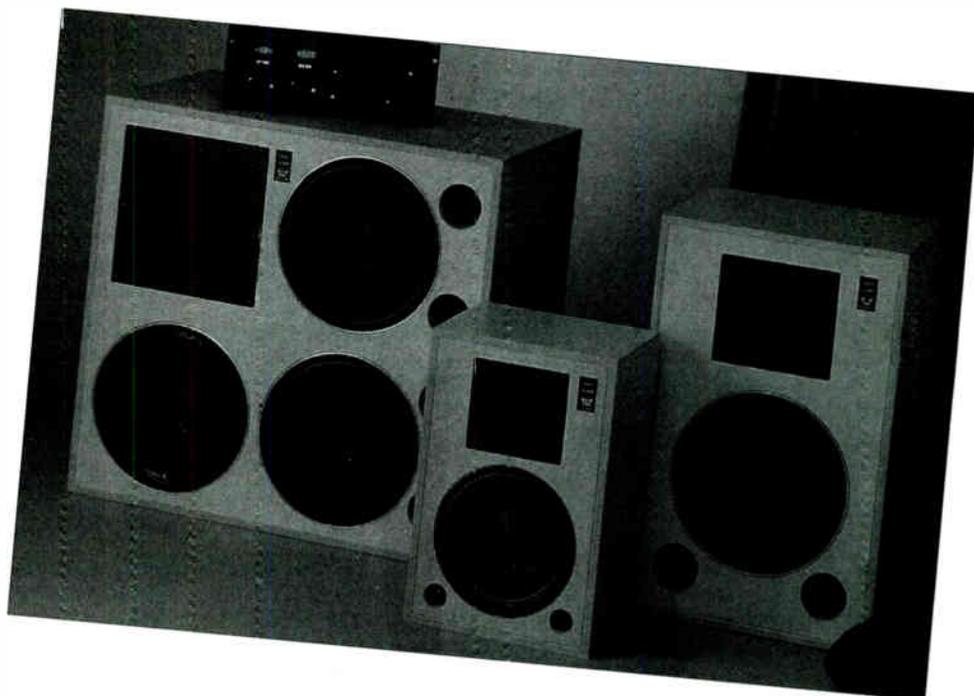
New from Symetrix (Seattle, WA) is the Model 602 Stereo Digital Processor, a digital "toolbox" that offers parametric EQ, multi-dynamics processing and delay effects in a single-rackspace chassis. Both analog (balanced XLR line level) and digital (AES/EBU and S/PDIF) inputs and outputs are provided, allowing the unit also to be used as a stand-alone A/D or D/A converter or workstation front end with 18-bit clarity. Real-time MIDI control is standard, as are 128 factory and 128 user settings. The 3-band EQ has peak/shelf characteristics and -50dB notch filtering; dynamics controls include compression/limiting, AGC/leveling, downward expansion, noise reduction and de-essing; and up to 300 ms of digital delay with feedback and random/sine/triangle waves for modulation effects. Retail is \$1,995.

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**TASCAM PA-20 MKII
POWER AMP**

Aimed at the project studio, the PA-20 MkII from Tascam (Montebello, CA) is a dual-channel amp that delivers 25 watts per channel into 8 ohms (or 50 watts when bridged for mono output). The 1U box has balanced XLR and unbalanced RCA inputs, level control and headphone monitor output. Suggested retail is \$250.

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**STAGE ACCOMPANY
STUDIO MONITORS**

Renowned for its P.A. products, Stage Accompany (Cincinnati, OH) now offers a line of studio monitors. Designed for near-field listening, the 4544 is a two-way, 16x22x13-inch design with 12-inch woofer and ribbon tweeter for a 45-32k Hz response. The mid-field model 4547 has a larger ribbon tweeter paired with a 15-inch woofer in a 21x33x17-inch enclosure for a 30-32k Hz response. The top-of-the-line 4549 is a three-way

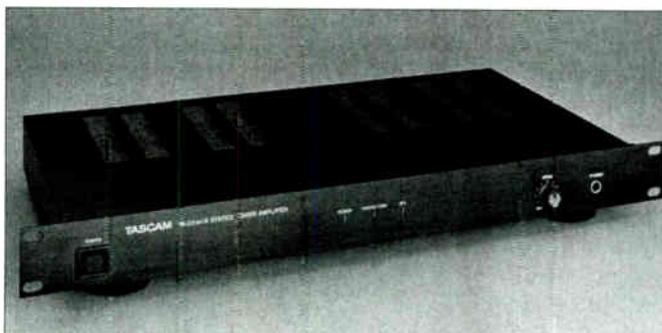
design with two 15-inch subs, a 15-inch low/mid driver and ribbon tweeter in a 38x36x22-inch enclosure, for a 30-32k Hz response and peak handling to 130 dB. The monitors are designed for use with active crossovers, although for convenience, the two-way systems also include passive networks. The tweeters combine ribbon diaphragms with neodymium magnet assemblies for high-SPL handling with low-distortion performance.

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**PRISMSOUND DA-88
20/24-BIT INTERFACE**

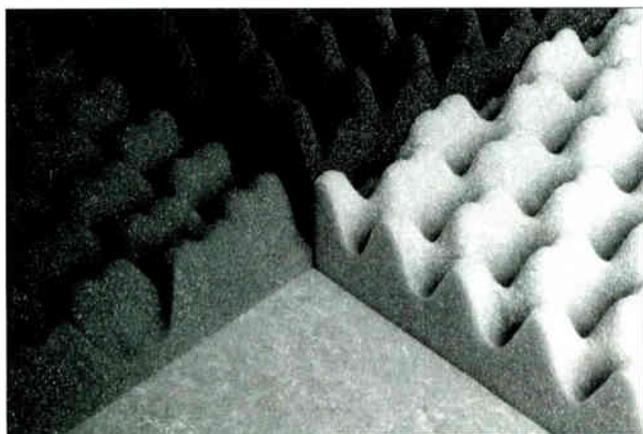
British manufacturer Prism-Sound (dist. by Sprocket Digital of Burbank, CA) unveiled the MR-2024T, an interface/adaptor that allows the recording of eight 16-bit channels, six 20-bit channels or four 24-bit channels on the Tascam DA-88 modular digital multitrack. The one-rack-space unit has four pairs of AES/EBU digital inputs and outputs, an S/PDIF I/O pair and four word sync outs. Two TDIF-1 (Tascam-format) digital ports provide connection to the main DA-88 and a backup deck, if desired. Applications include 20/24-bit music recording (or as a high-resolution mixdown deck), layback to 20-bit digital VTRs and 4- or 6-channel mixing for film/video surround sound.

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**TOA IX-11000
DIGITAL CONSOLE**

Toa Electronics (South San Francisco) debuted the ix-11000 digital mixing system: a compact console and free-standing processing rack built around twin Motorola 32-bit microprocessors. Operators can access any function instantly through color, touch-sensitive LCD screens and motorized faders; console setups can



**NETWELL ACOUSTICAL
FOAM PANELS**

From NetWell Noise Control (Minnetonka, MN) comes the noise-hungry Acoustical Wedge Foam Panel. Boasting an NRC value of 1.25, the standard AW4 panel measures 24x48 inches; other sizes are available. Different facial convolutions are offered, as is a Class-A fire rating option.

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**VALLEY 433 DYNAMITE
PROCESSOR**

The latest offering in the Dynamite Series from Valley Audio (Merriam, KS) is Model 433 Dynamite, a dual-channel, full-function compressor, limiter and expander/gate/ducker. Enhanced stereo linking for all control elements, function-interactive dynamics control, switch-selectable compression ratios (3:1, 6:1, 20:1) and balanced and unbalanced 1/2-inch inputs grace this single-rackspace unit. It operates traditionally (set the threshold, then make up the output gain—manually or automatic) or provides auto-level compensation with threshold adjustment.

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**ROCKSONICS
PL-2 LIMITER**

Rocksonics (Los Alamitos, CA) offers the PL-2 Dual/Stereo Peak Limiter, a \$169 processor said to simulate the gentle harmonic distortion of analog tape compression (through two stages of fast compression) while eliminating uncontrolled peak clipping. Two independent channels with RCA inputs/outputs are accompanied by a stereo link switch for combining the circuits into a single threshold control. An optional rack adapter mounts up to four PL-2 units in one rackspace.

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be preset offline for later recall with a PC. Up to 256 inputs and outputs are provided for patching analog and digital signals within the digital domain; four bands of parametric EQ, highpass and lowpass filters, delays and dynamics are offered for each input and output. Control parameters can be recorded and played back every 1/4-frame of SMPTE code. Control windows provide metering (80dB range) of up to 32 channels on one screen, fader levels with gain in dB, preset configurations, channel status and EQ curves. A keyboard window supplies onscreen keying functions identical to those on a standard computer keyboard. Prices start at \$350,000.

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HOT OFF THE SHELF

More than 122 models of speakers, tweeters, woofers and drivers can be found in the 267 pages of Polydax Speaker Corp.'s 1994 full-line product catalog. Call (508) 658-0700...Current Technology's MasterPlan suppression filter system line now includes the SBA Power Sifter to safeguard medium-exposure applications. Call (214) 669-0818...Adventures in Modern Recording, a four-hour, two-part series of recording instruction on videotape, hosted by Eddie Kramer, is offered by Premium Entertainment for \$99.95. Call (800) 995-9664...TimeStream Technologies' MC/48+ Visual Conductor is a \$329 conducting device that pro-

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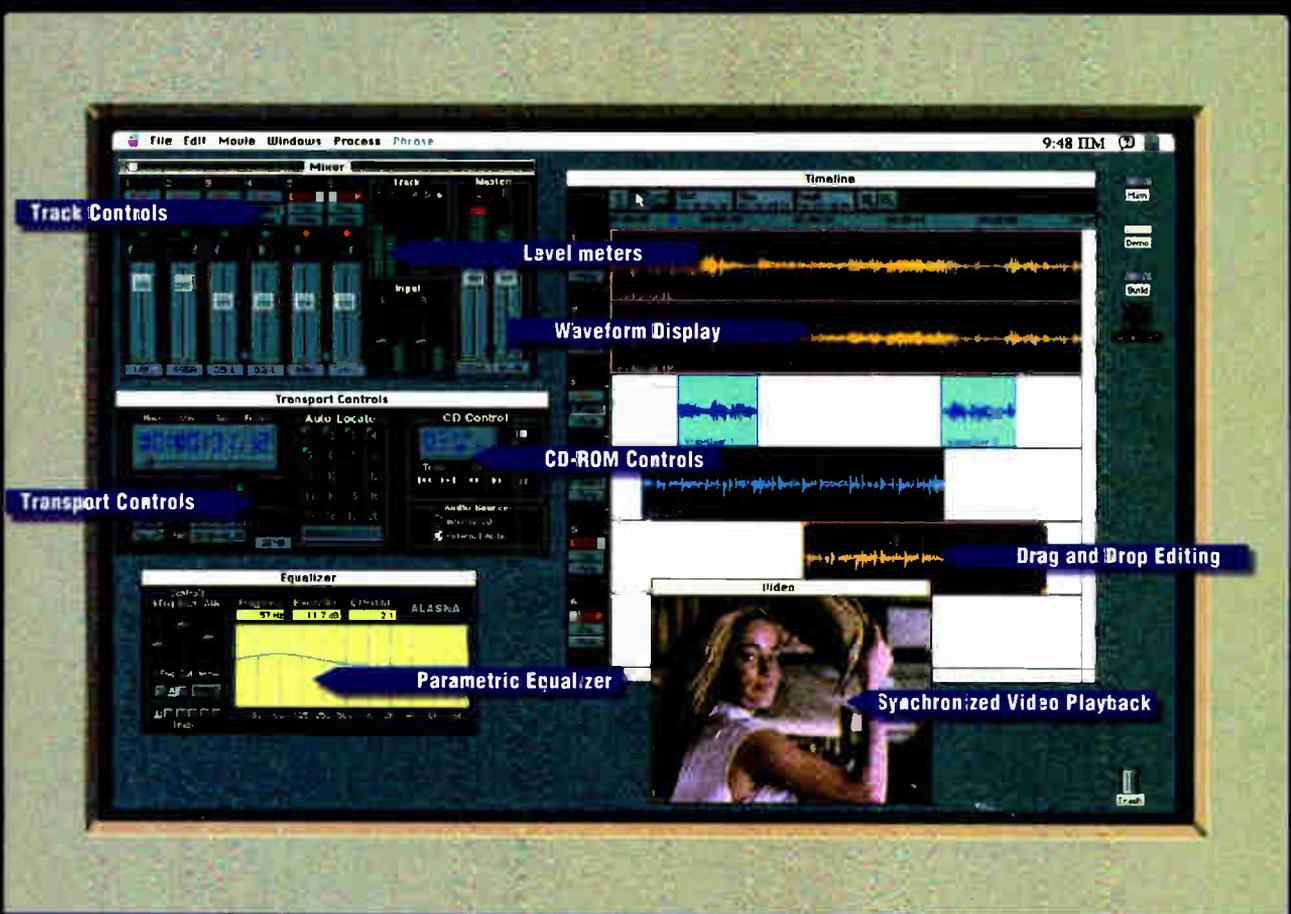
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by Dave Tosti-Lane

MTU MICRO SOUND

DIGITAL AUDIO WORKSTATION

The Micro Technology Unlimited Micro-Sound digital audio workstation allows digital recording, editing and playback of audio. Although the Micro-Sound is similar to other mid-priced digital editors in its ability to handle complex editing tasks easily, its approach to mixing sounds is unique.

The MicroEditor software foregoes the approach of assigning sounds to a finite number of specific tracks in favor of a metaphor of nearly limitless layers of sounds, which are then mixed to two outputs. Many workstations are limited to a specific number of tracks; some allow the creation of additional "virtual tracks," but most do not allow simultaneous playback of more than a few at a time—usually requiring more hardware to play more tracks. The MicroSound station uses "segments" of sound instead, allowing simultaneous playback of up to 50 segments, from up to 40 separate, original sound files.

OPERATION

The software operates through three main working screens: Mix, Record and Segment. The first step in a project is to open or create a Project File in the Mix screen, the workspace for assembling all the sounds for a project. Selecting "New" from the File menu prompts for a project name, sample rate (15 choices, from 8 kHz to 48 kHz) and number of tracks (1 or 2). Each "piece" of sound is called a "segment" and may consist of an entire sound file or a portion of a sound file.

The Record screen lets you record a large amount of audio easily. If you have a large number of takes to enter, it may be most effective to record them in several large sound files, rather than create many short files. Sound files are used simply as stor-

age locations, and all working edits are based on segments of sound that are defined from within sound files. Because a maximum of 40 sound files can be used in a single mix session, it usually is better to create large files defining multiple segments within each file. (A single mix can

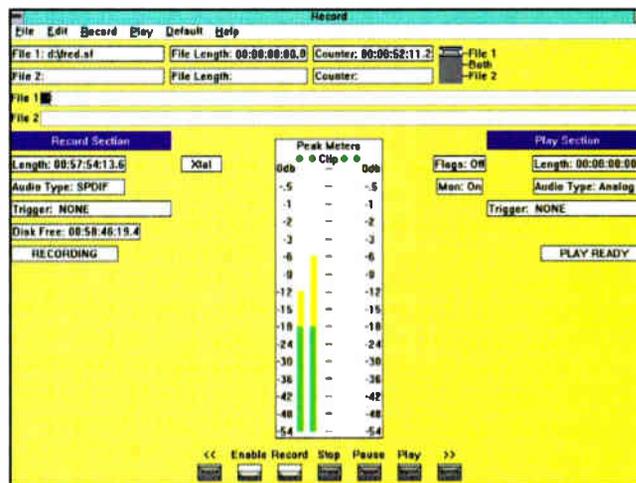


Figure 1:
MicroEditor's
Record window

contain up to 2,900 segments, with no length restriction.) All subsequent edits are nondestructive; the original sound file is never altered.

The Record screen (Fig. 1) presents a large bar graph peak meter display with a set of "tape transport" controls at the bottom. Each section of the screen (record and play) displays information regarding the audio source or destination (analog, AES/EBU or S/PDIF), Trigger (none, SMPTE, MIDI TC, MIDI note and channel), length remaining, and status. The record section also indicates sync source (internal crystal, video, SMPTE).

To record, you select New File or Open File from the File menu, select the source and hit the Record button. You might expect to be able to set levels at this point by playing your source material and watching the

peak meters on the screen. But the meters won't react and you won't hear the incoming signal on your monitors until you select Record Setup from the Record menu. After setting levels, you must select the



Figure 2: the Segment window

Stop button in the transport before the Record button will function. This operation seems counter-intuitive, although you easily could automate it by setting up a Windows macro shortcut key.

It is also possible to open a second file and perform simultaneous record and play, playing any file from the disk while recording a second file, although you can monitor only the playback file without an external mixer.

On systems containing the optional MicroSync card, recording can

be triggered by SMPTE, video sync and MIDI Time Code. Adding another MIDI card to the system lets you define a specific MIDI note and channel as the recording trigger. I experimented with triggering from SMPTE fed from a test CD; I could lock to SMPTE in just under three seconds, although other MTU users report faster lock using video sync. I also was able to sync to SMPTE striped onto the audio channels of a consumer VHS tape, although dropouts did cause loss of sync (regained after the dropout within about 2 seconds). According to users of the system in video post-production, with a better sync source, the unit performs well.

Exiting Record returns you to the Mix screen. Choosing Create Segment from the Segment menu in the Mix screen activates the Segment screen (Fig. 2). This displays the sound file selected for creating the segment.

