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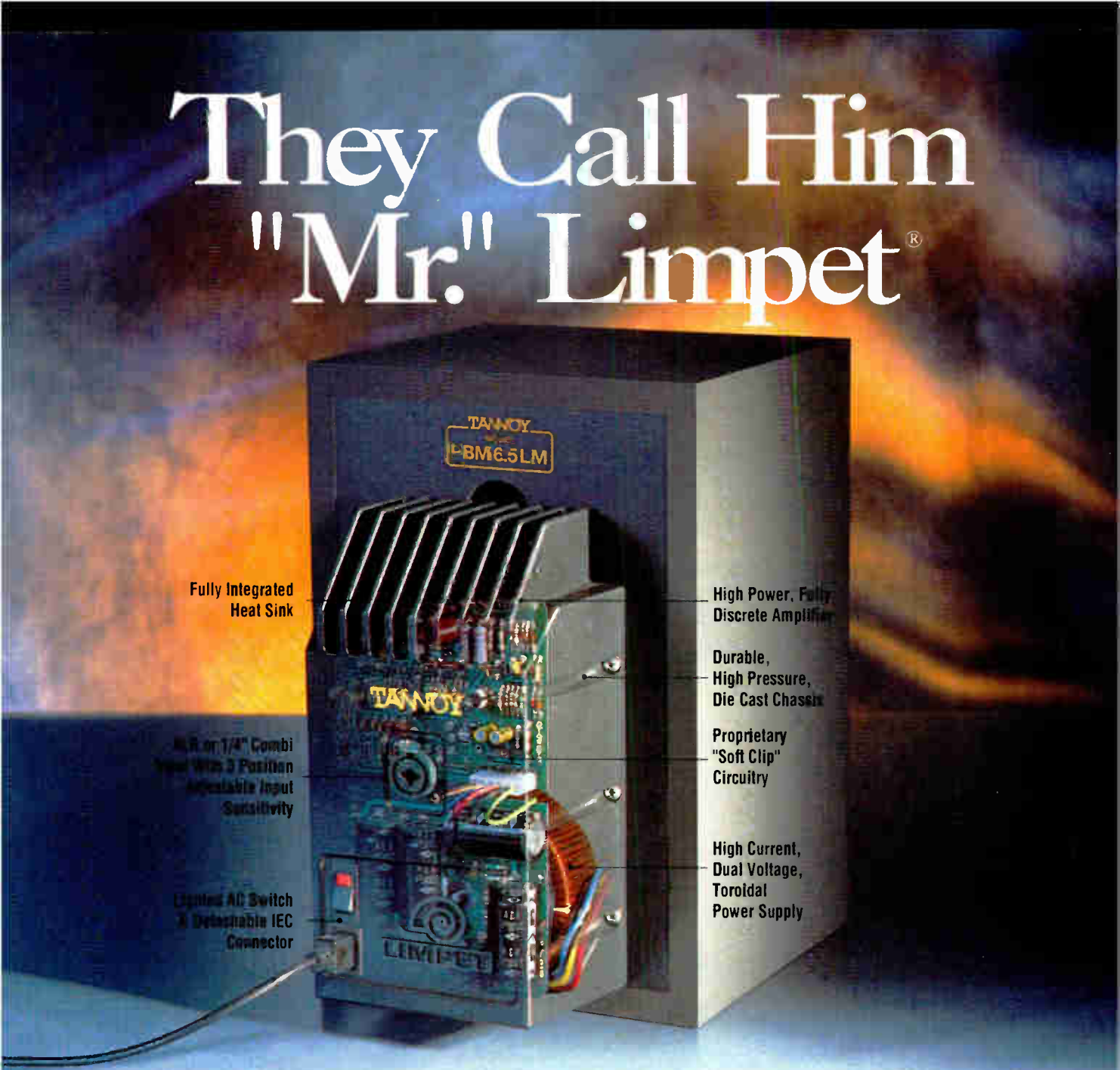

■ Every once in a while a product comes along which not only meets the ever increasing demands of the market, but one whose smooth commercial styling, ergonomics, durability and outstanding performance demands respect. Introducing MR. LIMPET. ■ The LIMPET is a unique, compact design that combines a very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

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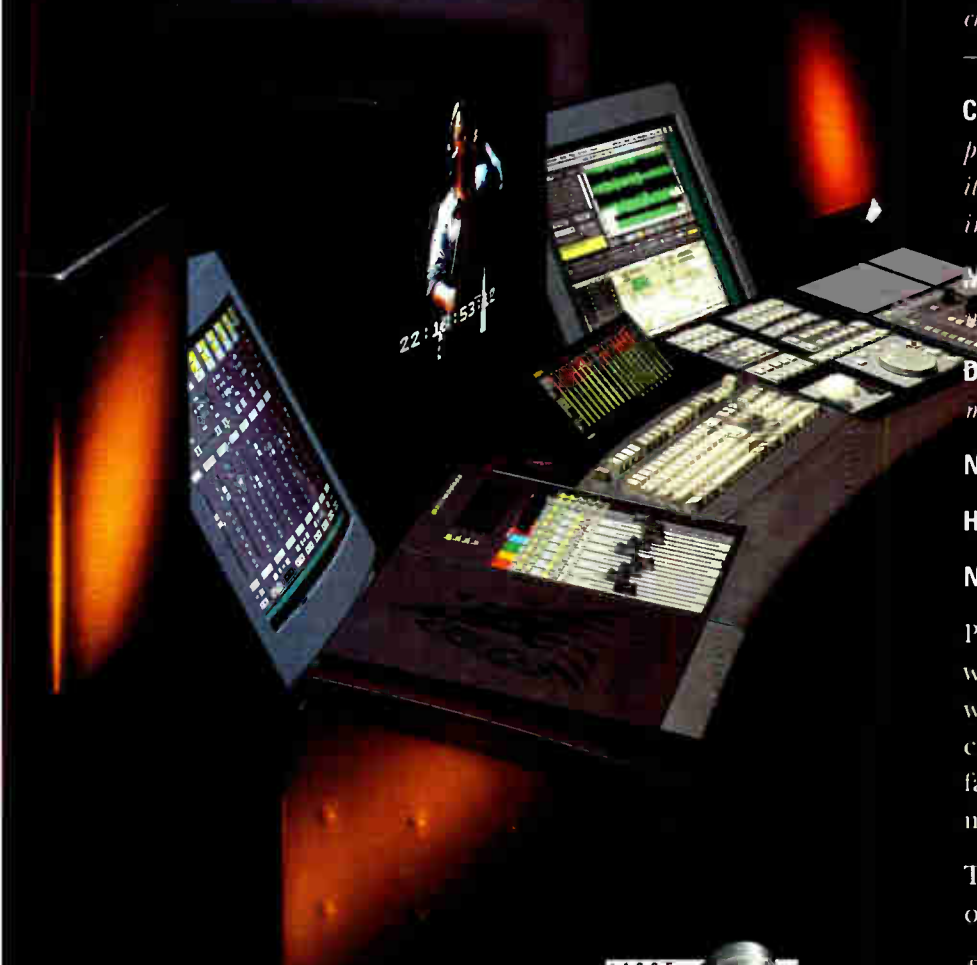

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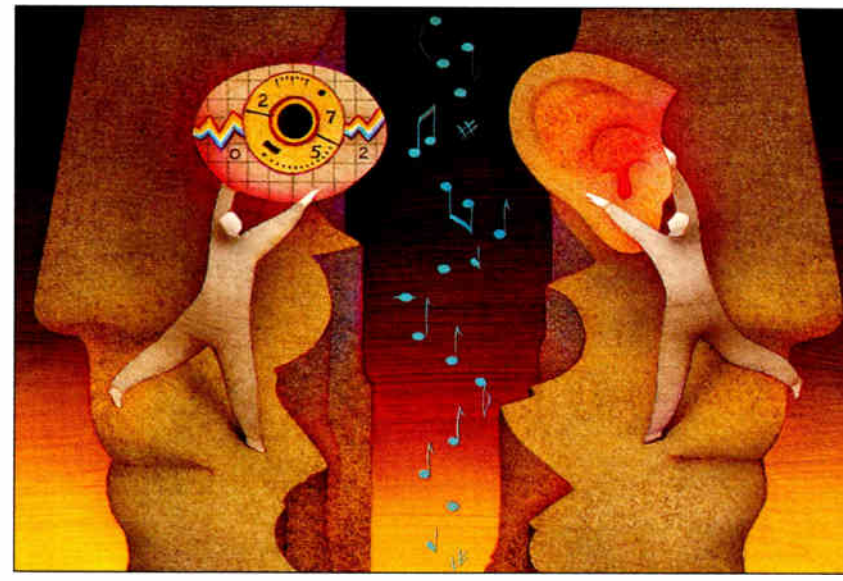

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Cover: Future Disc Systems' (Hollywood, Calif.) new mastering room, Studio 6, was designed by Steve Hall of Future Disc, with Chris Pelonis of Pelonis Sound and Acoustics. Acoustic treatment by Sound Waves. Custom Class A console electronics and installation by Charlie Bolis/Vertigo Recording Services. Electrical bi-phase systems by Kaplin Electric. 20-bit digital equipment includes a Weiss console, a TC Electronic M5000, a Sonic Solutions system, Manley and dB Technologies converters. Analog includes Sontec 6-band parametric EQ and Sontec and Manley compressors. Main monitors are custom four-ways, powered by Manley and Chevin amps.
Photo: Ed Freeman

FEATURES!

- 4 mono mic/line chs.
- Studio-grade mic preamps
- 4 stereo line chs.
- 2 aux sends per ch.
- 2 stereo aux returns
- Aux 1 master level
- Efx return to monitor
- Aux 1 pre/post switch
- 3-band EQ w/Low Cut filter
- Mutes on every channel
- 4 buses via Mute/ALT 3-4
- Easy metering via PFL Solo
- Control Room monitoring
- Headphone output
- 4 channel inserts
- XLR & 1/4" outputs
- Multi-way metering
- Sealed rotary controls
- Built-in power supply

A DOZEN NEW WE JUST MADE

1 WHAT IS VLZ? *VLZ stands for Very Low Impedance. Originally developed for our 8•Bus consoles, it's a unique Mackie approach to circuit design that reduces thermal noise and seriously cuts down on crosstalk. The end result is that VLZ design cuts circuit thermal noise in half! VLZ demands high current — which requires a beefy power supply. So we give you one — and it's internal, too. (No clumsy wall-warts!)*

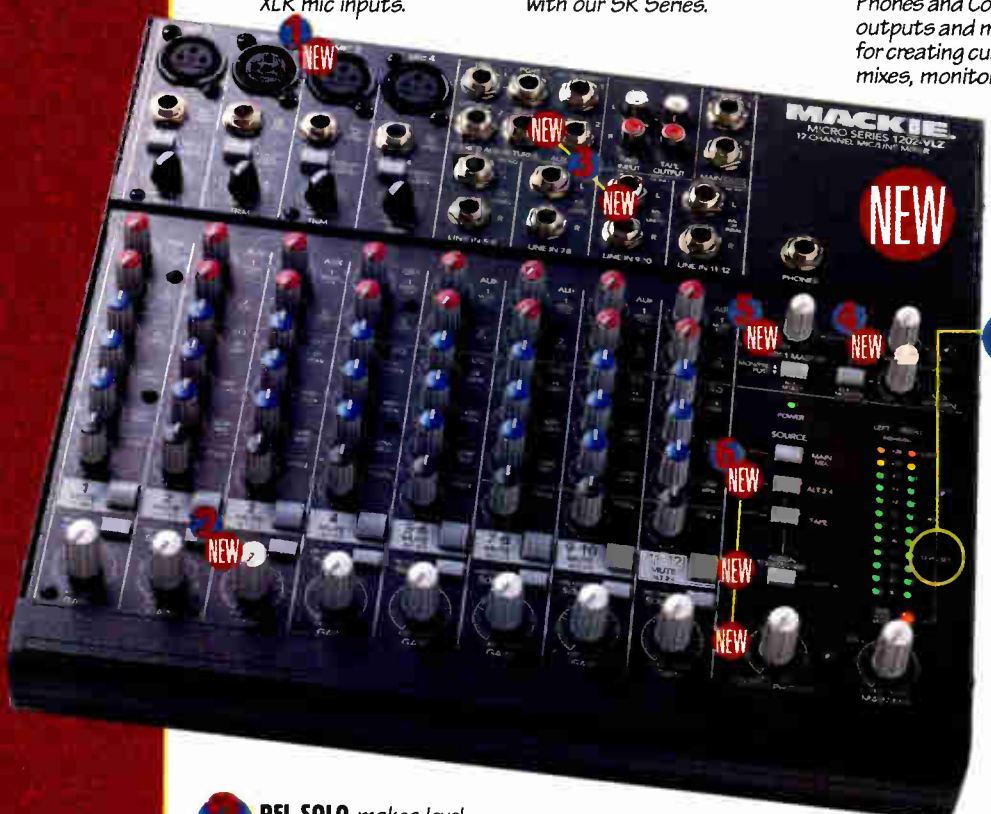
60dB GAIN *on first 4 chs. via balanced XLR mic inputs.*

3 ALL INPUTS & OUTPUTS BALANCED *(except RCA-type tape inputs). Balanced lines let you run long cable distances (longer than 15 ft.) with minimal hum and buzz. For short cable runs you can also use unbalanced lines, if ya got 'em.*

4 EFX TO MONITOR *switch and level control on Aux Return 1. When you're using the output of Aux Send 1 to feed stage monitors, you can now blend reverb or other effects back into the Aux Send 1 monitor mix, just like with our SR Series.*

5 Global AUX 1 PRE/POST *switch. Aux Send 1 on each channel can be pre-fader/pre-EQ (great for stage monitor mixes), or post-fader/post EQ (for effects in the studio).*

6 CONTROL ROOM/PHONES SECTION *with level control. A mini-version of a popular 8•Bus feature, that adds boocoo monitoring, mixdown and metering flexibility. Separate switches let you select any combination of Main Mix, Tape In and Ait 3-4 signals for routing to the Phones and Control Room outputs and meters. Perfect for creating custom headphone mixes, monitoring tape levels, etc. Plus, an extra button lets you re-route this multi-source signal back to the main mix!*



7 LEVEL SET MARKER *When used with PFL/SOLO, the level set procedure gives you low noise, maximum headroom and best dynamic range every time! No more guessing about how to set your gain trims, no more worrying about internal clipping!*

2 PFL SOLO *makes level setting easy. Just push a solo button, watch the famous Rude Solo LED start blinking, and adjust the trim control (ch. 1-4) for 0dB on the meters. Solo also replaces your source selection, feeding the control room and phones (see 6). It's great for previewing or cueing a signal prior to adding it into the mix. And remember, this solo is non-destructive. It doesn't interrupt the main left/right, 1/4" TRS or XLR outputs.*

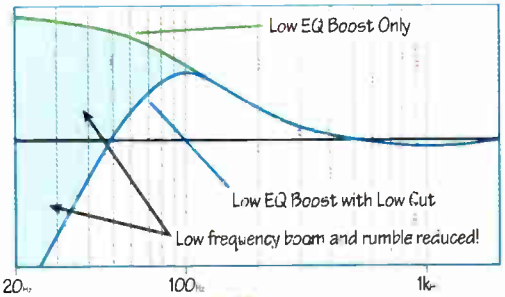
MS1202 VLZ

12x2 MIC/LINE MIXER

FEATURES AND 8-BUS VLZ CIRCUITRY. THE CLASSIC MS1202 MIXER EVEN BETTER.

1 3-BAND EQ *on all chs. You asked for it. Musical EQ at 12kHz, 2.5kHz and 80Hz, like on our CR-1604 & LM-3204.*

8 LO CUT FILTER *(Chs. 1-4). With the exception of bass guitar, low frequency synth sounds and kick drums, almost all sound is in the audio range above 75Hz. Our Lo Cut Filter reduces or eliminates unwanted frequencies below 75Hz. It's great for cleaning up the "mud" in recording and live sound work, and also lets you boost lower vocal ranges without increasing stage rumble, bass guitar, etc. It's like having a second Lo EQ control centered at a higher frequency.*



9 BALANCED XLR MAIN OUTPUTS *(along with balanced ¼" TRS output jacks). XLR outputs have a switchable 30dB pad to match the input sensitivity of camcorders and other mic level inputs.*

10 RCA TAPE LOOP INTERFACE *provides convenient hookup to tape decks and other devices.*

11 A MUTE ON EVERY CHANNEL PLUS AN EXTRA STEREO BUS! *As on our CR-1604, pressing a MUTE switch UNassigns the channel from the main L/R bus and reassigns it to the Alt 3-4 output. You can create two stereo pairs for output to a 4-track, bounce multiple tracks onto 2 more tracks, or preview a source that's not in the main mix yet.*

12 VIRTUAL PAD *on first 4 channels' line inputs. 10dB attenuation with trim all the way down; Unity at 9:00 instead of 12:00 so you can add even more equalization to already-hot signals.*

For 5 years, our Micro Series 1202 12-ch. mixer has toured with superstars, gathered network news, pinch-hit next to mega-consoles... and has been the ultra-reliable main mixer in a lot of home studios.

All that time, we've been reading warranty cards for suggestions on how we could improve the MS1202.

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FROM THE EDITOR

AUDIO RESTORATION: THE REAL PROBLEM

During the past century, humans have amassed a marvelous legacy of the recorded arts. Keeping up with mastering and playback formats has become a specialty in and of itself. What's the preferred stylus for Edison cylinder playback? Should a Victor "Orthophonic" disc be played at 76.59 or 78.26 rpm? Is there a recommended equalization curve for pre-RIAA releases? Should PCM-F1 tapes be played with or without emphasis—and at 44.1 or 44.056 kHz? Such technical matters are not trivial issues to the audio archivist. Unfortunately, the hardware playback considerations and the attendant concerns about the aesthetics of faithfully re-creating the original project (equalization, ambience enhancement, stereo synthesis, etc.) pale in significance to the *real* problem.

Today, we have all kinds of tricks for repairing audio glitches, dropouts, clicks, hiss and pops, yet there is little we can do if the original master recording cannot be found. In a large tape vault or archive, a misfiled master tape or acetate stored in the wrong box is just as gone as if it had been destroyed in a fire. In some ways, the situation was worse in the days of analog 2-track tapes: Stored tails out, such masters would have to be rewound off the original reels before playback. Unless the tape was wound back onto the original reel after the session, the master could be separated from the identifying info on the tape reel label. In any case, slipshod handling by an engineer can spell disaster to any master.

With DAT masters, the problem is both better and worse: Self-contained DATs aren't subject to the reel swapping of analog tapes, but there is not much room on a DAT to label an entire project. And as DATs are relatively easy to clone, the need to properly mark the tape is paramount in order to determine later whether the tape is an original master, clone, safety copy or a production master from various stages down the line.

Ten years ago, the British studio organization APRS adopted a standardized, color-coded means of labeling and identifying master tapes. Five years ago, SPARS adopted the same system for use in the States. If a master tape is worth creating and saving, then it's certainly worth spending a couple of minutes to properly mark, ID and label the tape. And for the past two years, NARAS, with the support of major and independent record labels, has been seeking a National Endowment for the Humanities grant to develop the "Directory of Recorded Holdings," a centralized database containing the physical location, format, release number, release date, producer, studio and other information on the roughly 1.5 million recordings released in the U.S over the past century. Additionally, NARAS is developing a list of musically significant recordings that—generally due to the corrosion of metal parts—are considered "at risk" and should be archived before being lost forever. A similar program for motion pictures has succeeded at the American Film Institute, and the time has come for audio.

Our priceless musical heritage deserves no less.

George Petersen

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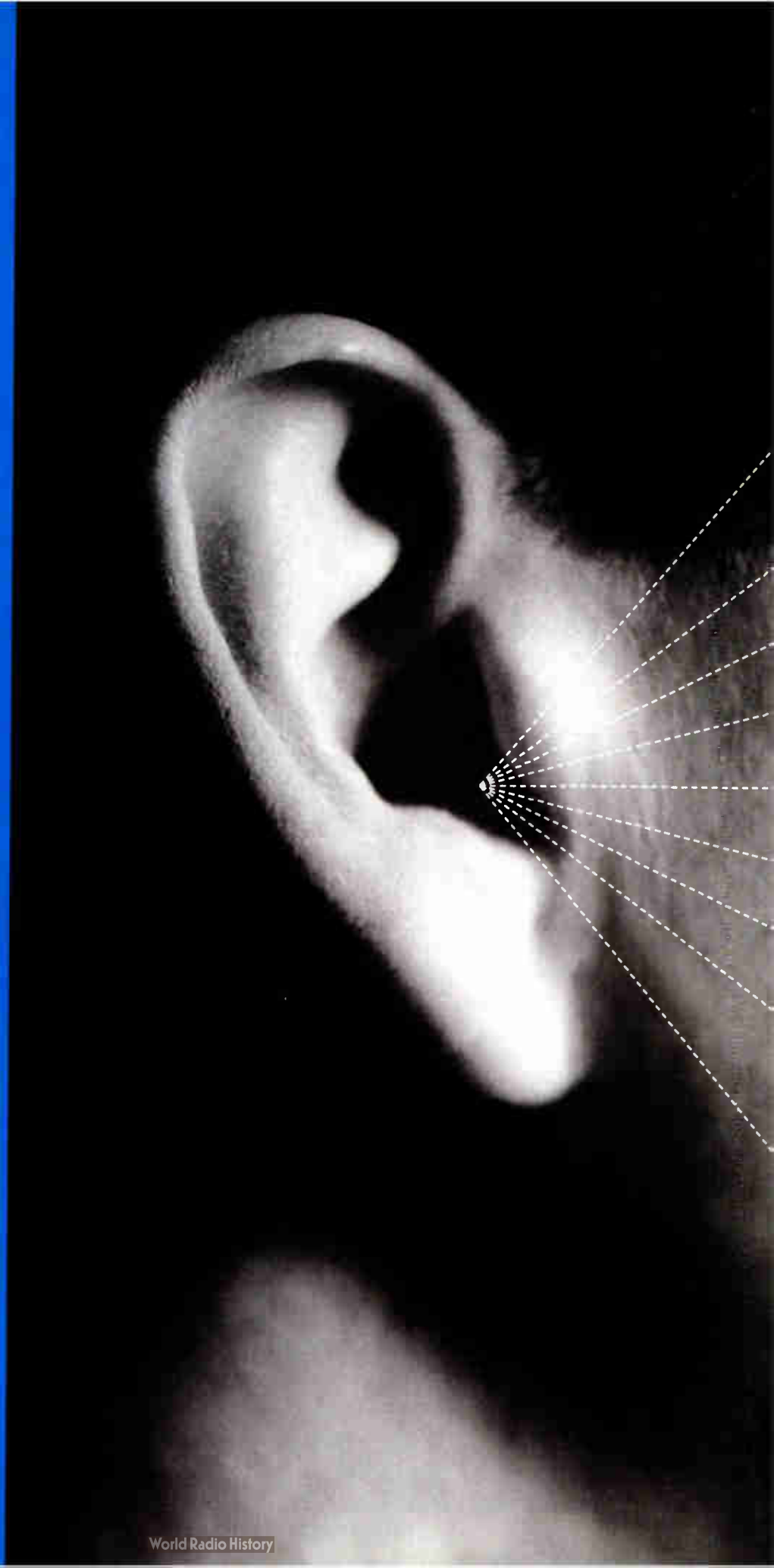
Gregg Rubin, Engineer
After several platinum and gold CDs, and an Emmy, he has an ear for sound.



He listens. Half the year in the studio. The other half on the road as a live sound mixer. For Gregg Rubin the challenge is to capture the immediacy of music. After hundreds of live performances and countless hours in the studio, he knows what music really sounds like. What goes in his ear is what gets laid down on Sony Digital Audio Recording Media.

"It doesn't matter if a performance is great if the tape you're recording it on, isn't. That's why I trust Sony DAT tape for my live and 2-track masters. In the studio, I prefer Sony DASH tape. It's so precise, and I can punch as many times as I want without compromising the quality of the recording. And for live multitrack recording, I've discovered the DARS series for 8mm MDMS — it's performed flawlessly. The bottom line is that I know everything I'm putting down is safe — so the sound I hear the day of the recording is exactly the sound I hear the day of the mix."

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CURRENT

JOHN MOSLEY REMEMBERED

Noted classical recording engineer and audio technology developer John Mosley died in a plane crash October 7, 1995, at the age of 63. For his significant contributions to the music and film industries, Mosley was honored with a Scientific and Engineering Award by the Academy of Motion Picture Arts & Sciences in 1984, and an AES Lifetime Achievement Award in 1995. More recently, Mosley completed his lifelong dream of recording and producing a definitive CD set of Handel's *Messiah*, featuring the Mormon Tabernacle Choir with a full orchestra. The recordings were completed using the Night Technologies Inc. (NTI) EQ3 Air Band EQs and preamps, which he co-developed. Mosley is survived by his wife, Mirah, and four daughters.

—George Petersen

TEC AWARDS SHOLARSHIP WINNERS ANNOUNCED

The Mix Foundation for Excellence in Audio announced the names of the first-ever TEC Awards Scholarship recipients at the eleventh annual Technical Excellence & Creativity Awards held in October in New York City.

Grants were awarded to William Carpenter, a graduate student at San Francisco State University, studying Broadcast Audio Production/Multimedia; and to Alexandra Loubeau, a sophomore in the Music Engineering Technology program at the University of Miami.

Applications for 1996 will be available in January. For more information, call the TEC Awards office at 510/939-6149.

JOHN FRY NEW SPARS PRESIDENT

The Society of Professional Audio Recording Services elected new officers and board of directors at the general membership meeting held at the New York AES convention in October. John Fry, president of Ardent Studios in Memphis, Tenn., was elected president.

"We've got big plans for SPARS this year," says Fry. "One of my main goals is to promote growth in our regional chapters and to further increase membership through our new independent producer and engineer category."

S. N. SHURE, IN MEMORIAM

S.N. Shure, chairman and founder of Shure Brothers (Evanston, Ill.), passed away on October 17, at the age of 93. Shure began his career as an amateur radio hobbyist and established the Shure Radio Company in 1925. He is survived by his wife, Rose, his son, Bob, and a daughter, Myrna.

APT AND AT&T FORM DEVELOPMENT PARTNERSHIP

Audio Processing Technology (APT) joined AT&T in a strategic partnership to develop new technologies for the acquisition and distribution of high-quality audio over direct-dial digital networks. The first joint-venture product, an audio compression system known as apt-Q, was unveiled at the AES convention in New York.

NORTHEAST BROADCASTING RENAMED, OFFERS DEGREES

The Northeast Broadcasting School in Boston received permission from the Commonwealth of Massachusetts' Higher Education Coordinating Council (HECC) to award associate degrees in broadcasting and in the recording arts. The college will continue to offer certificates as well as degrees in these programs. In addition, the school won approval to change its name to Northeast College of Communications.

INDUSTRY EXECS FORM EVENT ELECTRONICS

A new company, Event Electronics, formed to serve the MI and pro audio industries, focusing on both product distribution and development. The company was established earlier this year in Santa Barbara, Calif., and was founded by Russell Palmer, Frank Kelly and Ted Keffalo. The three are audio industry veterans and are all most recently from Alesis Corp., where Palmer served as president and COO, Keffalo as marketing manager and Kelly as sound reinforcement division manager.

WALTERS-STORYK/BERKOW & SIA JOINT VENTURE

Studio architect John Storyk of the Walters-Storyk Design Group (Highland, N.Y.) and acoustical consultant Sam Berkow announced a joint venture to provide critical acoustical analysis and evaluation for commercial and home systems and venues.

Storyk is enthusiastic about the collaboration. "We have been friends for over ten years and have constantly sought the equation that would enable us to work together," he says. The pair's first commission is the design of a $15-million International Performing Arts Center and music school in Kuala Lumpur, Malaysia.

SPECTRAL FORGES OEM ALLIANCES, NAMES NEW U. S. DEALERS

Spectral Inc. of Woodinvale, Wash., formed a strategic alliance with Broadcast Electronics that will allow Prisma editing systems to produce sound files for Broadcast Electronics' AudioVAULT digital audio system. Spectral also formed a relationship with Soundstar, manufacturer of the Soundstar Digital Machine-Room System, a digital dubber for play-

—CONTINUED ON PAGE 16

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INDUSTRY NOTES

TimeLine (San Diego, CA) appointed Robert A. McDonald to the position of president and CEO and promoted Michael MacDonald to vice president of sales and marketing...Lynn Martin was promoted to vice president of sales and marketing at the Harman dbx Group in Sandy, UT...Audio-Technica U.S. Inc. of Stow, OH, promoted Peter Sabin to the position of manager, market development and Michael Edwards to the new position of manager, sales engineering...Mike O'Neil joined Mark IV (Buchanan, MI) as director of research and development. In other Mark IV news, Don Keele returned after a 20 year hiatus, as senior engineer, loudspeaker products...Paul Freudenberg was named national product manager for Harman Pro North America's (Northridge, CA) BSS Audio product line...Tracer Technologies announced an exclusive distribution agreement with AdB Perfect Sound, for its MultiWave Digital Pro digital interface card. Call 717/747-0200 for information...KH America (Holliston, MA), distributor of Celestion, KEF and NAD products, announced that Robert Heiblim, president, left the company. Senior vice president Peter Wellikoff will replace him...New hires at EAW (Whitinsville, MA) include William Durfee as vice president, Murray Embree as purchasing/planning manager, Gary Hardesty as director of engineering, David Gunness as senior engineer/custom and new products team leader, Andrew Lewis as senior engineer/standard products team leader, David Swalek as mechanical engineer, Jim Buzzotta as associate design engineer and Kathy Lucer as document control team leader. In other EAW news, Pro-Tech marketing was appointed as the company's newest sales representative firm...Farmingdale, NY-based beyerdynamic U.S. brought on board new sales rep firms HP Marketing in Arizona, New Times Marketing in Irvine, CA, and W3 Marketing in Tampa, FL...Traycoman Inc. (Hollywood, FL) brought on board Randy Wade as director of performance sales; he will be based in Dallas...Aphex Systems of Sun Valley, CA recently celebrated 20 years of business...In a recent growth move, The Young Chang Research and Development Institute, responsible for research and development of Kurzweil Music Systems technology, bought an engineering facility in Bedford, MA...Charles M. Salter Associates of San Francisco celebrated 20 years of service in audio/visual system design and acoustical consulting...Garwood Communications named Don Holloway as president, and Hanoud Associates as its sales rep for the Northeastern U. S. Garwood's new headquarters are at The Atrium, Ste. 10H, 4 Terry Drive, Newtown, PA 18940. Phone 215/860-6866; fax 215/968-2430...Minneapolis-based illbruck inc. expanded its construction products division into two new groups, illbruck Industrial Acoustics and illbruck Architectural Products...RAXXESS Metalsmiths, based in Prospect Park, NJ, opened a new distribution center, in Chesterton, IN. Call 800/398-1917 for more information...The Carlsbad, CA-based American Music Conference (AMC) elected its new board and officers; Tom Burzycki was appointed president...Berkeley, CA-based Pacific Microsonics hired J.B. Stanton as its public relations agency for the pro audio market...Celestion Industries Inc. of Holliston, MA, brought on board NVus Enterprises, QTI Sales and Marketing and Highway Marketing as independent rep firms...Crystal Semiconductor expanded for the second time in 1995. The new facility is adjacent to the company headquarters, in Austin, TX...The Recording Workshop (Chillicothe, OH) is the newest member of ART's product advisory board...Audio Visual America opened a new sales office in Las Vegas. The address is 5130 E. Charleston Blvd. #5-114, Las Vegas, NV 89122. Phone 702/641-7740. ■

—FROM PAGE 12, CURRENT

back/record applications in film and television.

In addition, Spectral appointed the following new U. S. dealers: West L.A. Music (Los Angeles), Sam Ash Professional (New York City), Sam Ash Music (New York City), Sam Ash (Edison, N.J.), Brook Ways Music (Dallas) and Washington Professional (Wheaton, Md.).

MACKENZIE AND SUPERSCOPE FORM AGREEMENT

Glendora, Calif.-based Mackenzie Laboratories, U. S. master distributor for Philips Professional audio products, signed an exclusive agreement with Superscope Technologies Inc. (Aurora, Ill.) to co-market the Philips line of advanced digital signal processing products. Known as the IS 5021 and IS 5022 Sound Enhancers, the products are targeted for the semiprofessional and professional audio markets in North America, South America and the Caribbean.

AT&T EVALUATING OFFER FOR DIGITAL STUDIO SYSTEMS

AT&T is evaluating an offer from Russ Hamm to form a new company to take over its Digital Studio Systems division. "We feel it's best for the product to bring it to market through a company more traditionally involved in this industry," says Bill Gendron of AT&T.

Russ Hamm has been involved with the development, manufacture and marketing of AT&T's DISQ™ system since its introduction in 1992.

EVENT UPDATE

Winter CES will be held from January 5-8, 1996, in Las Vegas. Call the Consumer Electronics Group at 202/457-8700.

The West Coast MACWORLD expo will be in San Francisco, from January 9-12. For details, call 617/361-8000.

The Winter NAMM show will be in Anaheim, CA, from January 18-21, and is expected to draw even more than last year's 48,000 attendees. Call 800/767-6266 for more information. ■

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The TC M5000 gives you the ultimate effects now and in the future

Reverbs
Pitch shifters
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M5000 - A world of possibilities

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The M5000 Digital Audio Mainframe is unlike any other effects processor you have ever seen. The unit is continuously updated software as well as hardware-wise, and only the best is accepted by TC's vast but strict panel of testers.

Although there is the finest array of reverb-algorithms available already, TC has gone back to the drawing board and has through two years of intense research created a whole new concept for reverberation - the 'Co-efficient Optimized Room Emulator', or, in short, the TC C.O.R.E. Reverb™. The smoothness, intensity, and density is beyond anything heard to date.

On the hardware side, the ADA-2 20 bit in, 20 bit out converter card is now available. Ad to this the recently released ATAC Remote Controller, and you have a set-up that is simply unbeatable. Still, TC will continue to improve the M5000 in the future, making it a unit that will outlast and outperform any other in the market today.

To some it may look like any other effects processor - but you know better. Call your dealer today for a full demonstration.

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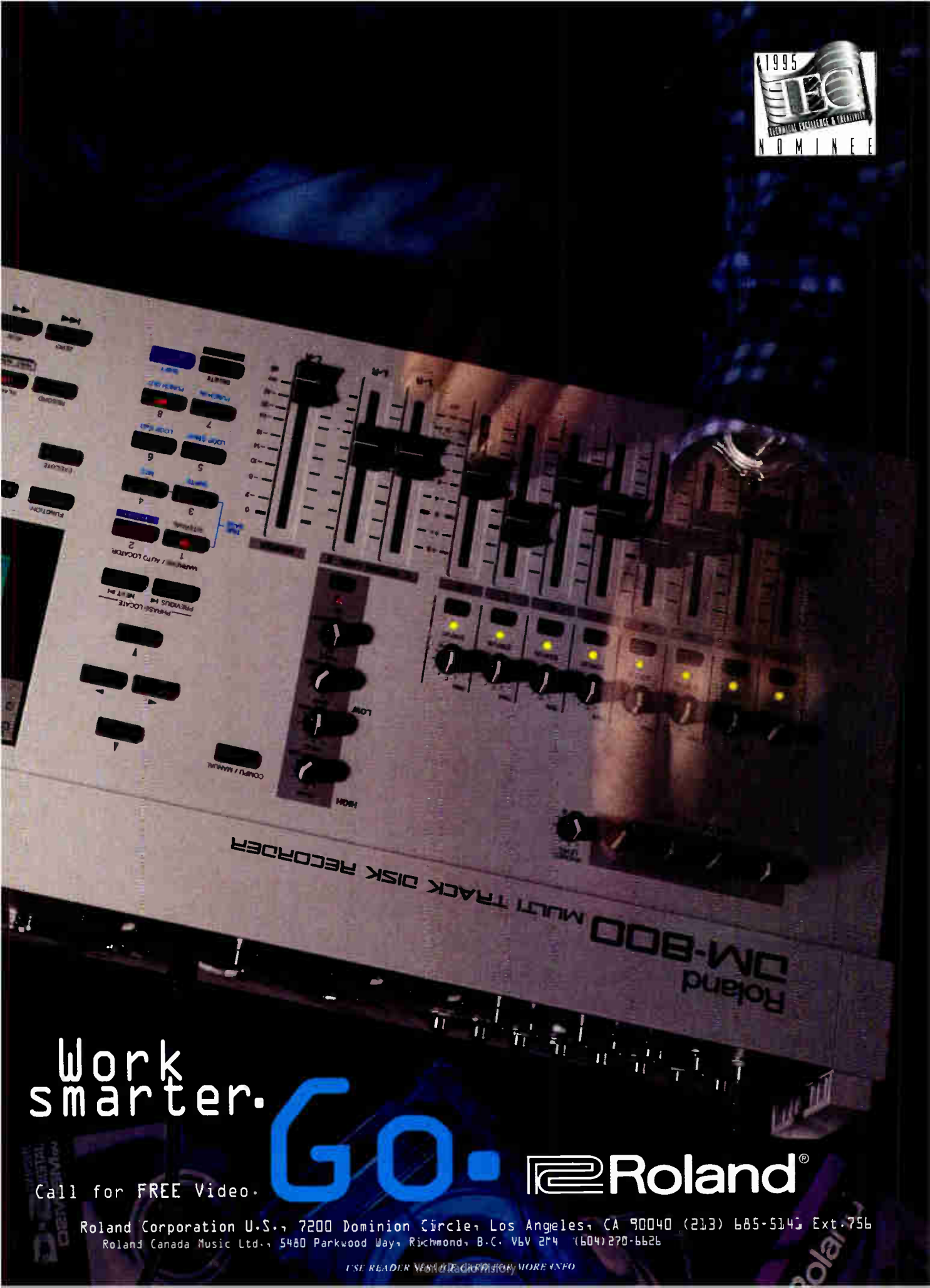
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USE READER SERVICE CARD FOR MORE INFO

by Stephen St.Croix

NERFWARE

I am on my way back from AES Version 0.99ny, and I thought I would take this opportunity to write my column. Version 0.99 got off to a warm, rainy, windy, miserable start and ended with a beautiful, sunny, low-humidity day. Everybody inside must have known that the bad weather would be gone by the time setup was over, because they all had an attitude that I haven't seen at an AES convention in five years: They were all happy. In fact, that happiness was matched by a general level of interest and involvement that reminded me of the old days when it used to all be *fun*. Wait a minute, the whole show *was* actually fun. Everybody, exhibitors and potential victims alike, was having a good time. Crowds upon crowds, toys upon toys, crowds upon toys. It was great. There was some new stuff, but I think it was the amount of evolution that set the tone. Almost everybody's rev one-more-than-last-time was a huge leap ahead: problems solved, features added, speed increased, same prices.

I was there as an exhibitor (not with Marshall but with one of my newer companies, Intelligent Devices), introducing a new high-res metering package that runs on Digidesign hardware and on Power Macs with no hardware at all. What an education for me, and what a landmark for the planet! No, my ego isn't big enough to imagine that My Showing a New Product was a significant event for humankind, but what made the product possible certainly is. I will explain.

This product has five 140-element real-time meters and a phase scope; it animates waveform history and has *two* simultaneous 30-band real-time spectrum analyzers, each with 140 elements per band. You can imagine the demands placed on the host computer to deliver the extremely fast screen draws needed for the task. The tight, well-optimized code that Metroworks Code Warrior produces is a huge help in that direction, and of course, there is no substitute for outlaw speed coding by an alien from some distant part

ILLUSTRATION AD MCCAULEY

STUDIO Quad 4 Inputs/4 Outputs.

Multi-Effects Redefined.

What does multi-effects mean to you? Plugging in multiple signal processors to achieve the perfect blend of effects? That isn't DigiTech's idea of multi-effects and it shouldn't be yours. How many times have you only imagined the ease of a single rack unit capable of true multi-effects? Check out the Studio Quad. With its ingenious user interface, large custom display, and potent S-DISC™ technology at its heart, the Studio Quad is capable of not just replacing, but thoroughly eliminating the need for multiple, expensive, single-purpose processing units.

The Studio Quad features 4 completely independent inputs and outputs that gives you the power of two true stereo processors or 4 independent mono processors. But true stereo is only the beginning. Imagine a quad drum gate where each signal path is optimized specifically to achieve the best audio performance from each drum. Imagine the power to process two true stereo sources simultaneously without sacrificing control. Imagine a processor that gives you the power to create an endless combination of effects. And then multiply by four.

Is the Studio Quad complex to operate? Not at all! The front panel of the Studio Quad is ergonimically designed, and features a simple yet remarkably powerful interface that gives you effortless control over this vast array of sonic textures.

Finally, a product that is everything a Multi-Effects Processor should be.

New, large, custom display with easy-to-use interface.

- 4 independent ins and outs
- Multiple input/output signal path
- S-DISC™ powered
- The equivalent of 4 signal processors in 1!
- Automatic input leveling
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- Multi-function effect modules
- Full bandwidth effects
- True stereo effects

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of the galaxy. But all that still won't cut it if the host platform isn't fast enough. The "landmark for the planet" is that this is the year that Power Macs arrived. Independent tests show that they blow the doors off Pentium machines, so now IBM and the other Pentium folks are retooling faster Pentiums to beat up the PowerPC chips. Isn't capitalism *wonderful*?

I just got a Power Mac 8500, and it renders 3-D ray tracing *six times faster* than my previous monster top-of-the-line-speed-demon-accelerated-clock Mac, and it cost me 3,600 bucks to boot (and it *did* boot, right out of the box). The internal SCSI-2 bus is as fast as the ATTO card on my last Mac, Ethernet is faster, and as soon as I installed Connectix's Speed Doubler, the desktop got so fast that I can't even see the windows zoom anymore.

Anyway, back to the connection. We originally wrote this metering package to run on the 56000 in Digidesign hardware. It runs great on all their various hardware cards, but as we finished the product, PowerPCs began to appear in machines with prices all the way down to slightly over one kilobuck. In the words of the much revered Gomer Pyle: "Surprise, surprise." We took a few days and added native PPC code, and now the package runs all by itself on any Power Mac (remember, these Macs have 16-bit Crystal A/D converters onboard). So the internal engines in the new Macs essentially match the de facto DSP chip in real-world situations—the Motorola 56000. A lot of this is because when you do the crunching on the main engine, there is no data shuffling through that old NuBus (now known, of course, as the OldBus), but a lot of it is because the PPC chips are very fast. And on the other hand, or is it the third or fourth hand by now, Digidesign will have its PCI card out by the time you read this, and the argument I just made about data bottlenecking on the NuBus may go right out the window. And speaking of windows, Digital Audio Labs has a card with up to *eight* Motorola 56002s glued to it. With that kind of horsepower, we should see some evil programs pretty soon...they are courting third-party developers; no waiting.

But back to the Mac. Rumors fly that within a month or so there will be 24-bit DIO adapters for the Geoport bus on any Power Mac, which will allow real-time DIO of AES/EBU or S/PDIF for the stunning price of under $100. Many solutions from many people, all because speed has reached critical mass. On this planet we now have enough digital horsepower, at low enough prices, to make it impossible for manufacturers and developers to ignore the potential. You can now do cooler stuff in software than in hardware. Let's do that one more time: You can now do cooler stuff in software than in hardware. Really. Finally. This is a very important day, but in a way that might not be obvious. Until now, you needed a certain amount of money to get the piece of gear you wanted. If you didn't have the bucks, you had to pass, or get an inferior machine and live in frustration and embarrassment. Sad.

But that was the bad old days. Now, you can get that monster DAW or DSP package you want—you know, the one on that ragged, dog-eared brochure you took to bed with you the last three nights—for a rea-

sonable price. Then, the variable isn't whether you can have the toy you covet, but how fast the toy you just bought actually runs. You can now get *exactly* the software you want, and only the speed at which it operates (or maybe the number of tracks) is determined by how much money you can afford to throw at the host computer (or the drives). Now that's something to think about, a new axis of economy. I, of course, believe that you should always buy the fastest computer made and save your money by buying the *smallest stripped configuration* of that fastest computer. Then you buy drives and memory at Casa Ubetcha or some other mail-order house or Mexican restaurant and save enough to pay for the interface card to run the new soft toys of your dreams. Remember, ladies and gentlemen, one-gig drives sell for $289, and four-gigs for $1k these days. Add ten bucks for A/V versions so they won't t-cal in the middle of recording, and you are good to go.