Within the Segment screen, you can see the waveform for performing edits or using scrub functions to "rock" into the begin- and end-points of a desired segment. Scrubbing is implemented with buttons at the bottom of the screen; they allow scrubbing forward or reverse at five selectable fixed speeds. The length of the

System Configuration and Options

The MicroSound review unit was a turnkey system shipped fully configured, as follows:

- Rack-mount '486/66DX2 computer with 4 MB RAM, VESA local bus video and SCSI interface, 5½-inch and 3½-inch floppy drives, 14-inch SVGA color monitor, 3-button mouse and keyboard.
- 2.01-GB SCSI-2 drive (8ms average access) providing over three hours of stereo recording space at a 44.1kHz sample rate.
- MicroSound AT-DSP56 system board (based on Motorola 56001 at 32 MHz clock).
- 2U rack-mount I/O module providing two channels balanced +4dBu analog in/out, S/PDIF and AES/EBU in/out.
- MicroSync board for chase-lock sync to SMPTE and video black burst.
- MIDI card for MIDI control of chase-trigger.
- MicroEditor software (for Microsoft Windows), plus software for noise removal, time compression/expansion, pitch shifting, sample-rate conversion, filtering and creation of waveform signals.

Cost for this configuration is approximately \$13,500. The motherboard has only six card slots, leaving only one slot free with the above configuration. Assembling a system using your own computer results in much lower cost. The simplest possible setup costs \$2,995 and comprises software, AT-DSP56 card and tabletop in/out module (S/PDIF and AES/EBU only, no analog). A typical basic system with the card and rack-mount in/out (balanced analog, S/PDIF, AES/EBU) goes for \$4,895; an upgrade to four channels goes for an additional \$1,850. —DTL

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FIELD TEST

waveform display is limited to about 11 seconds, although a time line lets you move the expanded display portion around quickly in the sound file. Unlike many editors, MTU does not create a separate display file, which, without frequent updates, may not accurately represent the edited waveform. MicroEditor actually shows an exact view of the waveform as you will hear it at any point.

Clicking on the Segment View icon switches to a "bar" display similar to the standard display in the Mix window (Fig. 3) for longer regions. At first I was skeptical about this arrangement, but the speed gained by not redrawing the display—and the assurance that the waveform view would be accurate whenever it was displayed—made editing operations faster.

Once you choose a region of the sound file for a segment, you select Create Segment, name the segment and define its parameters, such as gain, time code position, duration of fade-in and fade-out, and so on, or simply go with the defaults and access these attributes in the Mix screen.

Much of the real work takes place in the Mix screen, where you position segments, adjust their length, perform fades, etc. You can record straight into the Mix screen while working on a project, and perform overdub recording with simultaneous playback of the mix with automated punch-in/punch-out points. The Mix view shows a waveform or a bar-type display. The bar display shows the entire mix or zooms in to a small portion of the mix.

To move segments, you simply hold the shift key and use the mouse to drag the segment to a new location. You can choose to have the segment snap to the play cursor or to other segments. Markers allow quick and sure positioning of the segments; they can be placed individually or in real time while sound is playing. Segments can be locked into position to maintain timing, and have their end- and beginning-points shifted. Fade-in and fade-out points are easily established by dragging the appropriate markers.

Icons allow quick assignment of Amplitude Zones and Skip-Delay Zones. Amplitude Zones allow adjustment of a segment's level within a user-defined range and setting gain boost or cut, duration of the zone, and start- and end-fade into the affected region. These are handy for quickly setting up a voice-over region preparatory to a punch-in for the voice. Skip-Delay zones are useful for eliminating an unwanted sound in a segment or for inserting a

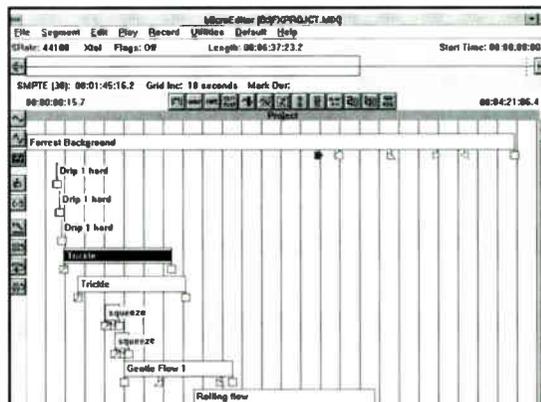


Figure 3: the Mix window

zone of silence.

The Effects Send icon allows playing a preselected segment while simultaneously recording a processed version of the sound from the system inputs. For example, to add reverb to a recorded vocal, you could connect the reverb inputs to the MTU outputs, and the reverb output to the MTU inputs. Activating Effects Send transmits only the selected segment to the outputs and records a new segment containing the "wet" return from the reverb. The newly recorded effects segment and the original segment are left locked to ensure correct alignment, and by adjusting the gain of the original "dry" segment and the new "wet" segment, you can control the relative amount of reverb.

The Overdub icon allows recording into a marked portion of a project and results in a new segment at the marked position.

The Record New Segment icon lets you add segments to a project quickly without going to the Record screen. Segments are recorded into the mix at the position of the play cursor.

There currently is no internal EQ or other DSP implemented in the software, though MTU does offer an optional set of DSP routines: Micro-Tools, a \$200 software package. Its

DSP functions are controlled by DOS batch files; basic examples are included with the software. Functions available include de-noising, time compression and expansion, pitch shifting, high- and lowpass filters, bandpass filtering, notch filtering, sample rate conversion and creation of pure tone sound files. The routines are not fast, but they are clean.

In general, DAW systems provide many ways to accomplish the same operation. Aside from sonic consid-

The MTU developers seem more willing than most to consider input from system users, even when that input suggests major revisions.

erations, users often choose a DAW on the basis of personal preference for a particular design. It takes at least a couple of weeks of working with a unit to fully understand its particular paradigm; often, initial impressions can be misleading. This was the case with the MicroEditor software. It is different enough from the systems I use daily that I was put off at first, but as I worked with it, I found that it has many advantages.

The ability to play up to 50 separate sounds simultaneously is a distinct advantage in building complex sound effects cues for theater or post-production. I also found the ability to shift a segment's position, start- and end-points, and fade-in/out times to be very powerful. These operations are nearly instantaneous, with no time-consuming wait for recalculation. Also notable is the ease of adding sounds and performing overdubs and punch-in/punch-out right in the mix area.

One of the MicroSound's strongest points is the excellent quality of its A/D-D/A conversion. Located in a separate, shielded enclosure, the converters are 16-bit A/D with 64-times oversampling, and 18-bit D/A with 8-times oversampling. They are among the cleanest, most natural-

sounding digital converters I've used, with very little coloration. Another strong point is the wide range of sample rates supported. Many other DAWs allow only a limited selection of rates; for the project studio owner trying to break into various markets, the ability to create clean voice or other sound effects at the lower sampling rates may be critical.

Richard LePage, who uses three MTU systems on network in his studios at LePage & Associates, points out that the MTU developers seem more willing than most to consider input from system users, even when that input suggests major revisions.

Who might feel most comfortable with a MicroSound workstation? Someone who does not run screaming from the room at the sight of an MS-DOS/Windows-based computer. Beyond that, the sound editor who must work quickly to assemble dense tracks of effects or music would appreciate this system's features. If you are always looking for one more track to layer in just one more piece of a complex effects sequence, then this may be the machine for you.

The MicroSound is not well-suited for live (i.e., non-time-code-based) playback operations such as theatrical sound effects, primarily because it lacks the interface to facilitate quick manual cueing of multiple effects. However, it would make an excellent system for assembling those complex effects in theater sound design projects.

The MicroSound clearly is a powerful machine for certain video post-production operations. So far it is limited to four simultaneous inputs, so it will not replace a serious multi-track tape installation. The ease of modification to the mix makes it a good choice for a situation involving many revisions to a sequence. Its ability to lock to even shaky time code sources makes it a candidate for quick projects that require low overhead. At the same time, the sonic quality of the converters means the system can be used on more demanding projects.

Micro Technology Unlimited, PO Box 21061, Raleigh, NC, 27619-1061; (919) 870-0344; Fax: (919) 870-7163. ■

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

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POSTSCRIPT

SOUND FOR FILM

Monitoring Your Mix

by Larry Blake

Motion picture sound is unique among all other sound recording and mixing disciplines in that there are carved-in-stone world standards regarding frequency response level and playback level. The world of records, in case anyone cares or has noticed, has absolutely no monitoring standards for recording or reproduction. As a result, the range of monitoring systems from recording studios (big speakers and little speakers) to mastering houses varies drastically,

the same monitoring conditions, TV has its own share of real-world compromises. Not only is mono reproduction (over 3-inch speakers!) the rule rather than the exception, but the playback level is considerably lower than the standard film playback level. Reduced level means not only decreased program dynamic range, but also serious Fletcher-Munson considerations regarding levels of low- and high-frequency material. Before I go any further, let me explain exactly how the film world defines its terms.

Each channel is set up so that pink noise at 0 VU on the meters will produce

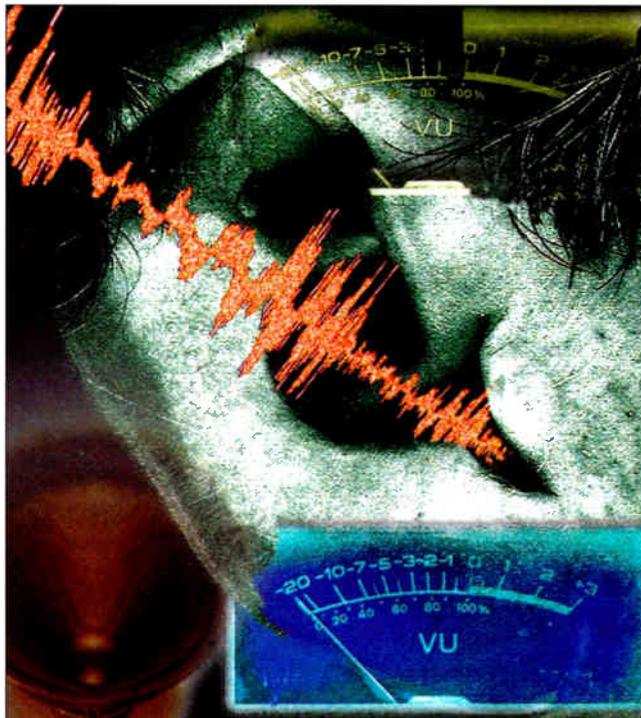
off. There is a "small-room" curve, which rolls off at 1.5 dB/octave after 2 kHz, that is intended to subjectively match small screening and re-recording rooms to large theaters. And indeed, it does translate: What you hear sitting 20 feet away from the screen in a small dubbing room will sound fundamentally the same in the back of a big theater.

Each of the three screen channels has third-octave equalization, either in the form of Dolby Cat 64 cards inside the Dolby cinema processor or with outboard graphic equalizers. Measurement is done preferably with multiple (calibrated!) microphones averaged with a "multiplexer," the output of which is fed to a real-time analyzer. Do some research and make sure that the filters in your analyzer are copacetic with the pink noise being fed to the speakers, not to mention that your pink noise source itself is good and flat.

It goes without saying (I hope) that once you have lined things up using the analyzer, you need to spend some time listening! First choice would, of course, be material that you have mixed, but selections from a wide range of facilities would also be helpful. Once you've done all this, don't forget to listen to the pink noise switched among the front channels; your ears can hear minute frequency response changes with pink noise, and you want those channels matched as closely as possible.

As a further check when setting up a room for film mixing for the first time, I recommend making test

—CONTINUED ON PAGE 135



not to mention the philosophy behind frequency response and level setup.

Television, on the other hand, lies somewhere in the middle. Although mixes are often done on film-re-recording stages and thus frequently share much of

a reading of 85 dB, using C weighting and slow response, at the console or two thirds of the way back in a theater. The frequency response curve (called the "X" curve in film parlance) is flat to 2 kHz, where it starts a 3dB-per-octave roll-

PHOTO ILLUSTRATION: TIM GLEASON

Scoring Big In New York

by Tom Kenny

Film scoring has always been a New York specialty, from even before the days of the big Broadway musicals on film. Hollywood has often come east to take advantage of that "New York sound." The best musicians in North America, by nearly all accounts, are in New York, as are some of the finest scoring stages in the country. BMG Studios, owned by RCA, pulled in a lot of work from L.A., but that facility closed last year, and



PHOTO: SHAN YANG

for many, it was perceived as the end of an era. The truth is, although the media spotlight focused on BMG's closing, New York has always had a number of big rooms to

handle orchestral work and film scoring. And, of course, the musicians are still there.

Hit Factory jumped into the vacuum left by BMG's closure with the

The scoring session for Spike Lee's "Crooklyn," arranged and conducted by Terence Blanchard, in the Manhattan Center Ballroom

January 1993 opening of the big room in the company's new facility on the west side. According to Hit Factory vice president Danielle Germano, when they started on the room, they had no idea that BMG was set to close.

"My father [Hit Factory owner Troy Germano] had always wanted an orchestra room, so when this building became available, they bought it and started construction. I'm not sure

—CONTINUED ON PAGE 136

Bill Nye The Science Guy

"S-s-s-sound. S-s-s-s-science." A stutter voice-over. Quick cuts. "Science is fun. Science is cool. Science rules. Sound is sci-

ence. Sound is a wave."

Each week, *Disney Presents Bill Nye the Science Guy*, a half-hour children's show produced by KCTS public TV in Seattle and featuring local stand-up comedian/scientist Bill Nye, dissects a scientific topic

and presents it to kids in an MTV-style format. The themes range from "Biodiversity" to "Flight" to "Skin." The idea is to present scientific concepts to children using real-world situations.

—CONTINUED ON PAGE 178



PHOTO: KRIS DANGLA

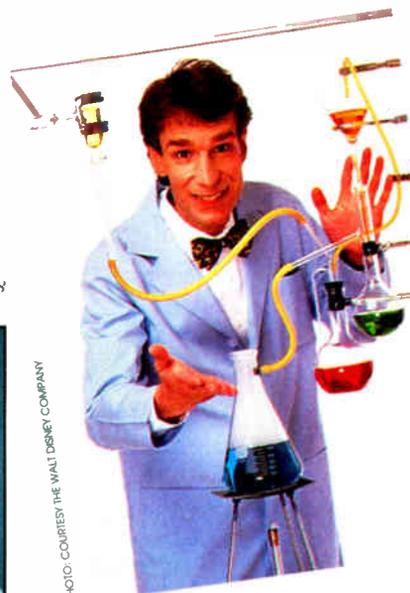


PHOTO: COURTESY THE WALT DISNEY COMPANY

Above: Bill Nye in the science lab. Left: The Bill Nye audio team at Bad Animals/Seattle (left to right): Erren Gottlieb, Jim McKenna, Steve Lawson, Vince Werner, Tom McGurk, Bill Nye, Jim Wilson and Sony Felho.

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World Radio History

—FROM PAGE 132, SOUND FOR FILM

mixes to DAT and taking them to large screening or dubbing rooms. Use some sample dialog from the film, "bracket" your EQ settings and see which ones translate the best. Do the same with music and effects, making sure to test for surround level, also. When starting out, you might want to go to a few different screening rooms (in Los Angeles, the Samuel Goldwyn Theater at the Academy of Motion Picture Arts and Sciences and the big theater at the

Directors Guild are outstanding in this regard) and dubbing rooms where you can be pretty sure that the monitor has been tweaked within an inch of its life.

I had a rare chance to compare mixing for theatrical release vs. CD release with the soundtrack album for *King of the Hill* (Steven Soderburgh's acclaimed most recent film). Cliff Martinez (the composer) and I mixed the album on the dubbing stage at Weddington Productions where I had mixed the film proper. For the most



POP systems designer Ron Lagerlof (left) and Apogee chief engineer Steve Kadar

PHOTO: MAUREN DRONEY

A Look at Apogee's New MPTS-1 Film-Monitoring System

by Maureen Droney

In collaboration with the THX division of Lucasfilm Ltd., Apogee Sound of Petaluma, Calif., has introduced a compact sound system capable of meeting all THX standards. Designed by THX and packaged for production by Apogee, it is an approximately one-third-scale model of the standard THX system. The system is called the Apogee/THX® Motion Picture Theater System One (MPTS-1), and it is licensed by THX for post-production facilities, dubbing stages, film and video screening rooms and small cinemas.

At a recent demonstration of MPTS-1 in Studio A at Pacific Ocean Post, Los Angeles, there were comments on the system's clarity and smooth high end. POP's designer Ron Lagerlof and Apogee's chief engineer Steven Kadar treated those assembled to brief laserdisc screenings of *The Abyss*, *Godfather III* and *Eric Clapton Unplugged*; *Godfather III*, in particular, seemed improved hearing it through the MPTS-1 system.

According to Apogee president Ken DeLoria, this is the usual reaction to a first listening on the MPTS-1. He told us that at the debut demonstration of the system, the plan was to screen short bits of *Terminator 2*. However, after the teasers were shown, the dealers in attendance demanded more. The Apogee staff was persuaded to run the

—CONTINUED ON PAGE 179

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part, we used the same EQ that I had used during the final mix, except we went back to his 6-track ADAT masters and made a mix directly to DAT.

Since Cliff and I were relatively new to the record game, I was prepared for the mastering engineer (Joe Gastwirt at OceanView Digital Mastering in L.A.) to perform open-heart surgery on our mixes. At the very least, I expected him to roll off some of the highs, since we'd boosted them because of the film-monitoring situation. (I was EQing to "poke it through the little holes in the screen," right?) In the final tally, Joe actually added a bit on the high end and lost a little below 50 Hz, and indeed what we heard on his huge ATC monitors was not all that different from the mixing stage.

I hasten to add that I'm not advocating mixing films in unvoiced (i.e., not EQ'd to the X-curve) recording studios, nor is there a reason to mix records in a film re-recording room. (I did it because I was familiar and comfortable with the room.) I just want to reassure anyone moving into the world of film mixing, even if it's just mixing a score, that there's no big mystery to mixing for films.

The toughest parts of a system to align are subwoofers and surrounds, primarily because the conditions in "the real world" vary so drastically. A chief culprit here is the Optical Bass Extension found in Dolby cinema processors: More often than not, the subs in theaters are turned up too loud. And depending upon the cinema processor and how it is set up, the subs often can be playing information that is already being reproduced quite nicely by the center speaker, thank you very much. Add to this dilemma the fact that many dubbing stages don't monitor standard stereo optical mixes with subwoofers; an unmodified Dolby DS-4 unit doesn't even allow for this. Set up correctly, OBE can effectively add an octave on the bottom end. Set up by a monkey, it can cause dialog rich in low frequencies to become severely muddled, not to mention making the low end of music and effects too damn loud. Even if you can monitor with subs on the re-recording stage, there is no way that you can take the downside into account and mix around it without compromising standard playback with just three full-range speakers.

In my experience (and I try to

hear each of my mixes in at least ten different theaters, some that I've just aligned and some that I walk into cold), the number of monkeys out there makes this downside of OBE much more common and severe than its upside. I ship a letter with each print asking projectionists, among other things, to turn O-B-E O-F-F. Surrounds are less of a problem, if only because the information going there (usually) isn't as important to the overall effect as the three screen channels. This is another way of saying that you should never rely on the surrounds being played back properly. As with the subwoofers, the error usually will be on the side of being too loud, or what I call the "assistant manager who knows enough to be dangerous" effect.

If you're mixing in a small room, you might want to start with the surrounds a few dB down (say, 83 instead of 85) because of the proximity of the speakers to your ears. Align the surround channel any louder, and you run into the danger of having your surround information disappear when you get into larger venues. Again, make tests before committing yourself. Monitoring being such a tricky subject, I expect that many will take issue with a thing or two that I've said. Fire your salvos directly to me at PO Box 24609, New Orleans LA 70184; fax (504) 488-5139. ■

Larry Blake is a sound editor/re-recording mixer who lives in New Orleans because of reasons too numerous to mention. Although getting down to the Dirty Dozen Brass Band at the Warehouse Cafe would be a good start.

—FROM PAGE 133, SCORING BIG IN NEW YORK
 how far into the project we found out that BMG was closing. I mean, what are the chances? Who would have expected it?"

Most newcomers are immediately impressed with the beauty of the big room at Hit Factory, which can hold up to 150 musicians. The roof was taken off the building, so that the ceiling now reaches 45 feet. There are no pillars or columns; four iso booths are located on the periphery, to hold drums, horns, backing vocals, whatever. The console is a Neve VRSP72 with Flying Faders, monitors are custom Boxers, and 48-

track digital and 24-track analog machines are located in a separate machine room. When you book the studio, you get the whole sixth floor, including a screening room, producer's lounge, artist's lounge, music editor's room, production assistant's room and support offices.

Almost every major film to come through New York last year came through Hit Factory at some point. The first session after the opening was a 75-piece date for Disney's upcoming animated feature *Pocahontas* (they still have more to do). *Carlito's Way* was scored there, as were *The Age of Innocence*, *The Hudson Proxy* and *Wolf*, which features an Ennio Morricone score: "It was an honor working with him," Germano says.

Besides film-scoring sessions, the big room has hosted the American Symphony Orchestra, Broadway cast albums (*Damn Yankees* was in with engineer James Nichols during this interview, and the Grammy-winning *Tommy* was recorded there), and plenty of rock 'n' roll dates, including parts of Edie Brickell's new album and all of Billy Joel's Platinum *River of Dreams*.

"We have a wide range of contacts in the music industry," Germano says, "and our business has always been word-of-mouth. It seemed like BMG's closing and a new studio opening...that was publicity right there. But we look at film scoring as another aspect of the music. Something new is always a challenge."

One of the best-kept secrets in New York, according to some, is **Manhattan Center**, located near Madison Square Garden on West 34th Street. Built by the Masons in the 1930s, the 94x98-foot Studio 7 (with an arched 45-foot ceiling!), commonly known as the Grand Ballroom, can hold as many musicians as a composer can bring in. Over the past 15 years, the seven-room facility (including a room for 20- to 60-piece ensembles) has seen all kinds of orchestral sessions; today the variety ranges from music video shoots to live broadcast to ensemble recording to Paul McCartney's pre-Carnegie Hall rehearsals. And now the company is moving into film scoring.

"We've been recording orchestras for the past 15 years, and even BMG was using our place, so it's nothing new to have classical sessions here."

says Victor Moore, president of Manhattan Center. "The difference now is integrating with film. We opened a video edit suite about seven months ago, so now we have more equipment to cater to that community." A large-screen projector with line-doubler, as well as spot monitors, are available in the hall.

Studio 7's control room houses a 56-channel SSL 4000 G Series with Total Recall and Ultimotion. It's set off to the side, which could be a drawback for some, until you realize that they set up a two-camera shoot for each session, which engineer James Nichols said was sometimes preferable during the scoring of Spike Lee's *Crooklyn*—he got to see closeups of Terence Blanchard conducting.

"There was a little discomfort originally, and Spike Lee was worried about it when they came in to score *Crooklyn*," Moore says. "But it became very comfortable over time. You still get the intimacy, and we have a clear talkback situation. We're also able to record on the raised 60x95-foot stage—we recently had a Phil Ramone project in with Andre Previn—where you have eye contact with the performers through the control room window."

The carpeted floor in the Ballroom can be brightened up acoustically with a large wooden dance floor and additional plywood, if desired. According to Moore, something about the carpeting and the arched ceiling contribute to an extremely natural sound. In fact, many sessions are handled without the need for musicians' headphones.

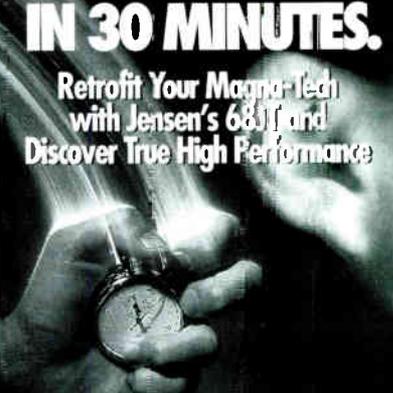
Nichols tracked the *Crooklyn* score (by Terence Blanchard) on the SSL; they moved downstairs to Studio 4 to mix on the Neve VR72. The two had already scored *Inkwell*, a Disney release, in the smaller room. Blanchard returned to record his new album project in the big room, and he did a video shoot as well, which gives new meaning to a "full-service" facility.

"A room like mine that caters to orchestral work gets its share of film scoring, and I'm glad that New York has rooms for 80 to 90 pieces also, so that these scores will stay in New York," says **The Edison's** chief engineer, Gary Chester, who moved into the music studio within National Video Center about eight years

—CONTINUED ON PAGE 177

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DAR SOUNDSTATION GOLD

Digital Audio Research, of Chessington, UK, (available through Sam Ash Pro of NYC) offers its SoundStation Gold, an integrated digital workstation, with assignable mix controller, dedicated edit control console, and both hard and optical disk storage facilities. The mix controller has four control layers, a stereo master and eight assignable channel strips—each with moving fader, display section and function control keys. Gold is available in 8- and 16-channel versions, and standard features include forward/backward variable-speed, dynamic automation and segment-based processing (for placing DSP functions, such as 4-band parametric EQ, anywhere on any channel).

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FAIRLIGHT MFX3 WORKSTATION

Fairlight (Sydney, Australia—U.S. offices in Los Angeles) introduced the MFX3 workstation. The new MFX package allows almost any audio recording/playback facility to be configured for four to 24 tracks of audio post-production and multitracking. The system provides 24 tracks of playback from a single hard disk, 24 digital and analog ins and outs, and DSP functions. Multiple systems can be configured for hundreds of tracks, and an MFX3 Mini unit offers four to eight tracks at a lower cost. Each system comes as a rack-mount or portable unit.

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OMNIMUSIC "SPORTS MUSIC" AND "SAILING"

Omnimusic (Hollywood, CA) increased its CD library to more than 100 titles with two new releases of production music. "Sports Image" features contemporary sports production tracks, emphasizing electric guitar, sampled sound, percussion and rock drums for high energy. The disc includes 16 full-length themes, plus 29- and 59-second broadcast edits. The "Sailing" disc includes the same number of tracks, offering light jazz and other contemporary backgrounds; the pieces are mostly acoustic and focus on saxophone, guitar and piano.

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SENNHEISER K6 SERIES

New from Sennheiser (Old Lyme, CN) is the K6 Series of modular microphones, based on the K6 (AA-battery) and K6P (phantom) powering modules. Designed for broadcast, film/video and music-recording applications, available electret condenser capsules include the ME66 (short) and ME67 (long) shot-guns, ME62 omni, ME64 cardioid, ME65 supercardioid and two omni lavalier capsules. Highpass filters on the modules provide a choice of flat or bass roll-off response.

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TIMELINE STUDIOFRAME WORKSTATION

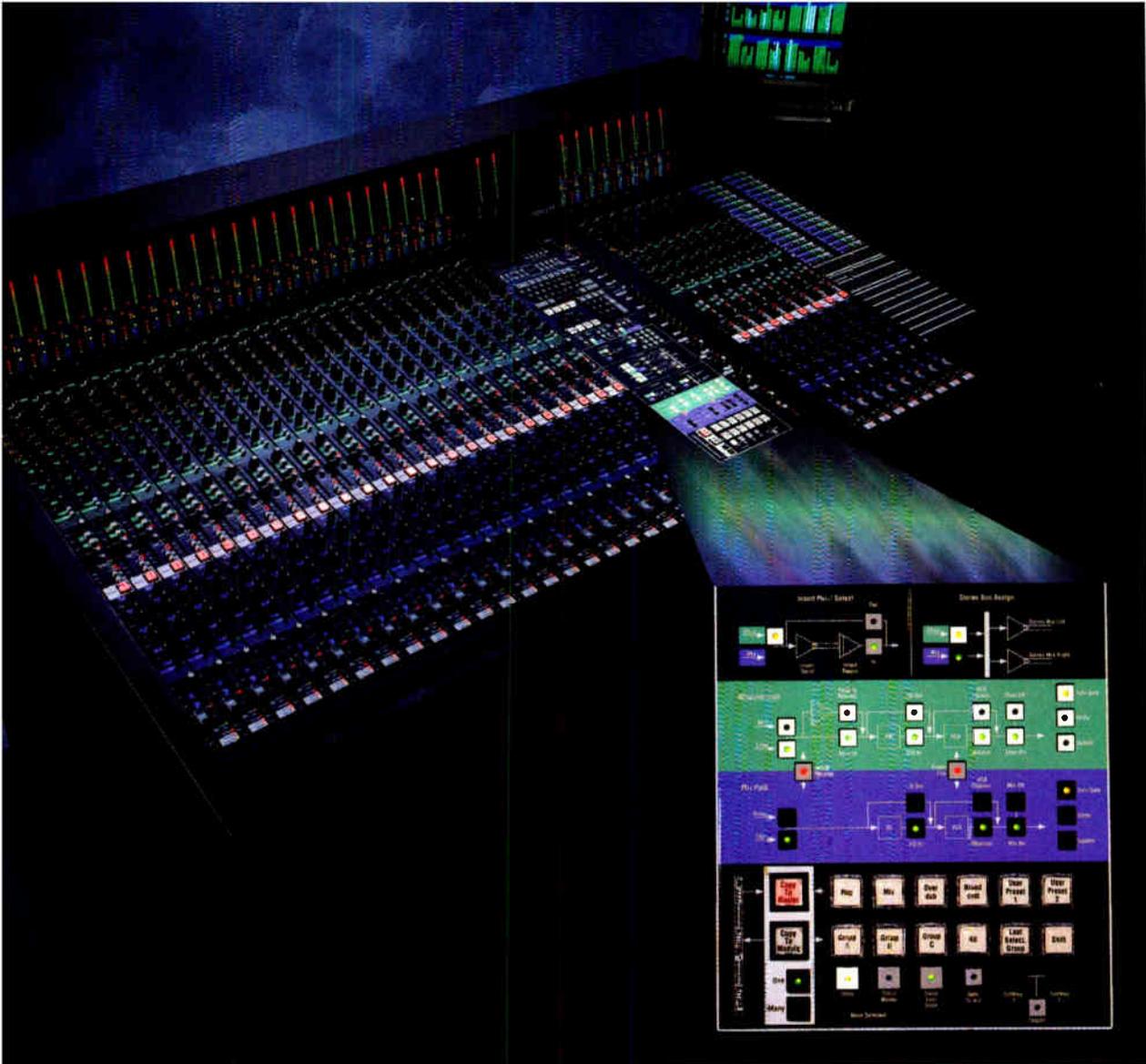
Following its recent acquisition of the WaveFrame line, TimeLine Vista (Vista, CA) announced the Studioframe DAW-80 workstation on the Intel/Windows platform. The basic configuration offers 8-track recording and editing, expandable to 32 tracks. It features icon-driven editing for quick learning and non-destructive audio operations that interface for multimedia production and post work. TimeLine also introduced new software for the Lynx-2 Time Code Module. Version 700-10 includes new features such as locking of serial transports to serial time code only, film transports parking to the perf., ten user-programmable transport settings, a serial transport setting that detects and automatically loads parameters, sample-rate selection for digital transports and LTC generation from serial time code input.

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MIDIMAN VIDEO SYNCMAN

MIDIMAN (Pasadena, CA) recently introduced a post-production video MIDI box that brings professional features to home use, retailing at \$649.95. The Video Syncman reads and writes VITC, LTC and MTC, and can translate any of these three into the other two simultaneously. It also has a built-in screen burner, showing the time code location onscreen for any video frame-locked to VITC or LTC.

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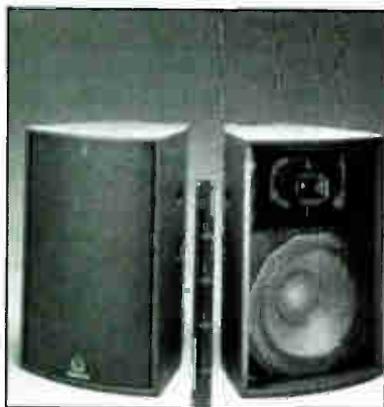
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by Mark Frink

SOUND CHECK



Some new products at NAMM (from top): Crest LM 8+4 monitor board, Turbosound TCS system and Apogee AE-9 speakers.



NAMM WRAP-UP

For anyone who has never been to the National Association of Music Merchants (NAMM) show, I recommend the trip to Anaheim in January only to the hardy. This show is enormous, taking up five convention center halls, each roughly 250-by-500-feet, plus a small arena of similar size.

At this year's show, about a hundred pro audio manufacturers displayed their wares, in addition to the thousand other manufacturers of everything from accordions to zithers. Many of the sound reinforcement manufacturers were clustered in the "Pro Audio Arena" with the rest scattered through the five adjoining halls.

If you can get through an airport like O.J. Simpson, you might have been able to see all the pro audio highlights in one carefully planned day. It was frustrating just trying to get from one room to the next through the crowd: throngs of music store owners trying to find new

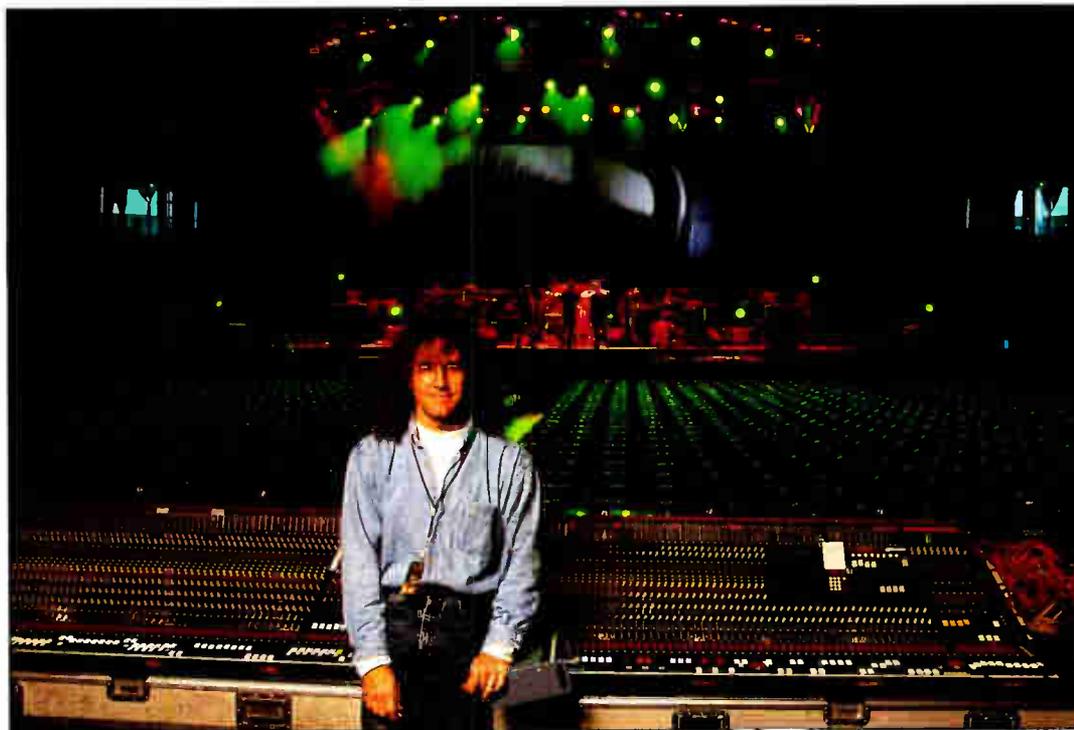
pots of gold to pay the rent; manufacturer reps checking out the competition; drummers and percussionists banging on anything they can; and guitar players scoping out the guitars and each other, trying to grab every piece of literature and anything else that's free. Just when I thought I couldn't take any more of this circus, Stevie Wonder came strolling down the aisle, and the crowd parted like the Red Sea.

One approach to events like this is to stay home, get some work done and ask people you trust to tell you about the ten most interesting things they saw. I hope to provide that courtesy for you here. In future columns, I will expand on other products being used on the road. Also, two new series in this section will be "Secret Weapons of Audio" and "The Pro Users' Microphone Listening Tests."

My first stop at NAMM was the Sennheiser booth to check out a new headphone model,

—CONTINUED ON PAGE 150

Robert Scovill Mixes Rush



Left: Robert Scovill at the FOH mix position for Rush at the Arco Arena in Sacramento, Calif.