Isn't it interesting that shortly after we were born we began playing with soft toys, and then we grew older and got into hard toys like baseball bats and small block Chevys. (Oh, yes, there was that horrible period when the toys became tanks and flame throwers, but I won't mention that, because this is not the proper forum to air my political and moral beliefs.) Then the world got a little older, and now we all find ourselves playing with soft toys once again: software. I said it before, and I'll say it again: Analog is that temporary bidirectional state between humans and digital. Still, it is interesting that the cold, hard, unforgiving exact world of ones and zeroes is sold in packages called software.

It's all gathering momentum, too much to ever be stopped now, so you might as well climb aboard. I have.

I wonder what the first real AES, Version 1.00, will have to show us next year. With 99 betas behind it, it should be pretty impressive.

MAIL FROM SOME FLOUNDERS

I have received some letters that I felt I should respond to, so here goes:

Daniel, Langley, B.C.: Pin 2 hot, unless it's not. And, yes, I could hear wire when I was younger, but now I can only hear *if* there's wire.

Timmy, Hollywood, Calif.: I know it's confusing, Timmy; because your dog's name is *Lassie*, but...

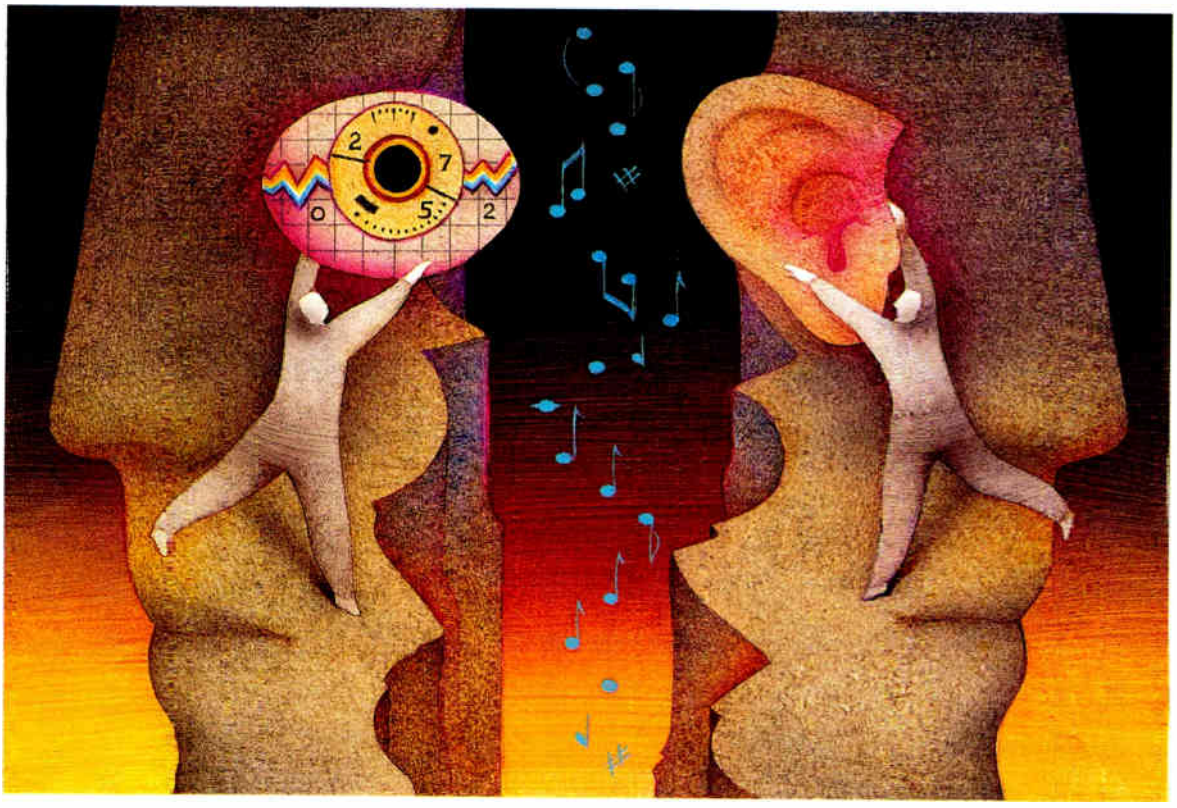
Joseph, Dalton, Pa.: Of *course* it's the damned James Gang! I have no clue how it morphed into what was printed. It was not the magazine's fault—I checked the file I uploaded, and it actually did say that Grand Funk was the perp. Maybe I shouldn't write while driving, or at least I should set the suspension to "Tour." And as for my letting the manufacturers get away with the statement that decoupling isn't a problem when separating subwoofers in my August column, "Dueling Subs," it just didn't matter. Losing 6 dB to decoupling is nothing compared to the effects of standing wwaves and room resonances. Moving subs around to flatten out these hot peaks is absolutely necessary, so there is no real choice.

TDK, Everywhere: Thanks for writing back. Don't be a stranger.

Kai Krause, Calif.: KPT3 takes first place for shocking use and abuse of horsepower. I thank you. ■

SSC stands behind what he says. He says so much so that there's plenty to stand behind.

by Barry Diament



A HOUSE DIVIDED

AUDIOPHILE MEETS PRO

From my very first moment on the job as a professional engineer, I was faced with the rift that divides the audio universe into two warring camps: Audiophile and Pro. The discovery of this rift came as something of a shock. Webster defines audiophile as "one who is enthusiastic about sound reproduction and especially music from high-fidelity broadcasts and recordings." Why, then, is the house of music a divided one, with the pros on one side and the audiophiles on the other? It would seem that both have a common goal.

As a music lover, amateur musician and "hi-fi" hobbyist, I'd spent years reading all the popular journals (*Audio*, *High Fidelity* and *Stereo Review*) and experimenting with recording my friends and myself. The journals taught me the basics about how the various audio components (speakers, amplifiers, tape recorders, etc.) worked and how they were evaluated. Evaluation was performed in a laboratory using very expensive and complex measuring devices to determine things like frequency response, signal-to-noise ratio and total harmonic distortion. The resulting specifications (the "spec sheets") were commonly used to compare the performance of, for example, two amplifiers. The assumption was that the amplifier with the best specs would sound better.

As time went by, I discovered other audio journals (*Stereophile*, *The Absolute Sound*) that offered a contrast to the writings in the "standards." These magazines used verbal descriptions of the sound instead of numbers and graphs to describe a component's performance. The writers employed a developing vocabulary (initiated by J. Gordon Holt of *Stereophile* and devel-

ILLUSTRATION: JAMES ENDICOTT

How to Succeed with a Sonic

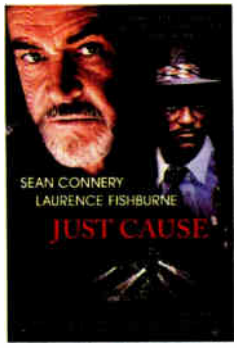
Edit and mix a Grammy® winner

Analog or digital in—Grammy out! It's no coincidence that the majority of the 300 plus recordings nominated for 1995 Grammys were edited on Sonic systems.

Record of the year *All I Wanna Do* by Sheryl Crow: edited and mastered by Dave Collins, A&M Mastering

Our precision editing, high-resolution recording (all Sonic systems support 24-bit data), and superb sound quality yield stunning results and kudos all around.

Just Cause: Sonic System dialog and background editing supervised by Michael Kirchberger; 20-bit music editing by Tom Drescher, Wonder Dog Music



Create big sound for the big screen

Bullets Over Broadway, Hoop Dreams, Just Cause, Pret-a-Porter, The Jungle Book, Apollo 13—what do they have in common? The Sonic System—of course!—because it delivers power and speed for dialog, music, and effects editing for film and video. Our new UltraSonic Processor provides up to 16 channels with full DSP on a single board making multitrack work streamlined and affordable.

Beatles Live at the BBC: editing, NoNOISE, and premastering by Peter Mew, Abbey Road

Restore priceless recordings for a release

NoNOISE® is used around the world to tackle the problems of tape hiss and ambient noise, clicks and pops, and distortion and crackle. Engineers, artists, and producers wouldn't trust their masters with anything less.

Cut radio programs without a reel to reel

"I haven't touched a reel to reel in months," says Bob Carlson from KCRW in L.A. That's because building radio programs with his Sonic System is fast, easy, and affordable. Stay tuned around the globe for promos and features prepared on the Sonic.

Tune in to ABC Radio, the BBC, the CBC, CBS, Danish Radio, Dutch Radio, KCRW, KIIS, NPR, Premiere Radio, WDR (Germany), WETA, WGBH, and dozens of others

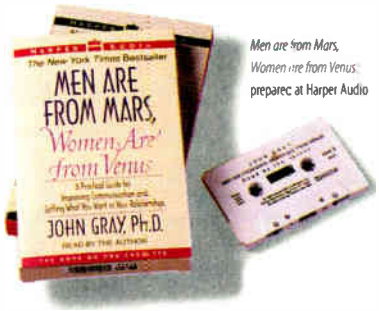
Blast out music and effects for multimedia

The biggest explosions, the clearest narration, the richest music—the Sonic brings life to audio for CD-ROMs. For multimedia pioneers, handling hundreds of soundfiles is all in a day's work for the Sonic. And with a native AIFF file format and OMFI compatibility, the Sonic is the CD-ROM producer's choice.

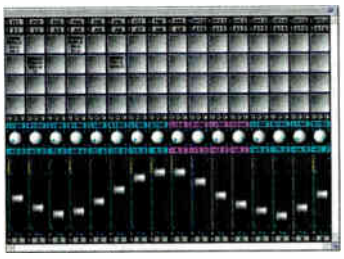
Star Trek CD-ROM: editing by Mark Waldrep, Pacific Coast Sound Works

Put the next best-seller on tape

It was a dark and stormy night…the project deadline was approaching…the talent was restless. With my Sonic, I recorded readings directly to hard disk, edited alternate takes, layed up effects, and slapped down a multi-track music bed. "No sweat," I said handing over the finished tape. "My Sonic always delivers a happy ending."



Men are from Mars, Women are from Venus: prepared at Harper Audio



The Ultimate in Power: USP

The USP (UltraSonic Processor) delivers more digital signal processing power than any other workstation—a single USP card includes up to 16 channels of digital I/O, 32 channels of playback, 32 EQ sections. No kludgy expansion chassis or multi-board cabling required.

The Ultimate in Affordability: SSP

Starting at $2995, the SSP-3 (Sonic Signal Processor) card is the best DAW value around! Each SSP card offers 2-4 channels of I/O, 8-12 channels of playback, and 16 EQ sections.

MediaNet: The Digital Media Workgroup's Data-Bahn

MediaNet, our high-speed FDDI/CDDI network, links Sonic systems (or any standard Macintosh or NFS application) in a seamless network. MediaNet is the only network that allows multiple users to share processing resources and hard disks (even the same soundfiles!) at the same time.

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oped and enhanced by Harry Pearson of *The Absolute Sound*) to communicate their experience with a given piece of audio gear.

What a wondrously novel idea! To find out what a component sounds like by sitting down and listening to it. You don't measure the flavor of a fine meal, you taste it! In food tasting, there is no substitute for an educated palate. In audio, there is no substitute for an educated aural palate. Though the standard audio magazines measured and made lists of numbers, ultimately declaring everything to be worthy of consideration, the so-called underground publications were boldly pointing out cases of the "Emperor's New Clothes."

Why is the house of music a divided one, with the pros on one side and the audiophiles on the other? It would seem that both have a common goal.

Among the early casualties was the usefulness of the standard specifications for describing anything other than negative qualities. In other words, you can measure speed error in a tape drive or harmonic distortion in an amplifier, but once the numbers get below a certain threshold (as most have in recent years), what audible meaning will the measurements have? The answer is "none." Two pieces of gear with seemingly identical specs often sound quite different. For example, 100-watt tube amplifiers sound subjectively louder than 100-watt amplifiers using transistors, yet on the test bench, both measure as delivering 100 watts. This suggests that either there is a flaw in the logic of the measurers, or we don't yet know how to measure as well as we can hear. My conclusion is that there is a flaw in the measurers'

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logic, that if you can hear it, they can measure it (and conversely, if they can't measure it, it doesn't exist). Experience tells a different story. Where, to cite only one example, is the measurement to gauge a component's ability to reproduce depth information? Remember, "stereo" is not simply about a left-right spread; it is, by definition, about three-dimensional sound space—not simply width, but depth and height, too.

The audiophile journals began taking an entirely different tack in their approach to equipment evaluations, and they were reviewing equipment the "established" magazines never mentioned, dozens of brand names I'd never heard of (much less heard) before. They were talking about how to get the best out of your playback system and explaining what to listen for and how to listen. I read and learned and listened and questioned and read some more and listened some more. These folks were onto something wonderful.

Around this time, I got my first job in the professional recording industry as an assistant engineer. In order to help gain familiarity with the pro audio world, I added all the pro journals I could find to my regular reading diet. I read *Recording Engineer/Producer*, *dB*, *Studio Sound* and occasional copies of the *Audio Engineering Society Journal*. I later added *Pro Sound News*, *Mix*, *EQ* and *One to One*. Reading these publications and observing the standard operations in the studio made me aware that I was straddling a rift. All of the pro writings were measurement-oriented. Listening, if it was mentioned at all, was relegated to a line or two at the end of pages of numbers and graphs.

Among the first things I noticed in the studio was that the monitors, the loudspeakers we listened to and used to judge our work, were imposing a sonic fingerprint on everything that played through them. Bass instruments sounded "thumpy" and heavy, with a one-note, juke-boxy quality. Middle frequencies, where most music and vocal sounds occur, were reproduced with a harshness I did not hear on the musicians' side of the glass.

> The division between pro and audiophile is bad for music, and it's bad for our industry.

It became clear to me that what we were listening to was a set of colorations that had little to do with the music signal being fed into the system. I started to wonder, "How can you hear what you're doing?" and asked the engineer in charge about this. His response was, "This is how it's done in the pro world." The professional magazines confirmed his statement with photographs of various studios and control rooms. All appeared to use the same style of monitor speaker, one designed for high speech intelligibility and high volume levels. "It looks to me that they're optimized for being heard from a quarter-mile away," I thought. So I asked my supervisor, "What about using a speaker designed to reproduce its input accurately so we'd know what we really had on tape?"

That's when he told me, with snideness in his voice, "This is the pro

—CONTINUED ON PAGE 190

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by Mr. Bonzai

ALAN PARSONS

PARSONICS REVEALED

Clarity and definition; depth and dynamics; power and subtlety. This year's TEC Les Paul Award-winner, Alan Parsons, is the living embodiment of what engineers strive for: musical creativity coupled with fine-tuned technology.

I had the good fortune to be in Vienna at AES '91 during the year-long run of *Freudiana*, a surreal musical conceived by Parsons and his Project-partner Eric Woolfson. After Sigmund finished romping and the erect cacti had flown away, Parsons invited me up to the booth to survey the opera hall from the engineer's point-of-view. After the show we met with the actors and crew in the convenient beer hall in the basement. (Ah, Vienna!)

Parsons' career stretches from Abbey Road Studios in the '60s to such milestones as Pink Floyd's *Dark Side of the Moon* and Al Stewart's *Year of the Cat* and includes 16 years of the Alan Parsons Project. He's still stretching, with his first tour ever and 1995's record of it, *The Very Best Live*.

Alan Parsons is a witty chap, a gentleman in the best sense, and at 6-feet 5-inches, stands tall, both physically and professionally.

Bonzai: Why did you wait so long to tour?
Parsons: Well, when I was with Eric Woolfson, the other half of the Alan Parsons Project, we often approached the subject of touring but felt we had rather different goals. We wanted to do multimedia shows and one-offs rather than a road show. Touring just never came about while we were working together. The only thing vaguely like it was *Freudiana*, which played in Vienna for a year. After that, the kind of show that I had always intended to do came about in Holland at the World Liberty Concert. [See *Mix*, October 1995, for more on this event.]

Bonzai: Did the waiting have anything to do with the technology?
Parsons: Certainly it had to do with musical instrument technology, such as sampling and multivoice keyboards. The other way of doing it is to take a full-sized symphony orchestra on the road with you, but that's just not economical. And technically, it's very difficult to pull off.
Bonzai: What's the greatest recording advance of the last ten years?
Parsons: I would say 8-track modular digital recorders are probably the most significant thing to happen in the last ten years. Ten years ago we already had 24-track digital recording, digital effects boxes coming out of our ears, etc. I think ADAT, DA-88 and others are still in the process of revolutionizing the industry. I think you will see a lot of major studios shutting down as a result of that tech-

GET REAL!

The final mix breathes life into the body of the visual medium. From the subtlest foley effect to the roar of jet engines, the audio must create a convincing experience for the audience. Each actor's voice must be treated like that of a skilled vocalist. The orchestral score must be combined with dialog and effects without losing detail and dynamic range. This final stage is the culmination of all the time, talent and investment that has gone into the production.

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nology and its price, and people making more and more records in their homes.

Bonzai: Do you see that as a sad change in the industry?

Parsons: It is a sad change, but it's one of these things—I'm afraid I blame the record companies for not sinking enough money into sound recording. They're only too happy to spend hundreds of millions for making pictures, but they won't spend the money making sound.

Bonzai: Let's go back to your beginnings. How did you get your first gig, at Abbey Road?

Parsons: Well, I didn't actually start there—I had a job at EMI leading up to the job at Abbey Road. I worked at a tape duplication facility making 3¾ ips mono commercial albums by copying from master tapes recorded at 7½ ips with the master and slave machines running at four times normal speed, recording both sides at once. It was kind of primitive technology—these huge green BTR-2 recorders, about 24 of them as I remember. I did that and maintenance and mastering for about a year, and then I worked in EMI's research department, studying vinyl record surfaces and cutting technologies. Then I got the job at Abbey Road.

> One day I was making tea at Abbey Road, and the next day I was working with The Beatles at their studio.

Bonzai: What was your first role there—making tea?

Parsons: Making tea and fetching and carrying tapes around the building, that type of stuff. But, in a funny sort of way, that first two weeks working in the tape library was a valuable piece of training that I think is missing from most first jobs in the industry. In fact, it's that two-week period that motivated me to write *The Master Tape Book*.

Bonzai: Who was your mentor at Abbey Road?

Parsons: Geoff Emerick. Not only was he The Beatles' engineer, but he engineered for a large number of other acts and consistently got a great sound. I learned a lot from him.

Bonzai: Can you recall any specific pointers he gave you?

Parsons: I especially remember his ability to set up a board before a session, before anybody had arrived, and then to push up the faders on the downbeat and everything would be there. That was a remarkable ability. I always feel that to be a true pro engineer, you should be able to achieve that, to anticipate and know what levels to expect out of what mics and how to record them and what EQ they are going to need. He used to do all the EQ in advance and just push the faders up, and off we went. Amazing.

Bonzai: When was your first solo flight as an engineer?

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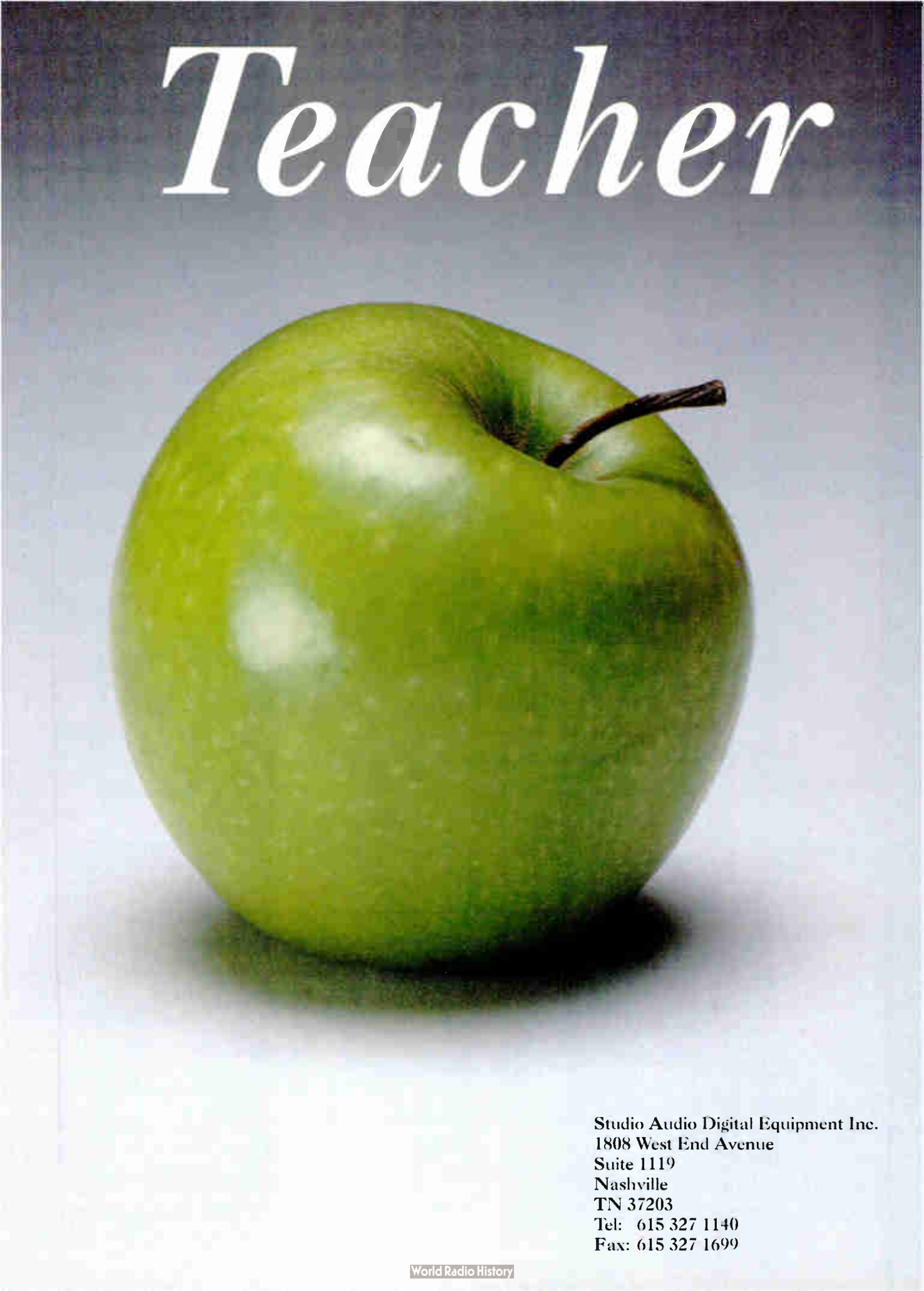

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Parsons: The very first thing I did as a fully fledged engineer was the follow-up single to The Hollies' "He Ain't Heavy He's My Brother." The song was "I Can't Tell the Bottom From the Top." This took place about two years after I joined Abbey Road.
Bonzai: Any stories about your first session with The Beatles?
Parsons: Well, it was literally just thrown at me. They were making their *Let It Be* film in their own studios at Apple and had commissioned a gentleman known as "Magic Alex" to build a console and install all their studio equipment for them. It became apparent, after about a day and a half, that it simply wasn't going to work.

So, the Beatles cried "Help" in a loud voice to Abbey Road, and lo and, behold, they produced two 4-track mixers and a whole bunch of equipment, a 3M 8-track, and me. Down we went, and installed all the gear, and I tape-op'd for the *Let It Be* album, including the rooftop session. I couldn't believe it—there I was. One day I was making tea at Abbey Road, and the next day I was working with The Beatles at their studio.

Bonzai: I was lucky to be invited to some sessions in '67 and '68—maybe we ran into each other in the halls?
Parsons: Quite possibly, but I was unbearded and wearing a tie in those days. That was what one had to do at Abbey Road.
Bonzai: What was the next big leap in your career?
Parsons: Well, I started to get work as an engineer, but the only big act I had was The Hollies, which was very good for me. We had a great time and had a really good friendship. The next big step was getting the Pink Floyd gig. I mixed the *Atom Heart Mother* album, so that's what got me started with them. I had been second engineer on that, and most of the recording had been done by Peter Bown, another Abbey Road engineer. That paved the way for *Dark Side of the Moon* and the first big-name rock artist album project I got involved with. It was quite a good way to start, really.

> Eight-track modular digital recorders are probably the most significant thing to happen in the last ten years. I think you will see a lot of major studios shutting down as a result of that technology and its price.

Bonzai: Isn't it amazing how well that album has held up?
Parsons: Yes, it's extraordinary.
Bonzai: What's your secret?
Parsons: [laughs] Well, it was probably youth. I was only 23 then.
Bonzai: How long did it take to make that album?
Parsons: About a year, on and off. It wasn't an intensive recording period. We were out on the road as well during the recording. That was good experience, too. A lot of people don't realize I was their live sound engineer for the early days of *Dark Side of the Moon*. That's what brought me

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Mixing is something like painting. Whether it's for a live audience or in the studio, equalization, or eq, is like the "palette and brushes" that let you adjust the shade and tint of each sound in your mix.

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Each sound in your mix is made up of many "colors" or frequencies. If you look closely at a shiny object, you notice it's not simply gold or silver—it displays a complex array of colors that let you know it's reflective. When you listen to a sound by itself, you mostly hear its predominant frequency—the fundamental. But like the shiny object, if you listen closely you'll hear subtle frequencies called harmonics that give the sound its character.

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Most equalizers give you a pre-determined choice of two or three frequency locations at which you can boost or cut. That can be really limiting—like having only two or three colors to paint with. You'll quickly discover this when you want to add presence to your vocal track, solve a feedback problem, or remove electronic "hum," and need frequencies that fixed-band equalizers don't provide. Parametric eq, as provided by ProMix 01, gives you a spectrum of frequency choices. Like having all the colors of a color wheel available to paint with.

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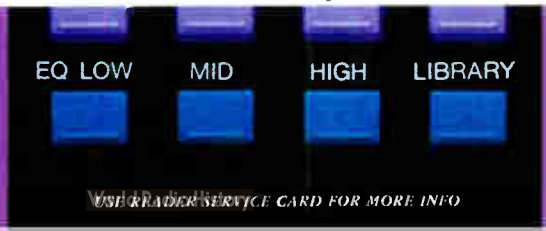

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to America for the first time in a professional capacity. I remember the first show I did, in Madison, Wisconsin. Great experience.

Bonzai: How did you make the transition to producing?

Parsons: I think that producing was a fairly natural progression. I was in touch with a lot of people from EMI records, a lot of the A&R people. The first things I did were for Pilot and Cockney Rebel, both EMI projects. I think it evolved as a result of getting a reputation from the Floyd album and just doing bits and pieces in a production capacity with other producers. The word just got out that I was capable of doing it. But I never actually went up to record companies and said, will you let me produce this act? They actually gave them to me, which is rather nice.

Bonzai: Of the records you've produced over the years, which ones are you most proud of, which ones show off your talents?

Parsons: I was very pleased with Al Stewart's *Year of the Cat* album. Not only did it have some interesting production ideas, it certainly deviated from anything Al had done before—particularly the saxophone. Al had never used a sax on a record before, and we got a good buddy of mine, Phil Kenzie, to play that part, and then we called in Andrew Powell to do the orchestral arrangements. It is a production-type song, and that extends to the whole album, really, as a sort of producer's showcase.

Bonzai: What have been your performing responsibilities during your recent tour?

Parsons: Acoustic guitar, a bit of keyboards, a bit of backing vocals, a few bits and pieces of percussion, woodwind.

Bonzai: You never sing lead, do you?

Parsons: I sing two lines from "Time" as lead vocalist, but basically it's back ups.

Bonzai: Is that your choice?

Parsons: Well, I think it's the public's choice [laughs]. I'm not a singer, let's face it. I'm a record producer and a passable guitar player, but I'm not in the virutoso category like the people I surround myself with.

Bonzai: What's your secret for a great mix?

Parsons: One thing I do is perhaps a little unusual. Most people start with

—CONTINUED ON PAGE 188

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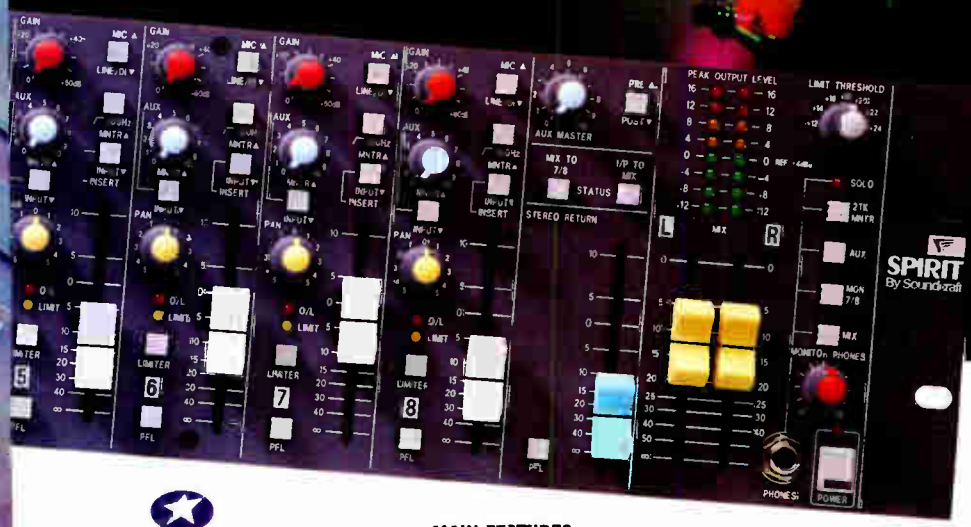
SPIRIT



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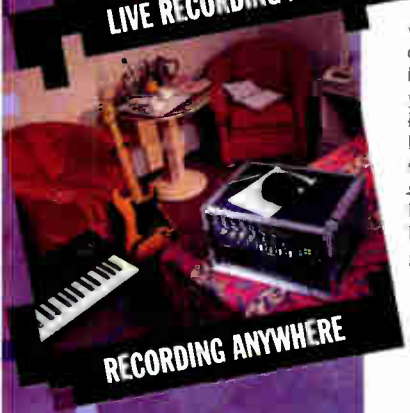

We've packed a high quality 8 channel in-line mixer into a 3U case. ProTracker has an ultra clean signal path, and everything you need to make professional digital quality recordings – yet ProTracker will also excel when you want to overdub; it'll even mix your front-of-house sound while you're recording. ProTracker's key to digital quality recording lies in its unique integration of superior components into the straightest possible signal path between its input and its balanced tape output, effectively giving you a pure direct-to-tape mix. To keep a tight rein on levels going to tape – and to prevent accidental digital overload distortion when a band member decides to crank up the volume – there's a fast limiter with switchable threshold: you just set and forget it. Take a good look at the impressive feature list...

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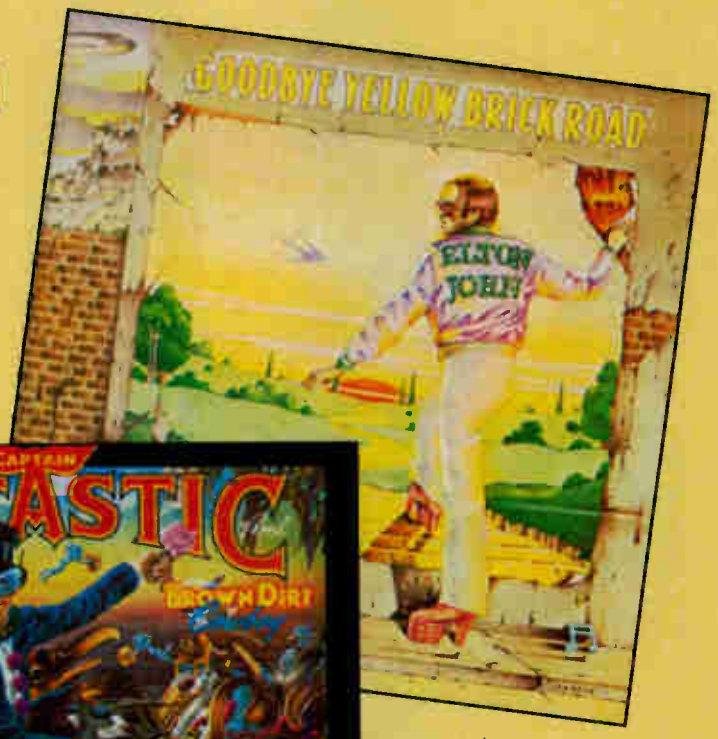
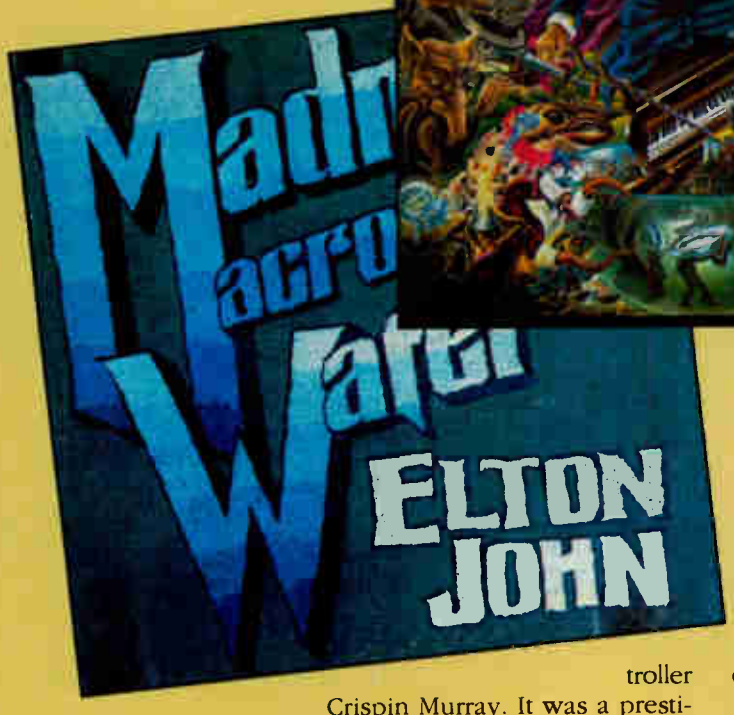
REMASTERING

ELTON JOHN

It was inevitable, really. Despite the broad and intense wave of remastered reissues, somehow Elton John had eluded the attentions of the back-catalogers. No mean feat, given his following and the wealth of material that he has recorded over his long career. But they got him in the end with a remastered reissue series focusing on his earlier works, most of which have been supplemented by extra tracks from the recording sessions or from the period.

BY ZENON SCHOEPE





It's a veritable gold mine—*Empty Sky*, *Elton John*, *Tumbleweed Connection*, *Madman Across the Water*, *Honky Chateau*, *Don't Shoot Me*, *Goodbye Yellow Brick Road*, *Caribou*, *Captain Fantastic*, *Rock of the Westies*, *17.11.70*, *Live at the Royal Festival Hall*, and *Live at Madison Square Garden*—and it's small wonder that record companies don't risk their necks on new signings when they can rest on such ample material from the past.

The project was handled by Metropolis Mastering in London, with mastering engineer Tony Cousins aided by original producer Gus Dudgeon and editor/quality controller Crispin Murray. It was a prestigious gig for Metropolis, which had caused a stir in the London mastering scene when it opened its multiroom mastering wing in 1993. Part of the excitement was because Metropolis had attracted mastering engineers Ian Cooper and Cousins, with editor Murray, from the Townhouse Cutting Rooms, in addition to grabbing mastering engineer Tim Young from Hit Factory, London.

The Elton John tapes were all stereo with Dolby and were played back from an Ampex ATR100 in Cousins' room through a selection of EQs and dynamic processors, including Sontecs, Summits and in-house designs. Digital gear included the TC Electronic M5000 and Yamaha DMC1000 console, plus the 20-bit Studio Audio and Video SADiE editor.

As is usually the case when dipping into antiquity, sourcing the correct tapes proved to be a problem. "When we started *Tumbleweed Connection*, we knew we didn't have the right master," Cousins says. "We asked everybody again and eventually found a tape that had 'Tumbleweed Connection, do not use, this is not the master' on the case in Gus Dudgeon's writing.

"As soon as we put it on, it was obvious that it was in fact the master," he continues. "It hadn't been played and therefore sounded much better, but more importantly, all the mixes corresponded to an original pressing that Gus had. And we realized that everything else that had ever gone out had come off the wrong tape. Even more upsetting was the fact that they'd only sent us one side. We'd just hit our deadline for delivery, and by the time we got the other side, we didn't have enough time to use it all."

Despite intensive searches, not all of the masters materialized, most notably the first album. "The *Empty Sky* tapes were just appalling—they were copies

***Above: a few of the many Elton John Albums, (L-R)* Madman Across the Water, Captain Fantastic & The Brown Dirt Cowboy *and* Goodbye Yellow Brick Road.**
Left: Tony Cousins, the lead remastering engineer on the new Elton John reissues.

ELTON PHOTO: OLLE/ENSHAW/IFI

of bad-quality 4-track recordings. The *Elton John* album was the original, *Tumbleweed*, as I said, we had the original but weren't able to use all of it. *Madman, Honky Chateau, Captain Fantastic* and *Caribou* were all originals, but *Rock of the Westies* was a low-level copy which was hissy and had been sitting in Gus' attic for the last 20 years.

"With that tape, we EQ'd and did all the work we wanted on it, and then on the really hissiest bits—i.e., the fade-outs and the gaps between tracks—we lifted just those sections from the production tapes which had been Dolby'd, then we edited them in."

The three live albums were remixed by Dudgeon on the Metropolis Focusrite console, resulting in full CDs of the performances recorded for radio, the Royal Festival Hall London and Madison Square Garden, with John Lennon. Cousins says Elton John fans will be interested "not only because it's been remixed but because you're getting that band—the Captain Fantastic Band—playing at its very best just before they broke up. For me, that was one of the eye-openers. They were brilliant."


PHOTO: DAVE PLASTIK/LFI UDP

STICKING WITH ANALOG

As a method of working, Cousins is a keen advocate of doing as much of the grunt work in the analog domain as possible. "I don't understand why people convert analog to digital and then process digitally," he says. "You get perfect phase correlation, but sonically you've got analog tape and you don't have any real reason to process it digitally, but people think that's the right way to do it.

"If you're in the analog domain, you do as much of your processing as you can there and get it into digital in as perfect a state as possible, with the EQ and dynamics sorted out. Then you can edit digitally. But if you start processing again in digital, you are putting on another generation."

He also finds analog to be kinder "musically" and says that nine times out of ten he can achieve better resolution with analog EQs. "Unless a client specifically wants to do something purely digital, which of course we can do, I will nearly always try to see which one sounds best, and nearly always I am led toward the analog," says Cousins. "All the albums were done on the old Dolby 301, and we made the comparison between that and the 363s—the 301s always walked the floor with it and sounded less processed," he says. "On occasions when we wanted it to sound more processed, we used the 363 because we couldn't achieve what we wanted EQ-wise. We always started by changing the Dolbys."

The tapes, a mixture of BASF and Ampex stock, were in average condition physically. "We tended to work from the original," Cousins explains. "I wanted to work from a level copy and then switch to the master for the final run, but the masters didn't smudge up the heads, so we used them. I was worried about rubbing off the top end, but in some cases, there wasn't any top end to wipe off anyway!

"The dullest one of the lot was *Madman Across the Water*—it sounded like there was a blanket on it, which is a pity as it's a really good record. That and the *Elton John* album had a certain amount of top put into them, but I was careful because there is distortion on those, and all it would do was highlight it."

Cousins and Dudgeon listened through each master two or three times before deciding on a course of action, and once changes were under way, they compared what they were doing to the current release to hear whether they were improving matters or making things worse.

"*Captain Fantastic* was streets ahead of the rest—it was the best-sounding of them all," says Cousins. "It was written chronologically, recorded chronologically and mixed chronologically as you hear it.

"In those days, they used to mix in a sort of concave fashion, with the vocal in the middle-back of the stereo semisphere. Gus wanted to make it convex, with the middle more up-front. We achieved this on one occasion by sending in four paralleled stereo channels of the same signal into the DMC1000 and then processing each differently and mixing them to stereo. How we processed depended on the requirement, but the most common was to get the center image a bit stronger—we'd mono a stereo pair, EQ out top and bottom and then feed it back in. You can do that on a digital desk without any problems.

"Gus cannot resist changing levels all the time, and he would be riding the left and right faders as the thing was going into the hard disk to alter the dynamics. I was doing any EQ at the same time, and if it was too complicated, we used edit sections and then fixed them in the SADiE."

SHOOT LOW OR SHOOT HIGH?

The mastering of the previously unreleased additional tracks posed the interesting dilemma of whether to mimic the constraints of the other tracks (which were intended for vinyl) or to push the limits and aim for something a little higher. "The approach was always to try and bring out as much of what was there as we could," Cousins says. "You're trying to make it larger than life because when you master something, that's what you're actually doing. You're trying to make the listening experience more immediate. Mastering often involves trying to bring the excitement out, which was obviously there originally. I always look at it as if you're trying to make the producer, engineer or client hear what they heard then and what they had in mind. And if you do that, then you're succeeding."

Crispin Murray picks up the plot,

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Jacks Belo

And Other Truths About 8-Bus Recording Consoles

Get Back Jack. Get Real.

Have you ever seen a pro-studio recording engineer mess with the cables on a console? Of course not. That's why true recording consoles have their jacks in back. Look at any console in any serious studio. Truth is, once the console is installed there's no need to change the setup. Like the TASCAM M2600MKII — the next-generation 8-bus. Available in 16, 24 and 32 input models, it looks clean, sounds sweet and works the way you want it to.

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With 6 AUXes *(2 are stereo)*, the TASCAM M2600MKII has more AUXes than any other console in its class. But the best part is — you can use all six — all the time. No other console in its price range can make that claim. That means you can use more effects, set up multiple independent stereo headphone mixes and have more flexibility. No limitations. And no repatching.

Get Out! Direct or With The Group.

A true sign of a recording console is direct/group switching. That's what makes recording with the TASCAM M2600MKII so smooth. Think about it. Send any signal direct to tape or disk by pressing one button. Or, send a group of signals direct to tape or disk just as easily — no patching here! You'll never have to crawl around or mess with your cables again. Spend more time recording and less time figuring out how.

The Features Demanded by Pros.

The M2600MKII has everything a great recording console should have — and more. It's an In Line configuration with flip switches. And you get your choice of balanced (+4dBm) and unbalanced tape ins and outs. Phantom power (48V) switchable in banks of 8 channels. And an optional multi-process meter bridge so you can keep your eyes on the board — and not your recorder. Plus, a semi-parametric split EQ on every channel and it's ready for automation using any of a number of third party packages.

Watch it. Do Those Switches and Knobs Wiggle?

Before you buy an 8-bus console check out the quality. Knobs and switches that wiggle are going to be a problem. For example, check out the contro's and faders of the M2600MKII. No play, no wiggling. You can feel the quality. Feel those smooth long throw 100mm faders. Clean. And check out the ergonomics. Even the largest fingers will fit between the knobs. Try that on others!

Use A Solid Heavyweight.

TASCAM has built more recording consoles than any other manufacturer in the world. We know how to build a quality product that will last. The M2600MKII is a solid console. You can feel the difference just trying to lift it. Just compare it to the less serious lightweights on the market. Plus it comes with an extra heavy external power supply that delivers more headroom than anything else in its class. Just what you expect from the leader in multitrack recording.

Get Smart. SmartSwitches.™

The difference is in the design. This is a serious console. Take a look and you'll notice the design touches that distinguish the M2600MKII as the next-generation 8-bus console. Like TASCAM's exclusive self canceling and two-tone SmartSwitches — for protection from redundant operations and visual confirmation of all button positions at a glance. Quite a hassle on others!

Great Sound. The Next-Generation 8-Bus.

The real truth about a recording console is sound. With Absolute Sound Transparency™, high-end mic pre-amps, ultra low-noise circuitry, and high-output op amps, the M2600MKII is amazingly quiet, absolutely transparent and perhaps the best sounding console under $20,000. And starting at only $3,199, it's truly the sound decision for a next-generation 8-bus recording console. Put it on your shopping list today.

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Increased range of mic amp trim control down to 0dB accommodates +4 signals without using the pad– improves signal to noise ratio

Double Reinforced Dual-Ground System

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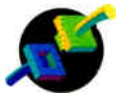

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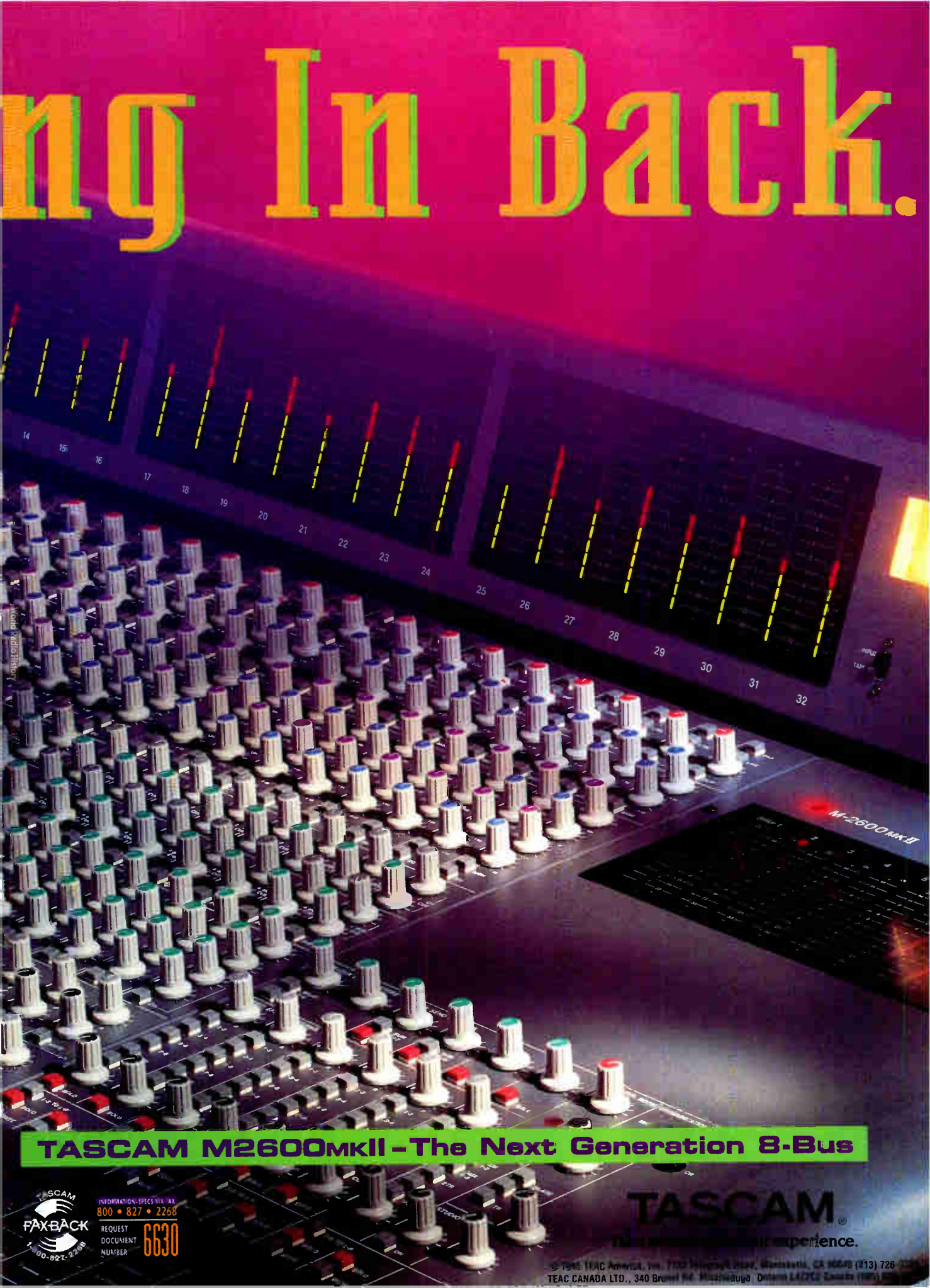
A more expensive, higher quality semi-modular design with 8-channel modular sections makes the M-2600MKII easier to service.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IN THE ACETATE GROOVE

THE WORLD OF TRANSCRIPTION DISC RESTORATION

BY GABE WIENER

We live in a disposable age, and nothing is more disposable in our industry than recording media. I don't know about you, but I have DATs strewn everywhere—in the studio, in my briefcase, even a few at home in the kitchen. We take it for granted nowadays that, generally speaking, our recordings are replaceable. If the ref from last week's session goes awry, it's a simple matter to roll off another copy from the digital workstation. When I'm working on a project, it seems that by the time I'm done, I'm left with dozens of tapes that chronicle its development from its crudest through its most polished form. Except for the masters and a few carefully produced safety copies, most of my work-in-progress tapes end up being re-used.

In the recording studios of 70 years ago, there were no tape masters, nor were there the ubiquitous safeties and work copies. Back when recording was new, there was only one way to preserve a recorded performance: a transcription disc.

Mastering engineer Gabe Wiener at the main mastering desk of New York's Quintessential Sound

These discs, in common use from the 1930s until well into the 1970s, were to prior generations of engineers what cassettes and DAT refs are today. They were the throwaway copies, the refs you took home to play for your friends and family, or kept on your shelf as a personal record of a project. If you were a musician who performed live on the radio, you could bet that the engineer would hand you a transcription disc of your performance as you left the studio. If your band or your college choir had a live concert, a call to the local engineer with an acetate recorder was the only way to preserve it. Prior to Jack Mullen and the first commercially available magnetic tape machines, transcription discs were the only way to make an "instant" recording with anything approaching reasonable fidelity. Wire recorders existed, but prior to the discovery of biasing, they were useless for music.

Many of Cab Calloway's historic live radio broadcasts have only been preserved on fragile acetates. Restoring these discs and recapturing Calloway's sparkling yet growling style took a rare combination of technical know-how and creative aesthetic judgment.

Transcription discs, or acetates as they're often called, consist of a layer of rigid core material coated with an acetate nitrocellulose, plasticized with mineral oils. When acetate recording became popular in the 1930s, aluminum was the most common core material. However, during World War II, aluminum was needed elsewhere, so the recording community switched to glass-based discs. In the 1940s, home recorders became available from Wilcox-Gay and other companies. The cheaper models used cardboard as a base, while the more upscale machines used flimsy versions of the professional aluminum or glass discs.

Consumers and even the musical community at large viewed acetate recording in much the same way we view CD-Rs today: A sense of "gee whiz" pervaded their entry into the mainstream. There was something ineffably snazzy about carrying home a freshly cut record. However, unlike CD-Rs, which can be played repeatedly without degradation, the same did not hold true for the noble acetate. The very factors that made it recordable—a soft, yielding plastic—were the same factors responsible for its rapid degradation. We all know how bad a poorly treated vinyl record can sound. Believe

PHOTO COURTESY OF CALLOWAY ENTERTAINMENT

PHOTO COURTESY OF THE NATIONAL LIBRARY OF CANADA

In 1954, Glenn Gould performed Bach's Goldberg Variations live on CBC Radio. The only surviving recording, found on acetate discs strewn about Gould's apartment, has been re-issued on CBC Records PSCD-2007. Restoration and noise removal required a variety of careful judgment calls to decide how much noise could be suppressed without damaging the program material.

me when I tell you that vinyl degradation is nothing compared to what acetates reveal when they're mistreated. The mere act of playing an acetate deforms the groove walls. The friction of the stylus momentarily liquifies the soft plastic under its pressure, and this repeated heating/cooling is enough to add egregious layers of surface noise each time the disc is played. Even in the best of all possible playback circumstances, a well-cut acetate could only hold up to a handful of playings before becoming unusable for any professional application.

Proper transcription and restoration can often involve several turntables as well as a variety of signal processing equipment such as the CEDAR Series II processors.

PHOTO GABE WIENER

Of course, as fate would have it, acetates are in many cases the only records of many historic live performances, radio broadcasts and albums for which no commercial copies survive. If you think my description of playback degradation is horrific, wait until you see a precious transcription that has been stored for 40 years in too-hot or too-humid an environment.

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

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First, the plasticizer—the substance that binds the acetate to the core—acidifies and seeps up through the surface of the disc, clogging the grooves. Next, the soft acetate expands or contracts unevenly, causing gaping cracks to develop along the disc's surface. Finally, when all the plasticizer has eroded, the acetate surface simply peels off of the core like confetti, usually right as you take it out of the sleeve to play it. I'm often reminded of the famous scene in the film *The Time Machine* when, far in the future, the only surviving book crumbles in Rod Taylor's hands.

Several months before Cab Calloway died, the curators of his estate decided to transfer all of his personal acetates to a more reliable medium. The collection, mostly comprising his early live radio performances, was sent to us for restoration and transcription. The aim was to restore them so that the audio could successfully be used for reissues, soundtracks and multimedia collections. Because the discs in the collection varied in age and quality, it was necessary for us to first evaluate each disc and then arrive at a consistent plan for restoring them.

Some discs had aged rather well, but others showed various degrees of degeneration. The first sign of acetate breakdown is the build-up of a thick, white powdery substance, which is the residue of the acidic reaction that the plasticizer undergoes over time. Depending on the core material, the severity of the build-up and the condition of the underlying acetate, special chemicals can be used to remove the residue. All archivists, mastering engineers and librarians who work with acetates have their own array of special brews and concoctions that are useful for combatting the different sorts of residue. Do not even *think* about chemically treating an acetate until you have learned how from someone trained in the field. A wrong chemical choice can destroy the disc instantly. In Calloway's case, some discs needed a gentle cleaning, while others needed to be bathed in a special petroleum-based fluid to remove the caked plasticizer from the grooves.

Even if no degradation is present, acetates can only be cleaned by gently wiping with distilled, pure water. Do not even consider using your

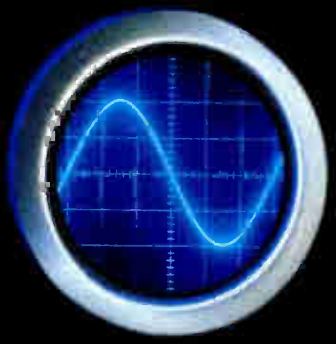
VPI or Nitty Gritty record cleaner unless you'd like to rip the acetate layer right off the core. The Keith Monks machine, usually found only in recording archives, can be carefully used to clean acetates that are in good shape. Even plain water can ruin an acetate if the core is made of paper or cardboard. Once the disc surface has been cleaned and prepared, it's on to the challenge of playing the disc.

Unlike LP vinyl records or even commercial 78s, there are *no* standards whatsoever for groove width in acetate discs. The make of cutting head, age and wear of the cutter, and softness of the acetate material itself combine to leave us with a pronounced lack of any standard. Anyone wishing to make serious transcriptions will need to have a variety of styli on hand to contend with the myriad groove sizes that come up. Acetate grooves can vary from under 2 mil to well over 4 mil, with the bulk being between 2.3 and 2.6 mil. If things weren't complicated enough already, one not only has to worry about the *size* of the stylus, but also the *shape* of the stylus. Styli come in many shapes—conical, truncated, truncated elliptical, for example—and different types are needed depending on the shape of the grooves and the sorts of degradation.

The transcriptions then came to us for remastering, and we discovered, to no one's surprise, that they sounded remarkably similar to a bowl of Rice Krispies.

Because every play of an acetate involves degradation, it is usually a *bad* idea to try every stylus in your collection before settling on the right one. Each archivist develops a personal methodology for judging groove size with minimal damage. Sometimes, a specially designed microscope can be used to measure the groove walls. Short of that, one must use very judicious (and very short) playbacks at random spots throughout a disc to determine the appropriate stylus size and shape. Too small of a stylus and it will sink to the bottom of the groove, producing rather large amounts of noise. Too large of a stylus and it will ride up out of the grooves too easily, causing poor frequency response and increasing the likelihood of mistracking.

I should perhaps take this oppor-



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SONY

tunity to say a word or two about turntables. Your father's turntable that happens to have a 78 speed won't do here. Although most early acetates were indeed recorded with the intent of 78 rpm playback, their actual recording speed can vary anywhere from about 65 to 90. For that reason, a variable-speed turntable is essential for acetate work. And because acetates come in sizes ranging from 7-inch to 16-inch (you haven't lived until you've held a 16-inch record in your hand), acetate tables and their tone arms tend to be somewhat large.

Speaking of tone arms, keeping one tracking across the surface of an acetate often can be tricky, especially if the disc has concentric cracks from shrinkage. Tracking forces of 2.5 to 5 grams are not uncommon to keep the stylus in the grooves. Depending on the shape and angle of the grooves, the arm may tend to drift outward or inward. At best, these attributes can be corrected using anti-skate. At worst, you may literally have to ride the tone arm in with a finger. In a few cases where the grooves had cracked apart in large concentric circles, I have played the grooves one at a time and edited them together in a digital audio workstation.

Let's assume that you've managed to get the disc to track and you now have a signal. It's time to deal with the pesky little question of equalization. Remember that we're back in the Depression or war years most likely, so we're still decades away from an RIAA equalization curve. You'll need a preamplifier that has adjustable turnover (bass boost) and roll-off (treble cut). Like modern discs, many acetates were recorded with their bass attenuated and their treble boosted so that a complementary curve could be applied on playback to minimize high-frequency surface noise and cutter rumble. But, like groove size and shape, back then there was no reliable way to know which of the several common combinations of turnover and roll-off were used at any given time. To that end, it is incumbent on the engineer to try many EQ options on a transcription preamplifier in order to find the one that simply sounds right for the recording. Preamplifiers like the OWL I (made by Audio 78 Archival Supplies in San Francisco) or the FM Acoustics 222 have variable equalization. Another option is to make a flat transfer and then use a processor like the EMT 248, which offers historic EQ settings on a plug-in module. Whatever you do, do *not* use your LP preamp! The RIAA equalization curve it provides is wholly unsuitable for acetate transfer.

To summarize the proper playback of acetate discs:

- Clean and prepare the disc surface in the most gentle way possible;
- Determine the most accurate playback speed;
- Use a stylus of suitable size and shape—truncated and truncated-elliptical styli tend to work quite well for most applications;
- Apply tracking force such that the stylus doesn't get squeezed out of the grooves. Remember that even throughout one acetate, the grooves will vary in width due to degradation. Expect to apply between 2.5

OBVIOUSLY, THESE GUYS ARE SERIOUS ABOUT AUDIO.

—D&R ORION REVIEW, MIX MAGAZINE

IF YOU WEREN'T AWARE OF HOW POPULAR D&R CONSOLES have become, we understand. After all, we're not very good at making a lot of noise.

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and 5 grams;

• Provide only enough anti-skate to keep the disc tracking properly. Too much or too little and the stylus will either skip ahead or get stuck in a groove;

• Don't be afraid to use bizarre methods to keep the disc tracking;

• If you don't know the original equalization, judge judiciously by ear.

For many people, the resultant signal may be all that is required, particularly if the aim is to make a library-quality archival copy of the acetate. The majority of libraries in the world still archive to ¼-inch analog tape, given that it is the only format known to have a reliable shelf life (CD-R is being looked at, but accelerated-aging tests are still inconclusive).

If, however, the aim is to reissue the material, further processing may be required. The first problems that one will likely wish to combat are the pops and clicks that no doubt pervade the recording. Physical damage to the surface of the disc will result in rather dramatic rises in impulsive surface noise. Case in point: In 1954, Glenn Gould performed Bach's *Goldberg Variations* live on CBC Radio. This performance is significant because it predates his first commercial recording of the Goldbergs, which took place the following year. Gould kept several rare transcription copies of this historic broadcast at his home. When the CBC decided recently to reissue the set (CBC Records PSCD-2007), the discs were transcribed by Gilles St-Laurent at the National Library of Canada. The transcriptions then came to us for remastering, and we discovered, to no one's surprise, that they sounded remarkably similar to a bowl of Rice Krispies.

Our first line of attack was to hit them with the CEDAR process. The new line of CEDAR stand-alone boxes is a mastering engineer's dream. No more loading to disk, detect passes or day-long offline restoration processing. The CEDAR Series II boxes are entirely real-time, even when cascaded. Send noisy audio in one end, get clean audio out the other. Further, because the surface noise on acetates tends to be most pronounced at the beginning and end of the disc and less so toward the middle, the ability to vary the strength of the CEDAR reconstruction while it runs is an added benefit not found elsewhere.

CEDAR is a fine tool for impulsive noise removal, but it won't fit into everyone's budget. One common and simple approach for reducing groove noise is to play the disc back with a stereo cartridge and choose the quieter groove wall. Often, one side will be appreciably quieter than the other. Over the years, there have been a few products that attempt to switch back and forth between groove walls, depending on which one is quieter at any given moment, but none of these has been entirely satisfactory. I think that the problem could certainly be tackled using modern DSP technology if a manufacturer were so inclined.

After impulsive noises such as pops and crackle have been removed, a pass of broadband noise reduction such as CEDAR DH-1, HISS-2 or Sonic Solutions' NoNOISE is usually in order, as acetates invariably suffer from incessant surface noise. The problem with all of these processes, however, is that they can only remove the steady-state portion of the noise components, and even at their best, they can only achieve about 5 to 8 dB of noise suppression before beginning to eat into your

—CONTINUED ON PAGE 207

THE 100-YARD UNIVERSE

Pro Football Hall of Fame's GAMEDAY Stadium

BY TOM KENNY

Football, perhaps more than any other professional sport, should be seen in a wide-screen film format, in full 6- or 8-channel surround sound. The length and width of the field, the impact of the close-up hits and the roar of 80,000 faithful fans cannot be duplicated, merely mimicked. Sunday-afternoon viewers with 51-inch TV screens and state-of-the-art home theater systems have a leg up on the rest of the world, but that is still network broadcast. To get the actual *feel* of a game, as it might be seen from the sidelines or from a seat on the 50-yard line, nothing can compare to the new-theme-park-like theater installation at the Pro Football Hall of Fame in Canton, Ohio.

Actually, it's two theaters, in the round, so to speak. A maximum audience of 47, plus two wheelchairs, begins the experience in an "intimate" high-definition video room, with 6-channel audio and a screen that's only slightly smaller than a multiplex cinema. After an eight-minute video depicting locker room preparation, complete with pep talks, boom boxes, pad slapping, whirlpools and all the anxiety and excitement that accompany game day in the NFL, the seating area begins to rotate.

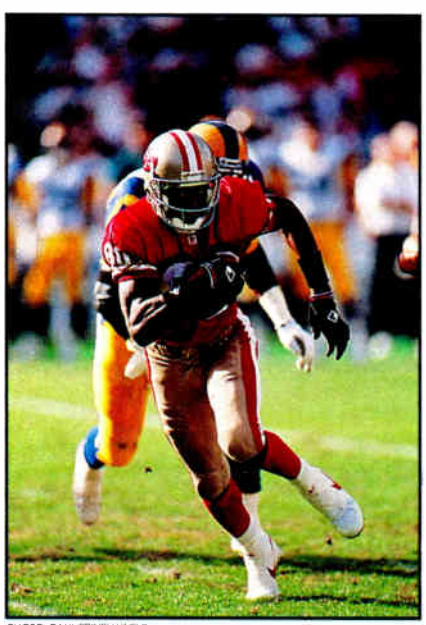

PHOTO: PAUL SPINELLI/NFLP

During the one-minute, 15-second counter-clockwise rotation (what the audio crew calls "the tunnel transition"), a laserdisc projector kicks in and a seventh audio channel comes up to re-create the feel of walking through the stadium tunnel and out onto the field. The added channel picks up the cascading, distinctive sound of cleats on pavement and allows the mixers to have the stereo music cue follow the rotation in the dead spot between theaters.

Audio, in fact, carries the transition. As the audience begins turning left, the right-surround drops out, then the right drops out, then the center. The hidden seventh channel kicks in, and the left drops out, then left-surround. At this point, the second theater begins to open up (it's configured for 8-channel audio, though instead of five behind the screen as in the Sony film format, it adds top-left and top-right surrounds

to give it that stadium feel), so the audio picks up in top-right, then right-surround, then right. Then, as the audio moves into the center channel, a blinding flash of sunlight appears on the curved 20x40-foot screen, the music swells, and 80,000 Kansas City Chiefs fans welcome you to opening day at Arrowhead Stadium, at 105 dB, in full 8-channel glory.

The ensuing 15-minute film is a visual and aural montage of the best of the 1994 NFL season, shot in 35mm anamorphic in that inimitable, handheld NFL Films style—complete with hits and grunts and heroic music. It's quite simply football in a way you've never seen or heard it before. And, complex show control aside, the video-to-film movement maintains a cohesive story, which is perhaps why the Pro Football Hall of Fame, a private organization, hired NFL Films to produce. Remember, this is the same outfit that produced "The Packer Years," "The Steel Cur-

PHOTOS: SHAWN WOOD/STUDIO 7

Above: Jerry Mahler at the OmniMix/Fairlight station in the Hall of Fame theater; right: the NFL Films Hall of Fame audio crew, (L to R): Rich Markowitz, Vince Caputo, Jerry Mahler and Steve Rainford; previous page: Jerry Rice of the 49ers

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Discussions on the Hall of Fame project, produced by Steve Sabol (son of NFL Films' founder Ed Sabol) and directed by Emmy Award-winning director Phil Tuckett, began about two years ago, centering mainly on what film formats would be used. Jerry Mahler, NFL Films' director of audio on the project, said they began talking about IMAX, then 16mm, but after demonstrations at Sony's high-definition video complex, decided to go with hi-def video in the locker room film and 35mm anamorphic once the project hit the field, or the second theater.

FROM LOCKER ROOM TO STADIUM

Perhaps the most important point to note at the outset is that all the locker room scenes and crowds were recorded multichannel—no doubled tracks and no artificial panning. Most of the locker room scenes were taped in Pittsburgh and Kansas City, where the NFL Films crew hung five Sennheiser mics to capture the pregame prep. Everything was recorded to ADAT.

The attraction actually begins on monitors outside the theater, as the audience is given a Game Day laminate and queues up, then proceeds to the theater door, which has been made to resemble the entrance to a bona fide NFL locker room. As the audience waits in line, the image on the video monitors is of the field being lined, benches being set up—typical day-in-the-life activities. Then a handheld camera bobs and weaves outside the Kansas City locker room, the door opens, and the hi-def video begins, in full 6-channel surround.

"The whole premise of this project is to show football in a way it's never been shown before," Mahler says, "and that includes the use of the surrounds. But I think the tendency is to go overboard, especially when you don't do much surround work. The first couple of times we did hi-def projects in surround, we just went nuts. We had players running overhead and hits coming in from behind, but then we realized, 'Hey, that doesn't really work, but it was fun.' We really toned it down for the locker room scenes. You may feel like there's somebody behind you getting dressed, but the voice is always up front so you don't miss the story. I think here the surrounds just create the whole premise of putting you in the middle of where you've never been before. You are a coach, or a player, sitting on a bench in the locker room, walking down the tunnel and in the middle of a football field.

"The stadium film was then pretty straightforward for us," Mahler continues. "We knew we had the crowd peaks, the hits, the radio voices, the individual player wirings, and we knew we had a great music score early on. The hard part, I think, was in making the story cohesive from the locker room, through the transition and into the stadium. Technically, we had to create all those elements across six or eight channels, we had to get enough speakers in place, and we had to get the turntable to rotate at the right time. We have this 90-second rotation, essentially in the dark. And we didn't want the audience to think, 'Oh, I watched one movie there, and I'm watching another one here. What's the big deal?'

"To make it work, we put stereo mics in the tunnels at Green Bay and Pittsburgh, all the way from the locker room on out to the field. This was planned a year-and-a-half before, so we knew that because the turntable was rotating to the left, we had to shoot the players exiting to the left. We went to Green Bay—which has this really narrow concrete tunnel—and stuck our sound man in the middle of the team as they came out, with a stereo shotgun aimed at the ground. That's the sound you hear in the film, the cleats. It was such a

The Music

"The number one audio focus going into the Hall of Fame project, aside from recording multichannel, was the music," says Jerry Mahler, NFL Films director of audio. "We thought that without an original score, we couldn't compete with the picture, because the picture is so huge. Steve Sabol [producer] said this is not going to be MIDI instrumentation. It had to be original, it had to be big, and we needed at least 60 pieces. We ended up with about 80."

The score, described by Mahler as "triumphant NFL Films style, very traditional, back to our roots," was written by NFL Films staff composer Tom Hedden and recorded at L.A. East Recording Studios in Salt Lake City. Percussion was iso'd off and close-miked; the rest of the orchestra filled the converted church that has been home to an increasing number of documentary, sports programming and lower-budget Hollywood scoring dates. A pair of Neumann M49s and an AKG C-24 borrowed from Mahler's previous home at Caribou Ranch in Nederland, Colo., were hung from the balcony; featured instruments were close-miked as well, with Neumann U87s and AKG C-414s. The orchestra played to a MIDI track and was recorded to 48-track, with the idea that the balcony mics would be used for the surrounds.

The tracks were then mixed down to stereo at Time Machine in Vermont, where they have an 80-channel SSL G Series and 48 tracks of Dolby SR, which Mahler considered a necessity. A stereo mix was delivered to the stage in Canton, with the original tracks submixed on three DA-88s.

"We wanted a big, heroic feel," Mahler says. "We had the music early, so we did a six-minute test print after we had shot the first eight weeks of the season. We went to an AMC theater with a 20x40 anamorphic screen, put a 30-frame projector in there, and ran the film for score only—no sound, just the music. And people got goosebumps just from that. I thought it was plenty. If you're not excited looking at that size picture, and that music, then you're not a football fan." ■

clean recording you can hear the echoes throughout the tunnel, and we didn't have to add any artificial reverbs or echoes. We did the same thing at a playoff game in Pittsburgh, and you can actually hear a player walk right by and brush your head."

The opening in the widescreen 35mm format is triumphant, with roaring crowd and huge music swell, followed by a welcome from the Kansas City radio announcer. The ensuing 15-minute romp through the 1994-95 season then roller-coasters along in signature NFL Films style—which means you hear linebackers barking the signals, coaches talking it up on the sidelines, players breathing heavily as they run, and hits and pops that are cleaner and more powerful than anything Hollywood could manufacture. Most of the effects come from shotgun Sennheiser 421s on the sideline and radio mics on individual players, recorded to a Fostex PD-2 DAT machine.

"Each week, every game comes in on DAT on Monday morning, and we sift through them," explains sound designer Vince Caputo, who has been with NFL Films for 10 years, since the golden days of mono 16mm sources, an 8-channel ADM console with three mono buses, six mono playback dubbers and a single 16mm 3-track record dubber. "We have an exclusive with the league to get a mic on players, or coaches, to get that sound, which helps create our signature. And those wirings comprise the bulk of our library for on-field effects. In this particular film, we have sounds from wirings five to ten years ago, and we have effects from wirings that were done a week before we came to mix."

For the film, Pittsburgh coach Bill Cowher and all-pro linebacker Kevin Greene agreed to wear mics in a playoff game with the Cleveland Browns, as long as their use was transparent. NFL Films sent a crew at 6:30 a.m. to wire Greene's pads, then handed them off to the trainer. A two-person audio crew accompanies each wiring—this in addition to the regular crew on a three-camera shoot. The NFL uses Lectrosonics UCR 195 radio mics in a special package provided by Systems Wireless of Virginia. The package, spec'd and requested by NFL Films but soon to be marketed as a product, adds an additional 9-volt battery to get up to eight hours out of a wiring, rather than the typical three to four.

The surrounds put you in where you've never been before. You are a coach, or a player, sitting on a bench in the locker room, walking down the tunnel and in the middle of a football field.

Wirings don't guarantee good effects, however. Sometimes, what looks like a great hit yields nothing because of where the contact occurred and how the mic was affected. Out of a typical game, Caputo says, it's not uncommon to only get one or two solid effects from a wiring. And while the radio mics are great for capturing the play-calling, most of the field-level vocals and many of the effects come from the shotgun mics used by the experienced boom operators and recordists Jeff Lotierzo and Scott Scharf, who stalk the sidelines each week.

"The location sound crews are kind of the heart of what we do," Caputo says. "In the past, I've tried to create some phony hit sound effects, but you can't do it unless you have a 280-pound guy crashing into another 220-pound guy at full speed, with that ambience and that field. There's nothing like it."

Radio announce voices add another NFL Films signature, and here

they're used traditionally, except for the fact that because much of the footage is montage-style, many of the radio calls overlap for a more sound-designed effect. The more interesting development on this project was the authentic crowd recordings, which took full advantage of the custom surround playback.

"We did some tests early on with some stereo crowds—offsetting them and putting them around in a 6-channel system," Caputo says. "And it sounded wonderful. But then we went out and put six mics up in a stadium, got a peak and pumped those channels discretely into six speakers, and it was like, Whoa! It made it easier to get a great sound with one shot, one solid recording. But then every time we wanted to put in a crowd, it was across six tracks. Track management was a little more involved [laughs], but well worth it.

"The first weekend of the season we went to the Meadowlands [in New Jersey] and did 6-channel crowds for the first time," Mahler explains. We brought an Alesis mixer, two ADATs, eight shotgun mics, line drivers to go the distance, and we ended up getting kicked off the sidelines because we had too much equipment. Then we found that this great big cumbersome mixer didn't work; we learned this was not the way to do it.

"Then we went to these PSC mixers, making our package much more compact," he adds. "But we still wanted to be realistic. We could have put up six mics in a row within 100 feet of each other and captured enough crowd noise. But we wanted this 360-degree image around the stadium. So we ended up recording 8-channel crowds, knowing that we'd have to throw some away—for instance, in Pittsburgh there was this annoying guy with a crowd horn, and he didn't stop the entire game. So we just threw that mic away. Then in the mix, we didn't send any to the center, and it was left-right, left surround-right surround, top-left and right."

At the Super Bowl in Miami, NFL Films laid hundreds of yards of fiber-optic cable to capture crowds and other effects/voices for that 3-minute segment of the film. "Being in the stadium is a very surround experience," Caputo sums up. "It's not like being at a concert or something where everything is in front of you. Unlike

when we mix for TV, here we have the option of putting a loud fan behind you. That opens all kinds of possibilities as far as making the viewer feel a part of it."

THE MIX

Because of all the multichannel recordings, the film was a "monster to edit," according to Mahler. Picture was edited on an Avid system, then conformed and locked around the second week of July. The picture editors did not cut sound, not even sync dialog, so the audio team received silent picture. They cut on three 24-track Fairlight MFX3s over the next six weeks, with all sounds imported directly from the digital source—either ADAT or DAT. The Fairlights, four Tascam DA-88s and a rented SSL OmniMix (complete with operator Steve Rainford) were then brought to Canton for a two-week onsite mix in late August.

Rich Markowitz of NFL Films arrived a few days before the rest of the audio team to construct the mix platform and set up the mix position and temporary machine room. The only glitch seemed to be that they had to add extra AC power lines. In fact, the watchword of the mix was power.

"The people at Edwards Technology [show control setup company], who do these special venue shows all the time, were amazed at the amount of equipment we brought in," Mahler says. "They say everybody just brings in DA-88s and a couple of Mackies. And they already have it all sorted out, with their subs already done. We had all our elements added, but we came in with nothing 'done.' We sat down to mix, and we realized how much power we had at our fingertips."

Changes and edits were made at the mix. Crowds and effects and voice playback came off the Fairlights, music off a DA-88. They printed to another DA-88 and used two more for making digital clones. The only real outboard gear in use, outside of what resided in the console, was a Lexicon 480L and TC Electronic M5000. But the heart of the project was the OmniMix.

"We met with the NFL people last year at NAB," explains SSL's Rainford. "They needed the surround features and the automation, but they were mainly interested in the interface with the Fairlights, because they owned three systems [now six]. That was pretty straightforward, as the Fairlights simply chase timecode from the OmniMix. Their second main concern was number of inputs. A standard Omni has 56 inputs—32 analog and 24 digital. In this case, I brought along one of our new mic amps, so we got another 12 analog inputs. I think in this mix, we have five spare faders.

"Then, of course, we have a custom architecture, custom busing scheme, set up for each mix—the smaller theater being 7-channel and the larger being 8-channel. Generally, they can pan most signals on the console, or route any fader directly to any speaker. I'm probably using on the order of 30 buses, along with 75 faders. Those buses are doing various things—summing crowds together, or summing reverbs down. We've used the Omni's SoundTrace capability quite extensively for moving music, as this particular project involves the seating area rotating, and they wanted the stereo image to move with the rotation. Basically, with the OmniMix, if you can concoct it, we can make it."

The tracks were then printed to a DA-88 at 48 kHz and burned onto 2-channel digital sound cards to run in the Alcorn-McBride Digital Bin Loop 32-Track Audio Reproducer, relatively standard fare in the theme park world. EAW speakers handle the playback.

Problems came up during the project, including late delivery of locked picture and the fact that in celebration of the NFL's 75th year, teams were allowed to wear "throwback" jerseys. That meant that a number of the games they had planned on shooting could not be filmed, because Sabol and Tuckett decided early on that they didn't want the visually jarring experience of putting, for example, the 49ers on screen in 1952 jerseys—it would have destroyed continuity. And, first and foremost, this is a story, the story of one season, told in widescreen glory, in full surround.

"The content of the show, and the wiring and the sound effects and the sideline banter, that's all standard NFL Films fare," Caputo says. "But when you can blow it out like this, you get to deliver more impact. And when you walk into this theater, you'll see and hear football like you've never experienced it before." ■

Tom Kenny is Mix's associate editor.

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AUDIO IN AN INTERACTIVE WORLD

TimeLine MMR-8 Magneto-optical 8-track

by George Petersen

Sony OXF-R3

B&K Type 5930 Head and Torso Simulator

PHOTO: GEORGE PETERSEN

From the very beginning, the 99th convention of the Audio Engineering Society had an aura of impending disaster. With a papal visit scheduled during AES, every hotel room in the five boroughs was booked months in advance, so many would-be attendees who—due to scheduling or other commitments—often wait until the last minute to go to AES found no room at the inn and merely stayed home. Meanwhile, dark skies and stormy weather brought chaos to exhibitors' pre-show setup, as the Jacob K. Javits Center's leaky roof dripped water on the area that was to house millions of dollars of the latest audio technology. The solution was to hang tarps from the ceiling to catch the drips and funnel the runoff down to floor drains via long hoses. (You didn't really think that those huge black ceiling tarps were for sound absorption, did you?)

And with the Pope in the area, the typical gridlock was transformed into Pope-lock, as New York's finest sealed off whole sections of town to make way for an unending contingent of security forces and limousines. And each time the Pope went for a ride, decoy limos would be dispatched along other (cordoned-off) routes to confuse would-be assailants. To add to the congestion, President Clinton (and his motorcade entourage) also stopped by to join in the festivities. Why *this* week?

Alesis XT

On October 6, this 99th AES began, under the unfurled banners beaming its theme of "Audio in an Interactive World." Unfortunately, by this point, I had experienced more "interactivity" in my world than I could stand, and what I really needed was some audio. *Real* audio. And interactive or not, AES did not disappoint. Thankfully, there was plenty of real audio at the show.

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TRENDS

In many ways, this AES provided an accurate picture of what's happening in the audio community. The resurgence in interest in tube gear was obvious on the show floor, where more than 25(!) manufacturers displayed equipment based on vacuum tube technology, and there were definitely a few standouts that caught my attention. Finally making its U.S. debut is the line of British-made JOEMEEK compressor/limiters, sporting a distinctive bright green color. Another retro approach came from dbx, whose Model 1650T single-channel tube compressor/limiter has a large VU meter and an industrial white front panel. The most talked-about tube product on the show floor was the new Groove Tubes Model 1 equalizer, a five-band quasiparametric unit that's priced at $695 and sounds great.

Even Studer got into the tube act, displaying its D19 Series Mic Valve—a two-rackspace stereo mic preamp with controls for tailoring the exact amount of distortion desired, along with knobs for "bass warmth" and "angel dust"—just a few feet from the U.S. premiere of Studer's high-end, large-format D940 all-digital assignable recording/broadcast console, a distinctly non-tube product.

As a study in contrasts, just farther up that same row was the tiny Mackie booth, crammed with onlookers trying to get a glimpse of the company's new SR•32 ($2,299) 32-channel, 4-bus boards. While there, one couldn't help but notice the splashy debut of Mackie's Ultramix Universal Automation System, which combines with your Macintosh to provide 32 channels (plus L/R) of fader and mute console automation, along with autogating. Best of all, it can be used with *any* mixer, and at $2,797, comes in at an affordable $83/channel. Those on a budget will be pleased with the new Mackie 1202VLZ, which at $429 is priced $30 more than its successful 12-input 1202 board but adds 3-band EQ, mute/alt 3/4-bus switching and *real* balanced XLR outputs.

The beauty of AES these days is that there truly is something for everyone, whether you're spending hundreds or hundreds of thousands. In the latter category, Sony demoed the OXF-R3 console, its all-digital 24-bit wonder that was featured in the October issue of *Mix*. Hardly just another megabuck console, the OXF-R3—combined with other Sony innovations, such as the PCM-9000 optical disk mastering recorder—provide a glimpse into the 20- and 24-bit reality that is on its way. How far away? The first 4.7GB CD products are due next summer, and now all the necessary pieces of the puzzle are starting to fall into place...And speaking of high-res CD tools, Sonic Solutions announced a 96kHz/24-bit option for its UltraSonic Processor (USP)-based Sonic System workstations.

Also poised to take part of the high-bit revolution is Studer's D424-2. This 2-track, 24-bit studio recorder for magneto-optical discs features basic "tape deck functionality" with nondestructive "razor-blade" editing, real-time playback with crossfades and mixing, selectable 16/20/24-bit linear resolution, digital scrub, serial control via 9-pin RS-422, digital I/Os and SMPTE/EBU timecode reader/generator.

Evidently, those on a budget won't be left out of the 96kHz recording market. First shown at AES Amsterdam two years ago, the Pioneer D-9601 studio DAT recorder will finally be available in the States from HHB (distributed by Independent Audio of Portland, Maine). Retail is $2,495.

A relatively new approach to CD hyperfidelity was Berkeley, Calif.-based Pacific Microsonics, which demonstrated its HDCD® (High Definition Compatible Digital) process. The system uses its three-rackspace Model One HDCD processor—routed between the 2-track analog playback or stereo console feed—to retain much of the original signal purity when the sound is stored on 16-bit media. As an encode/decode system, the HDCD process requires that the playback equipment be fitted with an inexpensive decoder chip, and as of this time, more than 40 hardware licensees (mostly high-end consumer audio manufacturers) have agreed to use the technology in future products. The best part about HDCD is the fact that when played through ordinary (*non*-HDCD-equipped) playback systems, there is no degradation of the sound, and it sounds like any ordinary CD. HDCD processors are now in use by Denny Purcell at Georgetown Mastering and by Joe Gastwirt at OceanView Digital Mastering.

Those who absolutely need a stable clock source for digital audio production will delight in Roger Nichols' Atomic Master Clock, marketed through Digital Atomics of Nashville. The Atomic Master Clock is based on Rubidium Plasma decay and has a stated accuracy of 44,100.000000 Hz, which is equivalent to one second per 10,000 years. Close enough for digital.

Is there a little Jaz in your future? Roland Corporation U.S. has entered into a cooperative agreement with Iomega Corporation of Roy, Utah, enabling it to serve the music and pro audio industries with Iomega's Jaz™ and Zip™ removable SCSI storage drives. For those of you who've missed out, Iomega's Zip is a 100MB removable disk (street priced around $19.95) with a compact companion

Iomega Jaz Drive

drive that retails in the $200 range. These are shipping now, but the real excitement for the pro audio community will come with Iomega's Jaz drives, which provide 1 GB (more than 200 track-minutes) in compact, low-cost (about $100), removable, reuseable media. The Jaz drives will retail in the $600 range. Roland is marketing drives to MI and pro users now, but how long will it take before these are built into samplers and other Roland products?

For unexplained reasons, Pro audio products seem to run cycles. This time, it was back to basics, with consoles and recorders taking center stage. There were also plenty of happenings from a sound reinforcement standpoint, and *Mix* editor Mark Frink—who mixed the Pope at Giants Stadium the night before AES—offers his AES report next month.

MIXING IT UP

New consoles are a major attraction at any AES. In its packed demo suite, Yamaha entertained a constant crowd of attendees who lined up to hear, feel and check out the 02R all-digital console (spotlighted in the August *Mix*). The 02R offers 24 analog inputs and 16 digital tape returns for a total of 40 inputs. Outputs include eight digital bus outputs, eight digital direct outputs, eight aux sends, and four card slots accommodating ADAT, DA-88, DAT, AES/EBU and Yamaha Y2 format signals. Features include 20-bit

A/D converters; real-time moving-fader automation with instantaneous reset of all console parameters; limiter/compressor/gate on every input channel and output bus; and two internal effects processors. Pair this under-$9,000 console with a couple of MDMs, and the notion of the all-digital studio is no longer a fantasy.

But what surprised me this time around was the number of relatively new names entering the console market. Those Paintpot preamp people at Crockwood (Cookham, Berkshire, UK) unveiled the Console Brick system, a radical, digitally controlled analog console system. Based on predefined building blocks, users can specify any required console architecture and features, from a minimal 8-channel board for classical work to a 256-channel film console—all controlled via a compact, assignable control surface.

Another new entry in the console market is Sacramento, Calif.-based Millennia Media, which has adapted its popular preamp technology into the Mixing Suite®. Intended for critical recording applications, this modular, GML-compatible, four-rackspace line mixer features high-accuracy discrete hybrid summing amps and a 20x2 architecture with four stereo aux sends, stereo solos, rumble filters, calibration oscillator, and True-Mute® engineer's talkback amplifier. Bandwidth is said to be -3 dB from 3 to 350k Hz, with THD+N less than ten parts per million.

Fairlight teamed up with Amek to create F.A.M.E., a completely integrated digital recording, editing and mixing system. Combining a new DSP engine for Fairlight's MFX3 workstation with a moving fader automation control surface based on Amek's Supertrue automation, the product will feature 36 inputs, 24 faders, assignable central EQ and dynamics sections, touchscreen control, LCRS monitoring, 40-bit floating-point DSP architecture, instant reset of all console functions and up to 12 insert sends and returns (analog and AES/EBU). First deliveries are expected in the spring.

QSC consoles? Well, not exactly, but this major player in the power amp market is now distributing a large-format digital console from Stage Tec of Berlin, Germany. Designed for live sound (opera and theater come to mind), recording or broadcasting, the Cantus board consists of a central controller that communicates to its remote audio electronics via fiber optics. A maximum of 480 inputs is possible, but the standard package is 64 inputs. Also standard is screen-based, instantaneous channel routing of any input to any channel, alphanumeric labeling throughout the console, onboard dynamics, moving faders, resettable rotary encoders, and SMPTE- or MIDI-based automation.

Soundcraft countered with the unveiling of Broadway, a digitally controlled analog console designed specifically for live theater applications. Broadway offers full resettability of all functions on a snapshot basis, with user-assignable control surfaces. The analog electronics are separated from the digital control system, with all components communicating over a high-speed control network. Any number of input audio racks can be specified for any given system, and by providing access to multiple banks of inputs from a single controller, the physical size of the board can be kept to a minimum, thus saving valuable seating space in a theater environment. Deliveries are set to begin next summer.

Not all the consoles at the show were mega-digital creations. Shep Associates (Meldreth, UK) exhibited its

reissue series of classic discrete Neve equalizer and dynamics modules but also showed a large-format (and *very* analog), full-feature studio board that it was producing for a major New York City facility. TL Audio (distributed by Sascom Marketing of Oakville, Ontario) was demonstrating a large-format recording desk entirely based on vacuum tubes. And former Vox and Trident designer John Oram unveiled the Oram (distributed by TGI North America, Kitchener, Ontario) "British Equalization" (BEQ) Series of affordable 8-bus consoles, available in 16-, 24- and 32-input versions.

Best known for its samplers and signal processing, Ensoniq has also become a console manufacturer. Slated for deliveries next month, the Ensoniq 1682 is a 16-input (32-on remix), 8-bus mixer that features eight mono channels (with mic preamps), phantom power, four stereo input channels, eight tape returns (switchable -10/+4 dB), solo-in-place and mutes on all inputs, four stereo effects returns, talkback mic and control room outputs, and MIDI program control switching for the onboard effects processor. The latter is a true stereo in/out unit with 24-bit quality, 35 algorithms and 384 presets. Retail is slated to be less than $2,500.