Robert Scovill, known for his work with Def Leppard and Rush, has twice been honored by *Mix* readers with the TEC Award for Sound Reinforcement Engineering, so he must be doing something right. He's currently out mixing the Rush tour. We caught up with the tour at the Arco Arena in Sacramento, Calif., where the band was supporting their newest album, *Counterparts*.

Scovill started out as a musician in the Midwest but decided to pursue the engineering side of music. He attended a technical school for electronics in Kansas City thinking they would cover recording, but they didn't. He went on to crew for Superior Sound, a local company managed by Michael Tremain and Tom Osterman, that was doing a series of Sunday shows in the



Left: Isolation box specifically built for Alex Lifeson's guitar sounds. Right: Geddy Lee sings into a Neumann KMS-150 microphone.



park for 15,000 people.

"I came down one weekend," he remembers, "after I saw an ad they put up in school looking for hands. At the end of the day they said, 'Thank you very

much.' The next weekend, I just showed up again, and they put me to work. By the end of the summer series, I had quite a bit of experience." At the same time, Scovill was also working in a

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LIVE SOUND

local 16-track recording studio. A band named Shooting Star came into the studio to do demos, and they mentioned they needed a monitor engineer. Scovill said, "I can do that." Their first few shows were opening act dates for ZZ Top and Jefferson Starship. Within a year, he had worked with Clair Brothers, Showco and Ultrasound and used just about every kind of P.A. "At the end of that period, I had a wide berth of experience and made a lot of contacts," he says.

When asked what advice he would give someone considering live sound as a career, Scovill replies, "If I was asked that ten years ago, I would have told you to get in with a local act that's playing regularly and work your way up to an opening act situation. The number of cities that have good live performance clubs are so limited now that that scene does not exist to the degree it used to. Plus the technology is overwhelming now. I sort of bluffed my way into a gig, but I'm not sure you can get away with that anymore. I would advise people to get some kind of formal training, at least in the fundamentals of electronics and sound. I was at the electronics institute for a couple of years, and the one thing I got out of that was a tremendous vocabulary. I could walk into any situation and discuss the concepts at a good level. That was an asset."

Asked what kind of reference or educational materials he'd recommend, Scovill says, "One staple certainly is Don and Carolyn Davis' *Sound System Engineering* [available through the Mix Bookshelf], and I always highly recommend the SynAud-Con seminars. I went to some of those early on, including one of the first ones that dealt with the TEF analyzer. I still go to them; they're incredibly helpful and eye-opening. I wouldn't be afraid to check into seminars or even recording workshops. Some have really good programs."

The sound system for the current Rush tour is provided by Electrotec of Canoga Park, Calif. The BSS Varicurve system is being used to equalize the main speakers. There is an FCS-926 dual equalizer analyzer and three FCS-920 "slaves," which are identical but don't have the front-panel controls. The FPC-900 is the handheld remote control that is about the size of a computer keyboard and can be used wireless or hard-wired to the rack-mount interface unit.

"It's not cheap," Scovill says, "but for concert sound, especially in big venues, it's priceless—you can't put enough value on it. The way we deal with the P.A. is to take the cluster and break it into three components so we have separate EQ and crossover for those components. One we call the 'long-throw' P.A. Then, as the P.A. wraps around, say for the last six columns, we call that the 'near-field' P.A. Then there's the angled boxes that hang along the bottom of the array—the 'underhung.' The beauty of the Varicurve is that not only can you go up into the audience and EQ, but you can also solo up those sections of the array. I may want to just hear the long-throw P.A. and its effects on the near field and vice versa, and tone-shape things accordingly. Many times the long-throw P.A. can be creating ambience for the short throw, and you're not realizing it. There is a function on the controller called 'solo' that mutes the other devices as you call up individual equalizers. There are some cool compare features on it where you can have different curves [stored] and bounce in and out of any one of them."

There also is a sophisticated real-time analyzer built into the Varicurve unit. Other features include a 'Room Curve' facility that stores user-defined RTA room curves for achieving the auto EQ process, which links the analyzer to the equalizer. There's a PCMCIA or "smart" card slot on the remote for archiving EQ, RTA, room

curves and event lists, and you can also use this on some of the newer lap-top computers.

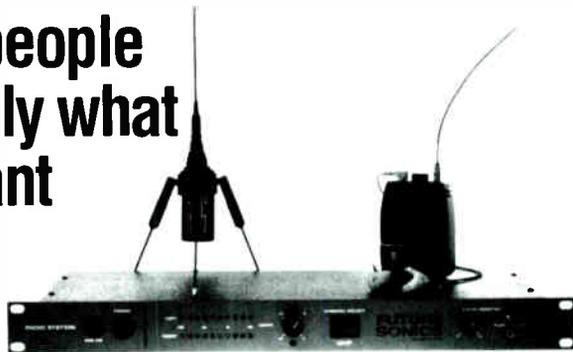
"I'm only using six filters a side, and that seems to be more than enough," Scovill continues, "although you can use one unit as a 12-filter device. We just do some real specific notches. For the first time, I feel like I can actually get into the P.A. and boost frequency at certain places, boost certain shelves if I want to. I never felt like I could do that with the old P.A. using the old equalizers."

There are two similar styles of the Electrotec P.A., which is a JBL-loaded two-box design plus subs. The original version is called the Lab-Q and uses a single 18 folded enclosure for the low box. The mid-high enclosure has two horn-loaded 12s with two bullet tweeters mounted in between the 12s at the front and then a 2445 on a custom version of the JBL bi-radial horn. The newer version is called Q-2 and has a double 15 low enclosure instead. The Q-2 was originally configured for David Kehrer for the Guns N' Roses tour.

"Kehrer and Flash [from Electrotec] got together and decided it was what they wanted," Pierre D'Astugues of Electrotec says. "We've also used it with considerable success with Bruce Hornsby in a different environment. Brad Madix, the engineer there, used it on a theater tour, and he felt it had a little more usable bass. It is a matter of personal taste, though, and it depends on the musical style of what you're trying to reinforce. We've got Nine Inch Nails in rehearsal now, and their system with the single 18-inch lows sounds fabulous. I think it's the right cabinet for them."

The mid-high in the Q-2 is almost the same, but the tweeters are placed below the horn instead of between the 12s. "I think that makes the

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12s sound a little better," Scovill says. "They might have also done a different design on the passive crossover between the horn and the tweeters." For subwoofers, there are 16 front-loaded dual 18s in a straight line on the floor at the center with the outside pair bent slightly. "We made a conscious effort to get all the subs in the center of the room," he adds, "because you get a pretty good fingering effect with them split left and right. Mick Whelan did some TEFs with them in the Electrotec shop, and we get very even coverage by splaying them electronically using a Klark delay."

The center pair is at time zero, the next set is at about two milliseconds of delay, and the outside is at about four ms, so that the wave front is propagated correctly. Directly over the subwoofers, hanging in a horizontal array from the down-stage half-moon thrust, are six small, trapezoidal EAW cabinets. "They're driven off a matrix send and delayed back in time to match the house, at about 28 ms. It really sounds great down in front," Scovill says.

For a system crossover, Scovill chose the Yamaha D-2040. "We've introduced some equalization as well as time alignment, so it's a completely different animal. It offers quite a bit of control over what we were using before. It's taken time to get the shelves sorted out properly. We had a really good show in San Jose the other night—it's the best I've ever heard the P.A. sound."

"The system allows for some variation in how you array it and drive it," D'Agostino says of the company's openness to input from their clients' engineers. "We don't really have a fixed idea, although we have preferences. There are many individual choices made by engineers. We're all for it. It gives us a flexibility that engineers are pleased to have. Robert [Scovill] has taken that

concept to the ultimate on this tour."

For tuning the P.A., Scovill says, "We use an AKG mic and do about ten measurements in the room. I use a combination of pink noise and music material and a source DAT that I'm very familiar with. There is a specific curve that I'm looking for. I usually take one curve at about 60 feet, right on center and store it, then take another seven or eight measurements and try to match that curve to get the coverage as even as possible. That helps me match amplitude as well as frequency response throughout the room, and it works out great."

Neumann KMS-150 hyper-cardioid condensers are being used as vocal mics. The company also makes the KMS-140, a cardioid that has a wider pick-up pattern. "I took the 150s on a recommendation from Neumann," Scovill explains. "I asked what the chances were of using the 140s, and they said that with this type of band I should take the 150s, just to be on the safe side. They've worked out great. You have the added advantage with singers using the in-the-ear monitors. Once they get used to them, their mic technique becomes really impeccable. You don't have to worry about them being off-axis anymore, because the singer can hear it in their ears when they're off-axis, so it's usually right on the money. I can't say enough about the vocal sound on this tour. We also just switched over to PRS in-the-ear monitors with Ety-motic Research transducers on custom molds. We have one wedge on stage for Geddy [Lee], but it's strictly for emergency backup."

Phil Wilkey performs monitor chores for Geddy Lee and Alex Lifeson. The only musician with regular monitoring is Neil Peart at the drum set, and he has Larry "Shrav" Allen and a Crest Century console

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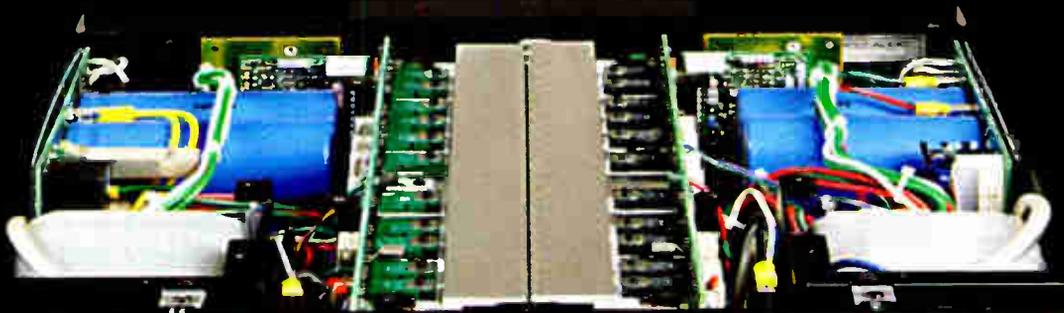
back there with him.

We asked Scovill how he's dealing with Lifeson's guitar sound. "We've had two new isolation boxes built for us by John Vrakking (one of the carpenters and engineers at Westbury National Show Systems in Toronto). They came out fantastic." Each box is a road case that isolates the 12-inch guitar speakers and their mics from the rest of the stage and houses a stereo pair with a mic on each speaker. "It's a tap right off of the guitar rig; it's just another set of speakers," according to Scovill.

They run two sources for Lifeson's guitar: a wet rig and a dry rig. "The dry rig is chorused," Scovill says. "We run a [Roland SD1-320] Dimension D on it and use it as a double-tracked guitar to sit underneath the wet one. At first we were fighting with the sound a bit. Alex went back to Marshalls this year—he's playing four stacks. We used to use GK amps, and suddenly guitars that we once considered primary guitars didn't translate well into the Marshall rig. We've gone back to a Paul Reed Smith Les Paul copy, which sounds fantastic, and one of the other guitars that was his 'A' guitar for the past couple of tours we've put back in the box."

For vocal and system compression, Scovill says, "I use the Tube-Tech [LCA-2A stereo tube compressor] on Geddy's vocal at a subtle ratio, like 2:1 or 4:1, just to smooth it out a bit and the [UREI] 1176 at 20:1. It's my favorite limiter to use at a 20:1 ratio." The Tube Tech is inserted on the mic pre channel, and the direct out of that channel is fed to the 1176 and returned to another channel that goes to the P.A.

"What I call the drive channel is the threshold control for the 1176, and you can pull it in or out of that 20:1 compression. It's a trick that Chas Sanford showed me." About



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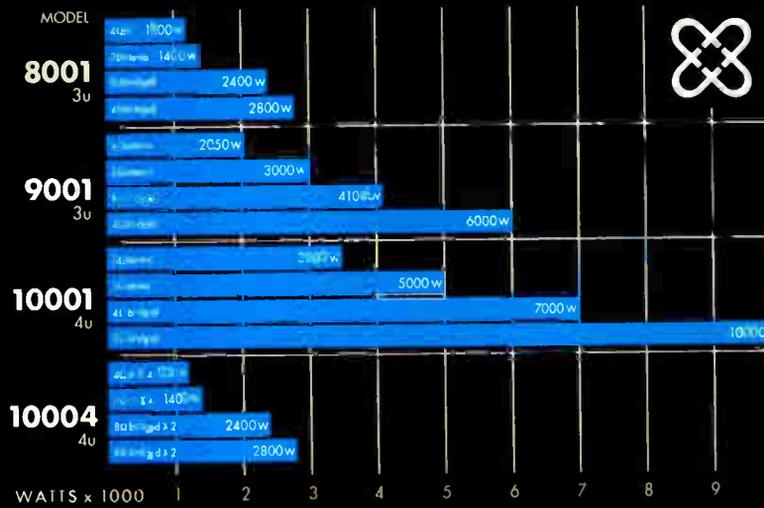
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system compression, Scovill says. "I use an SSL across the system mix bus strictly for mix compression, and it's very subtle. I'm running at about 2:1 with about 4 dB of compression, with slow attack and auto release. That's right in line with a BBE 8A02." He also uses a Behringer Studio De-noiser on the mix bus.

Live recording on the road seems to be a regular part of touring these days. Scovill records 32 tracks of ADAT with hopes of getting material for a live record. "We're using AKG shotgun mics to record the audience," he says. "We have two Blue Line SE-300Bs with CK-98s hanging from the offstage P.A. points, and two more hanging from what we call the 'alternate speaker system' or the rear speakers."

The P.A. includes speakers that are about 130 feet out, behind the mix position. These get special effects, special keyboard parts (e.g., one song has some wind on it). It's very

effective from the floor. "We have a mechanical rotator, called the 'Positioner,' on the shotguns that hang from the quads," Scovill explains, "and you can vertically and horizontally position those microphones from the console. After those speakers are up in the air, I can see where the people are, and if the mic ends up pointing into a vomitory, I can move it out of there. I tweak them in during the opening act."

The motors in the Positioners run on a 9-volt battery and are from Craig Boyce of Studio

Techniques in Danbury, Conn. The music-recording tracks are derived from combinations of subgroup outs for the drums, patch-point sends and three aux buses that just have things dialed in for certain tracks. They also have a pair of C-460Bs with CK-68s at the onstage P.A. hanging positions and a pair of the new AKG TLIs out in the house for ambience. Scovill says, "We end up with eight tracks of ambience and 24 tracks of music, and we're getting some very good stuff." ■

Quick Tips

Grant McAree from Vancouver, who mixes front-of-house for k.d. lang, suggests using an extra name when reservations are made on all group rooming lists. "Our extra room is booked under the name of Justin Case, as in, 'Just in case we need an extra room that night for whatever reason.' We can always cancel the room at the last minute if we don't need it; we tell the front desk that person isn't showing up. Most travel agents can arrange for an automatic 6 p.m. cancellation of a room." Don't like the sound of "Justin Case"? You might try Juan Moore, Annie Other, Will Needham or Ida Noyette. Half the fun is in thinking up the name. Thanks, Grant! ■

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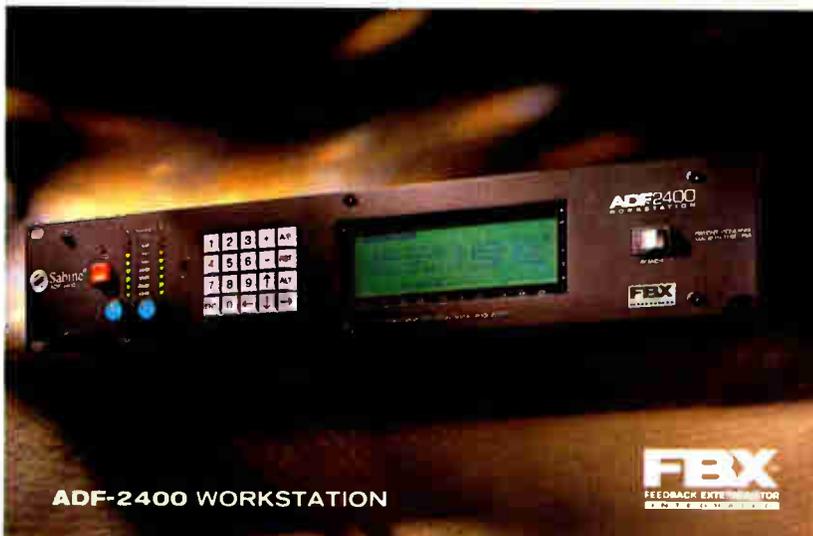
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—FROM PAGE 140, NAMM

the HD-25-SP. This is a derivative of the HD-25 with a simpler headband and a list price of \$129. These headphones are lightweight and provide excellent isolation. The cable is a generous ten feet and is plug-in replaceable at the earpiece. The comfortable earpieces spin around freely for easy, off-the-head, one-ear monitoring. The 85-ohm impedance makes them good for using with the limited-power headphone amps built into many pieces of gear in situations where extra sensitivity is needed to hear over ambient levels (such as the NAMM show). They seem sturdy and sound very natural.

Sennheiser also showed a low-priced hypercardioid dynamic mic, the MD-515, which lists for \$199. Its housing is made of lightweight, glass-composite material that is virtually indestructible. I dropped it on the floor repeatedly with no damage. It also comes with a switch as the MD-516 for \$20 more. The cardioid version is the 511 listing for \$60 less.

Next I met Duncan Fry in the ARX booth. He is the author of *Live Sound Mixing*, an excellent primer available through the Mix Bookshelf. ARX is a company from Australia that makes a line of well-designed auxiliary and processing gear. The item that caught my eye was their new 2-channel direct box. With all the features found in the single-channel model, including ease of battery changing, high output and quality sound, it can be very convenient for all those stereo devices on stage these days. Another unique product is the DI-6, which is more than just a rack-mount DI. It has six active channels that have much higher headroom due to the fact that the unit takes its power from a line AC plug. Each channel has a gain pot and a clip LED. It also acts as a 6:1 line mixer with both balanced and unbalanced outputs and a 3-watt headphone amp.