RECORDERS:
BIGGER, BETTER, SMALLER

By now, everybody on the planet knows about the new Alesis XT, the second generation of the company's ADAT modular digital multitrack system (see the October '95 *Mix*). In case you missed out, the $3,499 unit improves on the original with 20 new enhancements, including improved transport control and lockup (four times faster than the orignal), along with assembly editing features, onboard track delay (up to 170 ms on any track), auto-punch rehearse functions, a die-cast, one-piece aluminum chassis, servo-balanced analog I/O, ten locate points, running time of more than one hour (via T-180 tapes) and an alphanumeric fluorescent display with three modes of meter ballistics and running time accurate to 1/100 second. One noticeable change between the XT and the first ADATs is that the new models have replaced the ¼-inch unbalanced analog I/O connections with RCA jacks.

Immediately following the Alesis XT unveiling, other new ADATs—based on the XT—were announced by Fostex and Panasonic. Priced at $3,500, the CX-8 from Fostex is essentially similar to the Alesis unit, save for front panel cosmetics and the replacement of the XT's 56-pin EDAC connector (for balanced line analog I/O) with the D-25 sub connector used on the Fostex RD-8 ADAT. Speaking of same, the RD-8, with its onboard SMPTE and MIDI synchronization capability, remains in production and retails at $4,300.

A year ago, Panasonic announced that it was licensing the ADAT format, and at this AES show, the consumer giant debuted its first ADAT, the MDA-1, which is similar to the XT but adds a few twists of its own. Rather than provide a multipin connector for access to the servo-balanced analog inputs and outputs, the MDA-1's rear panel has a full set of eight XLR inputs and outputs. The MDA-1 also incorporates muting relays on the outputs, which avoids power on/off transients and improves the deck's signal-to-noise performance while the machine is in Stop

mode. Retail pricing of the MDA-1 was unavailable at press time, but in other Panasonic news, the company has recently reduced the price of its popular SV-3700 pro studio DAT recorder to $1,695.

Speaking of DATs, Fostex announced the Model PD-4, a professional, portable timecode DAT recorder that features a 4-head transport for confidence (off-tape) monitoring. Other features include a built-in 3-channel mixer with three-position pan, 48V phantom powering, variable low-cut filters, selectable sampling frequencies and a new low-power consumption design for two hours of operation from a single battery charge. Retail price is $6,995.

Sooner or later, it had to happen, but TimeLine is the first to introduce a modular digital multitrack recorder based on magneto-optical technology. Housed in a four-rackspace enclosure, the MMR-8 Modular Multitrack Recorder features eight channels of analog I/O on D-25 sub connectors, eight channels of AES/EBU digital I/O, provides OMF file support, handles 16/20/24-bit recording, plays standard StudioFrame disks, and has simple tape recorder-style transport controls, including a jog/scrub wheel. Intended for digital dubber applications, the MMR-8's sync functions are extensive, with SMPTE chase, four bi-phase inputs and bi-phase generator, and 48/47.952/44.1/44.056kHz sampling, along with forward/reverse lock and varispeed replay. Initial deliveries are slated for April 1996.

Clearly, the show's best bargain in stand-alone disk-based recorders is Akai's DR16, offering 16 tracks of random-access recording and editing in a rack enclosure. At a retail list of $4,995, this seems like enough of a bargain, but when you consider that the DR16 also includes a built-in digital mixer, with control of levels, panning, master outputs, two effects sends and the L/R bus—all controllable via MIDI or held in one of 99 snapshots—it's a steal. An optional EQ board adds eight or 16 channels of 4-band, sweepable-mid digital equalization; another provides ADAT lightpipe interfacing. Other optional boards include SMPTE, MIDI and bi-phase sync, along with MIDI Machine Control, an RS-422 interface for Sony 9-pin video editor control and a VGA board for large-screen output of system status and functions.

Akai DR16

The AD-8000 from Apogee Electronics is an 8-channel A-to-D converter featuring Apogee's latest 20-bit-resolution technology. Interfaces include AES and optional cards for TDIF, ADAT and other digital formats. Also included is Apogee's proprietary UV22™ coding for encoding 20-bit performance to 16-bit media, such as ADATs and DA-88s. Its ultracool purple-and-green color scheme should liven up any control room.

At the center of the AES show floor was something that resembled the world's largest audio kiosk: a huge oval structure known as the Digidesign Development Partner Booth. Surrounding the outside of the display were 19 companies, each showing third-party add-on and plug-in enhancements for Digidesign's Pro Tools, Sound Tools and Digi's other disk-based recording/editing systems. Besides the obvious partners—such as MIDI sequencer manufacturers Emagic, Mark of the Unicorn, Opcode, Steinberg and Cakewalk—a few of the more interesting third-party products included Focusrite, which announced the development of a software-based digital EQ based on the sound of its renowned Red 2 analog equalizer. Shown in beta form, this TDM plug-in will retail at $995 when it ships in the first quarter of 1996. Synchro Arts (Epsom, Surrey, UK) demoed VocALign, a plug-in offering automatic analysis, editing and time slipping for quick, painless dialog matching in ADR sessions. TC Electronic showed plug-ins based on the reverbs and chorus used in the company's TEC Award-winning M5000 and the TC1210 Spatial Expander. The new TC Tools reverberation package is due out this month, retailing for $995.

But what impressed me the most at this massive kiosk of toys was Stephen St.Croix's design for the Intelligent Devices (Baltimore, Md.) AD-1 Pro Audio Analyzer. Intended as a plug-in with Audiomedia or Pro Tools systems (or usable without any additional hardware on Power Macs), AD-1 provides five 242-element, high-resolution, real-time meters with center sum and difference, floating peak bars and 0.1dB resolution. Also included are dual 1,024-point spectrum analysis displays with 242 light bars per band; a phase scope that displays stereo imaging, depth and L/R discorrelation; and a waveform monitor showing a running history of stereo, summed mono or L/R difference amplitude envelopes. The plug-in replaces $6,000 worth of audio gear and retails for $349; the TDM version is $449.

MICROPHONES TAKE THE SPOTLIGHT

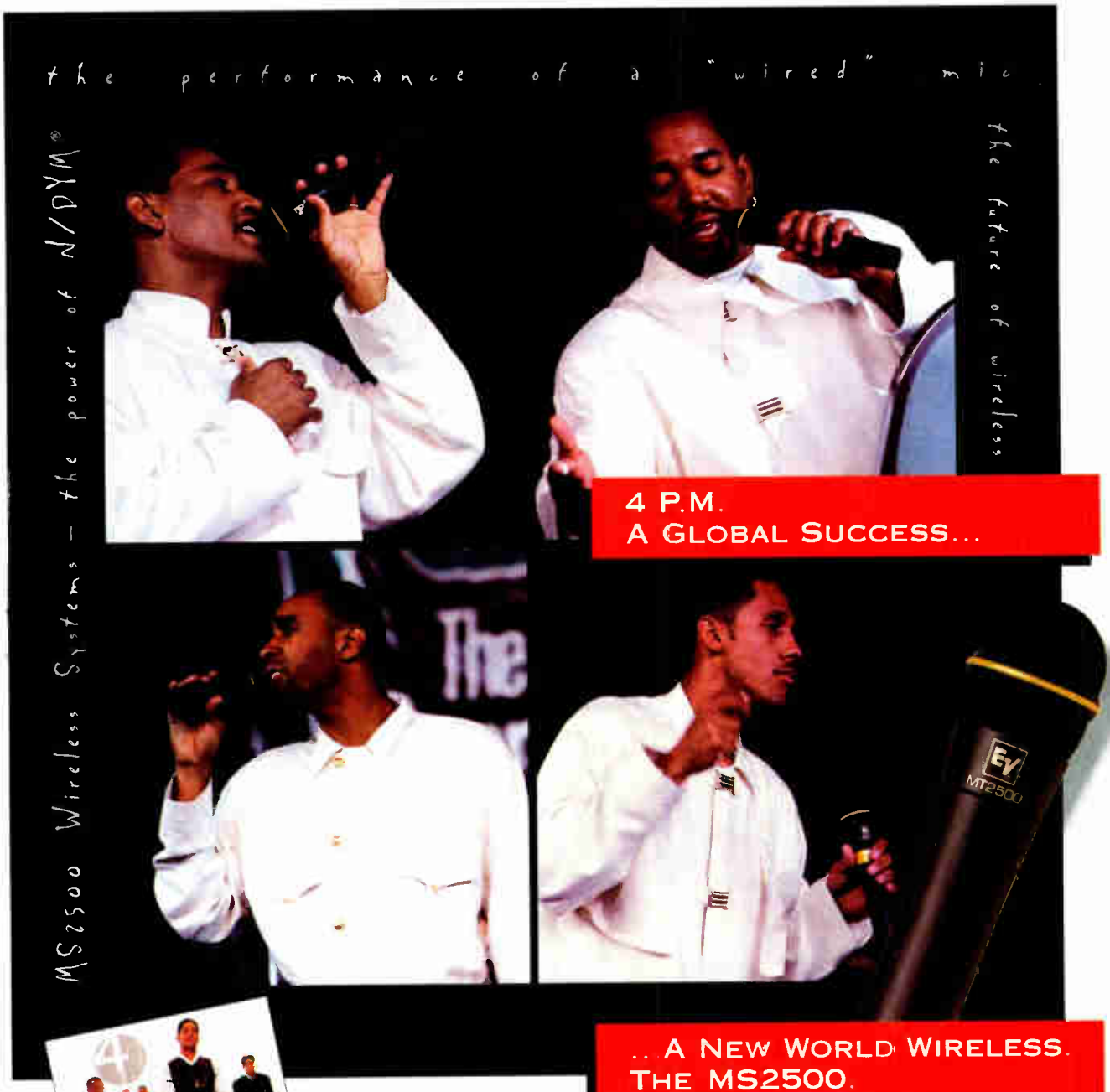
As an avowed microphone junkie, I'm in heaven when I go to AES and see new models. B&K unveiled its Head and Torso Microphone Simulator (HATS), Type 5930. This takes the concept of dummy head recording one step further by incorporating an upper-body section with the dimensions of an "international human adult," which should be ideal for "seated" placement in halls, theaters, automobiles and listening rooms. The 5930 is equipped with removable silicon rubber pinnas (ears) coupled to either a 130V or 48V phase-matched, 16mm studio microphones. Retail is in the $10k range, and although the system is intended mostly for measurement and industrial testing purposes, I imagine that more than a few of these will end up in creative binaural recording applications.

Microtech Gefell M900/910

Another interesting new microphone design is the M900/M910 from Microtech Gefell (distributed by G Prime of NYC). Designed for vocal recording applications, this condenser mic features a large-diameter capsule and a built-in pop filter. Retail is $995, but if this mic sounds half as good as its futuristic, Jetsons-style looks, this should be an awesome performer.

Soundfield (distributed by QMI of Hopkinton, Mass.) now offers the SPS 422 studio microphone system, which at $3,500 opens up the market for Soundfield microphones to a wide audience. The SPS 422 uses

—CONTINUED ON PAGE 106



After topping the charts in Japan, Australia and Canada with their single "Sukiyaki," 4 P.M. found today's live audiences expect CD quality sound. 4 P.M. lead singer Ray Pena says, "During our first world tour, we were using a different wireless system every night. Only the EV MS2500 gave us the strong, instant response we learned to expect from wired microphones."

Check out 4 P.M.'s latest album, *Years from Here*, available from London/Island Records. Check out the Electro-Voice MS2500 wireless systems, featuring the N/DYM® N/D757B microphone, at your local EV dealer.

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1995 TEC

TECHNICAL EXCELLENCE & CREATIVITY

ELEVENTH ANNUAL

TECHNICAL EXCELLENCE & Creativity AWARDS

Legendary rock 'n' roll producer Phil Spector accepted the Technical Excellence & Creativity Awards Hall of Fame Award as part of the Eleventh Annual TEC Awards ceremony, held October 6 in the Marriott Marquis' Broadway Ballroom in New York City. The more than 750 audio professionals on hand also saw Alan Parsons, who was "somewhere in South America" on a world tour, accept the coveted Les Paul Award on videotape.

Phil Spector(l) accepts the Hall of Fame Award from Paul Shaffer.

Twenty-five TEC Awards were also handed out at the ceremony, in the categories of Outstanding Technical, Creative and Institutional Achievement, but the night clearly belonged to Spector. After a warm, funny and anecdotal introduction by "Late Night" band leader Paul Shaffer, Spector proceeded to mesmerize the crowd with a 20-minute freeform tour through his years in the recording industry. His sometimes acid wit, which spared no music industry prisoners, was balanced by a heartfelt tribute to the people who have touched his life and provided the impetus for him to return to his rightful position "behind the glass." There have been memorable tributes through the years at the TEC Awards, but nothing to quite rival Spector.

Emcee Al Kooper plays an impromptu version of "I Love You More Than You'll Ever Know."

In another memorable portion of the show, and in what has become something of an annual impromptu event, master of ceremonies Al Kooper regaled the audience with a soulful rendition of "I Love You More Than You'll Ever Know," a song he wrote for the first Blood Sweat & Tears album.

Yamaha Corporation was the big winner in the awards portion of the show, walking away with two TEC trophies in the categories Sound Reinforcement Console Technology and Small Format Console Technology. Nashville producer Tony Brown won for Producer of the Year, and Ed Cherney took home the award for Recording Engineer. Ocean Way Recording in Los Angeles won for Recording Studio. A complete list of winners appears on page 83.

(L-R) Ocean Way's Allen Sides accepts the award for Outstanding Recording Studio from Phil Ramone and Tony Brown.

Clair Brothers' Roy Clair accepts the award for Sound Reinforcement Company.

Presenters Donald Fagen (l) and Roger Nichols.

On hand to present the awards was a star-studded celebrity lineup that included Paul Shaffer, producers Phil Ramone, Tony Brown and Bill Szymczyk, musician Donald Fagen, songwriter Jimmy Webb, engineers George Massenburg, Roger Nichols and James Nichols, and bass players Will Lee and T.M. Stevens.

A new award was also presented this year in an offstage ceremony at the pre-show reception. BASF Corporation received the first Environmental Merit

AWARDS

Award, presented in conjunction with the Recording Industry Environmental Task Force, for its EcoShuttle tape packaging system, designed to cut down on waste products in the delivery and return of tape.

Environmental Merit Award presentation: (L-R) MFEA president Hillel Resner, manager of applications engineering, BASF Magnetics Werner Singhoff, BASF director of marketing Terence O'Kelly, and RIETF members Will Moylan, Barbara Blezzard and Bruce Merley.

(L-R) Producer Keith Olsen, musician Herbie Hancock and producer Tony Brown.

The Mix Foundation for Excellence in Audio created the TEC Awards Scholarship grant this year, with the first two recipients being William Carpenter, a graduate student in Broadcast Audio Production/ Multimedia at San Francisco State University and Alexandra Loubeau, a sophomore in the Music Engineering Technology program at the University of Miami.

Above: (L-R) Bob Ludwig accepts the award for Mastering Engineer from Will Lee and T.M. Stevens.

Left: (L-R, top row) Jimmy Webb, Donald Fagen, Al Kooper, James Nichols, Bill Syzmczyk, Roger Nichols and Hillel Resner. (L-R, bottom row) Phil Ramone, T.M. Stevens, Mr. Bonzai, Keiko, Tony Brown, Karen Dunn and Jane Byer.

The House Ear Institute's Hearing Is Priceless (HIP) campaign will receive 50 percent of the evening's proceeds for its continuing efforts to educate young people and the audio industry about hearing conservation. The remaining funds will be distributed to the SPARS financial aid program for qualifying students; the AES Educational Foundation, audio scholarship programs for past winners and/or nominees in the category of Outstanding Institutional Achievement, Recording School Program; and to help support Hearing Education Awareness for Rockers (H.E.A.R.), based in San Francisco.

Photos by Alan Perlman

Presenters Bill Symczyck and Jimmy Webb.

The Eleventh Annual TEC Awards were partially funded by the generous donations of:

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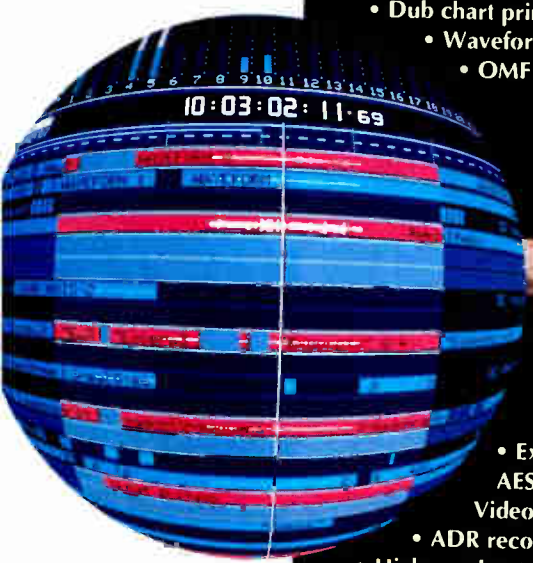

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1995 TEC Winners

Marvin Caesar accepts the Ancillary Equipment Award for the Aphex Model Tubessence 107 Mic Preamp from Bill Symczyck.

INSTITUTIONAL

- **Acoustics/Facility Design Company**
  Russ Berger Design Group, Dallas, TX
- **Sound Reinforcement Company**
  Clair Brothers Audio, Lititz, PA
- **Mastering Facility**
  Bob Ludwig's Gateway Mastering, Portland, ME
- **Audio Post-Production Facility**
  Buena Vista Sound, Burbank, CA
- **Remote Recording Facility**
  Record Plant Remote, West Milford, NJ
- **Recording Studio**
  Ocean Way Recording, Los Angeles, CA

Opcode's Paul deBenedictis accepts the award for Computer Software/Peripherals for Studio Vision 2.0.

Yamaha's Peter Chaikin accepts the Small Format Console Technology Award for the ProMix 01.

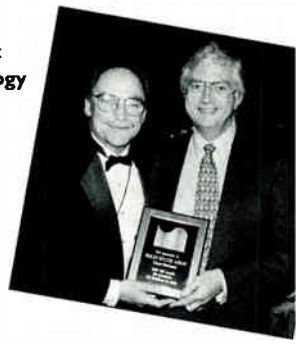
CREATIVE

- **Audio Post-Production Engineer**
  George Meyer
- **Remote/Broadcast Recording Engineer**
  Ed Greene
- **Sound Reinforcement Engineer**
  Bruce Jackson
- **Mastering Engineer**
  Bob Ludwig
- **Record Producer**
  Tony Brown
- **Recording Engineer**
  Ed Cherney

Presenters Phil Ramone (l) and Tony Brown.

TECHNICAL

- **Ancillary Equipment**
  Aphex Model Tubessence 107 Mic Preamp
- **Amplifier Technology**
  Hafler Trans-Nova P-3000
- **Computer Software/ Peripherals**
  Opcode Studio Vision 2.0
- **Microphone Technology**
  AKG C12VR
- **Sound Reinforcement Loudspeaker Technology**
  JBL 4890/4891 Monitors
- **Studio Monitor Technology**
  Genelec 1030A
- **Musical Instrument Technology**
  Kurzweil PC-88 Keyboard
- **Signal Processing Technology**
  Focusrite Red3 Compressor
- **Recording Devices/ Storage Technology**
  Tascam DA-30MKII DAT
- **Workstation Technology**
  Avid Technology AudioVision 3.0
- **Sound Reinforcement Console Technology**
  Yamaha PM3500
- **Small Format Console Technology**
  Yamaha ProMix 01
- **Large Format Console Technology**
  Amek 9098 by Rupert Neve



MFEA president Hillel Resner presents sponsor plaque to Solid State Logic's Piers Plaskitt.

VHS tapes of the Eleventh Annual TEC Awards are available for $29.95. For information call (510) 939-6149.

by Dan Daley

THAT WAS THE PHENOMENON THAT IS

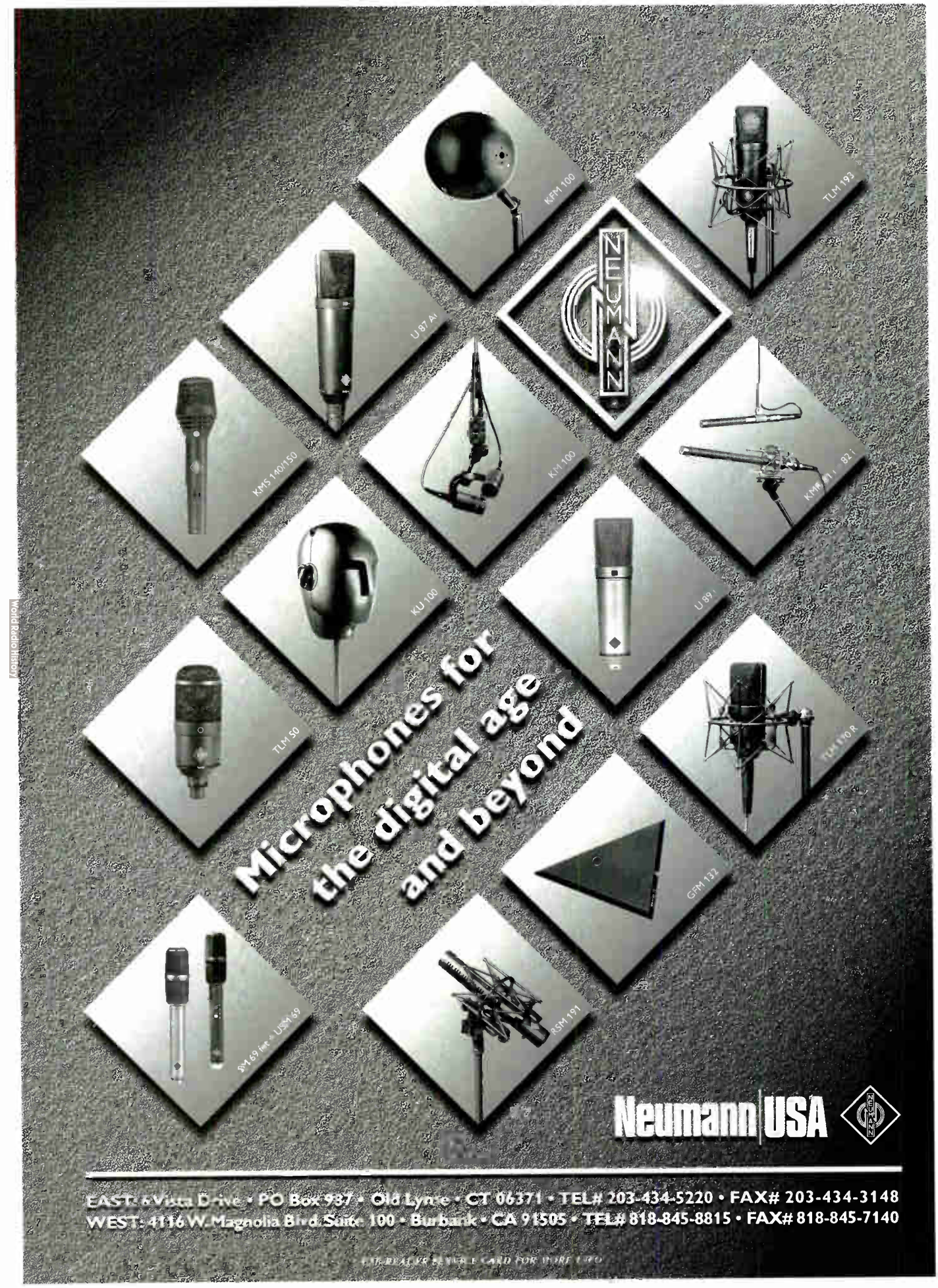
WHAT'S IN A NAME?

This month's headline is a bastardized version of the 1960s TV show *That Was the Week That Was*. I chose it because it illustrates the paradox of the project studio within the professional audio industry. Project studios are so-called for the same reason we now talk about "analog" tape. Fifteen years ago, there was no reason to say analog, because that's simply all there was. Tape needed no modifier. Once digital came into the picture, the medium that had been in use for 40 years suddenly required new identification. It was like your favorite club changing hands overnight, and when you show up, they ask for your membership card. (Ironically, tape is increasingly referred to as just tape, as digital audio workstations move into the music production realm. Watch for that trend in 1996.)

Project studios are studios. But the modifier "project" that they required in the beginning has stuck. Why? Why can't project studios simply be referred to as the professional studios that they are in most cases? Why not simply regard them as the "phenomenon that was" and incorporate them into the mainstream perceptually as has been done empirically? "Project" was a useful modifier in the early days, when project studios generally consisted of 8- and 16-track systems and a couple of QuadraVerbs and Shure SM57s. They were like training wheels on a bike. But now that project studios run the gamut from those same 8-track decks to Sony 3348s and SSL consoles, how appropriate is a dividing line? The phrase "project studio" becomes a back-of-the-bus code word for something that is implicitly and inherently less than what it is—a full-fledged, technically advanced recording studio.

The distinctions that separated project studios from what came to be called "commercial" or "for-hire" studios remain in place; project studios are defined as such because they are intended as tools specifically for an owner/operator and don't derive revenues from time and equipment rentals. When you hire a project studio, you are really renting the production and other talents of the owner; when you rent a commercial studio, you are hiring a space, equipment and varying degrees of technological talent, depending on whether an engineer, an assistant or no one at all comes with the hourly or daily rental rate.

Why can't project studios simply be referred to as the professional studios that they are in most cases?



But those distinctions have blurred considerably in recent years. Equipment investment has run up overhead costs for many former project studios to the point where they now take in outside clients to help defray the costs. And once someone is paying a rate for an acoustically designed space with a significant console and outboard gear, there's really nothing to delineate what kind of studio it happens to be, other than how good, or not good, it is.

The more appropriate modifier—if one is still necessary—is "personal" studio, to delineate those facilities that are purely for the use of their owners and not defined by financial parameters. In an age when Gibson Guitars takes out two-page ads in general-interest magazines like *The New Yorker*, it's not at all unusual to see stockbrokers and middle-aged, middle-management executives taking a couple of grand and buying a Mackie and an ADAT or DA-88 for personal pleasure and artistic fulfillment. And I gotta tell you, some of them ain't bad at it.

The "project" modifier does serve a purpose, though not a terribly useful one anymore. "Project" continues to function as a condescending term, a class tattoo that fuels an ongoing perceptual problem that wrongly but persistently pits commercial studios against project studios. The two major effects of the project studio phenomenon on the professional recording industry have been a revolution in access to technology in terms of price and performance, and an undeniable impact upon the finances of commercial facilities. The latter continues to rankle many commercial studio owners, some of whom still view project studios as technological torpedoes aimed at their hulls.

But both of these effects are as much unifying factors as they are divisive. All studios have benefited from the new generations of downsized, down-priced equipment. How many commercial studios have been able to implement previously unaffordable B and C rooms using Mackie or Yamaha consoles and Alesis reverbs, while still offering an SSL or Neve and Lexicon 480L in their main rooms?

And to address the issue of survivability, why should the recording industry be immune to the same sorts of evolutionary pressures that much of other U.S. and world industries were subjected to in the last several years? Hundreds of thousands of people lost their jobs at companies that were once thought of as cradle-to-grave employment propositions—AT&T and IBM, to name two examples. Like the steel, manufacturing and automotive industries before them, a new generation of businesses had to confront the bloat of managerial and market complacency. Well, recording studios are businesses, too, and now more than ever, as the entertainment industry undergoes mergers and acquisitions and is scrutinized like never before through green-shaded M.B.A. eyes, studio owners see that change is inevitable. Yet even though there have been much larger forces at work propelling change, project studios have taken the heat. It took years to form industry organizations like SPARS; by contrast, the Hollywood Association of Recording Professionals (HARP), which coalesced around the perceived threat of project studios in Los Angeles, was able to form itself into an effective organization in a matter of months.

The project studio has helped redefine the industries that recording studios most often serve. The A&R function of the record business has devolved now around a checkbook-driven business model, in which producers with their own studios develop acts and then receive lump sums to continue to develop them and others for major labels. They go on to build bigger studios, some of which become for-hire facilities, particularly as the fortunes of their initially successful producer/owners change in a very fickle business. You are only as good as your last hit. Now, pay the rent.

Plenty of film and broadcast audio is still done on soundstages at major facilities. But an ever-increasing proportion is being done off-offline in individual studios by people who once worked at those larger facilities.

This, in turn, brings up the empowerment issue. Though project studios have been accused of not playing on a level field in terms of meeting local regulations and building codes, they have certainly leveled the field artistically. A much broader range of audio professionals, from musicians to synthesists to those with neither talent but with their own sort of inspirational sparks, now compete with what had become a rather lock-step sequence for both film audio and broadcast commercials—much to the advantage of both industries.

"Separate but equal" can still be applied to the studios formerly known as project (sorry, Prince). But that appellation serves less and less of a useful function in light of the evolution of those studios into the mainstream of contemporary recording. In some cases, entire genres like hip hop and dance are done almost completely within personal recording environments. If one looks at the traditional studio as having now come through its economic shake-out period, and the former project studio as a legitimate contender for most types of audio work, then they can probably better face the future from a symbiotic view rather than an antagonistic one. If you do music recording in a studio, it's a music studio; if you do sound design in a facility, it's a sound design facility. It can be one of those things, or both and more. After all, what's in a name? ■

Dan Daley is Mix*'s East Coast editor. But what's in a title?*

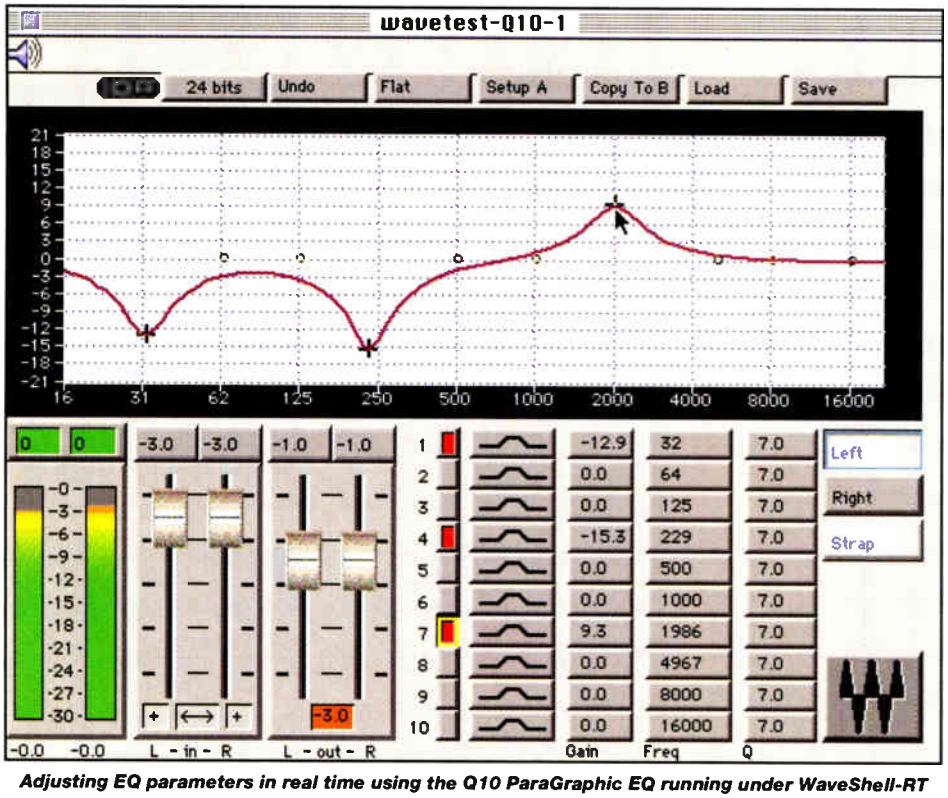
by Philip De Lancie

WAVES

ADDING FLEXIBILITY TO PLUG-IN PROCESSING

Since the release of its Q10 ParaGraphic EQ two years ago, Waves has been in the forefront of a burgeoning new market: the supply of software-based audio signal processors that run as "plug-ins" in Digidesign's popular Sound Designer II and Pro Tools hard-disk recording and editing environments for Macintosh. Waves was among the first companies to seize an opportunity presented by the fact that while the destructive and nondestructive waveform editing capabilities of SDII are well-regarded, many feel that the DSP features of the program (EQ, compression, etc.) are limited.

A variety of software modules compliant with the Sound Designer plug-in protocol are now available to provide sophisticated signal processing when run within a host application (SDII or Pro Tools with TDM). Waves has four such products, which use the Motorola 56000 Series DSP chips built into Digidesign's hardware to run their algorithms. Q10 is a 10-band fully parametric equalizer offering five filter types, full graphic display and either separate left/right or strapped stereo processing. The S1 Stereo Imager allows phase-compensated control over the spatial parameters of a stereo signal, including width, rotation and asymmetry. The C1 Compressor/Gate offers two simultaneous dynamic processes, broadband- or frequency-selective,



Adjusting EQ parameters in real time using the Q10 ParaGraphic EQ running under WaveShell-RT

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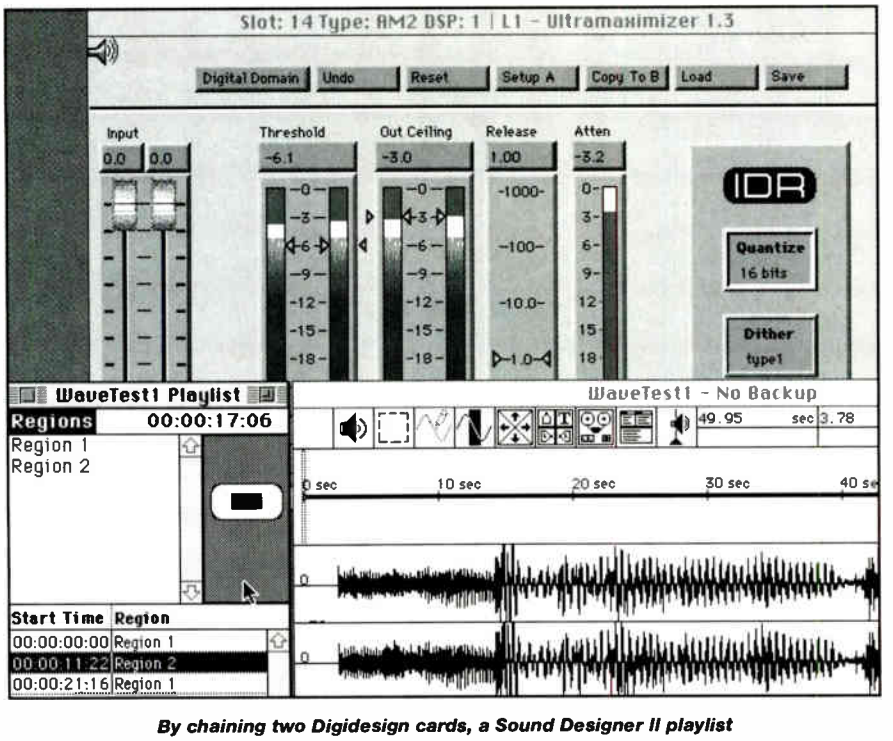
including compression, expansion and gating. All of the above plug-ins include limited control over Waves' built-in IDR (Increased Digital Resolution) noise shaping/dithering process. The L1 Ultramaximizer offers more IDR options than the other plug-ins, with greater user control over IDR dither, noise shaping and requantization processes to optimize bit-rate conversion. It is also a look-ahead peak limiter.

The SDII versions of the Waves plug-ins are priced at $450 for Q10, $500 for S1, $700 for C1 and $650 for L1. An SDII bundle of all four, plus WaveShell-RT (more on this later), retails for $1,650. Each plug-in is available in a TDM version for an extra $150, with a TDM bundle retailing for $2,300. The TDM bundle includes WaveShell-RT and WaveShell-TDM, which is required in order to use the plug-ins in the TDM environment.

As explained by Waves senior product specialist Seva (formerly known as David Ball), the idea behind WaveShell is to provide a "gateway" through which individual plug-ins are accessed by their host application. "We have fooled TDM into thinking that the only plug-in is WaveShell," says Seva. "And then within that, we can do what we like." For TDM users, the major benefit of the shell is that it allows the available processing power of the DSP chips to be allocated among multiple plug-ins. "We allow the user to break a plug-in into smaller components and route them internally on a single DSP chip. This is called DSP partitioning. So a user could take, say, maybe a couple of bands of Q10, plus the L1, and use them together within WaveShell-TDM on a single DSP chip."

This increased flexibility under WaveShell-TDM is a precursor of the company's plans for all applications in which the plug-ins might be used. "That is the way we are working on it for all the systems," Seva says. "A WaveShell is like a routing architecture that you plug in. They will all allow you to do the same thing, which is to route things the way you want, giving you better use of your available processing power."

Nearing release at press time are WaveShells for SDII and Adobe Premiere. Used with the forthcoming 2.0 versions of the plug-ins (the current versions are 1.3), these shells will support DSP partitioning. "With the advent of a shell for Sound Designer," Seva says, "you will be able to use as many [plug-in] components as will fit on a single DSP chip. It changes the Sound Designer platform considerably to be able to do a couple bands of EQ, maybe a small compressor and the IDR requantizer all in a sin-



By chaining two Digidesign cards, a Sound Designer II playlist (foreground) may be played through a plug-in processor (in this case the L1 Ultramaximizer) running under WaveShell-RT in the background.

gle pass. That would take you three passes before. So that is a fairly potent thing."

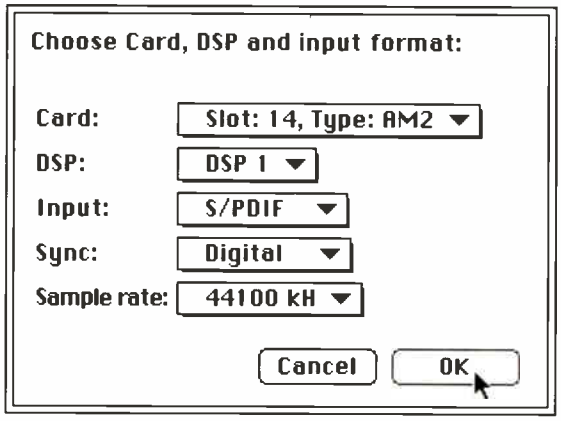
As for Premiere, Seva notes that "Version 2.0 of our plug-ins will have native support and native processing in Premiere format, meaning the processing is not dependent on the presence of Digidesign cards. This will not work on 680X0 Macs, only on PowerMacs and PowerPC-based machines. So any application that supports the Adobe Premiere plug-in protocol would be able to use our processors on a PowerMac or PowerPC machine." Seva says the next upgrade of OSC's Deck (v2.5) is among those using the Premiere plug-in protocol.

Aside from DSP partitioning, an interesting side benefit of the WaveShell approach is that the same piece of plug-in software will probably run under the various shells for different host applications. Waves has not yet finalized the plan, Seva says, but "we could add Premiere protocol support to the basic Sound Designer plug-in, so that when you buy Q10 for Sound Designer, it will also work in Premiere. The key to all this is that you get the appropriate shell for the application in which you want to use the plug-in." The shell for SDII, and possibly Premiere as well, would be bundled with an SDII plug-in; if users buy the upgrade for TDM, they would then get the TDM shell.

WAVESHELL-RT

The use of shells to plug into various host applications and to allocate processing power should add greatly to the flexibility of using the plug-ins in SDII, where you currently can run only one process per pass. But it doesn't address a number of other basic limitations of using the plug-ins in SDII. For one thing, you have to preload all your material onto hard disk, even if you just want to do signal processing, and you don't need to use SDII's editing/playlist features. If the material you want to process is long, this can require a lot of time and disk space (10.5 MB/minute for CD-quality). Additional disk space will be required if you process destructively and you want to first make a backup.

Another limitation is that SDII is not able to play audio from disk while a plug-in (or any other application) is the active window. This creates two potential problems. Let's suppose you are "running down" your material to decide how to set the EQ for a given song. If you were working with a console of some kind, you might listen to extended excerpts from the song, adjusting the EQ as you listen. But in the SDII environment, you can only adjust your plug-in settings while listening to a short Preview loop, the length of which is determined by the amount of memory allocated in the RAM Buffer Size dialog under the Setup menu (which is limited in turn by the memory settings in SDII's Get Info dialog box in the Finder). With an 8MB machine, you won't get a loop of much more than 12 seconds, which is hardly ideal.



The initial DSP setup dialog box in WaveShell-RT

A related limitation is that you cannot use your computer for anything else when processing your audio through a plug-in (or SDII's built-in processes). This can be frustrating if your material is ready to go and you just want to add some gentle limiting with L1 in playback mode as the material is played from the hard drive out to your CD-R or DAT machine. Even though most of the work is being done by the DSP chip, the CPU is unavailable for the duration.

To address these kinds of situations, Waves came up with WaveShell-RT (Real Time). Like the other shells, RT acts as a gateway to the Waves plug-ins. But instead of linking the plug-ins with an application, RT is itself a stand-alone application that links plug-ins directly to the DSP chips on the main I/O boards in Digidesign's Audiomedia II, ProMaster 20, Sound Tools II and Pro Tools systems. This allows audio entering the board to be processed with a plug-in and routed to the outputs, all in real time. In effect, this turns the host Macintosh into an outboard signal processor, which can be inserted in a signal path between any other two pieces of audio gear, such as a DAT machine and a CD recorder, with no requirement to go to disk if no editing is needed. The program is included in Waves' SDII and TDM bundles and is also available separately for $100.

Operation of WaveShell-RT involves just two steps. First, you use the New DSP dialog box to select a Digidesign card (if you have more than one installed in your computer) and set the input (analog or digital) and sync (internal or digital). At this point, audio fed to the inputs is passing through the card without processing. Then you use the Open Effect dialog box to choose any available Waves plug-in as the active processor. The plug-in, when opened, looks and operates essentially the same as if it were open under Sound Designer, with the exception of the Preview, Process, Bypass and Playback buttons, which are not needed under the shell.

If you own more than one Waves plug-in and you have more than one Digidesign card installed, you can chain multiple processes in series by hooking the digital output of one card into the digital in of the next. WaveShell will open as many DSPs as you have available. "I have three cards," says Seva, "and I configure them as I need for the session. I have even daisy-chained four cards, using an expansion chassis. I just put in four Audiomedia II cards and ran RT. If you daisy-chain those little guys, you have a full 24-bit reroutable architecture. It's configurable outboard gear." At present, Version 1.3.1 of the shell supports only one plug-in per DSP, but DSP partitioning will be included in Version 2.0.

One would think that the shell could open any plug-in that conforms to the SDII protocol, but in fact it works only with Waves plug-ins. According to Seva, that results from the plan to incorporate DSP partitioning. "It was obviously much easier for us to do that for our own plug-ins; it was impractical to try to incorporate the plug-ins of other manu-

facturers, which may be designed to use entire chips."

One other caveat: owners of Waves' C1 will not be able to run the plug-in under the shell on an Audiomedia II card. "There is just not quite enough RAM on the card to make C1 work under WaveShell-RT in its existing configuration," says Seva. "It works fine on other cards like ProTools III and Session 8 and ProTools 442, and it works fine under Sound Designer. But RT has a little bit more DSP overhead than Sound Designer, and we just ran out of processing cycles. But under 2.0, you will be able to choose what part of C1 you really need: Do you need the compressor, split or wideband, or the gate, or a wideband compressor and gate without the sidechain? But, to use everything all at once under WaveShell-RT will not work on the Audiomedia II card at present."

That aside, WaveShell-RT provides a great way around some of the constraints of working under SDII. If you don't need to record to disk for editing purposes, you simply pass the audio from your source through the shell and use the plug-in to process the audio in real time. Running down your material to decide on your setup is much easier under the shell than using the Preview feature of SDII, and you can save your setups for each selection or portion thereof, just as you would under SDII.

If you are using just one setting throughout the material, you can set up the process, start your source machine and your recording machine, and then work on something else (as long as it does not involve the Digidesign card) while the plug-in processes in the background. If you want to change settings while the audio plays (in the silence between songs, for instance), you can instantaneously load a previously saved setting at any time by double-clicking on the file for that preset in the Load dialog box.

WaveShell-RT's ability to load presets on the fly is a step toward turning a Digidesign-equipped Mac into a nice stereo console, perhaps for some low-end mastering applications. But not all the pieces are in place yet. For one thing, there is no master output fader (the faders in the plug-ins currently attenuate 20-24 dB). "We will be providing that," says Seva, "but we are not exactly sure how. You could make the faders

switchable [between their existing range and a full range], but another idea which we like a lot is to have a separate plug-in that you can just drop in as a master fader that also might have some extra-nice metering on it. You would want to do that pre-L1, because you don't want to do your fade after your dithering and requantizing. You would want to fade the original signal at its highest resolution and let L1's requantizer do its job to yield the appropriate output stream."

Another item on the wish list would be a way of automating preset changes and fades. This will become particularly crucial once DSP partitioning is in place, because it will not be practical to manually load presets into more than one plug-in at a time. "One of the things we are still looking at," says Seva, "is snapshot and continuous-controller MIDI-based automation, which could certainly run from timecode. We will make it so that you can save and load a snapshot of your setups while using multiple plug-ins, but that is not going to be part of Version 2.0."

PROCESSING TO AND FROM HARD DISK

Even if you plan to record your material to disk for editing, you can do your rundown under WaveShell-RT, then use your presets under SDII to process the various selections on disk. But under the shell itself, there is currently no disk support, which means you cannot process on the way to or from your hard disk. "We are going to add disk support to RT in a later edition, but not Version 2.0," says Seva. "Whether we will support SDII playlists or not, I do not know. If we could get the format of the SDII playlists, and we could also tie that to timecode, that would be excellent to do all that at once, so that you could simply open a file in RT and play an SDII playlist."

In the meantime, there are a couple workarounds for the disk support problem by using two Digidesign cards. One option involves using Deck II. "I did a Save Playlist as Soundfile and saved it as a split stereo file," Seva says, "then opened it in Deck, I put in some fadeouts and other stuff, which I automated in Deck, and then I played the file from Deck in the background with WaveShell-RT in the foreground." With this setup, you can make changes to the plug-in setting in RT while the file is playing back from Deck.

Another option for processing both to and from disk is to run WaveShell-RT and SDII each on one card. "I've done that with Pro Tools 442, Pro Tools III, Session 8, and AudioMedia II cards," says Seva. You can run a plug-in on one card under WaveShell-RT to process in real time from an outside source, then run the digital out of that card into the digital in on another and record to disk using SDII. Or you can use one plug-in (in playback mode) under SDII while playing a file or playlist from disk (this plug-in does not have to be a Waves product), then run the output digitally into a second card and use another plug-in under the shell.

Overall, WaveShell-RT offers the tantalizing prospect of a very flexible, competitively priced system combining real-time processing with disk-based recording and editing (when used with SDII).

Flexible as this setup is, you still are faced with the fact that SDII can only play a file or playlist while it is the active window. So you cannot make adjustments or load setups into your plug-ins while going to or from the hard disk. Individual processing for each selection can be handled by recording selections to disk one at a time through the shell with the desired setup, or by destructively processing each selection with the plug-in under SDII. For instance, you might record a series of songs to disk through the shell, running Q10 with a different EQ setup for each. Then you could do your editing, band-to-band leveling and normalizing in SDII. When the file or playlist is ready to roll, you could play it back using C1 or Jupiter System's MDT under SDII for overall compression, followed by L1 running under the shell for final peak limiting and IDR processing.

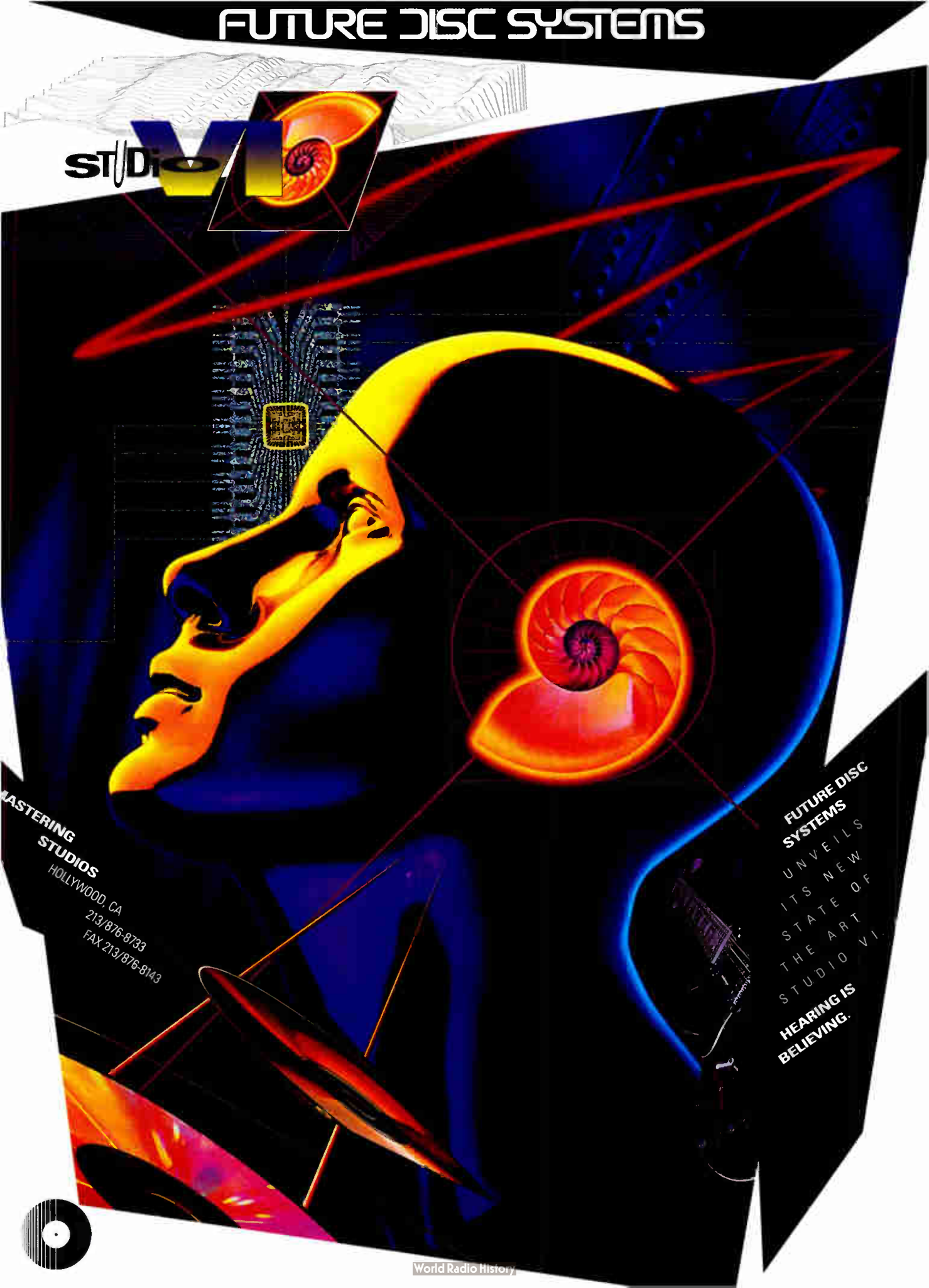
Depending on how much time you think you can save (and how much your time is worth), buying an additional Digidesign card to enable this kind of setup may or may not be a wise choice. The least expensive option is the AudioMedia II card, which goes for a street price of about $900 bundled with SDII. According to David Froker, Digidesign VP of product marketing, the company has no plans at this time to sell additional cards at a lower price to registered SDII owners. (A PCI version of the card, dubbed AudioMedia III, will be available for Windows PCs in February, with a Mac PCI version to follow sometime in the second quarter of 1996.)

The AudioMedia II card is actually particularly well-suited for use where two or more cards will be strung together in series because it features 24-bit digital I/O. "The S/PDIF and AES protocols both support 24-bit digital word lengths," Seva says, "and the S/PDIF ports on the AudioMedia II card will accept a 24-bit digital input and provide a 24-bit output. So it is a full 24-bit board. All the Digidesign boards use 24-bit processing internally, but the digital I/O of the other boards only pass 16-bit signals." This means that the AudioMedia II can accept 20-bit signals from an external A/D converter. (If you are recording in SDII, be sure to create the file as 24-bit.) It also means that when chaining two or more cards to use a series of plug-ins, the additional bits generally added by DSP processes will be retained throughout the chain. Waves recommends using L1 as the last process in the series to allow IDR to requantize the signal back down for 16-bit output.

Overall, WaveShell-RT offers the tantalizing prospect of a very flexible, competitively priced system combining real-time processing with disk-based recording and editing (when used with SDII). Given the various current complications and constraints, the system is still a work-in-progress, but it is already a very useful tool indeed. It's clear from both WaveShell-RT and the other WaveShell products in the pipeline that Waves has put a lot of thought into making plug-in audio processing as versatile and convenient as possible. ■

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

FUTURE DISC SYSTEMS



by Tim Moshansky

PHOTO: PETER HOLMES AND DON HACHEY

Le Studio Morin Heights, Montreal

CANADIAN SNAPSHOTS

Canada is a large country, but its population is small compared to its big brother to the south—about one-tenth. However, we Canadians do remarkably well when it comes to creating good recordings. We also have a huge pool of talented producers and musicians, many of whom defect to the U.S. for the bigger markets and the bigger budgets. Because Canada is so spread-out geographically, most of the recording is centered in just a handful of cities, most notably Vancouver, Toronto and Montreal. To get a sense of Canada's place in the world of recording, *Mix* traveled across the "True North, strong and free" and spoke to several producers, engineers and studio managers to get the scoop.

VANCOUVER

Jim Vallance, one of Canada's best-known songwriters (Bryan Adams, Scorpions, Aerosmith, etc.) built The Armoury in 1992 in Vancouver as a

—CONTINUED ON PAGE 99

Head technician, John Vrtacic (center) checking out half of the board at Bruce Fairbairn's Armoury Studios, Vancouver, B.C.

Wood control room (under construction) at Armoury Studios

PHOTOS: PAUL ILVI-IFA

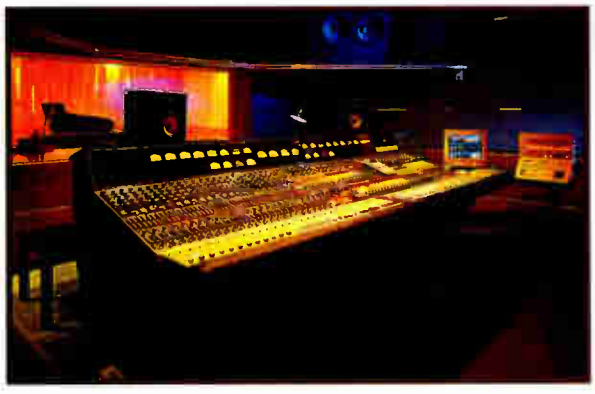
FACILITY SPOTLIGHT

The Factory

Vancouver, B.C.

by Barbara Schultz

It's a new studio and a legendary studio in one. The Factory took over the former Little Mountain Sound's Studio B last May, bringing new blood and new ideas to what for more than 20 years was Canada's most established, celebrated facility. In its former life as Little Mountain, the studio hosted artists such as Bon Jovi, Bryan Adams, Motley Crue, AC/DC, Cher and others. Today, it is co-owned and run by John MacLean, an engineer/producer whose greatest interest lies in the indie market.



"I'd like to follow in Sub Pop's footsteps," says MacLean, who also runs his own independent label called Nation Underground Records, the Record Label. "In the past, it was Porsches and Motley Crue's Harleys and people camping out front to to get a glimpse at Aerosmith, but now it's more accessible to smaller bands and to the indie labels. And we're one of the few indie labels in Canada that have a major studio at our disposal, so we're unique in that sense."

MacLean says he'd been driving past Little Mountain for years and considered it a pipe dream that he might some day work there, much less own it. But some months back, he was cruising by for the umpteenth time and saw a for-lease sign in front. "There was a vacancy of about two months before I got it," he says. "I had heard it was going to be a cookie factory."

MacLean took over only Studio B because it is plenty large for his purposes: 1,200 square feet with a 22-foot ceiling; the control room is 450 square feet, and there are three iso booths. (The gigantic former Studio A was taken over by a separate company and divided into five rehearsal spaces.) The Factory's equipment includes a 64-input Neve 8048 console with Flying Faders, and Otari MTR900-II and MTR-12 and Studer A80 tape machines. Monitors are UREI 813As with 838 Time-Aligned crossover networks, KRK 7000s and Yamaha NS-10 nearfields. There is also a wide array of signal processing gear, along with mics from AKG, EV, Neumann, Telefunken, Sennheiser, Shure and Sony. The five-person staff consists of MacLean, second engineer Sheldon Zaharko, assistant engineer Sammy Fernnete, administrative assistant Dawn Astdury, and Stephen Cameron, who MacLean calls the "house computer hack." Cameron is in the process of setting up The Factory's home page.

Three album projects had been completed at press time. The first was for Canadian artist John McCormick and featured guitarist Alan Darby (Van Morrison, Robert Palmer, Eric Clapton). Most recently, they had in pop band Cinnamon, who MacLean also signed to his label. "A lot of bands sign to an indie and keep their creative control," he says, "and then go to the majors for distribution. I'm in constant touch with the majors in Toronto; they're also interested in bringing bands in. We're also getting quite a few calls from the States about coming in. As you know, B.C. borders on some pretty happening states in the U.S." The Factory's next firm commitment is from Atlantic artists Moev.

MacLean also admits that the illustrious studio's reputation can be a mixed blessing: "A lot of the indie bands happening right now might not be Bon Jovi fans, so there's a bit of a thing to break with there as well. But I really respect Bob Rock and Bruce Fairbairn, people like that, for what they've done for this city and this room. They put this city on the map, and I just want to continue on making great records." ■

PHOTOS: PERRY ZAVITZ

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—FROM PAGE 96, CANADIAN SNAPSHOTS

writing studio, but it turned out to be a bigger room than he needed. Eventually, he opened it to outside projects for artists such as Joan Jett, and co-wrote with them while they recorded their albums. When producer Bruce Fairbairn used the studio to record a recent Chicago album, he asked Vallance about the status of the studio.

"Since Little Mountain Sound went out of business," says Fairbairn, "I haven't had anywhere to work in Vancouver, really, that's been up to scratch." A deal was struck, and Fairbairn now owns the studio. "Vancouver needs a new studio to anchor the city," he continues. "What I've done with The Armoury is put in a 72-channel, top-of-the-line SSL board, two new A800 Studer tape machines, a pair of original UREI 813 monitors, new microphones and mix stations. I've just taken what Jim's done and tried to move it up about ten or 20 percent to make it workable for me and guys like Mike Fraser or Bob Rock."

Fairbairn describes The Armoury as a beautiful, big room. The studio has skylights to let natural light in and a patio at the back where clients can get some fresh air between takes. John Vrtacic (pronounced *ver-tas-ik*), who was really the "magic" guy behind Little Mountain, is in charge of putting the new console (which was not fully installed at press time) in and redoing the monitors.

Fairbairn makes it clear that the studio is not just for his personal projects. "We want to keep a lot of the clients that Jim had going," he says, "like Raffi and k.d. lang, and the Barenaked Ladies and everybody else. If I can get a couple of months in to do one or two of my things, then that's great. I really like the way that Jim ran the studio, and I'm not going to do anything new. I'm just going to make the gear better and keep the same thing happening."

Vancouver offers a lot of unique benefits: There are mountains, ocean, beaches, excellent restaurants and a ton of recreational activities when you're not recording. "What Bob Rock and Mike Fraser and to a certain extent myself made out of Little Mountain," says Fairbairn, "was a place to come and record, and then Vancouver became a *city* to come to and record. As a city to record in, it's great. The people are very friendly here, the weather is good. To bring a band up here is perfect.

"I don't want to make The Armoury into an international recording studio," he stresses. "I'd like a lot of Canadian musicians to record here. I don't want to make it inaccessible to anybody. If you're on a real limited budget, there are alternatives in Vancouver, like Mushroom and Greenhouse [previously Vancouver Studios]. You've got to have a recording budget to come in, but I'm not going to hustle Brian Eno in to do the new U2 album here. Let Bryan Adams handle all the high-profile stuff. When he gets The Warehouse going in Gastown, he can do all the big-time stuff."

Fairbairn is currently recording the new Cranberries album in Ireland (they may do some recording at The Armoury) and a new Aerosmith album tentatively scheduled for the early part of 1996, most likely at the Armoury. Eventually, he may bring Van Halen in to record the follow-up to *Balance*, which he recorded with

the boys in L.A. at 5150 and the Record Plant.

A good example of a project studio in Vancouver that operates on a much smaller scale than The Armoury is Yaletown Sound. The studio is owned by Marc LeCorre, Al Vermue and Life Inside Lucy, a Vancouver band that recently returned from a three-month gig in Thailand. The studio, which opened a year ago, has provided a place for the owners to record their own projects and attract outside clients. A Mackie 32x8x2 mixing board, several Alesis ADAT units with a remote-control module, Genelec monitors, a Mac with Pro Tools III, several Neumann microphones and a host of outboard gear fill out the studio.

John Fyssas, an active freelance engineer around Vancouver, looks after the facility from both a management and engineering perspective while the band is overseas. He feels that people, more than gear, draw clients in and make them keep coming back. "Six or seven years ago," he explains, "you had to pay a quarter-of-a-million bucks or so to buy a Sony 24-track digital recorder, whereas today you can pick up three or four ADATs and a controller for under $20,000. So there are tons of studios out there that have the gear and give you a good recording, but if I can help a band from an arranging point of view or sing a vocal line or go out and play a guide drum track when their drummer doesn't show up, it makes a big difference to them, and they'll want to keep coming back."

CALGARY

Lanny Williamson, owner of **The Beach** in Calgary, Alberta, at one time owned and ran Can-Am Recorders in the San Fernando Valley outside L.A. before moving back to Canada. "I just couldn't take the earthquakes and couldn't take being shot at," he laughs. "I went to Vancouver first," he continues, "and I figured that the scene in Vancouver was pretty well looked after, and there was almost nothing happening in Alberta. There was a pretty good new music scene with an alternative edge, but there was no high-end music scene, no post-production scene, no media production. I thought it was a really good opportunity to open up something and build it up to where it would be competitive with both coasts. We have seven or eight rooms in a facility that covers 10,000 square feet. There are over a dozen staff working at the studio at any given time, with the occasional freelance specialist called in as needed."

The Beach is somewhat of a hybrid studio, one that can meet the needs of musicians and filmmakers alike. "We couldn't make it as a music studio," says Williamson, "and the post-production scene isn't strong enough here to support it, so we have to do a lot of everything, but we still have to do it real well." The facility has played host to many groups and musicians, including producer Daniel Lanois as he was recording and mixing a single by Midnight Oil and the Tragically Hip to raise awareness of the butchering of Vancouver Island's ancient rainforest area, Clayoquot Sound.

The studio has also kept busy on the post scene because of TV series being shot in the Calgary area, such as *Lonesome Dove*, *North of 60* and a new Global Television series entitled *Jake and the Kid*, which is shot in the rival city to the north, Edmonton. "We're posting it here in Calgary, but we have ISDN lines, so our client stays

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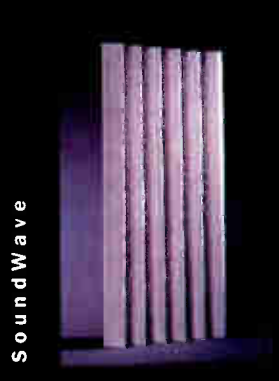

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in Edmonton, and we do all of the post-production in real time." At the time of this writing, The Beach was in the process of buying and installing a 128-input Lafont Chroma console, which Williamson describes as a hybrid between a Neve and an SSL. "It's an LCRS-type console, so we can do film mixes on it, but it's also a beautiful music console.

"I think The Beach [which opened in 1989] represents the kind of new wave of recording in Western Canada," says Williamson. "The Mecca, of course, is Toronto, and Vancouver runs a close second, and they dominate not only the music production but also the post-production and the film production and all that. Between those two cities, The Beach is now rising as the contender in the middle."

Williamson is quick to give credit to other local studios, especially Sunday Sound, which he says does the bulk of the alternative and country recording. "I think they are probably one of the best studios in Alberta," he says. "They have a really nice setup, a lot of esoteric Neve bits and pieces, and they do a lot of analog—they're more of the purists. EK Sound is another 24-track room, but they do more of the ethnic, gospel and cultural-type stuff. There are another half-dozen or so little guys who contribute to the industry a lot, but they are more one- or two-man operations."

TORONTO

Mix caught up with independent engineer/producer Richard Chycki as he was in the middle of mixing the new Four Horsemen album at Metalworks studios in Toronto. Chycki has been busy mixing and engineering many projects, including the last two Jeff Healey albums, a Sebastian Bach project and the new Kim Mitchell (Canada's guitar hero) disc. He works often out of Metalworks, which features both an old customized Neve console and an SSL G 4056 desk. He also uses Healey's Forte Records studio.

"Montreal, Toronto and Vancouver are basically the main hot spots," Chycki says. "Toronto has all of the staples of Canada, like Jeff Healey and Tom Cochrane and Rush and Kim Mitchell. As far as recession goes, I think it's put a temporary dent, but everything seems to be recovering fine. It's real busy right now. There are about ten studios that are fairly competent, and there might be four that are really, really on top, like Metalworks, Sounds Interchange, McClear Pathe and Manta. I hear Lydian Sound is supposed to be ergonomically a fantastic place, and I'm mixing a small project there soon. I mixed half of the Kim

Engineer/producer Richard Chycki

Mitchell stuff at McLear, whose main focus is definitely post, but they have a pretty nice room there with an SSL E 6000, which is a nice suite to mix in."

Chycki explains that they have three studios within the Metalworks facility. "The Neve is connected to a warehouse," he says "so I usually use the warehouse for drums and put the rest of the band in iso rooms. I usually track in the Neve room, do overdubs sometimes in the Neve room for guitars. The smaller studio has a Producer Series SSL, which is an old E 4040 fitted with 32 strips. So I do a lot of overdubs in the smaller room and do mixing in the large suite with the G 4056. You can have three clients going at one time, which has been happening a lot lately. All of the studios are pretty well isolated, so clients aren't running into each other."

Because the cities in Canada are so far apart, Chycki feels that there's no real competition between them from a recording standpoint. "Metalworks has had Guns N' Roses in and Celine Dion," he concludes, "so it's part of the international circuit. I think that Canada is due for another superband like a Bryan Adams or a Rush."

PHOTO: PETER HOLMES AND DON HACHEY

Le Studio Morin Heights

MONTREAL

Le Studio Morin Heights is now entering its third decade of recording in Quebec. It's located 45 minutes outside of Montreal in the rural setting of Morin Heights, and you couldn't ask for a more peaceful, relaxing setting to record in. Top recording acts such as Rush (who have cut eight albums there), David Bowie and The Police have come back again and again. The main room looks out over a lake, and clients stay in a cabin where they can canoe or enjoy a walk through the woods before, during and after recording and mixing sessions.

A new wing with a video room was added about ten years ago, and for a long time, it was used as a shooting stage and post-production mixing facility for television and commercials. Now called the "Far Side," it has become more of an overdub and basic tracking room, according to stu-

—FROM PAGE 78, NEW YORK AES

four capsules mounted in a tetrahedral array (two forward-facing/two rear-facing); from its rackmount controller, users can remotely adjust the mic's directionality from tight mono cardioid to four-capsule stereo spread—or anything in between.

Curtis Technology (Rockford, IL) debuted its AL-1 Tube Mic System, a matched stereo pair of tube condenser microphones with a stereo 19-inch rackmount power supply for $1,950. Designed for instrumental and vocal-recording applications, each microphone has a large-diaphragm element (1.25-inch) and uses a 12AU7 vacuum tube, which is readily available.

Neumann unveiled the M149, a large-diaphragm tube mic, its first new tube microphone in 14 years (for more information, see the October '95 *Mix*). The first microphone to offer a transformerless output combined with vacuum tube electronics, the M149 offers a choice of nine polar patterns: cardioid, subcardioid, hypercardioid, omnidirectional and figure-8, with an intermediate step between each. Initial deliveries are slated to begin around the end of the year, with package pricing expected to be in the $5,000 range.

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Lexicon celebrated the anniversary of the Delta T-101 delay line, the world's first commercial digital audio product, which was released 25 years ago. Its short 10kHz bandwidth and 100-millisecond delay performance seem trivial by today's standards, but the Delta T-101 (with Gotham Audio's logo on the front and Lexicon's on the rear) was a colossal achievement in its day. And the rest, as they say, is history.

Next year, it's back to Los Angeles for the 101st AES convention, scheduled for November 8-11, 1996, at the Los Angeles Convention Center. Until then, of course, we're all looking forward to the 100th AES, to be held in Copenhagen next May, and it's shaping up to be an amazing event. ■

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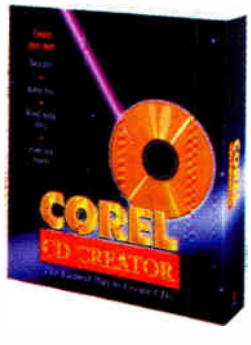

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BY TOM KENNY

POST·SCRIPT

SOUND FOR FILM

NEVER SAY NEVER AGAIN

by Larry Blake

This column marks the completion of my second year as a columnist for *Mix*, my longest stretch at such a regular writing gig. I have always admired newspaper columnists who write thrice-weekly or even weekly columns and never seem to repeat themselves. Even though I have only handed in my pieces 23 times, I have been getting the nagging suspicion over the past few months that I am starting to run dry, repeating the same drivel over and over. Or so it feels from where I sit.

I took a good look over my previous work and indeed came up with a too-long list of Blakeian clichés, metaphors and just-opinions that need to be retired. Put out to pasture. Given a gold watch. Moved to oceanfront property in Florida. So, please, like a man going on a diet who longs for one last slab of cheesecake, allow me to give all of these overused phrases one last lap around the "Post Script" section before getting the checkered flag.

Apocalypse Now. This has to be the leader in my repetition sweepstakes. A quick count shows that I have written at least four times something to the effect that it is the best sound job in the annals of film sound. In addition to the fact that I really *do* think that it is the *ne plus ultra* in the creative use of the medium, I have other, more personal reasons for that track being special. For starters, it was the first mix that I attended, having come West from New Orleans a few months earlier to write a book on the history of film sound. I phoned Walter Murch, who headed the all-star sound team, told him what I was writing and asked if I could come up to San Francisco to watch them finish mixing the film. Today you might have to get clearances from lawyers and have your Dun and Bradstreet checked, but Zoetrope Studios in the summer of 1979 was nothing like that. "Sure," Walter said.

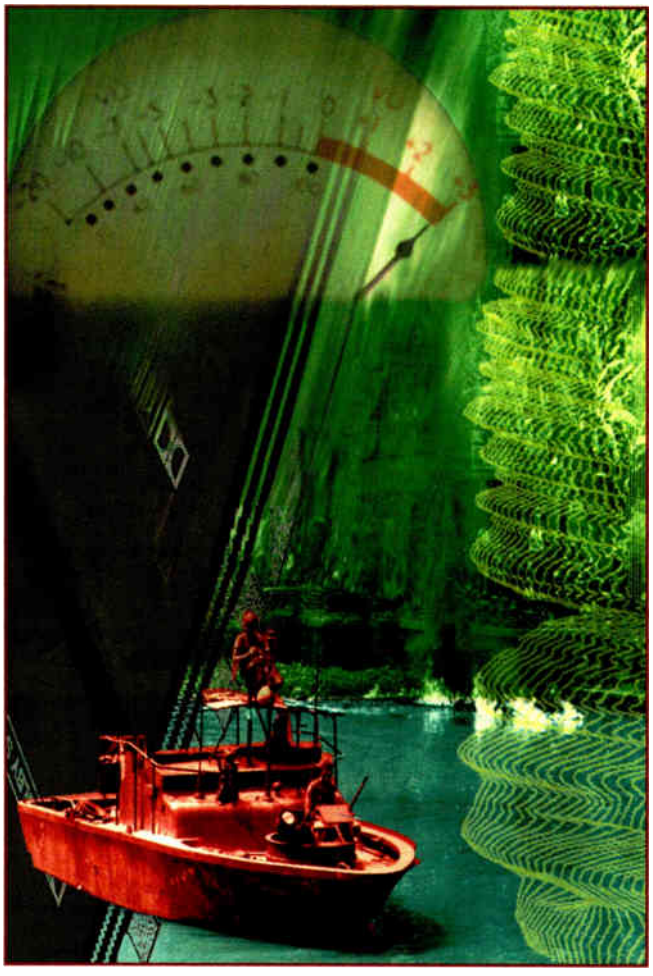

ILLUSTRATION: TIM GLEASON

What I found when I got to the Bay Area was not your standard mixing stage full of guys reading RV magazines (see below), but instead a group of relatively young turks close to my age, some of whom would become good friends of mine. They were in a womb-like small room with a 28-input console no more than 20 feet from the screen, as opposed to a barn-like, antiseptic Hollywood room with an Orange console. Being there while they were final-mixing *Apocalypse* (and returning two years later for the mix of *One From the Heart*) imprinted in my

—CONTINUED ON PAGE 111

JOHN CARPENTER

ONE-STOP MOVIE SHOP

by Maureen Droney

Auteur theory: *n (fr. the French; the view that directors are the true authors of a film): a cinematic technique characterized by the director's complete control over all aspects of production. (Webster's New Collegiate Dictionary)*

PHOTO COURTESY UNIVERSAL CITY STUDIOS, INC.

PHOTO: MAUREEN DRONEY

***Above: still from* Village of the Damned; right: (l to r) John Carpenter and Bruce Robb in Studio 4 at Hollywood's Cherokee Studios**

Director John Carpenter hit the box office jackpot in 1978 with *Halloween*, at that time the most commercially successful independent film in history. Made of seemingly pure adrenaline for a mere $400,000, it was a stylish shocker, offering audiences a thrill a minute.

It wasn't the first film he'd directed, just the one that made his name synonymous with big-screen terror. Carpenter's body of work encompasses 17 feature films, from 1975's *Dark Star*, to *Escape From New York* in '81, '82's classic *The Thing*, Stephen King's *Christine* in 1983, and, most recently, 1995's *In the Mouth of Madness* and *Village of the Damned*. His films take the audience on an exaggerated "What if?" journey into horror, humor and high camp (remember Isaac Hayes as the Duke of New York, complete with crystal chandeliers on the fenders of his Cadillac?), where apocalyptic events unfold in small arenas. Using an almost comic-book approach, Carpenter's films are a sardonic commentary on reality, combining classic western themes with noir sci fi. The result is a bleak and unrelenting vision that lives almost completely on the dark side. Yet, this dark and highly personal view of human behavior also comes laced with the director's signature sense of humor.

What many people don't realize is that in addition to writing and directing, Carpenter creates and performs the music for almost all of his films. And, as *Mix* readers know, music is instrumental (gotcha) in creating the feeling and atmosphere of a film. Carpenter's compositions are often minimalist—from that stark, "less is more" school—sparse, simple and evocative. With his music, as with his visuals, Carpenter taps into the viewers' subconscious and finds their worst fears.

In August 1996, we'll all get to check out what those worst fears may be for Los Angelenos—when I spoke with Carpenter, he was ensconced in his Paramount office in pre-production for *Escape From L.A.*, planning the return of Snake Pliskin.

Mix: I'm a bit in awe of your ability to be a quadruple threat: writer, director, composer and musician.

Carpenter: Well, there's a down side to that, too, you know—if you do a bunch

—CONTINUED ON PAGE 112

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—FROM PAGE 108, SOUND FOR FILM
brain the idea that it's not only possible to make small rooms work for theatrical mixes, in many ways it's preferable. (I'll throw that bait out to anyone who wants to disagree, but that is a subject for a whole 'nuther column.)

Backups, Backups, Backups. Hypocrite, hypocrite, hypocrite. Well, not exactly. When I'm cutting on a workstation, I am indeed stupidly careful about protecting the work in progress. But my personal computer is another story, and at least twice in the past three years I have gone six months or so with no backup of any kind. Stupid, stupid, stupid. So, out of deference to my inability to completely walk my own talk, I shall deep-six this one with the hope that you will still take my advice to heart, both at home and at work.

"Chef of the Future" metaphors. You might not remember these, but I think I have outworn my welcome in referring to what I consider the funniest *Honeymooners* episode, when Ralph Kramden plays the "Chef of the Future" on live TV. However, this should not preclude me from paraphrasing other nuggets of wisdom from this classic '50s sitcom, which is as quotable as Shakespeare or *Apocalypse*...all right.

Placebo Cable. This sources back to a certain company trying to take overall credit for the sound of films when the only parts of the film that had used their cable were Foley recording and, sometimes, music recording. Shameless. I have slammed them specifically both in my previous existence at the late *RE/P* and in a letter to the editor to *Stereophile* (October, 1990). But before I retire this phrase, let me be perfectly clear: It's not that I refuse to admit that cables can be "heard" (although I have yet to have it proven to me) or that the product under question is any good. Instead, it's their marketing department's *representation* of the product's place in the overall picture that puts my knickers in a twist.

Championship Calendar. This is a first-cousin of Placebo Cable and occurs when someone seeks credit (in magazines such as the one you are reading) by being the first to do something, such as "All Digital." I just can't wait for the latest AD permutation to arise, when someone says that they were *really* the first to be AD because they used a digital console. (Next up: All-Digital, All-20-Bit.) You see, previous AD films used analog consoles, so they weren't really...oh, nevermind.

I hate to restate the obvious, but the crux of my complaint is that just because particular equipment was used doesn't mean that the *work* was any good. Add to this the fact that it's almost axiomatic that the first permutation of any new leap in technology will not be as user-friendly as the latest generation of "the old-fashioned way," as Ed Norton said in the "Chef of the Future" episode. On a similar note, I can't think of any film sound category that *Apocalypse Now* was first in. Except in my list of all-time faves. Oops, there I go again!

It's especially aggravating when people want to be credited as the first to do what amounts to taking something off the shelf and using it in an obvious fashion, such as recording production sound on DAT. Ohhh, *there's* a leap of imagination! So while they have a right to go fishing for techno brownie points, I reserve the right to continue to piss on them, even if I am self-banned from using the phrase Championship Calendar.

Star Wars/The Beatles/King Kong: low-tech as high-class. Is everybody as sick as I am of my dragging out the obvious similarities among these productions: 4-track recordings, quantum leap in creative use of the medium in spite of relatively simple technology, and a long-term influence beyond their wildest imaginings when they were in the trenches doing the work. I can only hope that you will help others discover the joys of the work of Murray Spivack (*Kong*), George Martin (the boys from Liverpool) and Ben Burtt (*Star Wars*) on these and other projects.

Dolby's role in changing film sound. In each of the last two months, I have referred once again to the contribution of Mr. Dolby and his troops in the improvements in film soundtracks, beginning in the 1970s. While I will always resent their screwing up the 70mm format by using two of the channels for low-frequency bass extension only (thus my rantings about five channels behind the screen), I believe that their stereo optical format was really quite brilliant. Although I understand why having to deal with a matrix and optical sound recording pisses off most of my film sound brothers and sisters, I tend to look at it as the glass being half full, because stereo optical has allowed *every* movie to be mixed and released in stereo. Before its introduction in 1975, only a handful of films, in no more than a few dozen theaters, would be released every year in the 4-track mag process.

The Hell Sixplex. I am an avid moviegoer, and if you're not at the Academy's Samuel Goldwyn Theatre, the chances are pretty good that something will screw up with the projection, or the sound system alignment will be totally out of whack. My friends find it embarrassing to go to films with me because I complain when anything is amiss. Embarrassing, that is, until they get free passes in lieu of the left speaker being blown, something that they never noticed anyway.

It does no good for me to complain any more about the subwoofers and surrounds being turned up too loud; it's almost as if the American National Standard has been rewritten by a star chamber of pimply assistant managers.

The Westwood Village Theater in 1980 and The Samuel Goldwyn Theater today. Many of you, especially those who have never lived in L.A., are probably sick of hearing me rhapsodize about these two theaters, so I'll shut up for now. The 1,000-seat Goldwyn theater at the Academy of Motion Picture Arts and Sciences in Beverly Hills is the sonic point of reference for me and most members of the Hollywood sound community. Each January, in anticipation of the screening of nominated films for Academy members, a committee tweaks the A and B chains to within an inch of their lives, using material from a wide range of studios. Similar care is taken throughout the year, and if your mix translates to this room, you can be pretty sure that you're doing fine. The shape of the theater results in a stunning combination of the large and the intimate, not only sonically but visually.

My mythologizing of the circa 1980 Village Theater comes from having seen the film *Altered States* there for my third viewing, the first two having been at the Academy Theater and Todd-AO Stage A, where the 6-track version was

mixed. In those two rooms, the film sounded pretty good, but nothing outlandishly great. Then Warner Bros. gave Stephen Katz, who was the original Dolby consultant in Hollywood and had created special sound effects for *Altered States*, a lot of money to spiff up the sound system at the Village. After Katz had spent a week or so of work (including putting the speakers in plywood wall, something that he had done as far back as 1977 for engagements of *Close Encounters of the Third Kind*), I saw the film a third time, and it was almost as if the film could not be seen anywhere else *but* there. Never before or since have I experienced such a marriage of film and room, and I think subconsciously this is why I try to get to as many theaters as possible for films that I mixed (not that any of my films have had tracks in the same solar system as *States*).

Production mixers using EQ. I really hate to retire this one. People always talk about production tracks as if they are bratty kid brothers that we would prefer to get lost but have to put up with anyway. I don't take that approach. The recording made on location might be onscreen (assuming little or no ADR) for 90% or more of the running time of the film. Anything—poorly recorded radio mics, bad mic preamps, tape hiss—that affects the production recording brings the perceived quality of the whole mix down with it.

The idea that putting EQ on production tracks can "save the dailies" is such a load of crap. If the recording was good in the first place, then EQ will only make that recording sound worse. Or, stated another way, if you feel that you need to add extensive EQ (other than a steep highpass around 80 Hz for rumble or helping a radio mic poke through clothing), then the chances are something else is fundamentally wrong, like the mic was in the wrong place or it's a crappy console. In these cases, EQ will *still* only make things worse. I don't even need to get into the idea that headsets are not suitable "B Chains" with which to make EQ decisions, or the fact that you're not hearing everything cut together. LEAVE IT ALONE!

One comment on production that I will not shut up on, just yet, is trumpeting the work of boom operators as the unsung heroes of film sound. I have done that job on only one short film, which was long enough for me to know both how tough a job it is and that I should never try to earn a living doing it.

Movies are too damn loud. This vicious circle has to stop, although the more digital theaters and the more digital mixes, the more opportunities we have to further alienate many moviegoers. I know that 70mm 6-track films, as measured, were in many cases louder, but the success of the digital formats has resulted in a bad situation. (This is not to mention the very serious issue of the effect that these mixes are having on the hearing of the current generation of mixers, who are exposed to these SPLs ten hours a day.)

I will definitely stop picking on the "little old ladies with umbrellas," who are second in line to complain to the manager. (I get there first because I'm a little more mobile). A friend who is in speech therapy explained to me the answer to the apparent conundrum: If old people can't hear that well, why is it that loud sounds bother them more than they do those of us with better hearing? The answer is a phenomenon called "recruitment," which is the condition where the subject has a tight window of acceptance of sound levels—they cannot hear soft material and cannot bear loud ones.

Arrogant people who can't argue their point rationally. And who hide behind stupid phrases like: "No one has ever complained before," "This is the way we do it for Spielberg" (or sometimes "...the major studios"), "This room was tuned recently," or simply "Don't worry." Saying one of these nuggets to me has just the opposite effect that the person saying it thinks they have: I am not only not intimidated or impressed, I immediately lose respect for the person trying to convince me that I shouldn't do what I want to do. So although in Real Life I'll continue regarding people who throw out such phrases as boneheads, in *Mix* Life I'll give it a rest.

Cynical old-fart Hollywood mixers. Finally, I should note that I am aware that many times I have characterized Hollywood re-recording mixers as cynical, crusty old farts who resent putting down their RV magazines to do a simple music fade out, which will then be noted as a stroke of "Genius!" by the producer. Never again will I so characterize these artisans who "save the movie" day in and out in Hollywood.

Therefore, for the next year I'll have our mythical gold-chain-bedecked crew catching up on the latest in yachts.

Please tell me what other opinions I should retire. I can be found at PO Box 24609, New Orleans, LA 70184, fax (504) 488-5139, or via the Internet: swelltone@aol.com. ■

Larry Blake is a sound editor/re-recording mixer who lives in New Orleans because of reasons too numerous to mention—so numerous, in fact, that he never has to worry about repeating himself.

—FROM PAGE 109, JOHN CARPENTER

of things that are mediocre. I should probably pick just one thing and do it well!

Mix: That can be impossible when you have multiple sides to your personality. But which career came first?

Carpenter: It's difficult to say. All the things that I am in my career are the result of gifts from my parents. My dad was a Ph.D. in music and an accomplished violinist: he taught at the university and played in the Nashville symphony. He was also a session musician—one of the founding members of the Nashville strings. So I grew up listening to classical music and going with my dad to recording sessions, where I watched Roy Orbison, Brenda Lee, Elvis—everything. The sessions were actually kind of boring at that age, because I mainly wanted to spend my time at science fiction movies. But he'd bring me along, and I soaked it all up. He tried to force me to learn to play the violin, but it didn't work; I just didn't have the dexterity. Still, he was determined to give me something, and next I was forced to take piano. But I had this adolescent rebellion, and I stopped reading music. To this day, I still don't read music. I can, but I hang on to these adolescent rebellions.

The other formative thing was, my mom played the piano with a talent my dad didn't have—she could play by ear and write beautiful melodies. I picked that up from her, the ability to sit at a piano and write a song.

Then in high school, I joined a rock 'n' roll band, playing bass guitar and singing lead, and probably had the

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best time of my life. We were popular around southern Kentucky, where we'd play parties on weekends and make money. And meet girls! You say to yourself, "What better life than this?" But at the same time I had my childhood love of movies. I saw *The African Queen* when I was 4 years old, and it was profoundly influential. So, I decided I wanted to make movies. I came out to Southern California and went to film school at USC. And in learning to make movies in film school, you had to do everything. Not just directing and writing, but camera, sound, mixing, all of it. Even project movies in the booth.

Mix: But not write the music!

Carpenter: Well, they had a music department on campus that had scoring classes. But what I did was score my own movies—out of necessity, because I didn't have any money. So I began to use the crude synthesizers that USC had in its synth lab, back when they were all tubes, and they were individual modules. With a little work, you could sound like this little tinny orchestra. And that really excited me.

Mix: If you didn't write out your music, how did you compose?

Carpenter: Just sit down and go! Like at the piano. It's just a keyboard and sounds. That's my approach to composing. It's the sounds that I call up on the keyboards and how they relate to the image and the scene that I'm doing.

Mix: So the sounds help to create the music.

Carpenter: Absolutely. And having directed a film that I am going to score, when I sit down and do my work, I'm a journeyman. Basically, my job as a composer is to enhance the image. Not to enhance my reputation for the music, or to prove something, but to enhance the scene, the image, the movie and give it a unified whole. And to give it texture and a feeling, another voice to the film.

Mix: Are you at the final cut stage when you compose?

Carpenter: Yes, final cut.

Mix: But I suppose you have musical ideas in your mind the whole time you're filming.

Carpenter: No, I have no ideas. The thing is, for me, that's the best way to do it, because you end up with a creative process that gets closer to some basic humanity. Rather than planning out the music, which, by the way, gets brilliantly done by every other composer but me! I am in awe of the things that they do, someone like Jerry Goldsmith. I just love his scores and how he can plan it out, how his stuff works. It's just amazing to me. But I can't do that, so I do what I can do. Which is, I sit down cold, in front of a scene, and I just pretend I've never seen it before.

Mix: So you write like a rock musician.

Carpenter: That's it! And the music is all riff-driven. You reach inside and you're expressing. And in my case, it's easier, because there's something right in front of me, there's a scene taking place, there's an image. So you give it a couple of tries.

Mix: You must have an advantage in that you know exactly what you want to say in the scene.