The Turbosound booth showed the new Floodlight and TCS speaker enclosure. The

Floodlight is a three-way box using a 12, a 6.5 paper-cone mid-high and a 1-inch compression driver, all horn-loaded. The box sports two wedge-shaped phase plugs that they have dubbed "axeheads." The sound of the box is a result of the company's philosophy of keeping compression drivers out of the vocal range. The box is designed for 50x25-degree coverage, and the dimensions are 32x22.5x20 inches. The TCS-612 is a small-format, three-way, bi-amped, quasi-trapezoidal enclosure using a front-mounted 12- and a 6.5-inch horn-loaded paper-cone mid-high with a coaxially mounted tweeter in front of it. The enclosure has two different angles on its sides and allows for two different "splay" angles. I look forward to hearing both of these on the cur-

rent Pink Floyd tour.

Over in Crown-world, they were introducing the new CM-312 head-worn microphone, which differs from their popular CM-311 differoid. (A "differoid" is a differential noise-canceling condenser element that provides rejection of sounds that are not in proximity to the capsule. The handheld differoid is the CM-310.) The 312 is a hypercardioid condenser, smaller than the CM-311. It's lighter and is worn at the side of the mouth instead of in front. CM-311s are being used on the current Garth Brooks, Janet Jackson and Restless Heart tours.

Crown's Macro Reference amplifier, which has been out for several years, was being used across the aisle by another manufacturer to demonstrate a sub-woofer with a digital earthquake sound effect. The transparency

Club of the Month

At "Five Corners" in Vineyard Haven, Mass., on the island of Martha's Vineyard, is the Wintertide Coffee-house. The Wintertide is geared toward acoustic and folk music singles and duos and has hosted the Martha's Vineyard Singer/Songwriters' Retreat the last two Septembers. A result of the first retreat was the live recording *Big Times in a Small Town*, on Philo, featuring folk artists from around the country.

This intimate, nonprofit club is alcohol- and smoke-free, has a capacity of 95 and is staffed by volunteers from the community. Typical for this type of venue, it houses a restaurant and has a hardwood floor and the stage in one corner. At each side is an EAW KF300 and a JBL loaded dual-15 subwoofer, far enough back so that the performer is in the mix. The system is four-way tri-amped with Carver PM 1.5s. The two bi-amped stage monitors are JBL-loaded with a 15- and a 1-inch horn. The front-of-house rack has a Biamp 8-channel rack-mount mixer, two dbx 160x compressors and a Lexicon 200 digital reverb. The club uses Beyer M-88s, Shure SM57s and Whirlwind Director DIs.

The Wintertide's manager, Tony Lombardi, says the goal is to provide CD-quality sound in a relaxed environment where you can enjoy coffee, dessert and the company of friends. "We can't pay performers a lot of money because of our size," Lombardi explains, "so we try to provide an unforgettable experience for the musicians on the folk circuit."

A note to touring engineers: If you have worked in a club that has the kind of sound equipment that makes it an exceptional place to mix, send a note about it to Mark Frink at Mix. If possible, enclose a photo of the equipment with the people responsible for its installation. ■



Wintertide managers Tony Lombardi and Cig Van Raan

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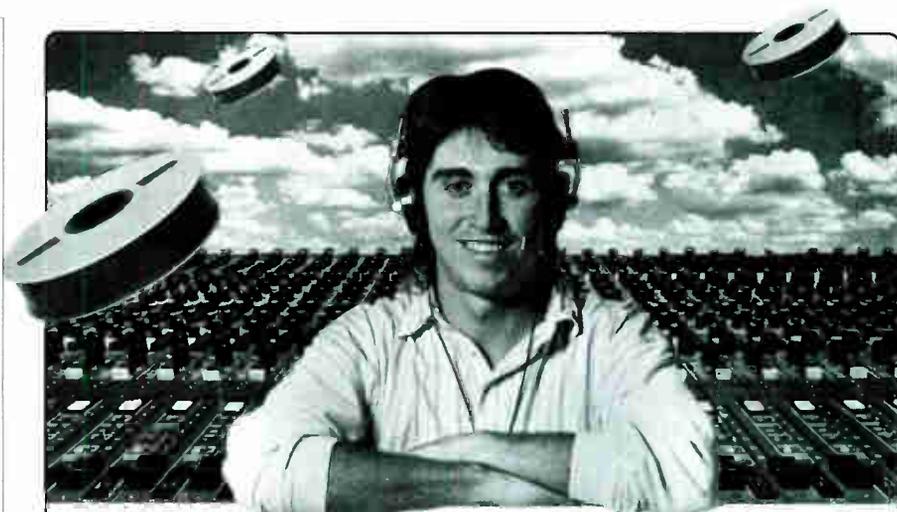
AKG was sharing a booth with BSS and dbx. AKG had a whole row of mics hooked up to headphones, including the C-3000 introduced at the AES show last October. An internally shock-mounted, large-diaphragm (22mm), touring condenser, it uses the same diaphragm as the 414 at about half the price. The mic sounds a little different and has a presence that the 414 does not. The C-3000 would work well for rock 'n' roll or digital project studios. It includes a 10dB pad, a highpass roll-off and is switchable between two cardioid patterns. The C-5600 and 5900 are instrument and handheld condensers, respectively, in the "Tripower" Series introduced at last year's NAMM. The C-5600 has the same diaphragm as the 414 in an even more rugged package than the C-3000, but with no switches. Both of these mics are aiming for the touring market. If you've been waiting to buy a 414, you might consider one of these.

BSS had its extremely cool FPC-900 Varicurve remote controller on display. This handheld unit works with either a standard RF wireless link or hard-wired via XLR to control up to 32 channels of programmable equalizers, either the two-space FCS-926 or the one-space FCS-920, which has no front-panel controls but all the same functions. Both equalizers are six-band stereo parametrics. You can do a lot with this unit, onstage or in an arena, and it's my pick for the "coolest toy that I can't afford" award. (See "Rush/Scovill" in this issue for more

on the Varicurve remote.)

Allen & Heath featured its new GL2 multifunction mixer, the first mixer I've seen at this price that is good for live front-of-house, monitors, multitracking or any combination of these. This mixer is a rack-mount derivative of the GL3, packed with most of the same features. It sports 100mm Alps faders and ten microphone-input channels; the mic/line switch for the 1/2-inch input also acts as a 20dB pad on the XLR, which has 48 volts of phantom power that is individually selectable; 4-band, 18dB-per-octave EQ with two fixed shelving EQ points at 70k and 12k; and 2-band sweepable EQ that reaches from 35k up to 15k and overlaps 500k to 1.5k. The two stereo-input channels each have 4-band fixed EQ and are each switchable between two 1/2-inch or RCA inputs. Six auxiliary sends on these 14 inputs eliminate the need to economize effect sends for foldback sends in combined FOH/monitor applications.

Like the GL3, the GL2's most remarkable feature is the ability to switch the six auxiliary buses to the 6 (4 plus left and right) groups' insert points, faders and out the balanced XLRs to make it a six-mix monitor board. At the same time, you have switched the four groups and left/right buses to the six auxiliary outs, and they become available for taking the fader mixes to multitrack inputs or effects or other mixes such as headphones. These output "fader reverses" are made with six individual switches, so the combinations are endless. There isn't space here for all the extras on this board that you'd expect on a much larger console. Suffice to say, at a list price of \$1,500, this is the most flexible mixer you can buy in this price range. It's the perfect utility console to use in a rehearsal space where you might also want to get rough cuts on a multitrack or take it out for a



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Audix, of Portland, Ore., showed its new OM-5, a vocal mic that, at a \$329 list, fits price-wise between its other two concert dynamic vocal mics, the OM-3xb and the OM-7. I took the opportunity to borrow and compare all three models by using them at a recent show, along with a popular, well-known, expensive dynamic vocal mic that has been a standby for me for years. The three Audix OM mics all have a similar, natural sound quality, which comes from the company's VLM capsule technology. On this particular system, which had been set up with pink noise to be reasonably flat, I was able to use these mics with no EQ or highpass filters, while with my regular mic, I would normally do some shelving and tweaking. All three Audix mics exhibited dramatic gain before feedback, with the OM-7 having the best.

This reminded me of a festival where I mixed monitors several years ago and Take 6 showed up carrying OM-3s for their vocal mics. Having tuned the monitors for the company's standard dynamic vocal mic (you know the one), I hesitated as I plugged these in, fearing the worst. Their house engineer said, "Don't worry, it'll be fine," and ran out to the mix position to get started. He was right. After the set, I thought I just got lucky, but now I know the design's extreme feedback rejection and smooth response were the reasons, making this an ideal mic to carry on the road when you can't carry much else. The top-of-the-line OM-7 is designed with a lower output so it can be used in high-SPL situations without needing pads or excessive trim at the mic pre-amp, which might affect the sound. (Pearl Jam is using these mics with great results.) The new OM-5 has the same extended high end and feedback rejection

as the OM-7 at a slightly higher output level than even the OM-3. The OM-5 is presumably designed for lower-volume, more traditional singers. If the OM-7 is for high-SPL arena stages and the OM-3xb for one-offs and clubs, perhaps this model can be characterized as being for pop singers in theaters.

At the Apogee booth, I checked out two new speakers and a subwoofer. The new XP-14 subwoofer is an extremely powerful, low-frequency speaker system designed as a companion to the 3X3 three-way concert loudspeaker. The XP-14 contains two 1,000-watt 18s loaded into a 2-meter horn column, folded into an enclosure identical in size to the 3X3. An even newer subwoofer not shown was the AE-15, identical in size to the 3X3. It houses four long-excursion, ferrofluid-cooled 15s mounted on a vertically split baffle, which is splayed at 30 degrees. These provide tighter response and better pattern control for superior array-ability in addition to extreme power handling. Eight of these were used along with four of the conventional dual 18 AE-12 subwoofers at the Grammy Awards on March 1st at Radio City Music Hall. Sound services for the Grammys were provided by Burns Audio. Patrick Baltzell was the FOII system designer; I asked him about the show and the room.

"There is a 70Hz problem right down the center of the room," Baltzell reported. "The geometry is such that it converges there. The scenery for the show is very high and wide, filling the entire proscenium, so that the left and right speakers are virtually on the side walls. The stereo image is really stretched. It's hard to get the right angle without aiming across and creating time problems from multiple path-length differences between the left, center and right clusters. I tend to put most of the dialog in the center cluster, which has wonderful coverage. I use the left and right stacks for music, and

in just the outside edges of them I'll put some dialog to cover the side walls."

The center cluster comprised six 3X3s and three AE-5NCs and ended up at a 36-foot trim. On the floor, the AE-3 front-fill speakers were cut into the step units with grille cloth so they were hidden. An even newer speaker that Apogee showed at NAMM was the AE-9, a mid-sized, three-way bi-amped enclosure with a 15-, a 10-inch horn-loaded mid-range and a 1-inch compression driver offering 60x40-degree pattern control down to 300 Hz and very low distortion. Baltzell added, "We would have used these on the Grammys if we'd had enough time. The pattern control makes them very attractive."

Also shown at NAMM was Apogee's new AE-8, a two-way bi-amped trapezoidal enclosure based on the AE-8B floor monitor, with a 15-inch woofer and a 2-inch compression driver. Twelve AE-8B wedges were used at the Grammys. "It's also

noteworthy that the entire monitor rig, driven by three Yamaha PM-4000s, is flown 25 feet in the air so that they can get the scenery on and off," Baltzell said.

In SR news at the Crest booth, along with the new CA 6, CA 9 and the 9001 amplifiers, there is a new version of the live monitor console in the Century series. The LM 8+4 offers eight stereo and four mono mixes and is ideal for use in stereo stage monitoring applications, especially in-the-ear monitors. Electrotec is currently providing an LM console for the Brooks & Dunn tour. The group uses Future Sonics Ear Monitors, and Pierre D'Astugues reported that the use of in-the-ear monitoring is becoming more commonplace. "Once the artist is comfortable with these, it's much easier for everyone," he said. He also said that the group switched from a Gamble EX 48 to the Century LM noting the "ease of positioning elements in the stereo mix is less cumbersome than with dual

pots," and the high sonic quality has not changed.

I caught up with the monitor engineer, Dave Haney, in Las Cruces, N.M. at the beginning of this year's Brooks & Dunn tour. Haney said the console is "very user-friendly; a teen-ager could drive it." He's using the LM 8+4 console to mix nine stereo in-the-ear and three mono speaker mixes, which are subs for the drummer and bass player, and a wedge for the steel guitar player. The steel player has a wireless lap steel and is on a hard-wire mix and "just pops his ears out and gets up and walks around" at certain spots in the show. Haney said the console is extremely clean. "I've worked with many consoles, and where there's even the smallest amount of crosstalk it doesn't affect you so much in the wedges, but in earpieces it's quite annoying. I was a little concerned how the electronics would stand the test, since it is a mid-price console, but it's definitely at the pro level. My next

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goal will be to see if it stands the test of time, because we're doing 140-some-odd shows this year, and it'll be bouncin' off the semi daily. My only concern now is to see how it rides."

Haney is using 50 of the 52 channels so far. "The 100Hz roll-off and the pad on each channel work well, and the EQ is pretty responsive," he said. The switch to change pre or post fader engages in groups of four sends. "I imagine one of their money considerations was putting pre or post on each send instead of switching them in groups," he added. "What you can do is pull out the module, which is a quick pull—you can pull a module in under a minute. You will see a jumper, which is a three-position affair." Number one is pre, two is post and the third one will mono the desk on that particular send. Each of the 12 dual-concentric stereo sends has the send on top and the pan below. When you engage the third jumper, the top

is send one and the bottom is send two so you can use it as a 20-mix desk.

"They could have spent more money on the faders," Haney continued, "but in this application with the ear monitors, my approach is to drive them with the sends on the channel. For Kicks and Ronnie [Brooks and Dunn], I put the jumpers in the post position on their sends, and I drive them post and I bump rides for 'em on the faders. The band stays in the pre, which makes them a little tighter and makes them work together a bit more."

The console has an XLR direct out that has a pin-one lift; it is being used for a 24-channel Alesis ADAT rig.

When I asked Haney for his advice for engineers considering in-the-ear monitoring, he says, "They're definitely the wave of the future, but there's a lot more to deal with. You're driving a lot of stereo mixes, and the room still affects your final mix. You can still end up with open

microphones, and they collect information. A lot of people can have problems with them—but there are solutions. It's better for the artist, and it's better for the crowd. I estimate that you take 25 to 30 percent of the volume factor out. That gives the artist and the house engineer a chance to get better articulation in the mix and give the crowd a better show. Also, a lot of venues have volume restrictions. I've done several with wedges where we exceeded the volume restriction at soundcheck with just wedges on. A wedge is like a fan: When you step out of the way of the fan, you don't feel the wind anymore. With in-ear monitors, you're walking around with that fan in your ears, and you're stayin' cool all the time. The freedom is unbelievable." ■

Mix sound reinforcement editor Mark Frink can be reached at 4050 Admiral Way #305, West Seattle, WA 98116; phone (206) 933-8404; BBS (206) 933-8478.

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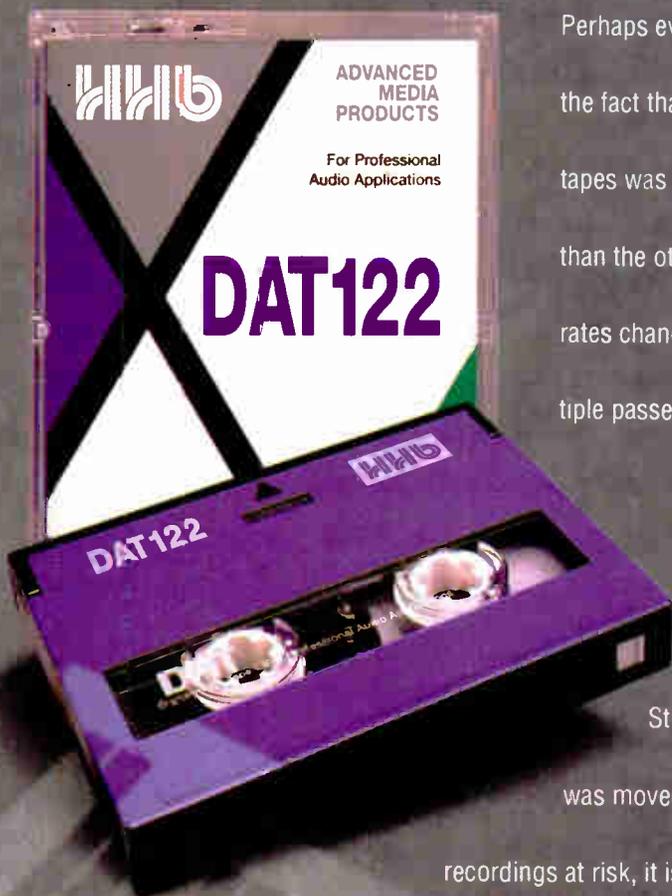
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TELEX FMR-450 WIRELESS SYSTEM

Telex Communications Inc. (Minneapolis) recently introduced a professional UHF wireless mic system that operates from 524 MHz to 746 MHz, with true-diversity circuitry for stable RF performance. Up to 50 systems can be used simultaneously, and a new compander design is said to provide an S/N ratio better than 110 dB. The half-wave collinear antenna offers substantial gain improvement over quarter-wave models, and the compact receiver features a transformer-balanced output. The system can be used with a micro-pack transmitter, handheld transmitter or lapel mini-mic.

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GOLD LINE DSP-CI

At NSCA '94, Gold Line (West Redding, CN) exhibited the DSP-CI, a black box designed to interface with IBM PCs and compatibles. Smaller than most laptops, the DSP-CI comes with RS-232 and Computer Video Option software and can run all software options for the Model DSP30 RTA, including RT60, loudspeaker delay timing, THD analysis and option print. Users can capture and store all RTA data on hard disk while at the job site; later, the unit can be controlled directly from the computer to display a full 80dB window with measurements in 0.25 to 5dB increments. Suggested retail is \$1,199.