Carpenter: Oh, sure, but it's all on a basic level by this point—I'm sick of the damn movie. At the point I sit down, I've got to do something to it

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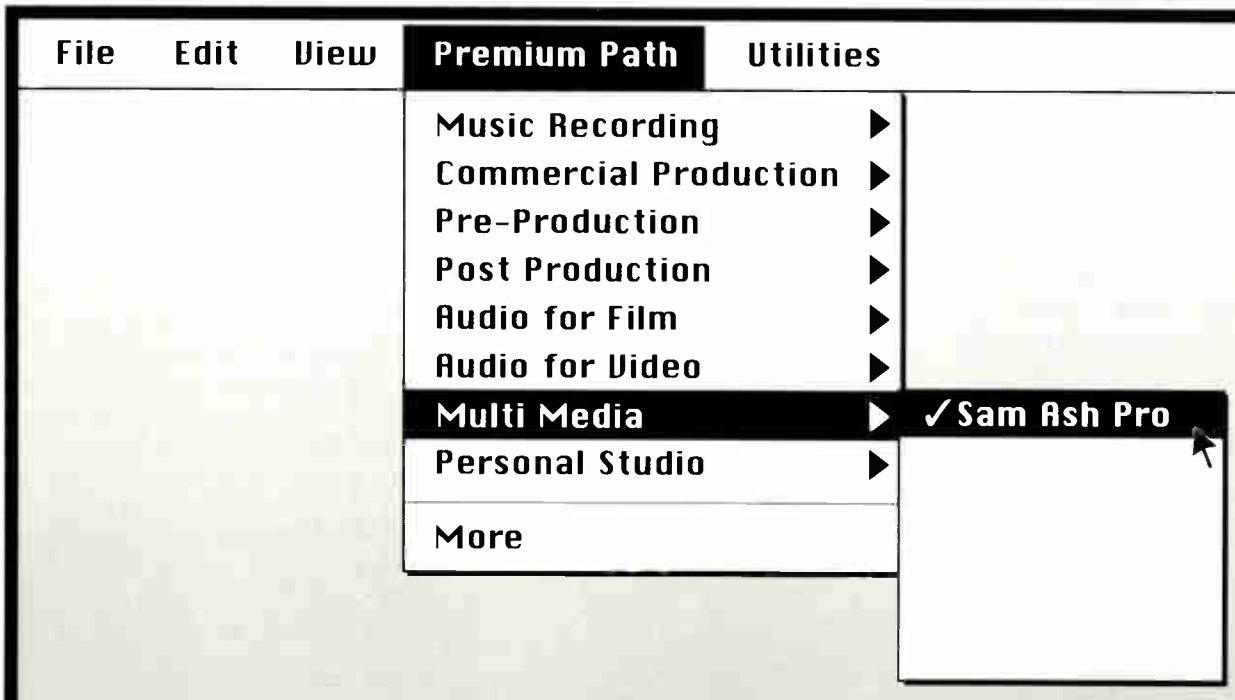

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to make it better. I'm sitting there going, "Who directed this piece of crap?" Oh, it's terrible. So you get to that level, and all you want to do is throw some music on everything and just try and make it work. The dead scenes are sitting there, and you try to pull them up.

But then you find, as you get into the swing of the score, that it takes on a life of its own. And you find yourself going back to sounds and motifs—and all of a sudden you are unifying it. It's really a fun, fascinating thing to do. And it seems to give the movies a unique quality, they seem to have a signature to them, which is my whole reason for being in the movie business—to do something of my own. Whether it's good, bad or mediocre, it's mine.

Mix: It's always a delicate balance between effects and music—maybe even more so in your movies where the music can be very subtle.

Carpenter: It's extremely subtle, and that's difficult to achieve with keyboards. I have a bit of a feel for synth keyboards, but they can be really hard to play. Of course, they've gotten more sophisticated, with touch-sensitive keys, so you can make the orchestra swell, louder or softer by the hit of your fingers. So it's become more intricate, and I can really do a lot of more subtle things now that I couldn't do in my earlier movies.

Primarily, for a [film] composer, most of your job involves doing music for scenes that further the story. They don't necessarily have to do with lyrical sequences that you associate with music. You have to set a mood for a scene. You have two people in a room talking about something very serious...played dry, that scene is deadly! Now you've got to bring something to it as a composer, to make it either ominous, or whatever emotion you are looking for. That's the hardest stuff. You have to just do it.

Mix: Where do the melodies come from?

Carpenter: The melodies come out of sitting in this room with a cup of coffee and having a TV in the corner, and off goes the movie, and now its time to go. Improvisational. So dig it out of your subconscious. All creativity comes from inside—you can look at things outside, but basically it's the feeling. Clearly, music and emotions are tied together. And it gives me a chance to put my soul into the movie in another way—making it as close as I can get to being my perfect film. It may not work for anybody else, but it's the best I've got.

I had a picture I did, *Christine*, and I had this driving scene where kids are talking, and it just wasn't working out—I had planned it silent. So I dashed out one night and threw this theme together, basically it has no end to it, just very slow and ominous, it just descends and descends. And as we were mixing it the next day, the music mixer said, "I can put this under anything and make this come alive!"

So you see, I'm Mr. Carpet! I carpet your house and make it live! But that's my job as a composer. And you shouldn't be aware of what I'm doing. Yeah, when it's scary or action-filled, you'll hear it, and it's fine. But you shouldn't be sitting there listening to music, or aware of it. It should be working on you. It should be subtle. That's my job. I don't want you to be aware of the technique, I just want you to feel it.

Mix: Do you have a favorite synthesizer?

Carpenter: Well, with Dave Davies (on *Village of the Damned*), we used two Korgs [an X3 and X5] lashed together. It's a new model that's coming out, it's unbelievable. I've got it set up in my house with a DAT and sort of a home theater sitting nearby. So I can create sketches ahead of time. And then I get someone better than me to actually sit down and put it in the keyboard, to do the multitracking and all that because my abilities on the keyboard are limited. But I try different machines for different movies. And hopefully you have someone who can help you through it. On *Village of the Damned* I just had a manual! So I go menu shopping. It's kind of silly, but what I'm looking for to start with is something that evokes mood. Usually a pad that you can pad down and then add melody to.

For *Village of the Damned*, Dave had sent me a cassette from England with this hauntingly beautiful theme that became "The March of the Children." Very structured, very simple, but it's like everything the movie is about is right in that theme. I said, "You've got to come do this!" So he went off and played it, tracked it and it's perfect. From there, he and I worked on scoring. He wasn't used to my technique, just sitting down and going. He's used to coming in and starting from a song. But once he got into it, we had great fun.

Mix: You've been working at Hollywood's Cherokee Studios lately.

Carpenter: Yes, with Bruce Robb. I love that place. It's old days of rock 'n' roll. We get to sit around during breaks and talk about the old days, before the world changed.

Mix: What's the hardest part about scoring your films?

Carpenter: The fatigue that sets in the second week or third week—frankly, that's the biggest killer. There's a famous picture, with Bernard Hermann, from an article about scoring movies. It shows Bernard asleep at the scoring session. He's obviously been up all night, and Alfred Hitchcock is standing behind him with his hands on his waist frowning. It's a staged shot—Bernard must have fallen asleep and Hitchcock said, "Lets get a shot of this." But that truly becomes your enemy—fatigue. When you're cranking out 40 to 80 minutes of music in a very compressed period of time, and you're doing it by this method, you hit a period when you are just physically tired of doing it and you have to find a way to rejuvenate yourself. You get a little dry, like a writer's block. You just have to push through it. And it happens on every movie, almost exactly at the same time. So I create diversions.

Mix: Like what?

Carpenter: I try to have a good time—Dave and I would go to strip shows! Sit around and drink beer. Oh, and I like to go to the Formosa bar in Hollywood—it's the greatest old place with good Chinese food. Just hang out at the bar and talk about life—anything but music! I love that Hollywood area, the old-time area. It's kind of seedy now, but that's attractive. That's fun. Or I'll go home and hang out with my kid and talk about what he's doing.

Mix: Reaching back into the past; you've had other composers score only three of your films. Ennio Morricone, who scored *The Thing* for you, was an interesting choice, considering your thematic similarities to Clint Eastwood movies. What was it like working with him?

Carpenter: He's wonderful; my experience was fantastic. We had a translator, he brought me up to his place in Rome, and when I got there, he'd composed four pieces for me, and I was to choose the ones I liked. You can't imagine such a dream—to have him play you four of the most exquisitely beautiful, amazing pieces and say, "Which one do you like?" It was like being in heaven! But I told him, the only thing I would comment on was that he was using a lot of notes. I'm talking through the translator here, so I'm putting it on a real basic level, but what I think is effective in these movies for creating dread and tension and anxiety in the audience is something that's repetitive and puts you on edge.

So I said, "By using notes and changing keys, by being overmelodic, what you're doing is taking us off the hook." Now I said this in a very simple way, through the translator. "Why don't you try using less notes?" And he came back, to show you what a brilliant man he is, with the most unbelievable score I have ever heard, and the whole main theme is three notes. He was very impassioned by the ferocity of *The Thing* and did some beautiful orchestral stuff for me that we used in the middle. Very mournful and melancholy. That came out of our discussion that this movie was about the Apocalypse, the end of the world, the end of everything. Because this creature is going to become every one of us. And these men are up against this idea, so we can't let the audience off the hook; we have to commit to that dark side. If we had made the audience feel that we were in a heroic situation, that movie would be a cheat. We figured out really quickly that if something like this landed on our planet, it would be like the Ebola virus—it would just go. And that would be it. There's no stopping it. And we committed to that mood in the music, which I must say is one of the reasons that movie has lasted and obtained fame. When it came out, it was routinely attacked by everyone as being horribly grim. It's a grim story, and we stuck right to it. And for that I'm happy. I'm glad we didn't make it heroic and give the audience a way out. When they hear that heroic sound they go, "Oh, okay, everything's going to be all right." But its not going to be all right, it's history!

Mix: Can you tell us a little about *Escape From L.A.?*

Carpenter: *Escape From New York* was made in 1981...now we're back doing a sequel. It's an ambitious film. It's interesting with sequels, you can't Xerox the same movie, but you can't go too far away. The sequel lives on its own but reminds you of the first film. It's after the earthquake, and L.A. is separated from the mainland. And the United States is a theocracy, so they deport anybody who is morally guilty to L.A. So it's the immigration point for people who don't fit into the right wing, Christian deal. And it deals with impending World War III.

[Snake] Pliskin [hero of *Escape From New York*] has to take a one-man submarine under the San Fernando Valley, which is under water. Parts of it are funny and fun, but basically it's a dark America, and a dark world. And the hero is the darkest of heroes—he doesn't care about anything but the next 60 seconds of his life. He doesn't care about you, he doesn't care about me. He just has a psychopathic instinct for survival. He's not a guy who believes in a higher cause. He's not a nice guy. But he's a very appealing character in some ways. I can't explain why!

•••

Snake Pliskin fans require no explanation—we'll just be happy to see him again. (Heard you were dead, Snake!) ■

JOHN CARPENTER FEATURE FILMOGRAPHY

1975	*Dark Star*
1976	*Assault on Precinct 13*
1978	*Halloween*
1978	*Someone's Watching Me*
1979	*Elvis*
1980	*The Fog*
1981	*Escape From New York*
1982	*The Thing*
1983	*Christine*
1984	*Starman*
1986	*Big Trouble in Little China*
1987	*Prince of Darkness*
1988	*They Live*
1991	*Memoirs of an Invisible Man*
1993	*Body Bags*
1995	*In the Mouth of Madness*
1995	*Village of the Damned*

Maureen Droney is Mix*'s Los Angeles editor and also a fan of Hollywood's Formosa Cafe.*

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Michael Bolton	Michael Bolton	Record Plant
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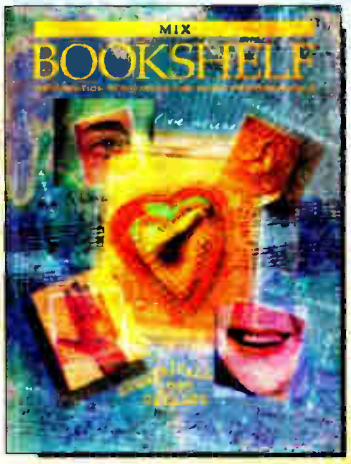

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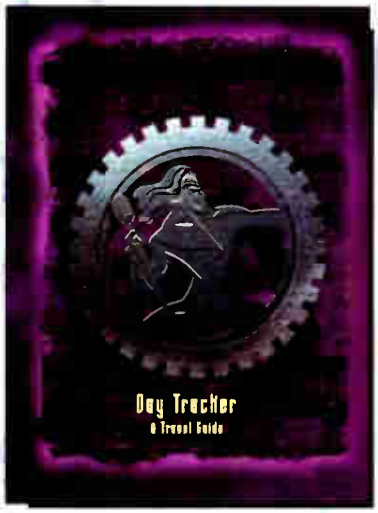

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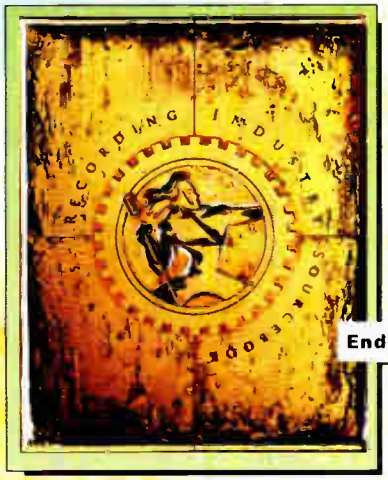

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Sourcebase for Windows **1946WA) $295.00**

AUDIO AND MUSIC EDUCATION 1995

©1995, 88 pp. (Bound)

AME) $15.00

Our comprehensive listing of programs from all over the U.S. and Canada in music recording, music technology, electronic music, music business, audio post-production, sound reinforcement, broadcast communications and music theory. Also includes articles on careers and choosing a program, plus resource listings of industry organizations, publications and software manufacturers.

ONSTAGE 1995

©1995, 96 pp. (Bound)

OS) $15.00

Onstage encompasses all segments of audio performance in a single annual directory. Listings include remote recording, sound reinforcement, lighting companies, equipment retail and rental, arenas and stadiums, booking agencies, managers, touring companies, promoters, production personnel, insurance companies, security services, corporate sponsors, festivals and more!

1996 MIX MASTER DIRECTORY

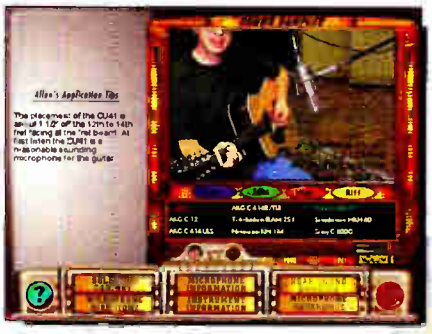
©1995, 208 pp. (Bound)

996A) $24.95

The *Master Directory*, available in December, is our national business-to-business directory for the audio industry, featuring manufacturer listings with new and current products, cross-indexed by product type. It also lists audio recording and video production facilities; sound-reinforcement and remote-recording companies; mastering, duplication and CD-replication services; independent engineers and producers; studio designers and suppliers; recording schools, seminars and programs; trade organizations; and more.

Call Toll-Free!
800.233.9604

A revolutionary new microphone



This unique, fully interactive CD-ROM lines up the top professional microphones, both classic and contemporary, for a series of audio comparison tests on dozens of instruments. A superb resource for professionals and students alike, the disc features:

From Cardinal Business Media, also publishers of Mix®, Electronic Musician® and Mix Bookshelf®

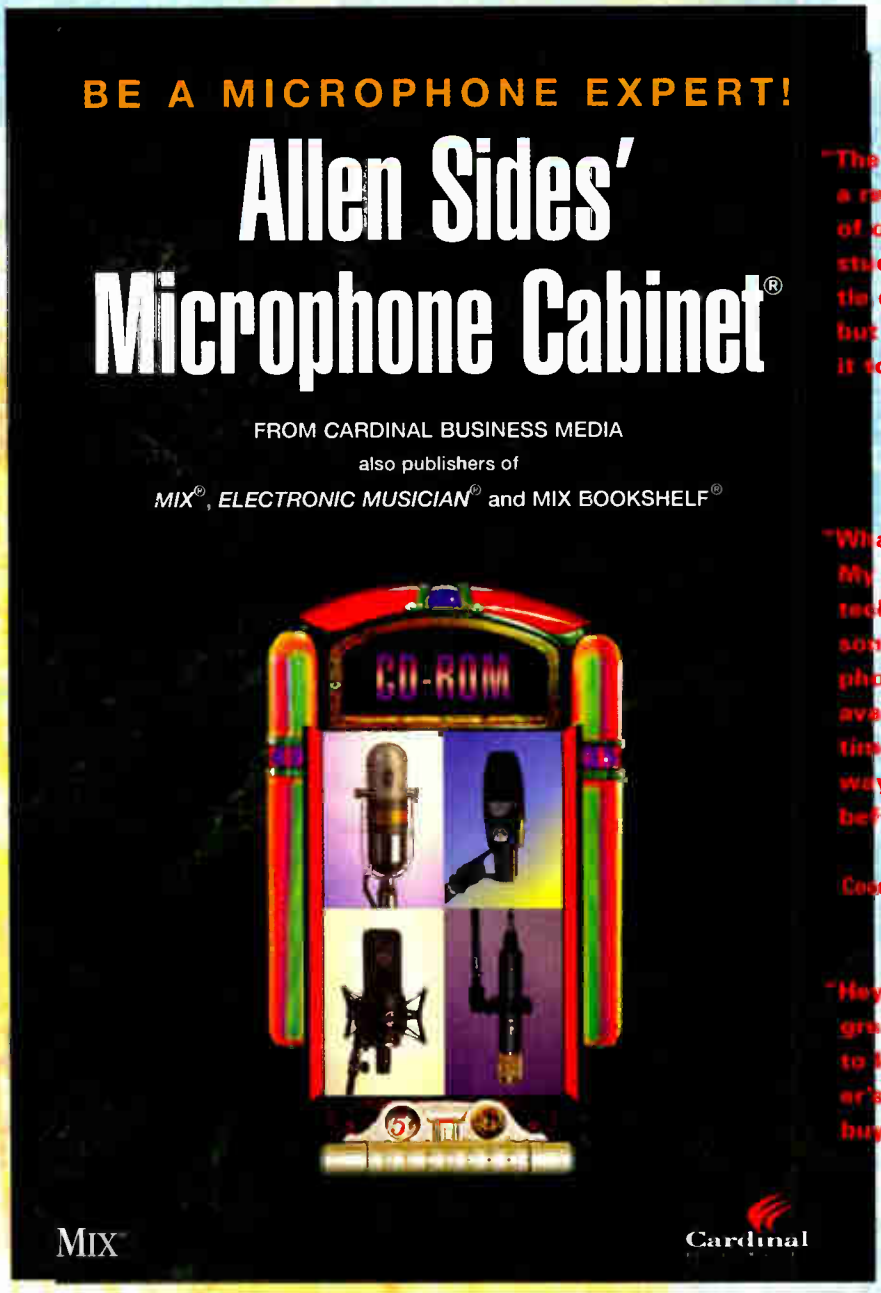
- A "Selector Cabinet" of both popular and classic mics for recording each instrument, chosen and recorded by famed studio engineer Allen Sides.
- 16-bit Red Book audio samples of the selected mics and instruments, as played by session pros like drummer Hal Blaine and guitarist Elliot Easton.
- Allen Sides' "Tips" for getting the best sound from each microphone on the selected instrument.
- A high-resolution color photograph of each microphone and the mic placement setup for each instrument.
- Complete specifications for each microphone, including frequency response diagrams and polar patterns.
- A color photograph of each musical instrument, with description and characteristics.
- A "Microphone Basics" section by noted author John Woram, including information on microphone design, characteristics and usage.
- A directory of the microphone manufacturers, with a list of currently produced models.

This amazing disc features tests of 66 mics and 33 different instruments. These include six different drums and cymbals, several types of percussion, five guitars, a Hammond B-3 organ and a wide variety of brass, woodwinds and strings. The microphones were chosen from the world-renowned collection at Sides' Ocean Way/Record One studios in Los Angeles, including models from: AKG, Audix, Audio-Technica, B&K, Beyer, Coles, Crown, Electro-Voice, Groove Tube, Milab, Neumann, RCA, Sanken, Schoeps, Sennheiser, Shure, Sony and Telefunken. Sort by microphone to check out the best instruments for each, or sort by instrument to see which mics you should use. The disc also includes a directory of microphone manufacturers and their current product lines.

Item MC) $69.95

Mix BOOKSHELF

auditioning tool on CD-ROM!



"The Microphone Cabinet is now a required reference tool for all of our classes. It really shows students the importance of subtle differences between mics, but best of all, I can secretly use it too!"

David Gibson
Founder and Chief Administrator
California Recording Institute

"What a great educational tool! My students can now learn the technical specifications and the sonic characteristics of microphones which normally aren't available to them. With studio time in such demand, it's a great way to get to know the mics before going into the studio."

Wesley Bulla
Coordinator of Recording Studio Curriculum
Belmont University

"Hey, I got the CD-ROM and it's great! Finally, you get a chance to look in a top engineer/producer's toolbox without having to buy all of the tools."

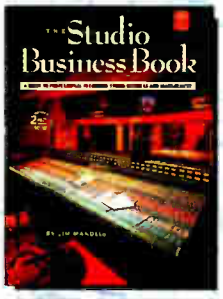
David Miles Huber
Author and musician

Allen Sides has recorded and mixed sessions for dozens of world-class artists such as Ry Cooder, Count Basie, Ray Charles, Sinead O'Connor and Brian Setzer. His Ocean Way Studios is a three-time winner of *Mix* magazine's coveted TEC Award for Outstanding Recording Studio.

David Schwartz, producer of this CD-ROM project, is the founder and senior consulting editor of *Mix*, the world's leading magazine for sound and music recording and production.

Call Toll-Free!
800.233.9604

Bookshelf BESTSELLERS



THE STUDIO BUSINESS BOOK, Revised Edition

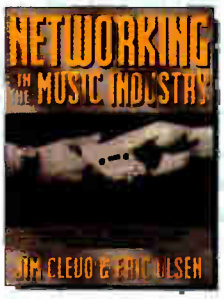
Jim Mandell
©1994, 288 pp. (P)
1319A) $34.95

The updated MixBooks edition of this informative, wide-ranging guide offers in-depth, detailed, specific information on all aspects of putting together and managing a recording studio, including: writing a business plan; getting funding; buying equipment; determining expenses and rates; bidding on projects; developing new income and contacts; advertising and PR; scheduling; managing, hiring and firing personnel; and more. It also includes a reference guide to studio terms and technology, a list of industry organizations and a recommended reading list.

RELEASING AN INDEPENDENT RECORD, 5th Ed.

Gary Hustwit
©1995, 182 pp. (P)
3025A) $24.95

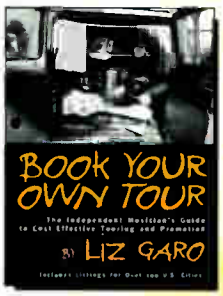
Updated edition shows, step by step, how to run your own record label and market your music on a national level. Learn how to get reviewed by the press, work with distributors, sell direct to retailers and tour behind your album. Features all-new sections on publishing and performing rights, sample contracts and a music publisher directory, plus expanded, updated directory information, including over 3,000 contacts in retail, distribution, print media and booking.



NETWORKING IN THE MUSIC INDUSTRY

Clevo & Olsen
©1993, 225 pp. (P)
3052A) $19.95

Find ways to meet other music professionals who can help your career with this streetwise book. Learn how to use music conferences, video, computer bulletin boards, music associations and the press to make valuable new contacts. Includes candid discussions of label/artist relationships, music publishing and the indie scene.



BOOK YOUR OWN TOUR

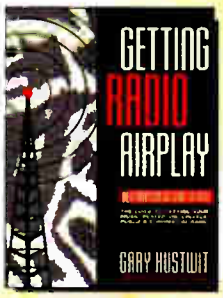
Liz Garo
©1995, 175 pp. (P)
3049A) $19.95

City-by-city directories of clubs, promoters, record stores, radio stations, print media and other fun stuff, like where to sleep and eat for cheap. Includes sections on putting together promo packages for clubs, dealing with club owners and promoters, getting paid and using local media, as well as sample contracts, tons of interviews with folks who've been through it all. There is even a van buyer's guide and directions for building a loft! This is by far the most complete title of its kind.

101 WAYS TO MAKE MONEY RIGHT NOW IN THE MUSIC BUSINESS

Bob Baker
©1992, 140 pp. (P)
3045A) $14.95

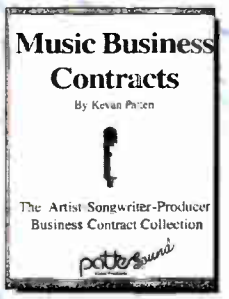
If your career plan only covers gigging and recording, you could be ignoring dozens of money-making opportunities. Use this book to discover specialized niches you may have overlooked, generate extra revenue and jump-start your career. Don't spend a lifetime paying dues—explore these untapped markets and cash in now!



GETTING RADIO AIRPLAY, 2nd Ed.

Gary Hustwit
©1993, 125 pp. (P)
3027A) $19.95

Learn how to get your record played on radio and make waves for your band by being smart about sending out review albums and professionally following up with phone calls. Features interviews with radio station music directors, record label promotions staff and independent artists who've done it. Includes new, updated college and commercial radio directories.



MUSIC BUSINESS CONTRACTS

Kevan Patten
©1993, 44 pp. (Bound) plus disk.
Macintosh: **3031-MA) $49.95**
IBM (3.5" disk): **3031-P3A) $49.95**

Cut down on your legal fees with this collection of essential music contracts on computer disk! You get a wide variety of contracts for recording and publishing deals, plus forms for songwriters, vocalists, performers, joint ventures/partnerships and producers—43 contracts in all. The documents are in Microsoft Word format for Macintosh or PC.

MIX REFERENCE DISC

From Mix *magazine*
©1994, one compact disc
MRD) $14.95

This versatile professional tool has a variety of applications, including tape-deck alignment, audio-equipment calibration, testing sound-system performance, troubleshooting and diagnostics. It features alignment tones, 1/3-octave bands, frequency sweeps, a digital black-noise check and frequency response tests, at a fraction of the cost of competing test-tone CDs.

Bookshelf BESTSELLERS

MODULAR DIGITAL MULTITRACKS: The Power User's Guide
George Petersen
©1994, 128 pp. (P)
003A) $29.95

The only book on the revolutionary new modular digital recorders! Petersen provides unbiased evaluations of the units and various peripherals; inside tips on connecting and operating them; advanced techniques for synchronization, editing and mixing; features that aren't mentioned in the manufacturers' literature; and secret commands and undocumented error messages. And the book pays for itself, with instructions for making your own cables and snakes!

MAKING MUSIC WITH YOUR COMPUTER
David (Rudy) Trubitt, ed.
©1993, 128 pp. (P)
013A) $17.95

A valuable introduction to the basics of computer music—whether you're a computer user entering the world of music and sound or a musician searching for the right computer, this book will help you get the most out of today's electronic music technology. You'll learn how computers contribute to the creative process and get tips on selecting programs and gear, plus info on MIDI sequencing, music notation, hard-disk recording and desktop multimedia, a directory of manufacturers and an extensive glossary.

MAKING THE ULTIMATE DEMO
Michael Molenda, ed.
©1993, 128 pp. (P)
017A) $17.95

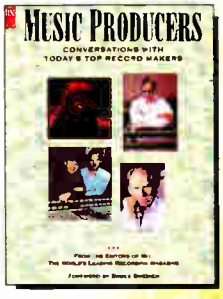
This book will teach you how to record and market a demo tape—a critical step toward gaining exposure for your music. You'll learn how to record killer vocal and instrumental tracks, use signal processing like the pros and make intelligent mixdown decisions. And once your ultimate demo is "in the can," you'll know how to release and promote your recording on a budget and approach record labels without wasting your time. Packed with tips from industry veterans, this book will improve both the sound of your recordings and your prospects for success.

CONCERT SOUND: Tours, Techniques & Technology
David (Rudy) Trubitt, ed.
©1993, 180 pp. (P)
004A) $24.95

Go behind the boards with today's top touring acts and learn the basic principles of live sound from the pros. *Concert Sound* combines exclusive coverage of 24 major tours, including U2, the Rolling Stones, Garth Brooks and k.d. lang, with practical chapters on live sound techniques and business, safety issues and new technologies. Special sections on monitor mixing, drum miking, noise regulations and computer control make this a unique introduction to professional sound reinforcement.

SOUND FOR PICTURE: An Inside Look at Audio Production in Film and Television
The Editors of Mix
©1993, 140 pp. (P)
011A) $17.95

Packed with film-scoring secrets! Take a look behind the scenes as top Hollywood sound professionals reveal how dialog, sound effects and musical scores are recorded, edited and assembled into seamless soundtracks. Exclusive case studies spotlight blockbusters like *Terminator 2, Malcolm X, The Simpsons, The Doors, Twin Peaks* and many others, focusing on both the equipment used and the philosophical side of sound design.

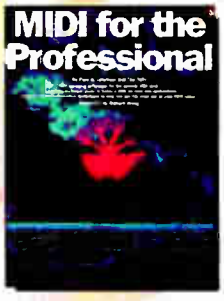


MUSIC PRODUCERS: Conversations With Today's Top Record Makers
The Editors of Mix
©1992, 128 pp. (P)
006A) $17.95

Twenty-four producers, including Don Dixon (R.E.M.), Bruce Fairbairn (Aerosmith), Daniel Lanois (U2), Bill Laswell (P.I.L.), Jeff Lynne (Tom Petty), George Martin (Beatles), Hugh Padgham (Sting), Phil Ramone (Billy Joel), Rick Rubin (Red Hot Chili Peppers), Don Was (Bonnie Raitt) and 13 others, discuss how they got started, how they mediate between labels and artists, what equipment they prefer, analog/digital format decisions, how they "build" a mix and much more.

MODERN RECORDING TECHNIQUES, 4th Ed.
Huber & Runstein
©1995, 425 pp. (P)
1031B) $29.99

The fourth edition of our best-selling recording text has been rewritten from the ground up, with tons of new material on project studios, acoustics, micrphone applications, digital audio and sampling, MIDI, synchronization, automated consoles, digital processors, CD-RDMs, session procedures, business opportunities and the future of the industry. A comprehensive, readable, up-to-date guide to all facets of recording.



MIDI FOR THE PROFESSIONAL
Lehrman & Tully
©1993, 239 pp. (P)
3480A) $19.95

This advanced reference for serious MIDI users combines in-depth technical information with expert creative advice and practical production tips. It examines every category of MIDI device and software, helps you resolve problems, suggests new ways to use your gear and guides your purchase decisions when it's time to expand. Features full, detailed chapters on sequencing techniques, sound editing, synchronization, automation and post-production, multimedia, MIDI programming, applications for music education and the limitations of MIDI.

Call Toll-Free!
800.233.9604

Bookshelf BESTSELLERS

MACWORLD MUSIC & SOUND BIBLE

Christopher Yavelow

In-depth analysis of over 800 Mac hardware and software options for MIDI sequencing, notation, digital audio, sampling and multimedia, plus System 7 coverage. ©1992, 1,398 pp. (P) **3522B) $37.95**

THE MUSICIAN'S BUSINESS AND LEGAL GUIDE

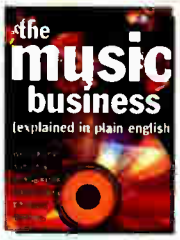
Mark Halloran, Ed.

The most complete, up-to-date, accessible book yet on music business and law, with real-life examples and clear terms that any musician can understand. ©1991, 454 pp. (P) **3013B) $29.95**

BUILDING A RECORDING STUDIO, 4th Ed.

Jeff Cooper

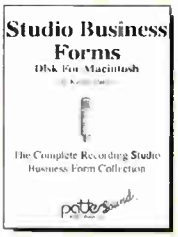
This classic advanced book on studio planning and construction covers acoustics, soundproofing and studio and control room design. ©1984, 209 pp. (Spiral) **1300C) $29.95**



THE MUSIC BUSINESS (EXPLAINED IN PLAIN ENGLISH)

Naggar, Esq. & Brandstetter, Esq.

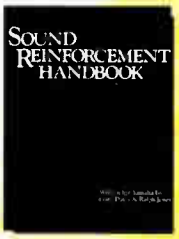
Helps you navigate the pitfalls every professional musician is likely to encounter and provides career-building and money-saving advice from two savvy entertainment law attorneys. ©1995, 124 pp. (P) **3080A) $12.95**



STUDIO BUSINESS FORMS

Kevan Patten

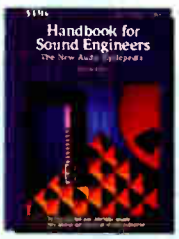
Features 46 vital documents, including work order, contract, invoice, equipment inventory, take sheets, track sheets, cue sheets, and more, plus tape-label and J-card templates. ©1993.
Paper **1056A) $39.95**
Mac 3.5" **1057A) $39.95**



SOUND REINFORCEMENT HANDBOOK, 2nd Ed.

Davis & Jones

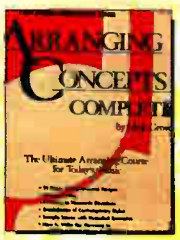
This definitive reference work on sound reinforcement examines every aspect from current and cables to speaker placement and room equalization. ©1989, 417 pp. (P) **1405B) $34.95**



HANDBOOK FOR SOUND ENGINEERS: The New Audio Cyclopedia, 2nd Ed.

Glen Ballou, ed.

The definitive pro audio technical reference, with updated coverage of sound-system design and installation, loudspeaker and enclosure design and typical audio circuitry. ©1991, 1,506 pp. (H) **1595B) $99.95**



ARRANGING CONCEPTS COMPLETE

Dick Grove

Landmark reference book and learning approach to arranging today's music, including discussions of how to handle melody, harmonic density and coordinating information to specific musical styles. ©1985 434 pp. (Spiral) plus audio cassette **3180B) $54.95**

GOLDEN EARS AUDIO TRAINING PROGRAM

KIQ Productions

This workbook/CD ear-training course will help you listen to your recordings more critically and make engineering and production more fruitful with exercises in signal processing and octave boost/cut recognition. ©1993, 57 pp. (Spiral) with four compact discs **1020C) $120.00**

HOW TO ORDER

- **Credit card orders:** call toll-free (800) 233-9604 from the U.S. and Canada, or fax (510) 653-5142; international orders call (510) 653-3307.

- **Ordering by check or money order:** For regular domestic orders, please include a shipping payment of $5.00 for the first item and $1.50 for each additional item. For express orders, please call toll-free (800) 233-9604 from the U.S. and Canada to receive shipping and handling cost information. For international orders, please call (510) 653-3307.

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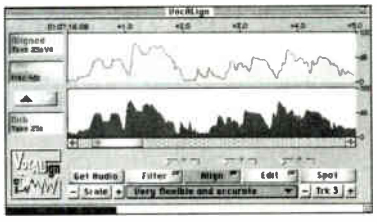
New gear from Electronic Musician and Mix!

Show your allegiance to your favorite magazine with one of our classy, 100% cotton T-shirts! Choose from the *Electronic Musician* design, with playful figures on a teal background, or the classic *Mix* logo on a black shirt. Or get one of our high-quality hats, featuring embroidered logos (emerald blue for *EM*, gold for *Mix*), terry sweatbands, braided visors and adjustable leather straps.
Extra-Large EM T-Shirt **090XL) $12.95**
Extra-Large Mix T-Shirt **090XL) $12.95**
Electronic Musician Hat **015B) $12.95**
Mix Hat **010B) $12.95**

New Audio Products For Film/Video Production



VOCALIGN FOR PRO TOOLS

Synchro Arts Limited (Epsom, Surrey, UK) debuts the VocALign plug-in for Pro Tools. VocALign analyzes replacement dialog and automatically matches its timing with the original signal, improving lip-synching of post dialog. The user simply captures the replacement audio in Pro Tools, and VocALign compares the energy content of the two signals, generates a best-fit alignment, automatically edits the replacement dialog, and spots it back to a selected track at the correct timecode address. Editors can adjust the start and finish points and adjust time alignment parameters.

Circle 190 on Reader Service Card

RADIUS ADDS CD-QUALITY AUDIO

Radius Inc. (Sunnyvale, CA) has added stereo 16-bit, 44.1kHz audio capture capability in its Version 2.5.1 of VideoVision Studio for the Power Macintosh or Radius 81/110. VideoVision Studio 2.5.1 uses the onboard audio circuitry of the Macintosh to integrate CD-quality audio with captured video, improving sound quality without additional investment in audio equipment.

Circle 191 on Reader Service Card

ION/NEVE FLYING FADERS INTEGRATION

Soundmaster Group (Toronto, Ontario) announces the integration of Neve Flying Faders console automation system into the ION Studio Operating Environment. With ION/Neve Flying Faders, users can access all motion control and edit decision list capabilities within Soundmaster SEVEN and other ION synchronization applications. The automation system gains new capabilities, such as communication with MIDI-based equipment, and software macros enable one Flying Faders key to issue command strings comprising thousands of key strokes.

Circle 192 on Reader Service Card

VMOD-100 MO DRIVE

The VMOD-100 from Future Equipment Design GmbH (distributed in North America by Rorke Data of Eden Prairie, MN), is the world's first magneto-optical drive-based digital video recorder. The VMOD-100 replaces analog VTRs and provides post-production audio mixers with all the advantages of nonlinear video playback. Two channels of 8- or 16-bit digital audio are available; the system incorporates M-JPEG video compression and provides an upgrade path for future developments in video compression.

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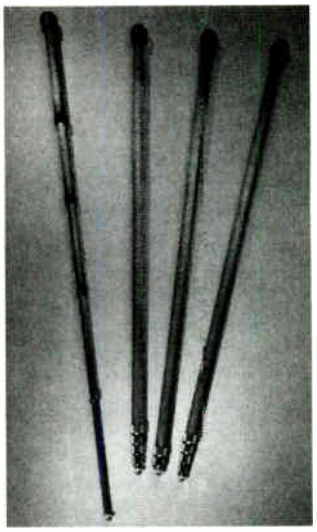

CONNECTRONICS CARBON FISHPOLES

Connectronics Corporation (Stratford, CT) has four new lightweight carbon-fiber microphone fishpoles. The shortest pole in the range weighs 10 ounces, and is 16.75 inches minimum, 62 inches extended. The longest pole extends from 47 inches to more than 17 feet, weighing 1.5 lbs. All poles are cushioned at the base and fitted with field-replaceable ⅝-inch thread microphone clip stud with a locking ring.

Circle 194 on Reader Service Card


Philips CDD2000 recorder

A BUYER'S GUIDE TO CD RECORDERS

Falling prices and advanced generations of CD-R systems have made the notion of desktop CD recording a reality. Many systems—complete with drive and software—now retail for less than $2,000, and a blank disc is cheaper than the average title in the used-CD bin at the local record store. New streamlined software with "drag and drop" features makes premastering a snap.

The advantages of creating CDs in-house are many; in addition to being a low-cost alternative to replication plants for small runs, desktop CD recording offers quick turnaround and an alternative to linear, magnetic media. Plus, CD-Rs are reliable means of data storage, cost pennies per megabyte, are easily transported and encounter few compatibility problems.

If you are considering purchasing a CD recorder for your studio or broadcast facility, check out the following selection of units on the market today. Please note that this is a partial list, and prices, all quoted at press time, have been rather volatile lately, and may be subject to change.

DYNATEK

DynaTek's (Nova Scotia, Canada) CDM 4000 is its top-of-the-line CD-mastering system. Components of the CDM 4000 system include a 4x reader/recorder, a 1.1GB SCSI-2 multimedia hard drive and a specially designed controller. DynaTek's CDM 4000 supports all major CD formats, including CD-DA (Digital Audio), Photo-CD, Video-CD, and all industry-standard ISO 9660 formats. The package includes all cables, a blank disc and DynaTek DiscMaster software. Retail is $9,495.


Kodak PCD Writer 600

BY SARAH JONES

Studer D741 stand-alone/SCSI CD recorder

The DynaTek CDM 200 is a 2x CD-recording system. Designed for self-publishing CDs or sound libraries, the CDM 200 comes complete with all necessary cables, a blank disc and DynaTek's drag-and-drop software for Macintosh or Windows systems. DynaTek's CDM 200 supports all major CD formats, including CD-DA, Photo-CD, Video-CD and all industry-standard ISO 9660 formats. Retail is $2,300.

HEWLETT-PACKARD

The Hewlett-Packard (Loveland, Colo.) SureStore CD-Writer 4020i is a PC-compatible system that includes a drive, software and accessories to support various forms of CD recording. The drive is a 4x reader and 2x recorder and installs in a half-height 5.25-inch bay. All Book standards are available for recording. Disk-at-once, track-at-once and multisession modes are supported, as is the ISO 9660 format. A 1MB RAM buffer is built in. The SureStore comes with a bundled software suite, featuring Easy-CD—an extension of the Windows file manager—for simple file transfer to CD, and Easy-CD Audio, which lets users prepare custom audio CDs. Also included are two HP SureStore CD-Rs, a SCSI-2 Bus mastering interface card and cabling. The entire system lists for $1,249.

JVC

JVC Information Products (Irvine, Calif.) offers two CD recorders, the Personal RomMaker and the Personal Archiver. Both are available in either 2x or 4x speeds and are available for PC or Macintosh. The Archiver is a desktop system designed to back up data as well as create audio and multimedia CDs, and it allows recording in a variety of formats, including Red Book, mixed-mode and Enhanced CD (CD Plus). The Archiver also supports multisession, single-session and in-

Plasmon Data Systems RF4102 recorder

This Holiday Season:

COOL NEW STUFF
EXTENDED HOURS
ON-TIME DELIVERY

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cremental modes, and ISO 9660 and HFS formats. A unique feature is its audio track copy utility, which allows the capture of CD-quality audio without additional conversion software or a sound card. Three system configurations are available: an internal 5.25-inch drive ($1,195), an external half-height model ($1,295) and a mini-tower with a 1GB SCSI hard disk ($1,895).

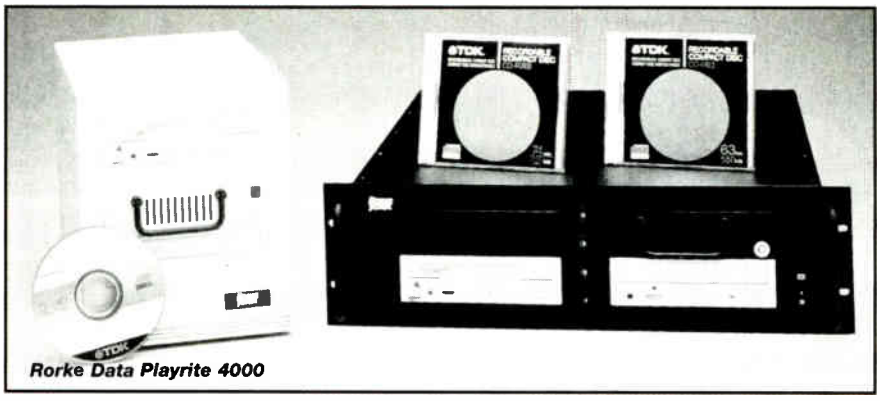
The Personal RomMaker is a system designed for professional multimedia disc development and publishing. It allows users to record in all of the formats available in the Archiver, yet the RomMaker also supports CD-I and CD-ROM/XA formats. Disc-management software features enable users to control disc geography and evaluate and optimize the disc prior to recording. The RomMaker is available in three different system configurations: an internal drive for $2,095, an external drive for $2,195 and a mini-tower for $2,795.

KODAK

Eastman Kodak (Rochester, N.Y.) offers the PCD Writer 225, a desktop-oriented CD recorder, and the PCD Writer 600, designed for industrial applications. The PCD Writer 225 is a SCSI-interface, 2x writer/reader, compatible with both Macintosh and PC. It is single- and multisession capable, with track-at-once and disc-at-once compatibility. PQ subcode programming is possible; all Book formats are available. A 2MB RAM buffer is expandable to either 8 MB or 32 MB, and the Direct Read During Write feature ensures continuous data integrity throughout recording.

The PCD Writer 600 ($19,995) is designed for continuous, high-volume CD production. Touted as "the world's fastest recorder," it operates at 6x speed and can write a 74-minute audio CD in less than 12 minutes. The SCSI recorder has 2 MB of RAM, expandable to 8 MB; firmware upgrades are available either on CD or by modem. A barcode reader feature is designed for use with Kodak's media with the InfoGuard identification. Discs are available in 63-minute (580MB) and 74-minute (680MB) capacities.

Both the PCD Writer 225 and the PCD Writer 600 are compatible with the Kodak disc transporter ($5,995), a device that automatically inserts and removes writable media from



Rorke Data Playrite 4000

the recorder. The transporter includes bulk loading and unloading via input and output spindles that hold up to 75 discs each; the unit can be configured to insert discs into an in-line thermal wax transfer or an ink-jet CD labeler.