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ALLEN & HEATH GL2 MIXER

Building on the popular GL3 model, the GL2 mixer from Allen & Heath (Sandy, UT) offers 14 channels and four subgroups in a unit that can be rack-mounted horizontally or vertically for live mixing. It can be switched between FOH and monitor configurations at the press of a button and can be set up for multitrack and stereo recording. Balanced XLR I/O, four aux returns, phantom power, 4-band EQ with sweepable mids (and EQ defeat switching) and six pre/post aux sends complete the package.

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CROWN CM-312 HEADSET MIC

The CM-312 head-worn microphone from Crown (Elkhart, IN) is a hypercardioid design with an electret condenser capsule, which is mounted on a boom to the side of the mouth rather than the front, making it as unobtrusive as possible. This lightweight design is suited for applications such as on-location broadcast and live entertainment. The microphone is available with a belt-pack or in a headset-only package that attaches directly to existing belt-packs.

Circle #212 on Reader Service Card

SABINE FBX-1802

Augmenting its line of automatic feedback controllers, Sabine (Gainesville, FL) announced the FBX-1802. This 2-channel upgrade of the FBX-900 Feedback Exterminator automatically senses feedback, determines the frequency and places a narrow notch filter (up to nine filters per channel) at that point. The filters can be locked to prevent them from going deeper, and users can choose the number and width of filters to be activated.

Circle #214 on Reader Service Card



by Philip De Lancie

TAPE & DISC NEWS

R IAA REPORTS '93 GAINS

1993 sales figures released by the Recording Industry Association of America show continued overall growth in prerecorded music sales. The trade group, whose members create, manufacture and/or distribute 90% of the sound recordings sold in the U.S., reports that net units (shipments less returns) were up 6.7% over 1992.

Total dollar value, meanwhile, reportedly rose 11.3%, breaking \$10 billion for the first time. That figure, however, is based on the suggested list price of the units shipped and not on the actual amounts paid by consumers.

The fact that the rise in dollar value was greater than the rise in units reflects the continuing increase in the percentage of the market held by CDs, which cost more than other configurations. CD units and value were each up about 22%, which translated into almost 90 million more CDs shipped than in 1992. At 495 million units, CDs now account for

about 60% of full-length albums sold. Based on estimates from the Electronic Industries Association, the RIAA says that CD players are currently owned by 43% of U.S. households.

The penetration of cassette players is much higher, of course, but cassette albums nonetheless continued a gradual downward trend from their peak at 450 million units in 1988. Last year saw 369 million cassette albums shipped, down 27 million from 1992.

Ironically, after all the fuss made (here and elsewhere) about the two new prerecorded music formats, apparently neither Mini Disc nor DCC sold in sufficient quantities to merit a mention on the RIAA list. Maybe next year...

SPLICES

Astral Communications (Montreal, Canada) increased its projections for initial capacity for its new plant in Boca Raton, FL. According to chairman

The Recording Industry Association of America's 1993 Year-end Statistics

	1990	1991	1992	1993	% CHANGE 1992-1993
Units Shipped					
(In Millions) CDs	286.5	333.3	407.5	495.4	21.6%
Dollar Value	3,451.6	4,337.7	5,326.5	6,511.4	22.2%
CD Singles	1.1	5.7	7.3	7.8	6.8%
Value	6.0	35.1	45.1	45.8	1.5%
Cassettes	442.2	360.1	366.4	339.5	-7.3%
Value	3,472.4	3,019.6	3,116.3	2,915.8	-6.4%
Cassette Singles	87.4	69.0	84.6	85.6	1.2%
Value	257.9	230.4	298.8	298.5	-0.1%
LPs/EPs	11.7	4.8	2.3	1.2	-47.8%
Value	86.5	29.4	13.5	10.6	-21.5%
Vinyl Singles	27.6	22.0	19.8	15.1	-23.7%
Value	94.4	63.9	66.4	51.2	-22.9%
Music Videos	9.2	6.1	7.6	11.0	44.7%
Value	172.3	118.1	157.4	213.3	35.5%
Total Units	865.7	801.0	895.5	955.6	6.7%
Total Value	7,541.1	7,834.2	9,024.0	10,046.6	11.3%

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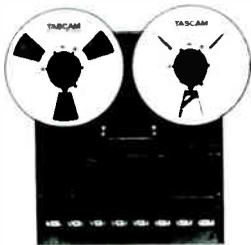
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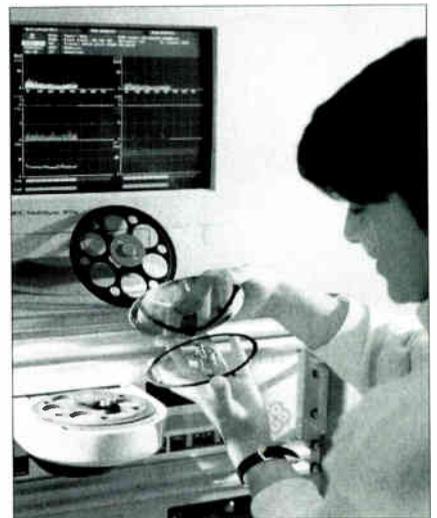


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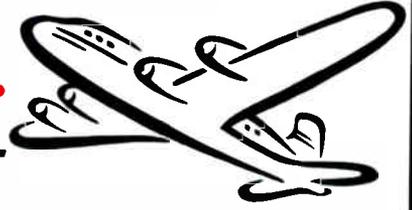
Harold Greenberg, capacity was raised from 12 to 15 million due to positive response to the announcement of the facility...Future Disc announced that the entire digital signal path of its Hollywood, CA, mastering facility will be upgraded to a minimum of 20-bit resolution. Chief engineer Steve Hall says the move is in anticipation of more and more studio recording being done at higher resolutions...CMS Digital (Pasadena, CA) reports mastering work for laserdisc releases by Madonna and Prince, as well as mastering album releases by Tom Scott and Fourplay...Pacific Coast Sound Works (West Hollywood, CA) mastered the soundtrack CD for the movie *Ace Ventura* and managed audio production chores for Media Vision's "Peak Performance" CD-ROM... Veteran cajun country swingers the Hackberry Ramblers mastered their latest at Disc Mastering Inc. in Nashville...Koch Digitaldisc introduced



Koch Digitaldisc CDCS 4/SA

the CDCS 4/SA stamper analyzer and the CDCS 4/R remote. The analyzer may be installed in a single or multi-player CDCS 4 system and combined with up to seven local and remote players. Koch is distributed in the U.S. by Studer Editech of Menlo Park, CA...Calibration tape maker Magnetic Reference Laboratories has endorsed magnetic recording heads made by Saki. MRL uses the heads in the manufacture of its reference and alignment tapes...Ampex Recording Media reports that its Opelika, AL, tape manufacturing plant has been approved for registration of its Quality Assurance System under ISO 9002. ■

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C O A S T

L.A. GRAPEVINE

by Maureen Droney

Euphonix made Margarita Mix Studios in Hollywood the first stop on their 1994 World Tour. The event made for a great juxtaposition: the adobe-like plastered walls, tile floors and Mexican folk art decor of Margarita Mix, and the elegant, spare, space-age design of Euphonix consoles. The world tour's agenda is the introduction of the CS2000 with its Digital Studio Controller and ES-108 dynamics package, with stops planned for, among other cities, New York, Chicago and London. At the Los Angeles

—CONTINUED ON PAGE 164

Dave Marcus demos the Euphonix CS2000 at Margarita Mix in Hollywood.



PHOTO: MAUREEN DRONEY

NORTHEAST CORRIDOR

by Jeff Forlenza

After being rocked by one of the worst winters in many years, the Northeast is finally thawing out and getting back to business. Many of the established recording facilities in New England are booming, and new



PHOTOS: STEPHEN GREEN-ARMYTAG



In the Catskills Mountains of upstate New York, Bearsville Studios recently renovated its Turtle Creek Barn, which now features live-in accommodations along with an AMR split console and Studer tape decks.

rooms are sprouting up to meet the needs of the music-hungry masses. We spoke with representatives of several Northeast studios to get an impression of business back east.

In upstate New York, Bearsville Studios recently transformed its rehearsal/pre-production barn into a live-in recording space. The Turtle Creek Barn on the Bearsville recording complex now features an Audio Media Research split console, Studer tape decks, and quality mics and outboard gear. The studio was founded by Albert Grossman nearly 25 years ago, and the spirit of the one-time manager of Bob Dylan and The Band lives on at Bearsville, which is now run by Sally Grossman and studio manager Mark McKenna. The Turtle Creek Barn began as an

C O A S T

PHOTOS STEVE BRADY

Battery Studios in New York City recently opened Studio K2, designed by Neil Grant. The room features an SSL G Series 4064 console and Boxer Five mon-



adjunct to the main studios; later, Muddy Waters recorded his Grammy-winning *Woodstock* album there. Today, the barn features a "glassless communal environment where there's no separation between musicians, producer and engineer," according to McKenna.

In the East Flatbush section of Brooklyn, Basement Recordings gives minority musicians a chance to get their hands on recording technology. The fully functioning recording studio also acts as a learning center with seminars on electronic music and digital recording techniques. Basement is committed to providing Brooklyn's African-American and Hispanic communities access to recording technology—for free. Basement features a Yamaha DMR8 digital recorder/mixer and a full array of Yamaha gear (Yamaha is a Basement sponsor). Basement

opened during last year's AES convention. Owned by five award-winning creative partners, Manhattan Beach has four rooms: 48-track Studio A with Manhattan's first fully automated Otari Concept 1 console, a 24-track studio and two MIDI studios. Also noteworthy at Manhattan Beach

—CONTINUED ON PAGE 166

Manhattan Beach Recording opened during last year's AES show with Manhattan's first fully automated Otari Concept 1 96-input console. World Coast Music is an in-house music production service.



NY METRO REPORT

by Dan Daley

Ed Evans has returned from Touchdown Studios in Germany to become director of technical operations at the Hit Factory. Touchdown closed its German operations at the beginning of the year, but its plans for a Portuguese studio are still on-track, though substantially delayed. Evans said he plans some minor modifications to existing production rooms at Hit Factory, and plans are being formulated for expanding the facility.

Broadway composer and producer Mitch Leigh, noted for the score of *Man of La Mancha*, opened Leigh's Folly, a studio on West 57th Street. The 1,500-square-foot studio, designed by John Storyk of the Walters/Storyk Design Group, features two control rooms that share a common recording space. Storyk said the hardest part was finishing the project be-

—CONTINUED ON PAGE 166

—FROM PAGE 162, L.A. GRAPEVINE

preview, invited guests were greeted with cocktails and appropriately south-of-the-border hors d'oeuvres, after which Euphonix VP of marketing and international sales, Andy Wild, gave everyone a detailed run-down on the CS2000. Then attendees adjourned for hands-on demonstrations in Margarita Mix's Bandida and Caverna Studios by house engineers Tim "Rocko" Rock and "Dr. Dave" Marcus.

Margarita Mix created a splash with its innovative decor when it opened in January 1990 and has gone on to specialize in commer-

cials, becoming one of the busiest audio post houses in town. This year, they are following up on 1993's Euphonix installation with the purchase of three more CS2000 digitally controlled analog studio systems. The new consoles will be in remodeled suites featuring 16-channel Spectral Synthesis workstations. The original Euphonix, in Studio Caverna, is coupled with a Synclavier PostPro hard disk recording/editing system. To accommodate the new installs, Margarita Mix completely overhauled its central machine room and replaced three consoles of a much larger size. "The suites will be even

more spacious now, plus we've got more console performance," says Keith Scheyving, Margarita Mix's chief technical director.

Margarita Mix has a lot of clients and a very fast turnaround between sessions. "We sometimes have a different client every hour on the hour," Scheyving says, "and we are delving into longer-format audio post as well, so the Euphonix automation is definitely valuable for the customary revisions and remixes. It also allows an engineer to move from room to room throughout the facility and just take a disk for instant reconfiguration of the console."

Rumbo Recorders in Canoga Park would like it known that rumors of major earthquake damage to their studios are unfounded. Although the 6.7 temblor's epicenter was less than two miles from Rumbo, all is well at 20215 Saticoy St. The studios were up and running four days after the shaker, with projects including an Eddie Money album and David Foster-produced tracks for Take 6.

New at Rumbo: To accommodate musicians who are getting more involved in technical matters, Rumbo has put together a custom headphone system for Studio A. Designed by Jim Mancuso, the setup gives up to four musicians control over 12 channels of program material, including individual reverb adjustments. A nice feature for the busy tracking engineer—no more complaints from the band about the level of bass or the amount of vocal reverb in the cans. Early reports indicate that the setup is working out great. Musicians who like to be relieved of mixing responsibility and fed a stereo board mix can, of course, also be easily accommodated.

Warner Bros. Studios has begun construction on a new 42,000-square-foot film and television post-production facility at the Burbank location. Two-thirds of the project is expected to be completed by August 1, 1994, with the remainder finished by June '95. The facility is part of an overall plan for Warner Bros. Studios under the direction of Don Rogers, senior VP of post-production services, along with Barry Snider, VP of post-production. The plan calls for a number of new buildings, including a Digital Sound Editorial Complex, Foley and ADR stages, and a telecine mastering facility.

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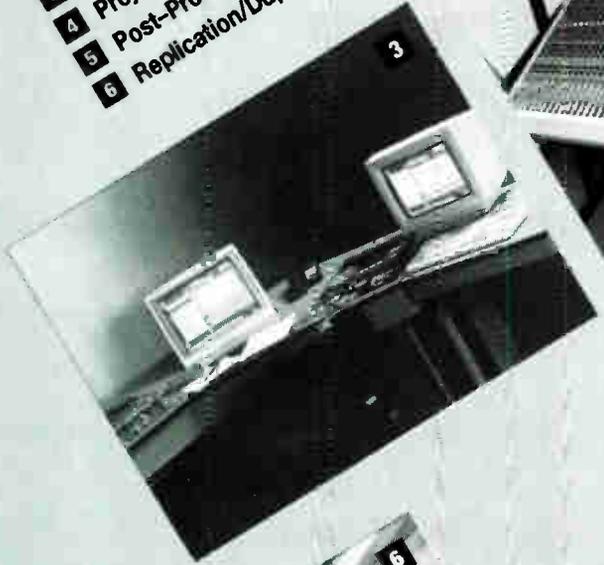
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duction resources at Warner Bros. Studios will remain operational throughout the construction, some of the post facilities will be completely refurbished and incorporated into the new design. Gary Credle, president of Warner Bros. Studios facilities, comments, "This is going to be a truly top-notch facility, with the best services, equipment and environment to foster the most creative work of the people using it." Rogers adds, "Our new post-production unit will be a full-service facility. It will, of course, be readily available for our in-house talent, but we also want it known that we're here for

television producers and filmmakers outside the studio as well."

Night Technologies International held an open house at its Woodland Hills office early in March to introduce the EQ³ High Definition Audio Sound Enhancement system to the Southland. (See April *Mix* for a Field Test of the Night EQ³.) Local engineers and audiophile types were invited to bring their favorite CD to check out the EQ³ processor on a "consumer"-quality system. Ed Simeone of Virtual Designs Ltd., an NTI Los Angeles affiliate, demonstrated the unit's features, and NTI president Richard Zimmerman reported recent

credits for the EQ³ including albums for the Indigo Girls, Kathy Mattea and Aaron Neville with Tammy Wynette.

Got L.A. news? Fax me at (310) 472-8223. ■

—FROM PAGE 163. NORTHEAST CORRIDOR

is a Baldwin Conservatory grand piano, which lured pianist Marian McPartland to the studio—now McPartland records her weekly *Piano Jazz* NPR program in Studio A.

Also in the Big Apple, Battery Studios recently opened Studio K2, featuring an SSL 4064 G Series console. Starting in October 1989 as a three-room facility, Battery now has studios in Nashville and Chicago, as well. In May 1992, Studio B was gutted, and the Neve 8068 console was sent to Battery Nashville. The new room was totally rebuilt with the aid of designer Neil Grant of Harris Grant Associates and now sports an SSL console and Boxer Five monitors.

In Caldwell, N.J., Glenn Taylor runs Taylor-Made Productions, a multiformat studio offering all the attributes of a Manhattan studio in the 'burbs of Jersey. Taylor's work earned a slew of advertising accolades in 1993, including the Silver Microphone, New Jersey Ad Club and ITVA awards. Specializing in corporate spots and short-film scoring, TMP also tracks music for music's sake. Veteran rocker Tommy James chose Glenn Taylor to remaster and overdub previously unreleased cuts for an upcoming 25-year anthology on Aura Records. On the technology front, Taylor-Made added the Optifile automation system to its 76-input Harrison Raven console. ■

—FROM PAGE 163. NEW YORK METRO

fore the five-week deadline. "That was a serious challenge in a place like Manhattan," he said, noting that acoustical isolation problems were the main design considerations. Both control rooms have daylight access, and one has a view of Central Park.

The tech component of Leigh's Folly is based around the Roland DM-80 8-track hard disk system, Soundcraft DC-2000 consoles and Quested 200 Series monitors. The tight deadline was due to several film projects undertaken by Leigh. All equipment was supplied by Audio Techniques, and Beth Walters han-

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cluded the interior design.

New Breed Studios, over in the West 30th Street music building, recently added a Sound Tools II system. The move is reflective of the trend of smaller studios adding relatively inexpensive but powerful digital editing systems in order to keep more of a client's project in-house. "That's exactly what we got it for," said co-owner Paul Jacobs, whose partner has the quintessential New York name, "Mugs." "We're looking to keep them here longer for editing and normalizing projects we record."

Staten Island is about to get a major mixing facility right near the ferry landing: Mystic Studios will open the first of two mix rooms this month, featuring an SSL 4080 G Plus with Ultimotion. Design and acoustic work was by Andy Munro and Richard Oliver. Owner Greg Angelides said the location won't be a hinderance because he's offering door-to-door limo service, and the ferry is expanding service up to West 48th. Mystic will be a two-room facility by summer, with a MIDI room for pre-production.