PHILIPS

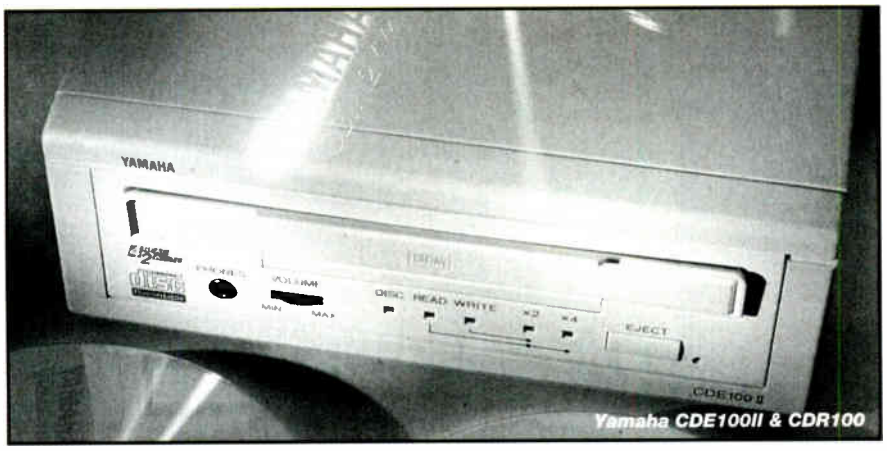
The CDD2000 is the third-generation CD recorder from Philips (San Jose, CA). The unit is an internal, half-height model, available through OEM contracts, as well as through distributors and resellers; it is compatible with all computer platforms via a SCSI-2 interface. Basic software is included, although the CDD2000 is backwards-compatible with earlier-generation application software. All CD book formats are supported; multisession, single-session and track-at-once modes are available. Users can choose between 1x, 2x

Stand-Alone CD Recorders

Not everybody wants a computer-based CD recorder. Whether you're recording sound effects, commercial spots or a quick reference disc for the client to take home at the end of a session, there are dozens of applications where the speed and ease of use of a stand-alone CD recorder is ideal. Hardly more complicated than a stereo cassette deck, these units combine both analog and digital audio inputs for real-time CD-recording, as well as SCSI interfaces for connecting the drive directly to a computer.

Superscope Technologies (Aurora, Ill.) recently introduced the **Marantz Professional** CDR620 CD recording system. The CDR620 can be used as a stand-alone unit or integrated, through its SCSI-2 interface, into a digital audio workstation. AES/EBU and IEC-958-II input/outputs are included, in addition to analog I/Os. The unit has 1-bit A/D and D/A converters, a sample rate converter, digital audio delay, and automatic tracking incrementing and indexing from CD, DAT, DCC and MD. All Book formats are supported. User-programmable settings include digital fade-in and fade-out, with adjustable time, auto track increment level, audio delay, calibrated input sensitivity and mute time. Additional features are ISRC code recording, catalog number recording, copy prohibit on/off and emphasis on/off. A 34-key wired remote provides full control and status of all CD620 operations. The complete system sells for $5,000; shipment is expected to begin this month.

The D741 ($6,950) is a stand-alone/SCSI CD recorder from **Studer** (U.S. offices in New York City). The machine is a 2U rack unit, with AES/EBU, S/PDIF and analog I/Os, in addition to a SCSI-2 interface. CDs can be written in disc-at-once or multisession mode, and can be conformed to meet various Book formats. Users can choose between 1x and 2x speeds when using the SCSI interface. Monitoring can be done through headphones or from the built-in speaker. The D741 also features individual level control for analog inputs. A switchable sampling frequency converter allows digital recording of sources from 32 to 48k Hz. ■



Yamaha CDE100II & CDR100

and 4x read speeds; and 1x and 2x write-speeds. Retail is $1,395.

PINNACLE

Pinnacle Micro's (Irvine, Calif.) RCD 5020 is available in both Macintosh and PC versions. The unit is a 2x recorder with a 1MB buffer, supports all Book modes, and allows Disk-at-once recording. The PC version is bundled with Corel CD Creator, which offers Windows 95, 32-bit mode compatibility, The package includes Kodak Photo-CD record/read software and an audio editing utility. An internal drive lists for $995, the external version is $1,295. An external Macintosh-compatible system, for $1,295, is bundled with software, which includes audio editing.

OMI

Optical Media International (Los Gatos, Calif.) offers Mac and PC versions of its QuickTOPIX CD Recording System, featuring the OMR120 2x CD recorder. The system supports multisession recording, Red Book audio, data, mixed mode (data + audio), asynchronous I/O and CD simulation in software. The external, half-height case provides SCSI interfacing. A 1MB buffer is standard. Retail is $1,995, with software.

PLASMON

Plasmon Data Systems (Milipitas, Calif.) recently introduced the RF4102 recorder. The system, priced at $1,795, has a standard SCSI interface and is compatible with both Macintosh and PC platforms. Users can choose between 1x and 2x operation, single- or multisession mode, and all standard CD formats, including compliance with ISO 9660 specifications; software is not included. The RF4102 ships with 2 MB of internal memory, which can be expanded to 32 MB.

PROCOM

Procom Technology (Irvine, Calif.) has two CD recorders. The PCDR-2X is an external SCSI unit that can record in either 1x or 2x mode. Premastering software is available for PC or Macintosh; either system supports multisession, multivolume and various Red Book formats, and ISO 9660. The unit has a 1.2MB buffer. A complete system sells for $2,395.

The PCDR-4X records at 1x, 2x and 4x speeds, includes a 512K buffer and has all of the software benefits of the PCDR-2X; in addition, the PCDR-4X is able to create mixed-mode discs. Procom's ISA SCSI Xelerator is included to enhance data transfer rates. Available for $3,865. Both the PCDR-2X and PCDR-4X include SCSI cables and blank media.

RICOH

The RS-1060C CD recorder from Ricoh (San Jose, Calif.) is a 2x CD recorder/player in a compact half-height external unit that supports all recording formats. The RS-1060C includes either Macintosh or PC versions of its proprietary CD Printer CD-Audio/CD-ROM software, and the drive is supported by other programs, including Digidesign's MasterListCD. List price is $1,295.

Green Book: The CD-I standard, designed by Philips, is also known as Green Book. The specifications are designed to synchronize separate audio and data tracks on the same disc.

Orange Book: The Orange Book defines formats for CD-R, magneto-optical discs and other writable CDs; specifications include multisession standards. Many Book formats incorporate Orange Book specifications.

Red Book: The original Book standard, the Red Book defines audio CD format specifications. Audio files are placed in one or more tracks on the CD; up to 99 tracks are allowed. The Red Book specifies an error-detection code and error-correction code, to compensate for gaps in audio information due to physical imperfections in the disc.

Yellow Book: Designed for CD-ROM, the Yellow Book consists of two modes. Mode 1 has rigorous error correction standards to ensure data intregrity necessary for computer information; Mode 2, most commonly associated with CD-ROM/XA (eXtended Architecture), is designed to integrate computer data with compressed audio (and often compressed video).

White Book: Originally known as Karaoke CD, the White Book standard uses MPEG specifications to compress audio and video files. The White Book addresses audio and video in the CD-ROM/XA format.

Disk-at-once: The entire disc is written in one burn; the laser never turns off. Ideal for audio, disk-at-once mode allows gaps between tracks of any length (except the first track, which must have a 2-to 3-second gap).

ISO 9660: The ISO 9660 format is a globally accepted standard logical file format that can be read by both Macintoshes and PCs. However, Macs need to meet certain system requirements in order to access ISO 9660 discs.

HFS: The Macintosh-specific logical file format. HFS (Hierarchical File System) discs cannot be read on PCs.

Mixed-mode: A mixed-mode disc includes more than one type of track format, usually Red Book audio and Yellow Book Mode 1 information.

Multisession: Allows sessions to be written to blank sections of a disc. In multisession mode, the disc is finalized after the last session.

Single-session: In single-session mode, the entire disc is written as one session.

Track-at-once: Track-at-once mode is used to burn one or more tracks at a time; a "link" is written between the tracks. This method is often used to create multisession CDs. A disadvantage of track-at-once recording is that gaps between tracks must be two seconds in length. ■

RORKE

Rorke Data (Eden Prairie, Minn.) is primarily a wholesaler/VAR-integrator that markets OEM-approved data storage devices. In addition, Rorke provides custom data-storage subsystems, combined with audio/video OEM products. It offers either the Yamaha CDE-100 or the Playrite 4000 4x CD recorders, in a variety of rack-mounted enclosures. Options include a 1GB removable hard drive that can be "shuttled" between workstations; a "split-bus" option allows two workstations to connect to the rack, allowing switching of a hard drive between receiver bays, therefore saving time by backing up data in the background. A rack-mount configuration, including a Yamaha 4x recorder, retails for $3,400. Other options are available.

SONY

The Spressa Series CD recorders are the latest offerings in Sony's (San Jose, Calif.) CD-ROM products. The Spressa 920 ($1,995) drive is a half-height internal drive for Windows systems. The Spressa 9211 ($2,299) is an external CD-R drive for Windows and Macintosh environments. Both Spressa models can operate at either 1x or 2x read/write speeds and are capable of multisession, disk-at-once and track-at-once modes. Write formats include Red Book, Yellow Book, Green Book, CD-I Ready and CD-Bridge. The Spressa Series come with blank discs and are bundled with Corel CD Creator software for CD-Audio or CD-ROM applications.

YAMAHA

The CD Expert Series from Yamaha includes the CDE100II, an external drive, and the CDR100, an internal drive. The units are SCSI-2 interfaced, are capable of reading and recording at 1x, 2x and 4x speeds, and will handle all standard formats, including Red, Orange, Yellow and Green Book specifications. In addition, both models are capable of writing in disc-at-once, track-at-once or multisession modes. The CDE100II currently lists for $2,995 (a 2x-record/4x-read version, the CDE102, sells for $1,450), and the CDR100 is $2,695 (a 2x-record/4x-read version, the CDR102, sells for $1,250). The drives are distributed in the U.S. by Revelation Products of Valley Forge, Penn. ■

Sarah Jones is Mix's editorial assistant.

NEW DEVELOPMENTS IN ANALOG Compressor/Limiters

BY CHRIS MICHIE AND GEORGE PETERSEN

Dynamics processing devices have been with us since the 1940s. Today, compressor/limiters are an essential part of broadcasting, music production and live sound—used not only for overload protection, but also for fattening vocals, increasing sustain, tightening drum tracks and, of course, creating thick, huge-sounding program material. But it would not have been controversial to predict that, by the mid-1990s, analog dynamics processors would have gone the way of the stagecoach, typewriter, Beta VCR and the PCM-F1. Yet such a prediction would have been woefully inaccurate. Analog gear is alive and well—in fact at last month's AES convention in New York, analog and tube gear seemed to be everywhere on the show floor. To be sure, DSP-based hardware and software systems are increasingly popular, but there seems to be room for both analog and digital technology in today's compressors and limiters.

What follows are short descriptions of compressor/limiters that have appeared over the past six months or so. We've divided the market into tube and conventional (solid-state) models and, rather than list the companies alphabetically, have ordered the devices by price per channel.

VACUUM TUBE COMPRESSOR/LIMITERS

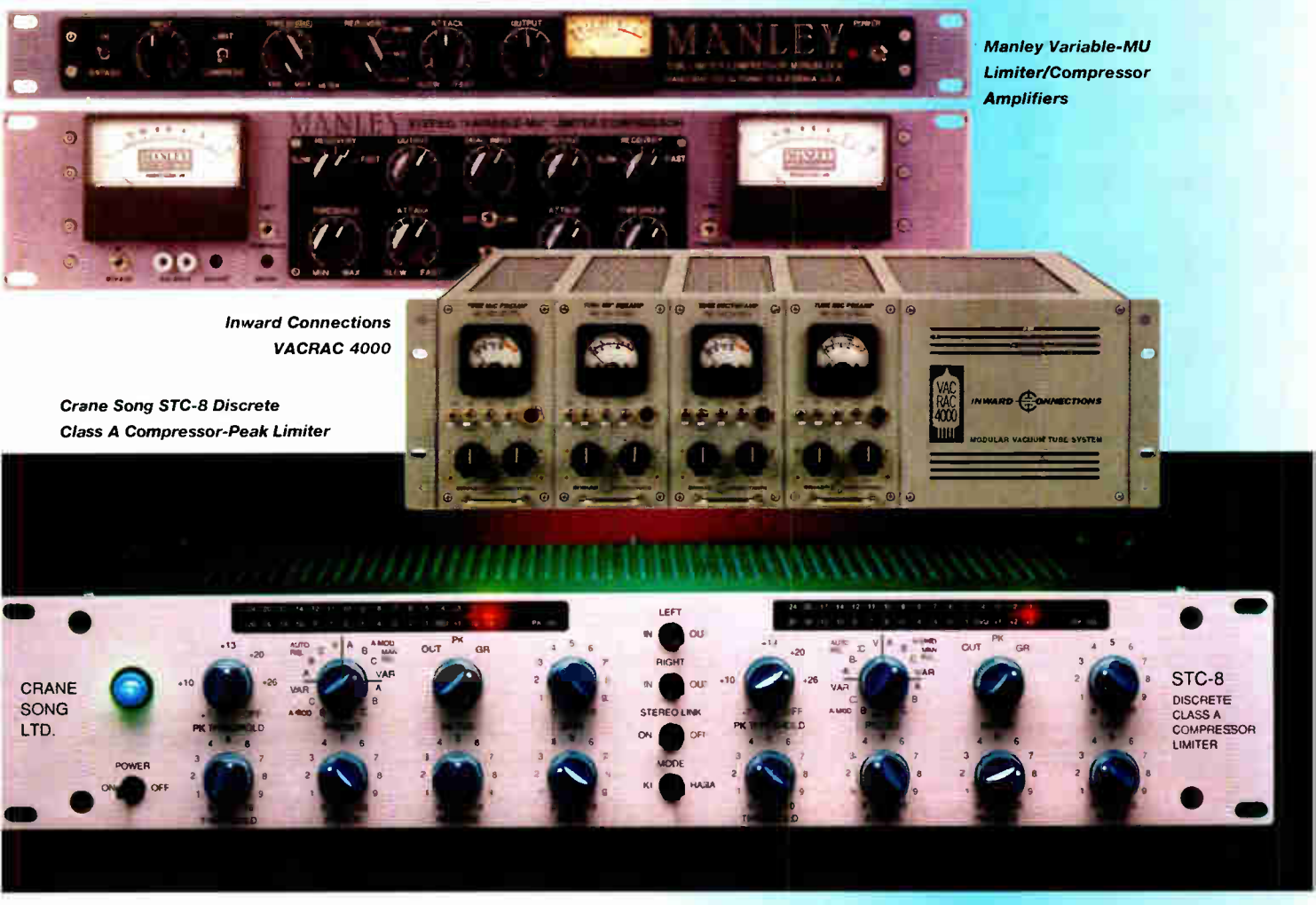
Whether in modern or vintage form, tube signal processors may just be the next hot investment choice of the '90s. As their designers are quick to note, the soft, warm sound of vacuum tube-based circuits are perfect for adding needed even harmonics to a cold digital track. Listed by decreasing price per channel, here are some recent tube compressor/limiters. Loan officers are standing by.

dbx 1650T MIC PREAMP AND LIMITER

Unveiled at AES, the Model 1650T high-end mic preamp and limiter from dbx Professional Products (Sandy, UT) offers a 154dB dynamic range with a fully balanced, Class A design from input to output, using no global feedback. Audio travels only through four 6992 tubes (originally designed for Russian radar) and a MOSFET output. Output is balanced and floating. Maximum output level: +34 dBV into 150 ohms. Internal operating headroom: +40 dBV, with limiting done at the +4dB level. Gain (input to output): 117 dB. $2,995.

SUMMIT AUDIO MPC-100

Summit Audio, Inc. (Los Gatos, CA) recently announced its MPC-100 mic preamp/compressor, an all-new single-channel tube compressor/limiter design with mic and instrument preamp. Housed in a 2U rackmount chassis, the unit features a tube mic preamp section with -15 and -25dB pads, phase switch and a high-impedance instrument DI with loading control, clip indicator and following stepped attenuator. The following compressor sec-



Manley Variable-MU Limiter/Compressor Amplifiers

Inward Connections VACRAC 4000

Crane Song STC-8 Discrete Class A Compressor-Peak Limiter

tion has variable threshold and slope controls (ratios of 1:1 to 1:8), and 3-position switches for attack and release times (which are somewhat program-dependent). A true VU meter indicates input, output and gain reduction, and there are front panel stereo link and bypass switches. $2,200.

MANLEY VARIABLE-MU LIMITER/COMPRESSOR AMPLIFIERS

The Manley Laboratories (Chino, CA) Variable-MU Limiter/Compressor Amplifiers use balanced variable-mu triodes in a fully differential all-tube circuit, a design which produces a limiter characteristic similar to that of the Fairchild 670. Front panel controls for the 2U unit include a dual input pot and stereo link switch for both channels, and independent rotary controls for threshold, attack, release and output. Individual switches select limit or compress functions and channel bypass, and output/gain reduction is displayed on front panel-adjustable illuminated large-format Sifam VU meters. $4,000 for the stereo version, $2,350 for the mono. A special mastering version is available to order.

MANLEY HIGH FREQUENCY LIMITER

The High Frequency Limiter (de-esser) from Manley Laboratories (Chino, CA) is designed to control the upper spectrum of critical tracks or mixes where audio performance is paramount. The 2-channel unit uses a passive device (variable reactor core) as the control element, followed by an all-tube line amp on the output. Controls include threshold, 5-9kHz bandpass filter, 7-16kHz high-pass filter, sidechain monitor switch, bypass and sibilance control. Inputs are balanced, and one of the outputs can monitor the sidechain while the other is used to record direct. $1,950.

ECLAIR MODEL 62

Eclair Engineering Services (Florence, MA) has stuck closely to the original Teletronix LA-2A design with its Model 62. The hand-built, stereo-linkable 2-channel unit includes the same optical attenuator and control circuitry as the LA-2A, but achieves a 15dB lower noise floor, and flat frequency response from 4-150k Hz. Other features include Jensen transformers, high quality components and large-format Weston VU meters. The unit has a lifetime warranty. $3,195.

ADL STEREO TUBE S/C/L 1500

Anthony DeMaria Labs (New Paltz, NY) offers the S/C/L 1500, a dual-channel (stereo linkable) compressor/limiter using eight vacuum tubes in a 2-rackspace chassis. Features include dual illuminated VU meters (switchable to gain reduction or output), balanced ins and outs, peak reduction and level controls, a 30kHz bandwidth and an opto-attenuator design. $2,999. Also available as the single-channel C/L 1000 at $1,699.

FLETCHER ELECTROACOUSTICS JOEMEEK STEREO COMPRESSOR

The JOEMEEK Stereo Compressor from Fletcher ElectroAcoustics (Newton Abbot, Devon, UK) is a 2U unit

Fletcher ElectroAcoustics' JOEMEEK stereo compressor

with two linked channels, but one set of front panel controls. They include Input Gain, Compression, Attack and Release rotary pots, and a 4-position Slope switch that selects compression ratios between maximums of 4:1 (position 1) and 7:1 (position 4). Compression is controlled by a photoelectric circuit, which creates predictable overshoot on some material, contributing to the unit's unique sound. A single VU meter indicates gain reduction, and there are a single in/out control and colored LEDs to indicate status. $2,500.

DEMETER VTCL-2A

Demeter Amplification (Santa Monica, CA) has released an upgraded version of its VTCL-2 stereo tube compressor/limiter. Housed in a 2-rackspace chassis, the VTCL-2A offers an all-tube audio path with electro-optical dynamics processing, variable attack and delay and dual VU meters; it is also available with balanced inputs or outputs using Jensen transformers. New features include an LED indicator for optimum input level, and improved graphics to allow for more precise indication of attack and release settings. $2,095.

INWARD CONNECTIONS VACRAC 4000

Distributed by AXI (Audio Exchange International) of Rockland, MA, the Inward Connections VACRAC 4000 is a modular vacuum tube processing system that can hold up to four modules. Modules include the TLM-1 Tube Limiter, featuring opto-isolator (LA-2A-style) limiting, with a mechanical VU meter (switchable to gain reduction or output levels), a stereo link function and independent

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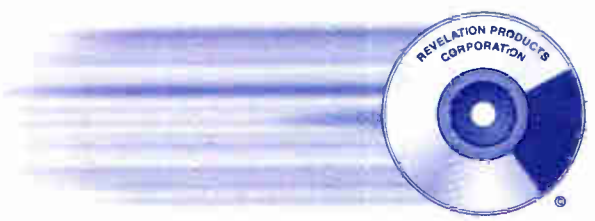

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input level and gain reduction controls. Price for the chassis is $1,295; modules are $795-$895.

GROOVE TUBES CL-1

The CL-1 from Groove Tubes (Sylmar, CA), introduced at the October AES, is available in 1- and 2-channel versions. The CL1s compressor/limiter couples two CL1 circuits to provide an isolated dual-mono unit with optional stereo linking, housed in a single 19-inch 1U steel chassis. Compression ratios are 2:1, 4:1, 8:1 and 12:1. Attack and release are front panel adjustable, VU metering is switchable between output and gain reduction, and a Sens Lo/Hi switch optimizes input level to compressor and sidechain circuits. The CL1 is a mono unit that occupies only one side of the chassis and can be used with either a CL1s or an EQ1 tube equalizer module (available by the end of 1995). CL1s (stereo) is $1,595, the CL1 (mono) is $1,095.

APHEX 661 EXPRESSOR

Aphex (Sun Valley, CA) offers the 661 Expressor™, a new version of its Expressor compressor/limiter, featuring the Tubessence™ circuitry from its Model 107 tube mic preamp. The single-channel 1U unit provides auto or manual adjustment modes, with control of threshold, ratio, attack and release, and a choice of hard-knee, soft-knee or Aphex-proprietary Easyrider dynamics curves. A patented High Frequency Expander automatically decompresses high frequencies up to a maximum of 6 dB, with adjustable ratio and corner frequency. Separate meters for gain reduction and switchable input/output levels are standard, as are XLR and TRS connections (-10 or +4 dB) and sidechain access. $749.

VOCE EVC-1

The EVC-1 Vacuum Tube Audio Compressor from Voce (Wood-Ridge, NJ) is a half-rackspace mono compressor offering the sonic benefits of tube compression in a economical package. Rotary pots control threshold, attack and release times, ratio and output gain. A proprietary photocell circuit offers ultra-fast attack times if desired. An LED indicates compressor action, and a 10-segment LED VU meter shows input or gain reduction. Switches control bypass, meter function and "key listen," or sidechain insert func-

Groove Tubes CL-1

tions. The device is stereo-linkable and rear panel connections are balanced XLR and ¼-inch TRS. $699.

BELLARI RP282

The RP282 is a stereo/dual-mono tube compressor/limiter from Bellari (a division of Rolls Corporation, Salt Lake City, UT). The unit is housed in a steel, 2U chassis with a silver anodized front panel and features independent controls for output, threshold, attack, release and ratio. Dual illuminated VU meters can be switched to indicate input or gain reduction action. The circuit is designed so that the output level remains constant as threshold setting is changed, and balanced XLR and unbalanced ¼-inch inputs/outputs are standard, as are sidechain access jacks. $600.

ROCKSONICS MB-3X

The MB-3X Multi-Band stereo tube compressor with peak limiter (Rocksonics, Los Alamitos, CA) provides variable-ratio compression and independent peak limiting on three separate frequency bands. Designed for broadcast, cassette duplication, CD mastering and other high-quality stage and studio applications, the single-rackspace unit features switchable -10dBV/+4dBm balanced operation, tri-level gain reduction meter, and variable gain, ratio, threshold, EQ, release and peak limit settings. Scheduled for delivery in January '96, price to be announced.

SOLID-STATE COMPRESSOR/LIMITERS

Conventional compressor/limiter designs using solid-state components have always been a popular choice, especially in live sound and broadcasting applications where reliability is a major issue and weight, equipment size and heat dissipation parameters must be considered. Also, conventionally designed devices are generally less expensive than their tube technology counterparts, a compelling attraction for budget-minded buyers. With that in mind, the following listing is in ascending dollar-per-channel order, with the lowest-cost units listed first. Get your Hi-Liters ready.

UNDER $300 PER CHANNEL

PRESONUS ACP-8

PreSonus (Baton Rouge, LA), best known for its DCP-8 digitally controlled, programmable 8-channel analog dynamics processor, now introduces the ACP-8, which provides eight channels of analog dynamics control in a nonprogrammable unit, with knobs rather than digital controls. Housed in a 2U chassis, the ACP-8 features eight compressor/limiters, gates, gain makeup controls and mutes, along with balanced TRS ¼-inch inputs and outputs (+4/-10 dB switchable) and key inputs on the first two channels. $699.

dbx 1046 QUAD COMPRESSOR

The 1046, from dbx Professional Products (Sandy, UT), is a 4-channel compressor/peak limiter that can be stereo linked in two pairs. Each channel features adjustable threshold, ratio, output gain and peak limiter threshold controls. Users may select either dbx's OverEasy® compression characteristic or a hard-knee compression curve similar to that found in the popular dbx 160. Attack and release times are preset and program-dependent. Each channel has two 8-segment LED bar graphs for gain reduction and I/O levels and a peak limiter indicator. Switches include channel bypass, OverEasy or hard-knee curve, I/O meter select and stereo link. Rear panel connections are balanced XLR and ¼-inch TRS and there are individual +4dBu/-10dBV select switches. $549.95.

PEAVEY AUDIO
MEDIA RESEARCH CDS2

The CDS2 from Peavey Electronics (Meridian, MS) is a 2-channel (stereo linkable) compressor/limiter and de-esser in a 1U chassis. The soft-knee compression ratio is a function of the input signal dynamics, as are the

attack and release times, though a 3-position switch allows for fast, normal and slow settings. A 5-LED display indicates gain reduction, and there are front panel switches for bypass, power and stereo link. All rear panel connections (input, output and sidechain insert) are via ¼-inch TRS jacks. $249.99.

DOD 866 SERIES II

The 866 Series II from DOD Electronics Corp. (Sandy, UT) is a 2-channel (stereo linkable) gated compressor/limiter. Gate threshold, input gain, compressor threshold, compression ratio, attack, release and output gain are all adjustable on front panel rotary pots, and a 6-segment LED display indicates gain reduction. There are front panel compressor bypass and stereo link switches. Rear panel inputs, outputs and sidechain connectors are balanced/unbalanced ¼-inch TRS and unbalanced RCA. $279.95.

FURMAN C-128

Designed for studio, live sound or broadcast use, the C-128 from Furman Sound (Greenbrae, CA) is a single-channel compressor/limiter/de-esser. Features include controls for limit threshold, compression ratio (2:1 to 50:1), attack and release time, a 10-segment gain reduction LED meter, output level control and overload LED. The de-ess switch ensures that only program material above 4 kHz will trigger compression, and rear panel sidechain inserts may be engaged via a front panel switch for "ducking" or frequency-selective compression. A stereo link function allows two units to be linked. $269.

dbx 1066 STEREO COMPRESSOR/LIMITER/GATE

The 1066 from dbx Professional Products (Sandy, UT) is a stereo/dual-mono device that offers compression, peak limiting and gating in a single rackspace. Designed around a new VCA, the 1066 includes both dbx's familiar OverEasy® circuitry and a hard-knee characteristic, and a new PeakStopPlus™ limiter design improves transient control. Each channel has front panel controls for gate threshold and ratio, and compressor threshold, ratio, attack and release controls and peak limiter threshold. Illuminated switches select OverEasy compression characteristic, auto attack and release times, and insert sidechain processing. A Contour switch prevents compressor modulation due to LF energy in the compressed signal. Additional switches are for I/O metering, bypass and stereo link. New lightpipe indicators meter input/output, gain reduction and gate and compressor action. $549.95

DOD 410 SERIES II

The 410 Series II PA/Monitor Processor from DOD Electronics Corp. (Sandy, UT) offers EQ, notch filters, highpass filter and automatic Variable-Ratio Limiting™ in a single-rackspace package. Designed to increase system headroom in stage monitor or FOH live sound applications, the single-channel 1U unit features Automatic Variable Ratio Limiting™ which changes compression ratio from soft-knee to hard-knee as the threshold setting is raised. The unit includes a 15-band constant-Q graphic EQ, two 2-band sweepable (-24dB) notch filters and ¼-inch and XLR inputs and outputs. Price $279.95.

SYMETRIX 422 STEREO AGC-LEVELER

The 422 stereo AGC/leveler from Symetrix (Lynnwood, WA) is a sophisticated automatic gain controller that boosts stereo signals falling

below the target output level and pulls back those rising above it. Intended for use at any point where there is "line-level" audio, the 422 features a parallel input/output meter to allow the user to see and adjust the input level to a desired target output level. Also features threshold control, response control and peak limiter. $595

$300 - $1,500 PER CHANNEL

ARX SILVER SERIES AFTER BURNER

The Silver Series After Burner from ARX (distributed by The Saber Group, Woodland Hills, CA) is a stereo/dual-channel compressor/limiter. Featuring "industry standard" controls for compression ratio, threshold, stereo link and output, the unit can also operate as a single-channel, dual-band compressor/limiter. Separate dynamics control low- and high-frequency compression, and an enhance feature restores sagging low- and high-frequency response of compressed material. Inputs and outputs are fully balanced and specs include -93dB S/N (A/W) ratio, .03% THD and 108 dB of dynamic range. $659.

BSS DPR-404 4-CHANNEL COMPRESSOR

The DPR-404 from BSS (Northridge, CA) is a 4-channel compressor which can be stereo linked in two pairs. (Controls for channels 1 and 3 become stereo pair masters.) The 1U unit provides individual front panel controls for threshold, ratio (variable from 1:1 to infinity:1), gain makeup and de-esser center frequency and threshold. Attack and release times are program-dependent and can be switched between Norm and Fast settings. Metering is via LEDs and indicates gain reduction, sidechain level below threshold and clipping. $1,449.

ARX SYSTEMS DDP-1

Part of the new Silver Series from Australian manufacturer ARX Systems (distributed by The Saber Group, Woodland Hills, CA), the DDP-1 is a dual-channel dynamics processor, with noise gating, a variable ratio compressor and peak limiting in a 1U chassis. A total of 27 LEDs per channel monitor operating status, I/O level metering and gain reduction metering. Also standard are stereo link switching, sidechain insert jacks, balanced inputs/outputs and a hard-wire bypass. $859.

dbx 168A

dbx Professional Products (Sandy, UT) offers the Model 168A, which is designed for stereo or dual-mono operation and combines compression, de-essing and spectral enhancement functions in a single-rackspace unit. A "silence gate" gain-hold function prevents holes, pumping and breathing and noise build-up during pauses in program material, and both high- and low-frequency spectral enhancement is provided. Based on the popular dbx 902, the 168A's dual independent de-essers eliminate excessive sibilance, and the compression sections offer separate drive and density controls. Dual 10-segment LED meters for gain reduction and peak output, balanced inputs and outputs and selectable -10/+8dB operating range are standard. $999.95.

LA AUDIO CLASSIC COMPRESSOR II

Manufactured in the U.K. by SCV London and distributed in the U.S. by Promusica (Keene, NH), the LA Audio Classic Compressor II is a 2U stereo/dual-mono compressor based on discrete FET circuitry. Fully adjustable front panel controls include

dbx 1650T mic pre/limiter

input trim, threshold, attack and release time and gain makeup pots. The traditionally styled compressor offers six compression ratios (1.3:1 to 12:1), input clip LEDs, individual channel bypass switches and a stereo link switch. Large-format VU meters show either gain reduction or output. $1,200.

BSS DPR-402

The DPR-402 from BSS (Northridge, CA) is a 2-channel compressor/limiter that includes de-esser circuitry for both HF and wide-band applications. The 1U unit provides individual front panel controls for threshold, ratio (variable from 1:1 to infinity:1), gain makeup, and de-esser center frequency (800-15k Hz) and threshold. Attack and release times are program-dependent. The peak limiter (20:1 ratio) has independent threshold control and fast and slow settings for attack and release times. Internal filters can be inserted in the sidechain to contour compressor action. Metering of gain reduction and sidechain activity is via LEDs. $1,449.

EMPIRICAL LABS DISTRESSOR

From Empirical Labs (Garfield, NJ) comes the Distressor, a classic knee compressor in a 1U space. The unit features three modes of programmable analog distortion for added warmth, distortion indicator lights, a built-in sidechain EQ and eight compression ratios (from 1:1 to "Nuke"). Metering is via LEDs, with additional LEDs to indicate distortion thresholds, and the unit includes sidechain emphasis to avoid grating sounds and reduce pumping. Bypass, compressor ratio and distortion characteristic are switched, but threshold, attack, release and gain makeup are controlled by large-format rotary pots (that go all the way to 10½). The single-channel mono compressor can be strapped for stereo operation and features ¼-inch and XLR balanced connections, along with switchable 110/220 VAC operation. $1,395.

BSS DPR-901 II

The DPR-901 II Dynamic Equalizer, introduced at the October '95 AES by BSS (Northridge, CA), advances the unusual multiband processor architecture introduced with the BSS DPR-901. Like its predecessor, the 901 II consists of a 4-band parametric EQ feeding discrete compressor/expander sections. By separately compressing or expanding different segments of the audio signal, users can eliminate sibilance or the coloration of proximity effect and fine-tune frequency-dependent dynamic effects. New with the 901 II device, a "split band switch" allows the unit to be used as a dual 2-band or single 4-band device, and a sidechain monitor feature allows users to tune in to exactly the spectral area needing compression or expansion. $1,549.

API L200 RACK AND 225L COMPRESSOR

The L200 rack from API (Springfield, VA) is a modular system that holds 12 API Legacy 200 modules in a 2-unit, 19-inch rack chassis featuring an external tri-power supply and 48V phantom powering. Among the several all-discrete modules available is the 225L compressor, which is based on the original API 525 circuit. A toggle switch selects compression (4:1) or limiting (20:1) ratios. Four release times between 0.1 sec. and 2.5 sec. are available, also via toggle switches. A unique ceiling control maintains constant output level while input and output controls are adjusted to vary amount of compression. Gain reduction is indicated on a 5-segment LED display. All inputs and outputs are via rear panel XLRs, with TT jacks for sidechain insert. The L200 rack is $795 and individual modules are around $600 each.

$1,500 PER CHANNEL AND UP

CRANE SONG STC-8

The STC-8 from Crane Song Ltd. (Superior, WI) is a stereo/dual-mono compressor with peak limiters capable of providing overload protection for broadcast and digital recording applications. The 2U unit offers comprehensive control of all compression parameters (threshold, attack, release, shape, gain) and peak limiter threshold. Metering is via 16-segment bar graphs that also operate as LED meters in gain reduction and peak headroom modes. Overload and Peak LEDs indicate clipping and peak limiter action. Two advanced functions control attack and release times, and an innovative 16-position switch (both channels) allows users to select among various attack and release presets. Front panel switches include channel in/out, stereo link and a KI/HARA switch that inserts a "tube-like" enhancement circuit. $3,200.

AVALON AD2044 MARK II

New from Avalon Design (San Clemente, CA), the AD2044 Mark II is a 2U dual-mono (stereo-linkable) compressor using all-discrete, pure Class-A circuitry with linear optical control elements (no VCAs). An update to the AD2044, the Mark II features a wider dynamic range threshold, faster attack and release times with greater range, and increased accuracy in reset control. The unit offers variable compression ratio, threshold, attack and release controls, large-format VU meters, sidechain access, electronically balanced inputs and twin balanced servo outputs, and a master bypass stereo switch. $4,290.

FOCUSRITE BLUE 330

Designed for demanding applications, the Focusrite Blue 330, distributed in North America by Group One Ltd. (Farmingdale, NY), is a stereo dynamics processor with separate compression and limiting sections. Other features include manual or program-dependent release times and transformer balanced inputs and outputs. $6,750. *[For more details on the Blue 330, see "Technology Spotlight" on page 140—Ed.]* ■

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TECHNOLOGY SPOTLIGHT

Focusrite Blue 315 Equalizer and Blue 330 Limiter/Compressor

BY ZENON SCHOEPE

Focusrite's Blue 315 and 330 apply the popular appeal of the Focusrite name in the studio world to the altogether different planet of mastering. It's a predictable development for a manufacturer that prides itself on its high-end status, particularly since its products have been finding their way into mastering rooms for some time now. However, the 315 dedicated dual-channel four-band parametric with high- and lowpass filters and the 330 stereo limiter and compressor are much more highly adapted for the task at hand with the notable inclusion throughout of precision switched pots for ease of reset and the matching of settings.

THE BLUE 315

A brief glimpse at the 315 reveals the core of the ISA 110 equalizer found in the Focusrite Studio console. The four bands—two fully parametric mids with 11-step variable Q and two shelving HF/LF bands—offer ±10 dB of boost/cut. All the bands provide a wide degree of overlap; additionally, each of the parametric mid bands has a switch that allows the user to select from two ranges to expand the degree of control. The high-mid band operates from 560 to 3.9k Hz, or 2.7 to 18 kHz; the low-mid band can be switched from 39 to 270 Hz, or 180 to 1.2k Hz. The other bands also offer wide range adjustments: The shelving HF is 3.3 kHz to 22 kHz; shelving LF is 33 Hz to 560 Hz; also standard are frequency-selectable (10/12/15/18/22kHz) lowpass and (33/47/68/100/150Hz) highpass filters.

Most significantly, the gain pots are calibrated to give very fine intervals close to zero—you get ½dB steps on the first three clicks, for example—graduating to a wider resolution per click at the extremes. Very fine control over input gain is also offered, along with balanced, transformer-coupled I/Os. Retail is $6,750.

THE BLUE 330

The 330 is genetically closest to the popular Red 3 compressor and limiter, with completely separate compression and limiting sections running to Focusrite VCA control. Rather than regard limiting as an extreme form of compression—which is most usually associated

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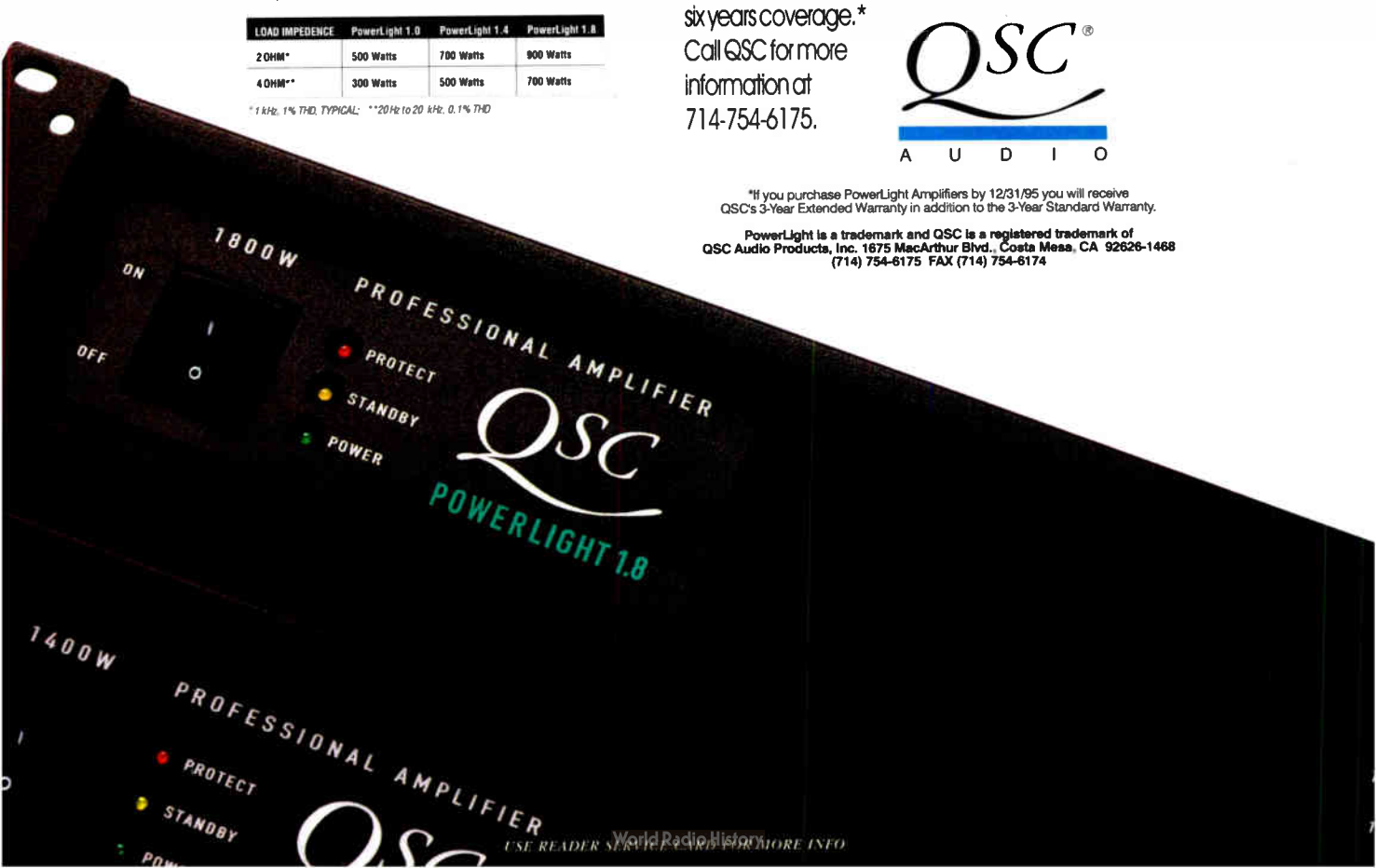

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with full clockwise rotation of a ratio pot—the separation of the two processes enables safeguard brick-walling to be administered independently of any program squashing for effect. The distinction may seem subtle, but operationally, it's a real eye-opener.

The compressor has threshold, ratio, attack and release controls while the limiter has its own threshold pot. The control ranges are as follows—Compressor threshold: -26 dB to +16 dB in 1dB steps; ratio: 1.2:1 to 20:1 in 11 steps; attack: 300 microseconds to 100ms in 22 steps; release: 100ms to 4 seconds with auto program-dependent release; and the limiter threshold is adjustable from 0 dB to +22 dB in 1dB steps. As with the 315, very fine control over input gain is possible along with fine make-up gain and balanced, transformer-coupled I/Os. Retail is $6,750.

THE USER'S VIEWPOINT

Ray Staff at Whitfield Street studios in London was one of the first mastering engineers to see the 315 and 330 units. Having been invited to give comments on a prototype of the equalizer and the fully finished compressor and limiter, he was surprised to find the fully finished compressor/limiter included when the full-production 315 arrived.

Staff admits to being very impressed. "We haven't bought any yet but it's something we're going to be looking at in the future, because we we're so happy with the cleanness of the units, how quiet they are and the fact that they're resettable," he says. "The 315 would replace the GML EQs that I use most of the time, and as we have customized level presets in the desk, it would replace that part of the circuitry as well."

Staff has been at Whitfield Street Studios for two years. Previously, he spent five years at The Exchange and, before that, 16 years at Trident Studios. He has always been a mastering engineer.

"I do enjoy working with people and trying to get the best out of what I'm given, and you can only really do that when people are there," he says. "Otherwise, what you do is just your opinion—it's not necessarilly what the band wants. If you're working with a band, they have a good idea of what they want to achieve, and that helps you."

It's something of a boom time for mastering in London at the moment, with the fairly recent developments and refurbishments at Metropolis and The Town House, respectively. Staff says that he's a prime candidate for the 315 and 330, because he is a self-confessed Focurite fan and regular user of ISA131s and other ISA modules. They would also fit in well with the sound chain in his studio, which is based around a customized ¼-inch and ½-inch Studer A80 rebuilt by Timelord in Japan, GMLs, the ISA131s, and a customized level-control panel that Staff put together with the Whitfield maintenance department. Digital is handled by Sonic Solutions and the TC Electronic M5000 with MD2 mastering software and the new EQ software release. Monitoring is via ATCs for the big stuff; a small pair of B&W CD1s biwired to B&W Zone amplifiers are his favorite reference. He believes that comparisons of the Blue 315 to the Sontec are inevitable. "I'd never actually seen a Sontec until about a month ago when I went to New York," admits Staff. "I'd always heard about them but never seen one, and it is obvious that Focusrite is competing with them. Sontecs are hard to get, which the Focusrites shouldn't be.

"We got on very well with the 330. It has a beefy sound—a bit like the old Neve beefiness," he adds. "It has that lovely characteristic to it—it's a very, very nice limiter/compressor.