Also on Staten Island, Laughing Dog recently took delivery of a Big by Langley console, three Alesis ADATs with BRC, an Eventide H3000 and other outboard gear in an expansion to 24-track digital recording.

Richie Kessler, owner of Platinum Island, reports a new record label he's started called Necessary Records.

The name of the label tells us a bit about how things are changing in the business, particularly in New York. Kessler prefaced his comments by saying, "I've been starting to think about my future..." Maybe it's time fellow studio owners stopped to think of their futures, as well.

Studios, which were once regarded as expenses by major labels, are now being viewed as resources. Instead of simply being production factories that make records, they're increasingly becoming the places in which artists are found and developed, then produced. Kind of like farm teams for the majors, so to speak. Rates have remained static and even fallen backward in New York in recent years, and more and more studio owners are beginning to see their own roles becoming more pro-active in terms of artist development—as a means to ensure a continuous flow of clients and revenue.

And record companies, particularly in black and urban music genres, are funding producer-owned studios as de facto A&R extensions. I don't editorialize much in this space, but this is an area studio owners need to investigate more as the business continues to shift away from its traditional tracks. To paraphrase Kessler, we have to start thinking about our future.

If you have any musings on the future of Gotham's recording community, fax Daley at (212) 685-478. ■

SESSIONS & STUDIO NEWS

by Jeff Forlenza

NORTHEAST

Kid n' Play, the Select Recording artists who also happen to be movie stars, were at Bayside Sound Recording in Bayside, NY, completing their new album to coincide with the release of their latest movie, *House Party 3*. Kid was also producing LaFace recording artist Ras Posse's new album. Parris Robinson engineered both projects...At Quad Recording in Manhattan, remixes are the rage: David Morales remixed a track for General Public with engineer David Sussman, and hot remixer Frankie Knuckles was working on Melanie Williams' single "Everyday Thang" with engineer John Poppo... At Philadelphia's Studio 4, Joe and Phil Nicolo (a.k.a., The Butcher Brothers) were working on a num-

ber of projects including pre-production for the upcoming Aerosmith blues project for Columbia and recording the latest Goats CD for Ruffhouse/Columbia...Producer Phil Ramone was at Soundmirror Studios (Jamaica Plain, MA) editing a new collection of Jerome Kern songs featuring artists Sylvia McNair and Andre Previn. The album was recorded by John Newton for Philips Classics...At City Sound Productions in NYC, Zimbabwean mbira (thumb piano) player Ephat Mujuru was tracking a world music CD with producer Rachel Faro and engineer Bob Kirschner...The Warehouse Recording Studios (Philadelphia) had producer/engineer Ross Hogarth in recently tracking a demo of Jersey rockers Mercy River for Elektra Records with warehouse engineer Mitch Kricum...At New York Audio Productions (NYC), various artists have been tracking spoken-word projects, including actor Tony

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Roberts narrating Robert Aspen's novel *Myth Directions* for Durin Hayes Audiobooks, with producer John Wynne and engineer Perry Pilagonia...

SOUTHERN CALIFORNIA

At Encore Studios in Burbank, Epic recording artists General Public were mixing with producer Ralph Sall and engineer Brian Malouf in Studio B; and vocalist Patryce "Choc'let" Banks (formerly with Graham Central Station) was mixing a two-song cassette with producer Jorge Martin and engineer Milton Chan...Proto-punkers Bad Religion were at Skip Saylor Recording (L.A.) remixing their singles "Kerosene" and "American Jesus" with engineer Andy Wallace and assistant Eric Flickinger...At Hollywood's Paramount Recording Studios: Comedian Jim Carrey and rapper Tone Loc recorded the title track to the soundtrack of Carrey's hit movie *Ace Ventura: Pet Detective* with engineer Andrew Hay...At Track Recording in North Hollywood, DJ Quik cut his self-produced CD for Death Row/Interscope Records, and producer Broadway was remixing tracks for Tupac Shakur...At Backroom Studio in Glendale, Brian McKnight recorded his new album with engineers Chris Wood and Mark Abetz, and assistant Todd Elhart...

SOUTHEAST

The Allman Brothers Band were at Miami's Criteria Recording Studios mixing their upcoming Epic release with producer Tom Dowd and engineer Jay Mark...At Nashville's Scruggs Sound Studio, Randy Scruggs worked on a track for the *Red Hot & Country* project for PolyGram. Scruggs self-produced the sessions, which included Vince Gill and Ricky Skaggs joining Scruggs in the studio for an instrumental jam, with engineer Ron Reynolds...Peabo Bryson was at Atlanta's Musiplex Studios tracking vocals and overdubbing a remake of the song "Through the Fire" with producer David Foster and engineer/co-producer Marc Freeman... Travis Tritt was at Nashville's Castle Recording Studios overdubbing and mixing his latest for Warner Bros. with producer Gregg Brown and engineer Rob Feaster...At Nashville's Music Row Audio, Bela Fleck self-produced his latest Warner Bros. CD with engineer Bill VornDick...Hardcore techno act Syn-



PHOTO: JIM CARROLL

Oops! We goofed. In the March "Coast to Coast" section we incorrectly reported Richard Horniblow as producer/engineer of the Belly single "It's Not Unusual," mixed at Manhattan's Platinum Island Studios. The correct producer/engineer on the Belly project for Sire/4AD Records was Matt Stein (seen here, seated at the console with the band); Richard Horniblow was assistant engineer.

ical completed tracks for their second release, *Killjoy*, at Atlanta's Transmedia Studios with producers Brian Haught and Tom Griggs, and engineer David Norman...

NORTHWEST

Warner Bros. artists American Music Club tracked their latest release at Studio D in Sausalito, CA, with producer Joe Chicarelli, engineer Tracy Chisholm and assistant Larry Brewer...Bay Area favorites Zero were at Prairie Sun Recording in Cotati, CA, compiling and editing live material for a CD release. Guest musicians on the live tracks included Vince Welnick, Pete Sears, John Kahn and Nicky Hopkins...Engineer Don Gilmore (who assisted on Pearl Jam's *Ten*) produced the L.A. band Ondine at Triad Studios (Redmond, WA) for an independently released CD...

SOUTHWEST

Doug Pinneck of the band King's X was at Rivendell Recorders (Houston, TX) producing a demo for local act Therefore I Am with engineers Brian Garcia and Ryan Birsinger... The Blue Johnnies were at Planet Dallas working on their second Gaglian Records release with producer/engineer Rick Rooney...On the big island of Hawaii, Rick Asher Keefer recorded and mixed Hawaii's own Brother Noland and Tony Conjugacion for Creative Native Records at Sea-West Studios...

NORTH CENTRAL

Rock/fusion band Amazing Headgear were at Chicago's Paragon Recording Studios working with producers Rob

Curtis and Kirk Davis, and engineer Thom Fiegle on an upcoming CD... MCA recording artist Mr. Fingers (Larry Heard) tracked his latest album, *Back to Love*, with engineer Mike Konopka at Chicago's Seagrave Recording. Fingers and Konopka remixed the first single off the album, "I Need You," at Streeterville Studios, also in Chicago...

STUDIO NEWS

Music Grinder Studios (Hollywood) recently installed an SSL 6072 E/G Series console into its Studio A. The console has 72 modules (48 of which are G Series) and Total Recall. Music Grinder also added a Lexicon 480L and a host of other techno-goodies...The Egyptian Room opened in downtown New Orleans. With API and Neve consoles, the Egyptian Room will join the small coterie of state-of-the-art studios in town. ■



Producer Steve Lillywhite

Music West Sponsors Master Producers' Workshop

This month's Music West conference in Vancouver, British Columbia (May 13-15), features a Master Producers' Workshop, in which a prestigious group of professionals will work with conference delegates, who must apply to attend the MPW by submitting their production credits to the conference staff. Confirmed participants include Hugh Padgham (Sting, Phil Collins), Steve Lillywhite (U2, Peter Gabriel, Morrissey), Steve Brown (Wham!, The Cult) and Bruce Fairbairn (Aerosmith, AC/DC).

Each of the pros will take a group of ten to 15 participants into a local studio for 90 minutes of intensive instruction and Q&A. Host facilities include The Armoury, Mushroom, The Warehouse, Blue Wave and The Greenhouse. Although the workshop is invite-only, anyone can visit Music West. For information, phone (604) 684-9338.

—FROM PAGE 116, DAWN II

requirements. If necessary, individual event lines can be reconfirmed. DAWN II also can interpret CMX notes, which specify source and record tracks relevant to a selected edit, as well as character name, dialog line(s), crossfades and other data.

For ADR and Foley recording, each spotted event can be selected for looping. DAWN II will locate the VTR or internal video source to a targeted preroll location, replay while locked to video, then punch in at the desired point. ADR beeps and streamers also can be generated for cueing the voice-over talent or actor. Recorded takes are numbered sequentially and can be edited together to form a final version.

DSP AND FUTURE FUNCTIONS

In terms of DSP functions, DAWN II currently offers time compression and expansion, plus sample-rate conversion. By the time this review appears, however, Version 4 software will offer 4-band parametric equalization, panning and internal mixing, as well. The enhanced software will require a companion DAWN IIxe Input/Mix board, which features four analog inputs, stereo output, plus digital output and digital loop-thru for cascading the stereo mix bus between separate DAWN II processor units.

The DAWN II manual and tutorial, currently undergoing final revisions, are well-written and easy to follow, providing a simple A-to-Z of basic system features and functions. Anyone familiar with Mac control graphics and conventional editing practices can master the system easily and be cutting audio within just a couple of hours. I was particularly impressed with the uncluttered screen layouts and the intuitive way in which most functions are readily apparent from onscreen icons or can be accessed easily from simple, pull-down menus.

All in all, the DAWN II is an excellent value at \$12,500 (for a basic 8-track system, less computer and hard disk), offering a remarkable amount of editing power in a compact, easy-to-master package.

Doremi Labs Inc.: 3255 Cahuenga Blvd. West #101; Los Angeles, CA 90068; (213) 874-3411. ■

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

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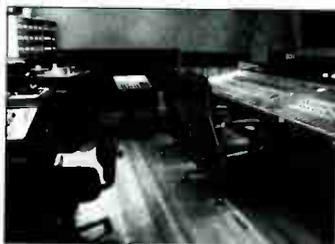
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—FROM PAGE 70, CD-ROM AT NDR

The equipment is very similar. You can use the same stuff for both. We have a Macintosh dedicated to CD-ROM, but the CD recorder is interchangeable. It goes from room to room because we are not writing CDs all the time in all the rooms. And the hard drives are also interchangeable. Both music and CD-ROM work use large, fast drives. We have about six 1.2GB drives that roam around. The only difference is that the drives have to be reformatted when they are used with the Sonic system.

Give us a step-by-step overview of the various phases of CD-ROM mastering that you handle.

Let's start with something simple like a basic Yellow Book CD-ROM, which is just taking somebody's files and putting them on CD. The client sends us their stuff on some sort of media, usually something removable

such as a Syquest cartridge or a Bernoulli, dataDAT or 8mm Exabyte tape.

If the client asks us to do any testing on the material they give us, we can run Norton Utilities, which will detect if the directory is screwed up, or Speed Disk, which will defragment the files. It is just like in audio mastering, where you might find something on the source that is not quite right and you get the client's permission to fix it.

The next step is to copy the data onto a partitioned hard drive connected to our Mac. The drive is partitioned to the size of the data that will go on the CD. We copy from the source medium to our hard drive, ensuring that none of the files on our drive are fragmented and that the directory is intact. That is very important, because it affects the performance of the finished CD, so that when you go to access something off the CD, it can find it right away.

It is also important to keep files that are going to be accessed during

certain application moves either near or within the folder of the application that will be accessing them. That kind of ordering of files may be done as we are copying the material to our partitioned drive. Generally, that is something that is up to the client to do in advance, though we may be able to tell them that they will get better performance if they change the order of certain files.

After we finish copying the data, we open MacTopix or QuickTopix, whichever we are using. Although MacTopix works pretty well, it has a fairly clumsy interface. But QuickTopix does not do all the things that MacTopix does. For instance, we still do mixed-mode discs with MacTopix, although the QuickTopix capability for that should be available soon.

One thing you can do with QuickTopix is to use the CD-ROM simulate feature. Once you have your data on the hard drive, you can select the profile of any of several different types of CD-ROM drives, and the program will simulate how the finished disc will function on that kind of drive.

From there on, it is really pretty easy to record the CD-R. Assuming you have both your hard drive and your CD recorder in your SCSI chain, you just give QuickTopix a command to take everything that is on that partition and write it to the CD. QuickTopix has a nice test-writing feature, which will simulate the writing. It goes through the whole cycle of writing to CD just to make sure that your data is good so you won't waste a disc.

Once it passes the test mode, the data will automatically be recorded to our CD-R recorder. Then the final step is to test the CD-R. We can do a bit-for-bit verification with QuickTopix to confirm that everything on the disc is the same as everything on the source partition.

You mentioned the mixed-mode disc as an important future format for the music industry. What special considerations are involved in preparing a disc for playback on both computers and stereos?

The first thing is to understand exactly how much room you have on the disc: how much of the disc will be track one, which is computer data, and how much will be tracks two to 99, which are CD Red Book audio.

In terms of putting it together, the client will give us the data on their removable media, and they will supply their audio on a DAT (see Fig. 2).

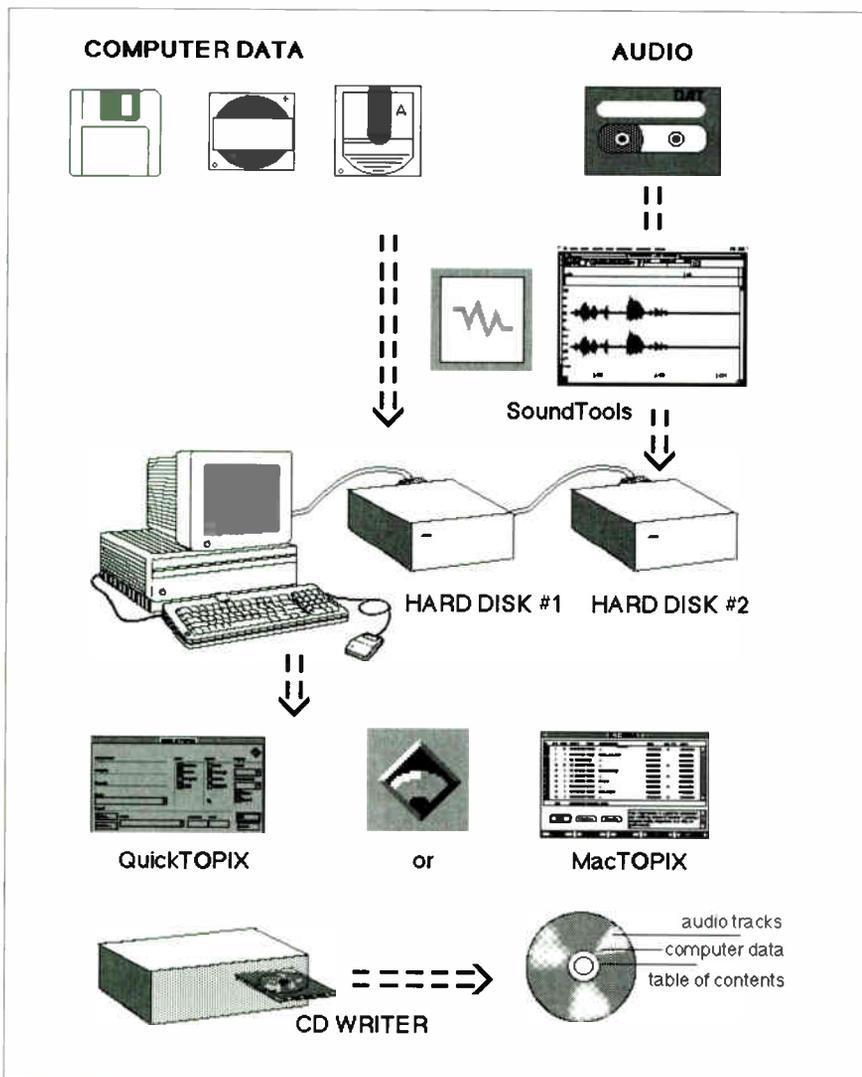


Figure 2: Flow chart showing the master-making process for a mixed-mode CD-ROM

We ask if they want us to perform any of our typical mastering services on the audio. If they do, we generally do the work on the Sonic System. Then we send them back a DAT for approval of our EQ or editing or whatever.

Once the audio is in finished form, we dump each track from the Sonic into a separate file in Sound Tools. That gets the audio into the Macintosh's HFS [hierarchical file system] format, which can be read by the CD-ROM software. And the computer data also needs to be put on the same hard drive.

Then, using MacTopix, we create a CD layout, which is basically a sequence of the tracks with track one as the file that contains the computer data. And we put a gap into the CD layout corresponding to the spread time we want between each of the audio tracks. So in that sense, the process is very similar to making a playlist in Sound Designer II. And once the tracks are laid out, you go through a couple of protocols and you can write your disc.

Now that you have been doing this for a while, what observations have you made as far as which subjects and styles of discs actually work in the CD-ROM market? Which clients get reorders, and which fade away after just one project?

As far as our work goes, there are two types of clients. One is the archiving clients, who use CD-ROM for their own in-house needs. The other is the commercial-release client. From what we have seen so far in the latter group, the most interesting products seem to be the ones that both integrate several media types—text, graphics, audio—and are interactive, meaning that they really engage the person who uses it. It is pretty important for the user to get involved and to have choices throughout the process. Those types of releases are the ones that are the most popular.

What are some of the projects that have been most interesting for you to work on?

I think that the *Sing-A-Long* project we did for Dr. T's Software is an interesting example of a mixed-mode CD (see Fig. 1). It is an interactive karaoke title for children with animation and lyrics. Right now it is only available for PC, but apparently there will be a Mac or a hybrid [Mac and PC on the same disc] version soon. It has both Red Book audio and MIDI, which

you can use if you have a General MIDI interface in your sound card. It was a challenge because we were creating for a different platform [PC] than the one we were working on [Mac].

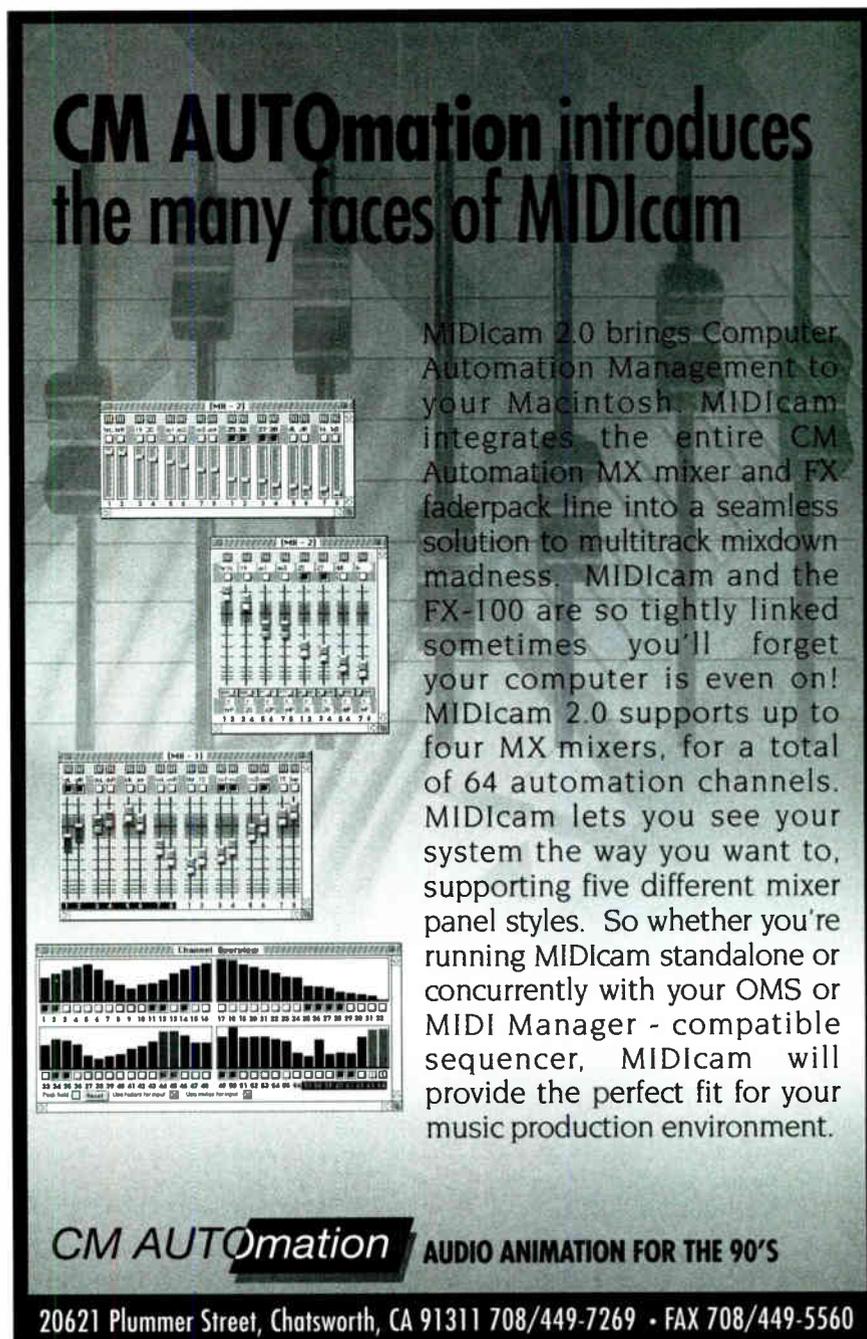
Another one which was interesting was a hybrid disc for a company called Silver Platter, which makes educational software. The disc was about cancer. It would be used at a medical school. We went through a series of tests to make sure it would play back on both platforms, with all the files organized and named the right way for a hybrid disc.

In retrospect, how do you feel

about the decision to enter the CD-ROM field? Do you ever wish you had just stuck to your core music business?

The whole CD-ROM thing has been a lot of fun for me. I feel energized by this stuff, sort of like I was energized by digital audio ten years ago. We are getting to see a new medium develop, with an open field, and to see creative stuff start to happen. It's been fun for us. ■

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



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—FROM PAGE 137. SCORING BIG IN NEW YORK ago. “We did stuff for *M. Butterfly* [Howard Shore score], including the authentic Chinese Revolution music, and we did the jazz score for [Robert De Niro’s] *A Bronx Tale* [Butch Barbell score]. We’ve also done some work on *The Hudsucker Proxy* and other Coen brothers films—*Miller’s Crossing*, *Barton Fink* [scored by Carter Burwell].

“The city hasn’t done a great job of enticing film work,” Chester says. “If you have five or six major films come out of New York each year, and each one of them takes a week to record the music, that gives you five or six weeks of music. Somebody said to me, ‘Why don’t you knock a bunch of walls out and make a bigger room? Or a second room?’ Well, it wouldn’t pay to make it bigger for five films a year. We have to find ways to bring more films into the city. We have the musicians, we have the composers, and we have the talent. I’m hoping the composers bring the music back.”

In the aftermath of BMG’s closing, Chester did remove a drum booth, which he says wasn’t being used much, to make space for ten to 15 more musicians, bringing capacity up to 70. In order to fill the room, he relies on a steady diet of jingles and is looking at more rock ‘n’ roll and R&B sessions.

“The sound of the Edison is rather tight,” Chester says. “It’s live, but it doesn’t swim, and it has an exceptional amount of separation for people sitting in such close proximity. You don’t really lose people. You very rarely have to say to someone, ‘I can’t get you anymore because of all the other pieces in there.’ It has as good a separation as you can expect for a room this size. There are no square walls, and we use Tectum a lot, so it stops a lot of reflections without creating any boom. You don’t find yourself rolling off the bottom of your microphone before you even start. In a few cases, we’ve done some minimal miking-type things, and it works out quite well.”

One final note: Chester says he has noticed an increase in American film scores being done in Europe. The Edison handled some vocal work on an upcoming Lucas film called *Radioland Murders*, but all the orchestrations were done in Germany. “It’s a ‘40s movie about ‘40s music, and it was pretty strange to

hear these people counting off in German and going into a ‘40s blues lick.”

Clinton Recording’s main room, 55x50, with 24-foot ceilings and live, wood surfaces, can hold up to 85 musicians (tightly), making it one of the bigger rooms in Manhattan. The facility has a solid collection of vintage tube mics, and one of the Neve 8078s has been modified with Flying Faders on both mics and monitor returns.

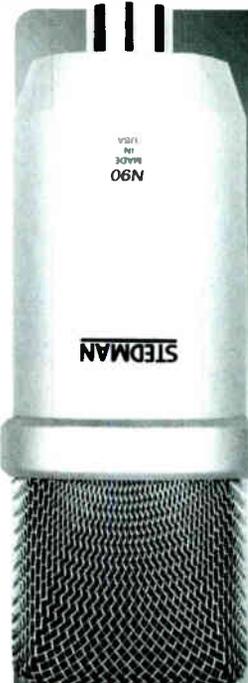
“We’ve stood firm on our reputation,” says Jim Janik, night manager, in reference to steps taken after the BMG closure. “We have a nice, large room that can fit an orchestra, along with a good collection of tube mics and a great engineering staff.”

Recent scoring projects include *Sugar Hill*, *Best Little Whorehouse Goes Public* (infomercial), *The Night We Never Met*, *Legendary Songwriters* (documentary), *Sleepless in Seattle* and *Life With Mikey*.

“At Clinton, we’re committed to combining our technical expertise with excellent customer service,” says facility manager Lynn Bagley. “I want people to be pleased with their recording experience and looking forward to coming back soon.”

Power Station, legendary in music-recording circles, now carries the subhead “Sound Recording and Audio Post-Production Studios” on the company letterhead, prompted by the fall 1990 opening of Studio AV/1. Used primarily for mixing national commercial spots and some TV work (although *Laws of Gravity*, the low-budget, critically acclaimed Nick Gomez film, was mixed there, as was some of the music for *The Hudsucker Proxy*), AV/1 houses an 80-input SSL 4080 G Series console, Sony 3324 24-track digital recorders and Magna-Tech 6-track (6, 4, 3 and mono erase, record and playback heads) and 4-track dubbers (4, 3, mono and 16mm heads), as well as a Synclavier 9600 system.

“AV/1 was built specifically for audio post-production projects,” says Zoe Yanakis, facility manager. “Although the bulk of the work right now is commercials, we put in 6-channel surround capability [Dolby SDU4 and Shure HTS] to take on any project. It’s a bit of a departure for us, but we’ve been able to maintain that classic sound and feel that Power Station is noted for. He didn’t use Studio A, but Nile Rodgers was



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in AV/1 recently doing the score for *Beverly Hills Cop III* on the Synclavier."

Studio A at Power Station can hold up to 60 musicians, and the company is counting on its reputation in music to bring in some more scoring work for film. ■

—FROM PAGE 133, BILL NYE, THE SCIENCE GUY

One week, the show was about "Sound," which begs the question: How do you illustrate aural concepts in such an intensely visual medium? The simple answer is that you assemble a top-drawer sound team and use music to illustrate sound. Throw in plenty of effects, some visual waveforms, an explanation of frequencies, examples of echo, a music video...kids get the idea.

The audio post-production timetable for *Bill Nye* matches the furious production schedule and fast-paced, fact-filled 22-minute show. "It's kind of like guerrilla TV," says Jim Wilson, chief engineer at Bad Animals/Seattle, which handles the sound design and audio post. "It's very off-the-cuff, a lot of Hi-8 shooting. There are no rules. Sometimes we can tweak the science, but in the end, science rules.

"This show has a rich texture all the way through," Wilson continues, "and it never slows down. The pilot was done at KCTS, and when we got the assignment, we looked at it and said, 'Boy, they're never going to be able to keep up this pace for 26 shows,' thinking maybe we could slow it down during the season. It hasn't happened. They've gotten faster. We're absolutely amazed at what the production company is doing. I think there's some sort of competition going on between the two major editors, Daryl Suto and Michael Gross, about how many edits they can put in each show," he says with a laugh, "but we're keeping pace with them."

Each episode arrives at Bad Animals on a Tuesday, on Beta SP and ¾-inch. Wilson sits down and spot-checks everything—getting time code numbers and coming up with rough ideas before transferring the audio into a PostPro for a frame-by-frame look. Then, Wilson says, "We throw everything in the world at it."

The design, creation and sweetening occur simultaneously in Stu-

dios C and D over the next four days, culminating in a Friday night mix. Studio C contains an automated MCI console and NED PostPro; D has an automated Sony board, also with a PostPro. Time code DATs are delivered to the optical house—Digital Post and Graphics in Los Angeles—Monday morning for transfers.

"We have a very quick turnaround time," Wilson explains, "and we're just monsters on top of it. It's a four-man team. Sony [pronounced 'Sonny'] Felho does the layup and backgrounds, as well as sweetening particular effects. Tom McGurk does the music—original compositions and library stuff from the Tiny Hat Orchestra, a band in town—and Vince Werner mixes on Friday with me. It's a pretty tight group, and we all bring something to the party. Sony has a lot of experience and depth in the cartoon-sweetening world. Tom is pretty anarchic. If there is a way to get off the beaten track and throw in something from left field, Tom is the one responsible. Vince is great at making sense of all our madness. And I bring the Oreos."

More than one person involved on the show described the effects design as a "live-action cartoon." Wilson's goal, he says, is to give each show its own identity, matching the week's theme. If you listen closely to the opening title sequence, there is some little audio clue to the theme of the week. Even sound designers have to have fun and stay fresh.

Aside from the effects associated with the lobby of the Nye Lab (the main set), everything is new each week—even the gurgling beakers and background sparks. The show moves inside and outside, uses odd perspectives, goes to a water slide, enters school gymnasiums. Because of time constraints, there is a lot of library-pulling from Hanna-Barbera, Warner Bros. ("I like the sound, and it brings the comedy notch up a little bit," Wilson says.), Sound Ideas ("probably use it the most"), BBC, De Wolfe, Elektra/Asylum and Hollywood Edge Cartoon Trax. Effects are loaded into the PostPro for manipulation. Curiously, they have not put together a *Bill Nye* library—yet.

There's not much Foley walking, though Wilson occasionally fires effects in electronically on the stage to match picture. But there is a lot of ADR, mainly, Wilson says, because

Bill Nye is a stickler for detail and accurate scientific content. So, in the cracks of the show, when Nye's face isn't on camera, they throw in some science facts and tidbits.

No matter what theme they're working on, music plays a key role. After all, the show is meant to appeal to 6- to 12-year-olds. Each episode contains a music video parody, with lyrics appropriate to the theme (e.g., "Smells Like Air Pressure" replaces "Smells Like Teen Spirit"). Bad Animals provides a time code DAT for playback and editing. "Everything uses time code," Wilson says. "We laid down the law early."

Perhaps the most interesting musical part of the "Sound" episode is the recording studio sequence with Soundgarden, the popular Seattle hard rock band. The band was in working in Studio X, down the hall, and apparently one of the bandmembers knew Nye from previous work on a local show called *Almost Live*. Soundgarden expressed an interest in doing the show, the production company pursued it and, next thing you

know, TV cameras were behind the SSL and in the studio.

In the sequence, Soundgarden jams and engineer Adam Kasper explains, in very simple terms, what goes on in a recording studio. He solos a hi-hat on playback, talks about EQ, describes what might go on the 24 tracks—then says it all ends up on your CD. At one point, there is a brief description of what happens inside a microphone when the wave hits the diaphragm.

The other captivating musical sequence—which, unfortunately, didn't make the released version due to clearance problems—takes place inside a gymnasium, where The Persuasions, the four-man a capella vocal group, are teaching kids about harmonies. They separate the soprano from the tenor, alto from bass, then put them all together for a rendition of "Goin' to the Chapel." The excitement in the kids' faces is evident. They, and the audience, have learned something about sound. ■

Tom Kenny is a Mix associate editor.

—FROM PAGE 135, MPTS-1

entire film (complete with popcorn) while the dealers settled in to experience T2 and its soundtrack in a way that had been impossible in a large theater.

Asked to sum up MPTS-1's advantages, DeLoria said, "For one thing, we are currently the only licensee with THX/Lucasfilm for a nonconsumer system of this size. In addition, I think there are three major features: One, it's a full-package system, with a 6-in, 12-out processor, left-center-right speakers, subwoofer, surround speakers and the U-brackets to set pan and tilt—it's ready to install. Two, it requires only 18 inches of depth behind the screen, which is an important space-savings. And three, it's designed to work well in the near field. We believe that with the proliferation of professional dubbing stages and screening rooms, the trend toward smaller cinemas and the growth of people's expectations for quality sound, there is a large market for this system." ■

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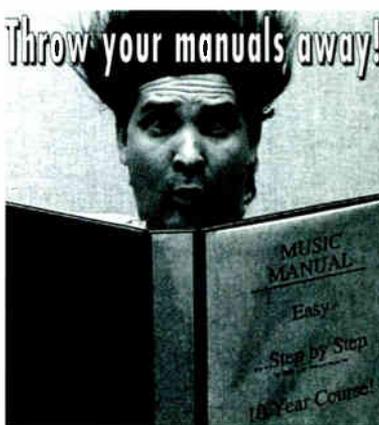
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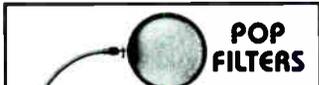
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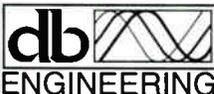
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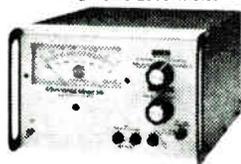
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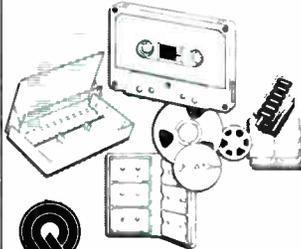
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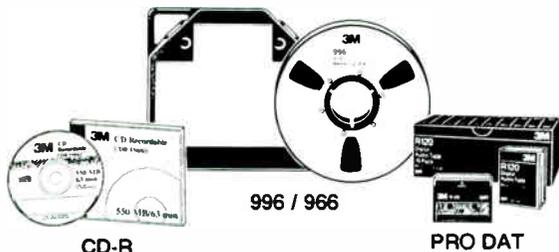
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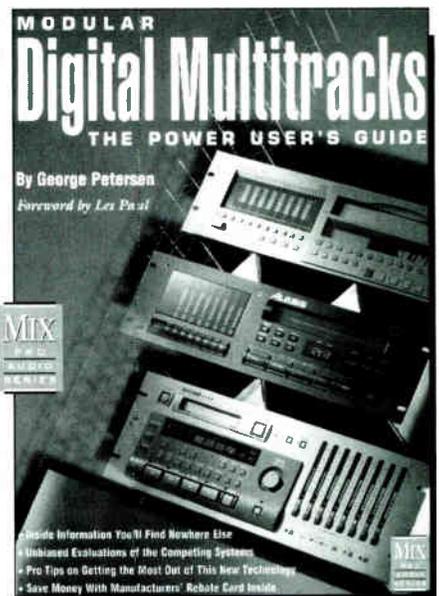
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H&SR(UK edition 9/94)

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32•8 shown (instead of 24•8) because we had a cooler picture of it.

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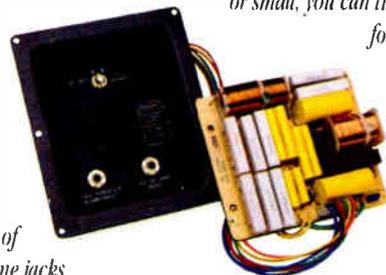
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