"The way it's built and the way each area is monitored for overload and how the noise and other things are kept down is impressive," says Staff. "Compared to the ISA131, in which if you increase the gain you do marginally increase the distortion, everything in the 330 has been designed to avoid any increase in distortion at all, and the VCA circuit is quite unique and very low-distortion." Having separate compressor and limiter sections is a benefit, as is the fine resolution either side of zero on the gain pots of the 315. "I quite often find that people want to relate back to digital, because with something like the TC M5000, you have very fine adjustment of say 0.5 dB or 0.1 dB with the Sonic System," explains Staff. "People like it because just that 1 dB more or less can make quite a difference, and it's the sort of refinement that has just not been available in analog. With the Focusrite, you can go up or down in ⅓dB steps to begin with, and it's lovely to make tiny refinements. Plus, it's resettable, and both sides are identical, so your phase shifting and amplitude should theoretically be exactly the same. You couldn't do that with a freestanding pair of parametrics."

Staff used both units on the remastering of Jeff Wayne's *War of the Worlds* epic, which Sony had decided to give the 20-bit treatment to. "They were nice—lovely and quiet and actually quite appropriate to *War of the Worlds* because the tapes were very, very good considering their age.

"It wasn't a bad transfer, but just going 20-bit alone straight off the machine sounded better than the original CD, so I felt confident immediately," he adds. "The changes that were made were very minimal—small changes of 1 dB here and there just to tidy the tape up and to make it flow. That's what the 315 is great for.

"There are two ways of looking at the business of mastering," Staff continues. "If you've got a quality source that is low-distortion and all the rest, and technically is a good tape, then you can often add more EQ if it's required; but if it's a good tape, then it's been well-balanced and well-EQ'd and doesn't actually need a lot. On the other hand, I do get some tapes in, especially from small studios, that are really awful, and you have to put the kitchen sink on them: everything you've got just to get something half decent out of it."

Staff states that he has no hard-and-fast rules and believes both units apply themselves well to both extremes, but he wishes that more manufacturers would address the mastering sector with product.

"I think Focusrite has spotted a good market, and it would be nice if more people joined in and we had more choice," he explains. "The only thing I would have liked to have done is to put Focusrite side by side with Sontec. Sontec is the de facto standard in the States, but I would suspect that Focusrite could hold its own quite happily."

Focusrite is distributed in the U.S. by Group One Ltd., 80 Sea Lane., Farmingdale, NY 11735; 516/249-1399; Fax: 516/753-1020. ■

New Products

TIMELINE MEDIAMATRIX DSP

TimeLine (Vista, CA) introduces the MediaMatrix® DSP Audio Processor, manufactured by Peavey Electronics. A user-programmable DSP sound card/software package for the Windows-based Studioframe workstation, MediaMatrix enhances Studioframe's DSP functionality by enabling the user to construct mix channels with pre-designed building blocks, including filters for up to 24-channel mixes, multiple parametric and graphic equalizers, delays and compression.

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PINNACLE MICRO APEX

Pinnacle Micro (Irvine, CA) offers its new Apex 4.6-Gigabyte rewritable optical drive. Available as either an internal or external drive, the Apex features a raw data rate of 6 MB/second, an average seek time of 17 ms and a single-pass write system. Pinnacle also offers a proprietary A/V mode that, by switching an option jumper or SCSI mode select command, switches the drive into a constant linear velocity (CLV) mode, increasing its data-storage capacity. Street prices are less than $1,500; additional 4.6GB disks retail for $199 each or $895 for a 5-pack.

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CEDAR AUTO DE-HISS

CEDAR Audio Ltd. (distributed by Independent Audio, Portland, ME) has introduced its Auto De-Hiss software for PC-based CEDAR systems. In conjunction with CEDAR's ProDSP/R-20 DSP processor board, Auto De-Hiss removes hiss in real time without affecting the fine detail, transients and ambience of the original signal. Priced at $12,800, Auto De-Hiss runs on any PC configured as a CEDAR System.

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NOW! MOTHERS CASSETTE REPLICATOR

NOW! Recording Systems (New York City) introduces the Mothers M2010 Mark II Series 10-pocket cassette recorder/duplicator, which can produce ten original master cassettes from any line-level source, or nine duplicates from a single master. The unit offers normal or high-bias settings, and can duplicate in stereo or mono, at normal or 2x speeds.

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NHT 2.5

The design for NHT's (New York, NY) newest loudspeaker, the 2.5, incorporates concepts from its flagship 3.3 speaker and the 2.3 tower. Measuring 7x15.5 inches, the 2.5 tower has a 1-inch soft-dome tweeter, a 6.5-inch midrange driver and a vented 8-inch, side-loaded woofer. An angled front baffle minimizes early reflections, standing waves and comb filtering inside the cabinet. The system handles up to 200 watts; the vented woofer goes down to 33 Hz. Available in high-gloss black, the 2.5 retails at $1,100/pair.

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SONIC FOUNDRY NOISE FORGE

Sonic Foundry (Madison, WI) releases Noise Forge, a noise-reduction plug-in for its Sound Forge 3.0 Windows-based sound editor. Noise Forge is designed to analyze and remove background noise—such as tape hiss, electrical hum and machinery rumble—from recordings. Unlike conventional filtering that affects the entire passage, the Noiseprint feature distinguishes noise from source material. The plug-in also includes a Click Removal tool that allows either manual or automatic glitch replacement. Separate plug-ins are available for either the 16-bit or 24-bit version of Sound Forge.

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STUDER D19 MICVALVE
The latest addition to Studer's (Regensdorf, Switzerland) D19 line is the D19 MicVALVE, a 2-channel mic preamp with digital output. MicVALVE features a 20-bit A/D conversion and a "Valve Dignifier" that can be switched into the signal path, providing controls for valve sound treatment. Also included are analog line outputs, switchable inserts and an AES/EBU output. Outputs to ADAT or TDIF are optional, including individual channel I/O routing.
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VESTAX HDR-8
Vestax USA (Fairfield, CA) is now shipping its HDR-8 8-track hard disk recording system. Vestax also announced the new MX-1 remote mixing controller for the HDR-8 and HDR-6 6-track hard disk recording system. The MX-1 stores up to 99 snapshots of mixer settings and can control up to four HDR units.
Circle 233 on Reader Service Card

TRANSPARENT CABLES
Unveiled at AES, Transparent Audio (Hollis, ME) now offers a line of speaker, interconnect and microphone cables for mastering facilities and recording studios. Most of the cables include internal networks to match impedance, control resonance, reduce RFI and compensate for cable length.
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BARCUS-BERRY PIANO PICKUP
The 4000N Planar Wave Piano Pickup System is the newest product from Barcus-Berry (Huntington Beach, CA). The transducer is designed to reproduce a piano's complete spectrum with equal amplitude across the entire keyboard. A sensor attaches to the sound board with a removable adhesive; the control unit features volume control, high/low impedance outputs and a low-drain circuit for up to 2,000 hours of battery life.
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REDUNDANT POWER FOR MACKIE 8•BUS
Designed for broadcast, live sound and other failsafe operations is the Twecomm Inc. (Pittsburgh, PA) TC-5000 redundant power supply adapter for the Mackie Designs 8•Bus console. The TC-5000 adapter provides a method for powering the console from two standard Mackie power supplies simultaneously. List is $522.
Circle 236 on Reader Sewice Card

B.A.D. PRODUCTION MUSIC
British Audio Designs (distributed by Frontline Media, Aliso Viejo, CA) released its first three albums, entitled *The Best of B.A.D.*, with compositions by Christopher Page, Patrick Moraz and John Cameron. The 3-CD, 210-minute production library features a wide variety of musical styles, and is buy-out priced at $1,485, with unlimited usage allowed.
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DYAXIS II CD PRESS SOFTWARE
Studer Editech Corporation (San Leandro, CA) has added CD Press premastering software to the Dyaxis II range of nonlinear DAW systems. CD Press for Dyaxis combines Red Book-compatible audio CD recording with powerful editing and signal processing tools. Existing Dyaxis II system owners can add CD Press by upgrading to MultiMix Version 3.0 software and expanding disk storage to 4 GB.
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CROWN STUDIO REFERENCE AMPS
Crown International Inc. (Elkhart, IN) introduces its Studio Reference 1 & 2 power amplifiers for sonically demanding studio applications. Specifications include SNL ratios of at least 116 dB, THD of less than 0.05%, and IMD of less than 0.025%. The 4U units include Crown's patented ODEP protection circuitry and intelligent on-demand fan cooling for quiet operation, and a six-year, no-fault warranty.
Circle 241 on Reader Service Card

BELLARI MP110 DIRECT DRIVE
Bellari (Salt Lake City, UT) offers the MP110 Direct Drive, a single-channel mic preamp, featuring a 7025 vacuum tube. The unit has XLR and ¼-inch I/Os, a -20dB input pad, phase reverse switch, 48 VDC phantom power and true transformer input balancing. Specs include <0.1% THD, EIN of 129 dB, +20 dB of gain, +11dB output level and a noise floor of less than 90 dB. Retail is $199.99.
Circle 239 on Reader Service Card

SONIC SOLUTIONS MULTITRACK USP
Sonic Solutions (Novato, CA) introduces its new Multitrack USP Sonic System. The new multitrack digital editing and mixing workstation offers up to 64 channels of I/O and 80 to 100 discrete disk playback tracks. In addition to its multichannel capability, the Multitrack USP provides new multitrack-optimized editing features, including instant punch-in/-out. Each USP card provides 16 channels of I/O; up to four cards may be integrated in one system. Hardware features on the USP card include four Motorola 56002 processors (at 66 MHz), a high-speed SCSI controller and four serial/SMPTE ports.
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HOT OFF THE SHELF

The CableTek Radial JDI direct box is a passive design based around the Jensen JT-DBE transformer. Features include ground lift, -15dB pad, line/pickup switch with HF roll-off at 70 kHz, XLR output and hand-wiring. Price is $229. Call 604/942-1001...**LA Audio's** MX2 2-channel mic preamp offers individual gain controls, filtering, LED metering, -20dB pads, transformer-balanced XLR inputs, XLR and ¼-inch outputs and +48V phantom power. Price is approximately $400. Call 603/352-4831...**Chameleon Music** announces a comprehensive library of buy-out production music and effects available on 12 CDs, with three more CDs scheduled for November release. Call 413/789 1917... ***Making the Connection—The Fender Pro Audio Primer*** ($19.95) by Tom Butler is a 253-page guide to the world of professional audio. Available from Fender Pro retailers or Mix Bookshelf: 800/233-9604...**Manhattan Production Music's Apple Trax library** adds two new releases, *AT9—Play the Game*, 10 themes and 50 cuts of modern, up-tempo action themes, and *AT10—Cinema Magic*, a similar 10/50 mix of dramatic orchestral music. Call 800/227-1954...The Harris Creative Group offers an instructional video on audio recording. ***PC-based Digital Recording*** is a two-VHS-tape, 3-hour program covering hardware and software selection, recording techniques, and sound for multimedia and video. Eight software packages are reviewed and demonstrated, and nine popular sound cards are tested and reviewed. Call 415/454-4567...***Platinum Sounds for the 21st Century*** from L2 Sound Effects is a 10-CD selection of sound effects from the library of Hollywood sound designer Frank Serafine. Available in a number of formats, including Sound Fonts, AIFF and CD-ROM, the sound effects include Science Fiction, Supernatural, Combat, Industrial and Metal, etc. 310/587-2100 or 800/779-L2FX...**LEMO USA** has a new catalog describing its precision fiber-optical connectors for single and multiple fibers. 800/444-5366...**Analog Devices** has two new VCAs designed for professional audio applications. The new SSM2018T and SSM2118T do not require external trimming potentiometers to minimize distortion and control feedthru and offer 100 dB of attenuation and 40 dB of gain. 617/937-1428...**BNK Electronics'** low-cost 20-bit D/A converter module, the **BNK MightyMight 20DA**, features two Burr-Brown PCM1702 20-bit D/A converters, 8x oversampling digital filtering, analog reconstruction filter and glue logic. The compact module is suitable for embedded applications. 201/894-5905...**FirstCom Music** has added 23 new CDs to its Personal Music Library, including new works from Ralph Towner and John Jarvis. The Personal Music Library consists of more than 400 production music CDs in seven music categories from the FirstCom, Music House, Chappell and Hollywood Film music libraries and is updated quarterly. 800/858-8880...**The Universal BNC Connector** (UNI-BNC) from Marshall Electronics allows for speedy digital connections under any conditions, without crimping tools. Durability, performance and ease of attachment recommend the UNI-BNC for video, computer and test equipment applications. 800/800-6608...**Sampleheads Inc.** offers the *New York City Drumworks* collection of drum loops and hits from six of the finest session drummers. The 146-minute, 2-CD sampling library contains 1,252 events, 735 loops and 517 hits, ready to sample and copyright-free, all for $99.95. 212/866-1533...Robert Hartwig's ***Basic TV Technology***, 2nd edition ($19.95), explains the technical fundamentals of television and video systems in easy-to-understand language. Call Focal Press at 800/366-2665. ■

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P7000 DIABLO

NEW!

Dynamically Invariant A-B Linear Operation is an extremely important advance in front-end/driver circuitry for directly, exciting, large arrays of power MOSFETs. Traditionally, such circuits have only 6dB of surplus current headroom over their static or quiescent bias current. The new circuitry works on a variable-gain current-steering principle which results in absolutely linear current headroom of 20dB or more at low driver dissipation. This is extremely important for providing the high transient current needed to drive the capacitance of MOSFET gates at high frequencies. The result is both lower distortion and greater inherent stability.

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- Bass Guitar and other Instruments
- Sound Quality in a Big Amp!

- EIA (1kHz, 0.1% THD)
- 375 Watts/Channel into 8Ω
- 525 Watts/Channel into 4Ω[A]
- 1050 Watts Bridged Mono into 8Ω[A]

[A]Continuous sine wave power limited by current rating of line fuse.

The award winning 9303 and 9505 Trans•nova amplifiers are already a huge success!

Check out MoJAZZ recording artist **Wayman Tisdale** and The Fifth Quarters' new release "Power Forward!"

Wayman uses the 9303 Trans•nova in his home studio and the P7000 on bass.

Finally a Big Amp with Hafler's Legendary Sound Quality!

"The new Hafler Trans•nova D.I.A.B.L.O. sounds great here at Capitol's Tower Mastering. Dependable as always - clear and detailed with wonderful bass response."

Wally Traugot
Tower Mastering
Capitol Records
Hollywood, CA

"The D.I.A.B.L.O. circuitry makes an already great sounding amplifier even better. The high end is truly vacuum tube like, while the bottom has the punch of solid state.

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Tom Jung
DMP Records
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D.I.A.B.L.O. patent application in progress.
Trans•nova patent #4467288

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TANNOY

System 6 NFM II

A 6.5 inch Dual Concentric with Tulip HF wave guide forms the heart of the System 6 NFM II providing a reference single point source monitor in a more compact enclosure than ever before. Every aspect of design fully complements the drive unit's capability. The rigid cabinet with carefully contoured baffle and trim minimizes diffraction and the high quality minimalist DMT crossover and gold-plated Bi-Wire terminal panel optimize the signal path. Pin-point stereo accuracy with wide frequency response, good power handling and sensitivity make this an ideal nearfield monitor.

PBM Series II
Reference Monitors

The PBM II Series is the industry standard for reference monitors. They feature advanced technologies such as variable thickness, injection molded cones with nitrite rubber surrounds and the highest quality components including polypropylene capacitors and carefully selected indicators. With a Tannoy monitor system you are assured of absolute fidelity to the source, true dynamic capability and most important, real world accuracy.

PBM 5 II

- Custom 5" injection-molded bass driver with a nitrite rubber surround for extended linearity and accurate low frequency reproduction. They are better damped for reduced distortion and exhibit more naturally open and detailed midrange
- Woofer blends seamlessly with the ¾" polymide soft dome ferro-fluid cooled tweeter providing extended bandwidth for extremely precise sonically-balanced monitoring
- Designed for nearfield use, the PBM 5 II cabinets are produced from high density medite for minimal resonance and features an anti-diffraction radiused front baffle design.

PBM 6.5 II

- Transportable and extremely powerful, the PBM 6.5 II is the ideal monitor for almost any project production environment.
- 6.5" lowfrequency driver and 3/4" tweeter are fed by a completely redesigned hardwired hand selected crossover providing uncompromised detail, precise spectral resolution and flat response.
- Fully radiused and ported cabinet design reduces resonance and diffraction while providing deep linear extended bass.

PBM 8 II

- High tech 1" soft dome tweeter with unmatched pattern control and enormous dynamic capability. 8" driver is capable of powerful bass extension under extreme SPL demands.
- Hard wired crossover features true bi-wire capability and utilizes the finest high power polypropylene capacitors and components available.
- Full cross-braced matrix medite structure virtually eliminates cabinet resonance as a factor.
- Ensures precise low frequency tuning by incorporating a large diameter port featuring laminar air flow at higher port velocities.

Stewart

PA1000/1400/1800
Power Amplifiers

- High frequency switch mode power supply fully charges 120,000 times per second (1000 times faster than conventional power supplies) requiring far less capacitance for filtering and storage
- High speed recharging also reduces power supply "sagging" that afflicts other designs.
- Incredibly efficient, 5 PA-1000 or PA-1400's (4 PA-1800's) can be run on one standard 20 amp circuit. There is no need for staggered turn-on configurations or other preventive measures when using multiple amp set-ups, as current drown during turn-on is only 6 amps per unit.
- They produce smooth and uncolored sound, while offering very full detailed low end response and tons of horsepower.
- They each carry a 5 year warranty on parts and labor

PA-1000 weighs 9 lbs, is 15" deep and occupies one standard rack space. Delivers 1000 watts into 4Ω when bridged to mono.
PA-1400 weighs 16 lbs, is 15" deep and takes 2 standard rack spaces. Delivers 1400 watts into 4Ω when bridged to mono.
PA-1800 weighs 17 lbs, is 17" deep and takes two rack spaces. Delivers 1800 watts into 4Ω when bridged to mono.

TASCAM

M-2600 Series
16/24/32 Channel Eight Channel Mixers

LOW NOISE CIRCUITRY

- Combining completely redesigned, low noise circuitry with Absolute Sound Transparency™ the M-2600 delivers high-quality extremely clean sound. No matter how many times your signal goes through the M-2600, it won;t be colored or altered. The signal remains as close to the original as possible. The only coloring you hear is what you add with creative EQ and your outboard signal processing gear
- Double reinforced grounding system eliminates any hum. World-class power supply provides higher voltage output for better headroom and higher S/N ratio.

PREMIUM QUALITY MIC PRE-AMPS

- The M-2600's mic pre-amps yield an extremely low noise floor, enormous headroom and an extremely flat frequency response. This lowers distortion and widens dynamic range. It also increases gain control to an amazing 51dB. Plus, you get phantom power on each channel.
- The M-2600 accepts balanced or unbalanced 1/4" inputs, and low-impedance XLR jacks. Better still, the TRIM controls operate over a 51dB input range. For the hottest incoming signals, all it takes is a press of the -20 dB PAD button atop each channel strip to bring any signal down to manageable levels. Plug anything into it – keyboards, guitars, basses, active or passive microphones, samplers and more. No matter what you put into it, you can be confident that signal can be placed at optimum levels without a lot of fuss.

THE BEST AUX SECTION IN THE BUSINESS

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

FLEXIBLE EQ SECTION

You'll find both shelving and split-EQ sections on some mid-level consoles. But that's where the similarities with the M-2600 end. The M-2600's bi-directional split EQ means you can use either or both EQ sections in the Monitor or Channel path...or defeat the effect altogether with one bypass button. Most other comparably-pricedmixers will lock the shelving mix into the Monitor path only, limiting your EQ application

ADVANCED SIGNAL ROUTING OPTIONS

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

ERGONOMIC DESIGN

The M-2600 has a big studio feel. All buttons are tightly spring loaded, lock into place with confidence and are large enough to accomodate even the biggest fingers. The faders and knobs have a tight, smooth "expensive" feel and are easy to see, easy to reach and a pleasure to manipulate. Center detents assure zero positions for EQ and PAN knobs. Smooth long throw 100mm faders glide nicely yet still confidently allow you to position them securely without fear of accidentally slipping to another position.

MACKIE

MICRO SERIES 1202
12-Channel Ultra-Compact Mic/Line Mixer

Usually the performance and durability of smaller mixers drops in direct proportion to their price. Fortunately, Mackie's fanatical approach to pro sound engineering has resulted in the Micro Series 1202, an affordable small mixer with studio specifications and rugged construction. The 1202 is a no-compromise, professional quality ultra-compact mixer designed for professional duty in broadcast studios, permanent PA applications and editing suites where nothing must ever go wrong.

BIG CONSOLE FEATURES

- Working S/N ratio of 90dB, distortion below 0.025% across the entire audio spectrum, switchable +48 volt phantom power and +28 dBu balanced line drivers
- Real switchable phantom-powered mic inputs with discrete, balanced mic preamps as good as those found in big consoles
- Has 4 mono channels, each with discrete front end mic pre-amp/line input and four stereo channels, each with separate left and right line inputs.
- Every input channel has a gain control with unity at the center detent for easy setup. Also a pan pot, low frequency EQ at 80Hz, high frequency EQ at 12.5 KHz, and two aux sends with up to 20dB available gain.
- Main outputs operate either balanced/unbalanced, as required.
- Switchable three-way 12-LED peak meter displays
- Master section includes two stereo aux returns, a separate headphone level control, metering and two stereo aux returns
- Line inputs and outputs are designed to work with any line level, from instrument level, to semi-pro -10dB, to professional +4dB.

HEAVY DUTY CONSTRUCTION

- Designed for non-stop 24-hour-a-day professional duty in permanent PA applications, TV and radio station, etc
- Sealed rotary controls instead of open frame phenolic potentiometers that suffer from dust and contamination
- Has steel chassis, rugged fiberglass circuit boards and a built-in power supply. Also has exceptional RF protection

MULTIPLE APPLICATIONS

- Ideal "entry level" mixer for those just starting a MIDI suite
- Ideal as headphone or cue mixer, level matching pro audio "tool kit", drum or effects sends submixer, 8-track monitor mixer.

CR-1604 16-Channel Mic-LineMixer

The hands-down choice for major touring groups and studio session players, as well as for broadcast, sound contracting and recording studio users, the Mackie CR-1604 is the industry standard for compact 16-channel mixers. The CR-1604 offers features, specs, and day-in-day-out reliability that rival far larger boards. It features 24 usable line inputs with special headroom/ultra-low noise Unityplus circuitry, seven AUX sends, 3-band equalization, constant power pan controls, 10-segment LED output metering, discrete front end phantom-powered mic inputs and much more

LOWEST NOISE, HIGHEST HEADROOM

- With the CR-1604, having the lowest noise and highest headroom (90 dB working S/N and 108 dB dynamic range) at the same time are not mutually exclusive. It is free of commonly encountered headroom restrictions, and is able to handle the occasional pegged input with ease. In fact, many drummers consider it the only mixer capable of handling the attack and transients of acoustic and electronic drums.

CONSTANT POWER PAN POTS

- Only with constant power pan pots will a source panned hard left or hard right have the same loudness as when it is sitting dead center. While most small mixers pass simple balance controls for pan pots, the CR-1604's carefully optimized constant power pan circuitry make it a professional tool with the kind of performance necessary for CD mastering, video posting and other critical audio production

IN-PLACE STEREO SOLO

- Stereo "in place" solo allows not only the monitoring of level and EQ, but also stereo perspective. Usually found in very expensive mixers, stereo solo allows you to critically scrutinize and carefully build a mix using all the channels with their respective sends and AUX returns.

UNITYPLUS GAIN STRUCTURE

- Proper gain settings are facilitated by proper gain labeling, along with center-click detents on the faders, clearly understandable input trim controls and output meters that read channel levels in solo mode. With properly set levels you achieve very high headroom and low noise at the same time

EFFECTS SEND WITH GAIN

- Unusual circuit design that provides two different "zones" that reflect real world use: send from each channel can vary in level from off to unity gain, which is the normal range of effects sends in other mixers. Since you also get another whole zone from the center detent to +15 dB of gain, the channel fader can be pulled down and the effects send can be boosted above unity when more effect is needed.

INTELLIGENT EQ POINTS

- Low frequency EQ is at 80 Hz where it has more depth and less hollow midbass "honk". Midrange is centered at 2.5 KHz, providing for more control of vocal and instrumental harmonics. A specially-shaped HF curve that shelves at 12 KHz creates more sizzle and less aural fatigue.

REAL MIC PREAMPS

- The CR-1604 has genuine studio-grade phantom powered, balanced input mic preamps on channels 1 through 6. All CR-1604 (and XLR10) discrete input mic preamp stages incorporate four conjugate-pair, large-emitter geometry transistors just like the big mixers use. So, when recording nature sound effects to heavy metal or miking flutes or kick drums, you get the quietest, cleanest results possible

BUILT TO LAST

- The CR-1604 is designed for non-stop, 24-hours-a-day professional duty – even for tours that log 100,000 miles in three months. It has sealed rotary potentiometers that are resistant to airborne contamination like dust, smoke, liquids, and even the oxidizing effects of air itself.

Optional Accessories

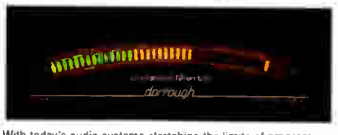
OTTO-1604

Add sophisticated computer controlled automation to your CR-1604. When connected to the MIDI port of your computer (PC, Mac, Amiga or Atari), each one of the 16 input channels can be programmed to change gain or to mute, just as you would program a sequencer. Master levels can be programmed as well, along with all buss channels.

XLR10

While the standard CR-1604 comes with 6 high performance mic inputs, there are times when you need more. Enter the XLR10. This simple-to-install accessory adds 10 more (for a total of 16) mic inputs, with the same quality, performance and features as those in the CR-1604

dorrough



With today's audio systems stretching the limits of program dynamics it's become critical for engineers to obtain maximum loudness with the minimum of distortion components, to fully utilize the dynamic range available. It is of equal importance that they have a method of monitoring and establishing the maximum safe level at which a system can operate.
That's why every Dorrough Audio Level Meter simultaneously shows three dimensions of program material content. Peak, Average Power and Compression are displayed on a color-coded 40-segment LED scale. The meters are easily viewed while providing high precision indications of program energy content.

Loudness Meter Model 40-A

The model 40-A has a scale allowing 14dB of headroom in 1dB steps. A stand-alone unit, it measures 6¾" x 2¼" x 6¼" and has an internal power supply. Model 40-AP has a peak-hold option as well.

Loudness Meter Model 40-B

The Model 40-B provides metering of relative loudness to peak modulation. The 40-B is a scale differentiation of the 40-A and is calibrated in percent (%) modulation, with the lower scale in dB from +3 dB to -3 dB. Model 40-BP has a peak-hold option as well.

BEHRINGER

MDX 1000 Autocom
Automatic Compressor/Limiter

- Incorporates an interactive auto processor for intelligent program detection. With the auto processor, the attack and release times are derived automatically from the respective program material – preventing common adjustment errors.
- The auto processor also allows you to compress the signal heavily and "musically" in dynamic range without any audible "pumping" "breathing" or other side effects.
- Provides both Attack and Release controls allowing for deliberate and variable sound processing.
- Switchable soft knee/hard knee characteristics. Soft knee is the basis of the "inaudible" and "musical" compression of the material. Hard knee is a prerequisite for creative and effective dynamics processing and for limiting signal peaks reliably and precisely.

MDX2000 Composer
Interactive Dynamics Processor

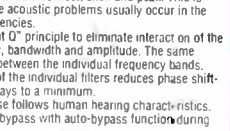
- Powerful and versatile signal processing tool provides 4 most commonly dynamic control sections: fully automatic compressor, manually controlled compressor, expander and peak limiter.
- Innovative IKA (Interactive Knee Adaptation) circuit combines the "musicality" of the "soft knee" function with the precision of the "hard knee" characteristics. Provides subtle and "inaudible" compression of the sound allows creative dynamics processing.
- Auto processor provides fully automatic control of attack and release times. There is also manual control.
- Interactive Ratio Control (IRC) expander eliminates "clatter" on or around the threshold point.
- Interactive Gain Control (IGC) Peak Limiter combines a clipper and program limiter. This allows for "zero" attack, distortion-free limitation of signal peaks.
- IGC is invaluable in live applications. Servobalanced inputs and outputs. Operating level switchable from -10dB to +4dB.

PEQ305 Studio Parametric
The Musical Equalizer

- Five independent, switchable bands. The quality of each band can be modified gradually from notch to broadband characteristics. This offers more flexibility than any graphic equalizer can provide.
- Bands 1 and 5 are switchable between shelf and peak. This is extremely useful, since acoustic problems usually occur in the upper and lower frequencies.
- Utilizes the "Consistent Q" principle to eliminate interaction on of the parametrics frequency, bandwidth and amplitude. The same applies to interaction between the individual frequency bands.
- Parallel arrangement of the individual filters reduces phase shifting and associated delays to a minimum.
- Potentiometer response follows human hearing characteristics.
- Relay-controlled hard bypass with auto-bypass function during power failure

TASCAM

103 Mastering Cassette Deck



Cost effective three head stereo mixdown cassette deck, appropriate for audio and video production facilities. With its three head design you can hear what is actually on the tape as it is recorded. Auto Monitor Function switches from playback to input automatically while in record/pause mode, allowing you to set record levels or match tape levels. Dolby HX PRO circuitry provides extended high frequency performance while keeping distortion and noise to a minimum. Tape type is automatically sensed and adjusted for by the Auto Tape Selection feature.

SENNHEISER

RF CONDENSER MICROPHONES

Unlike traditional condenser mics, the capacitive transducer in Sennheiser condenser mics is part of a tuned RF-discriminator circuit. Its output is a relatively low impedance audio signal which allows further processing by conventional bi-polar low noise solid state circuits. They achieve a balanced floating output without the need for audio transformers, and ensure a fast, distortion-free response to audio transients over an extended frequency range.

MKH 20 P48U3 Omnidirectional

Low distortion push-pull element, transformerless RF condenser, flat frequency response, diffuse/near-field response switch (6 dB boost at 10 KHz), switchable 10 dB pad to prevent overmodulation. Handles 142 dB SPL. High output level. Ideal for concert. Mid-Side (M-S), acoustic strings, brass and wind instrument recording.

MKH 40 P48U3 Cardioid

Highly versatile, low distortion push-pull element, transformerless RF condenser, high output level, transparent response, switchable proximity equalization (-4 dB at 50 Hz) and pre-attenuation of 10 dB to prevent overmodulation. In vocal applications excellent results have been achieved with the use of a pop screen. Recommended for most situations, including digital recording, overdubbing vocals, percussive sound, acoustic guitars, piano, brass and string instruments, Mid-Side (M-S) stereo, and conventional X-Y stereo.

MKH 60 P48U3 Short Shotgun

Short interference tube RF condenser, lightweight metal alloy, transformerless, low noise, symmetrical capsule design, smooth off-axis frequency response, switchable low cut filter (-5 dB at 100 Hz), high frequency boost (+5 dB at 10 KHz) and 10 dB attenuation. Handles extremely high SPL (135 dB), ideal for broadcasting, film, video, sports recording, interviewing in crowded or noisy environments. Excellent for studio voiceovers.

MKH 70 P48U3 Shotgun

Extremely lightweight RF condenser, rugged, long shotgun, low distortion push-pull element, transformerless, low noise, switchable presence (+5 dB at 10 KHz), low cut filter (-5 dB at 50 Hz), and 10 dB preattenuation. Handles 133 dB/SPL with excellent sensitivity and high output level. Ideal for video/film studios, theater, sporting events, and nature recordings.

We are also full stocking dealers of

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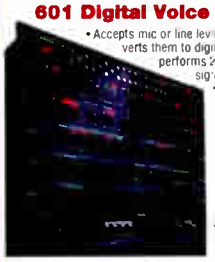
Signal Processing Products

601 Digital Voice Processor



- Accepts mic or line level analog signals, converts them to digital (18 bits) and then performs 24-bit digital domain signal processing.
- Processing includes fully parametric EQ, shelving EQ, notch filtering, dynamic filtering (noise reduction) de-essing, delay, chorusing, gating, expansion, compression, AGC and DC removal.
- Combination of 128 factory presets and 128 non-volatile user programs guarantee predictable and repeatable effects from session to session, performance to performance.
- Has XLR-balanced (analog) monaural mic and line inputs and XLR-balanced stereo output. XLR-balanced and S/PDIF (RCA) inputs and outputs. MIDI input/output supports connection to virtually any type of MIDI control device for programming or controlling the 601 in real time.
- Ideal for a variety of recording, broadcast, live sound, and post production applications.

488 Dyna-Squeeze

8-Channel Compressor/Interface

- Can easily increase average recording levels on your digital or analog tape recorder by 10dB with no side effects.
- Tracks processed by Dyna-Squeeze have presence and increased articulation. Subtle sounds become more up front.
- Many professional mixing consoles have output levels that are much hotter than digital recorder inputs. The 488 matches any console to most any digital recorder.

We are a full stocking dealer for the entire Symetrix line

TASCAM

DA-88 Digital Multi-Track Recorder

The first thing you notice about the eight channel DA-88 is the size of the cassette - it's a small Hi-8mm video cassette. You'll also notice the recording time - up to 120 minutes. These are just two of the advantages of the DA-88's innovative use of 8mm technology.

- The ATF system ensures that there will be no tracking errors or loss of synchronization. The DA-88 doesn't even have (or need) a tracking adjustment. All eight tracks of audio are perfectly synchronized. What's more, this system guarantees perfect tracking and synchronization between all audio tracks on all cascaded decks - whether you have one deck or sixteen (up to 128 tracks!).
- Incoming audio is digitized by the on-board 16-bit D/A at either 44.1 or 48KHz (user selectable). The frequency response is flat from 20Hz to 20KHz while the dynamic range exceeds 92dB. As you would expect from a CD-quality recorder, the wow and flutter is unmeasurable.
- One of the best features of the DA-88 is the ability to execute seamless Punch-ins and Punch-outs. This feature offers programmable digital crossfades, as well as the ability to insert new material accurately into tight spots. You can even delay individual tracks, whether you want to generate special effects or compensate for poor timing. All of this can be performed easily on a deck that is simple and intuitive to use.

FOSTEX RD-8 Multi-Track Recorder

Fostex has long been a leader in synchronization, and the RD-8 redefines that commitment. With its built-in SMPTE / EBU reader/generator, the RD-8 can stripe, read and jam sync time code - even convert to MIDI time code. In a sync environment the RD-8 can be either Master or Slave. In a MIDI environment it will integrate seamlessly into the most complex project studio, allowing you complete transport control from within your MMC (MIDI Machine Control) compatible sequencer.

- Full transport control is available via the unit's industry-standard RS-422 port, providing full control right from your video bay. The RD-8 records at either 44.1 or 48KHz and will perform Pull-Up and Pull-Down functions for film/video transfers. The Track Slip feature helps maintain perfect sound-to-picture sync and the 8-Channel Optical Digital Interface keeps you in the digital domain.
- All of this contributes to the superb sound quality of the RD-8. The audio itself is processed by 16-bit digital-to-analog (D/A's) converters at either 44.1 or 48KHz (user selectable) sampling rates, with 64X oversampling. Playback is accomplished with 18 bit analog-to-digital (A/D's) and 64X oversampling, thus delivering CD-quality audio.
- The S-VHS transport in the RD-8 was selected because of its proven reliability, rugged construction and superb tape handling capabilities. Eight tracks on S-VHS tape allow much wider track widths than is possible on other digital tape recording formats.
- With its LCD and 10-digit display panel, the RD-8 is remarkably easy to control. You can readily access 100 locate points, and cross-fade time is fully controllable in machine to machine editing. Table of Contents data can be recorded on tape. When the next session begins, whether on your RD-8 or another, you just load the set up information from your tape and begin working. Since the RD-8 is fully ADAT compliant, your machine can play tapes made on other compatible machines, and can be controlled by other manufacturers ADAT controllers. Your tapes will also be playable on any other ADAT deck.

Panasonic

SV-3700/SV-4100

Professional DAT Player/Recorders

Panasonic's SV-3700 and SV-4100 are designed for professional applications. They have highly accurate and reliable transport systems with search speeds up to 400 times normal play speed. They also feature advanced, high-quality analog-to-digital (A-D) and digital-to-analog (D-A) converters and input/output circuitry designed to interface with the widest variety of devices.

- When recording via the analog inputs, a front panel switch permits selection of the sampling rate (44.1kHz or 48kHz). When recording through the digital inputs, it automatically clocks to incoming frequencies of 32kHz, 44.1kHz or 48kHz.
- Ramped record mute and unmute with three seconds fade-in and five seconds fade-out provides automatic level changes at the start and end of a recording.
- High speed transport enables searching up to 250x normal speed. High-speed search up to 400x normal speed is possible once the tape has been scanned in Play, Fast-Forward or Reverse mode.
- Built-in shuttle wheel has two variable speed ranges: 3 to 15x normal speed in Play mode and -1/2 to 3x normal speed in Pause mode - an ideal way to find tape locations.
- Comprehensive display includes program numbers, absolute time, program time, remaining time and Table of Contents, which displays total recorded time and total PNO count for commercial prerecorded DAT tapes.
- Has XLR-balanced and unbalanced (phono) digital inputs and outputs. Also has XLR-balanced analog stereo inputs and outputs. Output level is selectable between +4db and -10db. The input level is +4db.

SV-4100 Has All the Features of the SV-3700 PLUS:

Offers enhanced performance required for professional production, broadcast and live-sound systems. Features instant start, external sync capability, additional digital interfaces and exceptional 20-bit audio.

QUICK START WITH TRIM AND REHEARSAL

- With 8MB of memory holding five seconds of audio data, the Quick Start function provides sound almost instantly after a play command is executed. Other DAT recorders lag about .7 second, making them unsuitable for professional applications.
- Easily adjust the Quick Start position and specify it by A-Time, Start ID or PNO. Recording via Quick Start is also possible, allowing two SV-4100s to be used for frame-accurate punch-in/punch-out and assemble editing.
- You can adjust the Quick Start position with 1-Frame resolution over a range of ±50 frames.
- Without playing the tape, you can monitor the level of stored data to check your Quick Start position. This preview capability is handy before actual editing or on-air play. Repeated play is also possible, using about 1.5 seconds of the data to create a kind of sampler effect.

FRAME ACCURATE INDEXING AND EDITING

- Using the trim and rehearsal functions, you can accurately determine points to write, start and skip IDs. These IDs can be written, rewritten or erased at any point in the recording and automatically renumbered.
- With two SV-4100s connected via the 8-pin parallel remote terminal, synchronized frame-accurate editing can be performed. Continuity of edit points can be checked by rehearsal playback. By entering and editing end position in one of the Locate buttons, you can determine a punch-out point as well.

FLEXIBLE SEARCH

- Easily and accurately access your A-Time. You can specify hour, minute, second and frame.
- In most modes, the currently displayed A-Time can be assigned to one of the Locate buttons. Then from Stop, Pause or Play you can rapidly cue to any of these four addresses by pressing its Locate key. In addition, Locate Last takes you to the most recent Quick Start A-Time position.
- Search is also possible by Start ID or program number.

5-MODE EXTERNAL SYNC

External sync is essential for applications such as video post-production and stereo submix recording. It assures uniformity of timing between different equipment so the audio data consistently matches up with the target media. Select from 3 video external sync modes (25, 29.97 and 30 frames per second) or use the word sync or Digital Data modes (which lock to the input sampling frequency).

MULTIPLE DIGITAL INTERFACES

- Has XLR-balanced digital input and output plus unbalanced digital coaxial and optical inputs and outputs. Analog inputs/outputs are XLR-balanced and output level is switchable between +4dB and -14dB, providing compatibility with other equipment.

3-WAY REMOTE CONTROL

- GPI input allows simple triggering of Quick-Start Play. 8-pin parallel remote terminal connects to another DAT deck, computer or wired remote. Includes wireless remote control.

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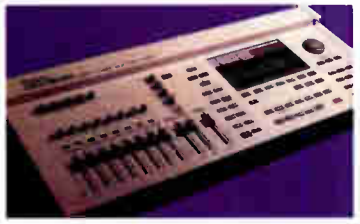

The DM-800 is a compact, stand-alone multi-track disk recorder that provides an amazing array of features at an unbelievably low price. Whether for music production, post production or broadcast, the DM-800 will make your work simpler, faster, more productive and more profitable. A full function workstation, the DM-800 performs all digital mixing operations from audio recording, to editing, to track-bouncing, to final mixdown. It fully supports SMPTE and MIDI time codes and also features a built-in Sample Rate Resolver to synchronously lock to any time code.

TASCAM

DA-P1

Portable DAT Recorder

- With rotary two head design and two direct drive motors the DA-P1 offers one of the best transport in its class.
- XLR-balanced mic/line inputs (with phantom power) accept a broad range of signal levels from -60dB to +4dB.
- Analog line inputs and outputs (unbalanced) plus S/PDIF (RCA) digital inputs and outputs enables direct digital transfers.
- Uses next generation A/D and D/A converters for amazing quality.
- Supports multiple sample rates (48, 44.1 and 32 kHz) and SCMS-free recording.
- Included in its design is a MIC limiter and 20dB pad to achieve the best possible sound without outside disturbances.
- To monitor your sound there is a TRS jack and level control for use with any headphones.
- Built tough, the DA-P1 is housed in a solid, well-constructed hard case. It includes a shoulder belt, AC adapter and one battery.

SONY

TCD-D7

DAT Walkman Player/Recorder

- Long Play (LP) mode allows up to 4 hours of record/playback of 12-bit audio on a single DAT cassette.
- Equipped with digital coaxial and optical input connector. Maintains the highest signal purity for recording and playback of digital sources with all information retained in the digital domain.
- Also has analog Mic and Line inputs for recording from analog sources without external adapters.
- High-speed Automatic Music Sensor (AMS) search function finds and plays tracks, skips forward or back up to 99 tracks, all at 100x normal speed.
- Has a Digital Volume Limiter System (DVLS) that increases listening comfort and sound quality by automatically adjusting for sudden level changes of the recording. It also helps prevent sound leaks through headphones.
- Two-speed cue-review lets you hear sound while player is in fast-wind modes, up to 3x or 25x normal speed.
- Compact and portable, it has an anti-shock mechanism that permits accurate recording and playback even while in motion.
- LCD display with backlit windows clearly shows recording level, track number, operating status and 4-segment battery indicator, even in low ambient light conditions.
- Optional RM-D3K System Adapter Kit for complete digital interface. The kit is equipped with the input/output connectors for both the optical cable and the coaxial cable. Therefore you can use it as a relay between the TCD-D7 and other digital equip-

TCD-D10 PRO II

Portable DAT Recorder

- Has balanced XLR input, switchable microphone (-60dB) or line (+4dB) inputs. A 12-pin digital connector provides interfacing with AES/EBU digital signals of 32.0, 44.1, or 48.0 KHz sampling rate. This means that compatibility with other digital systems is assured. It also provides the convenience of digital dubbing and editing without any degradation.
- Equipped with a comprehensive self-diagnostics function that constantly monitors the rotation of the head drum, capstan and reels. The tape transport mode and load/unload time are continuously checked as well. Upon detection of trouble, the tape is brought to a forced stop and unloaded automatically to protect the tape and the recorder.
- Up to 99 start IDs can be recorded in the subcode area. When the record button is pressed, the start ID is recorded automatically for 9 seconds. During recording, it can also be added manually to any position of the tape. Search for these start IDs is performed in two modes at 100 times normal speed.
- Offers a maximum spooling time of 140 x normal speed. A two hour tape can be rewound or fast forwarded in under a minute.
- 20-segment digital peak level meters include overload indicators. Closely tracks input signal for accurate level indications.
- During playback, the date and time of recording is displayed.
- Has a 5-segment battery indicator. The last segment blinks on and off, notifying you to change batteries.
- To eliminate distortion caused by unexpected peaks, the TCD-D10 PRO II incorporates a record-level limiter with a fast attack time of 300ms. The microphone attenuator prevents distortion by suppressing the signal level 20 dB.
- Immediate playback is possible through a built-in speaker.
- A wired remote controller is supplied to control the record, play, stop, and pause functions of the recorder. The top end of the controller is designed to accept a microphone holder. Two microphone stand screw adapters are also supplied.
- The supplied NP-22H rechargeable battery pack provides 1.5 hours of continuous operation. The optional NPA-D10 battery adapter enables 1 hour of continuous operation on AA-size batteries. With the use of the supplied AC-88 AC power adapter, it can also be operated on 100-240 VAC, 50–60 Hz.

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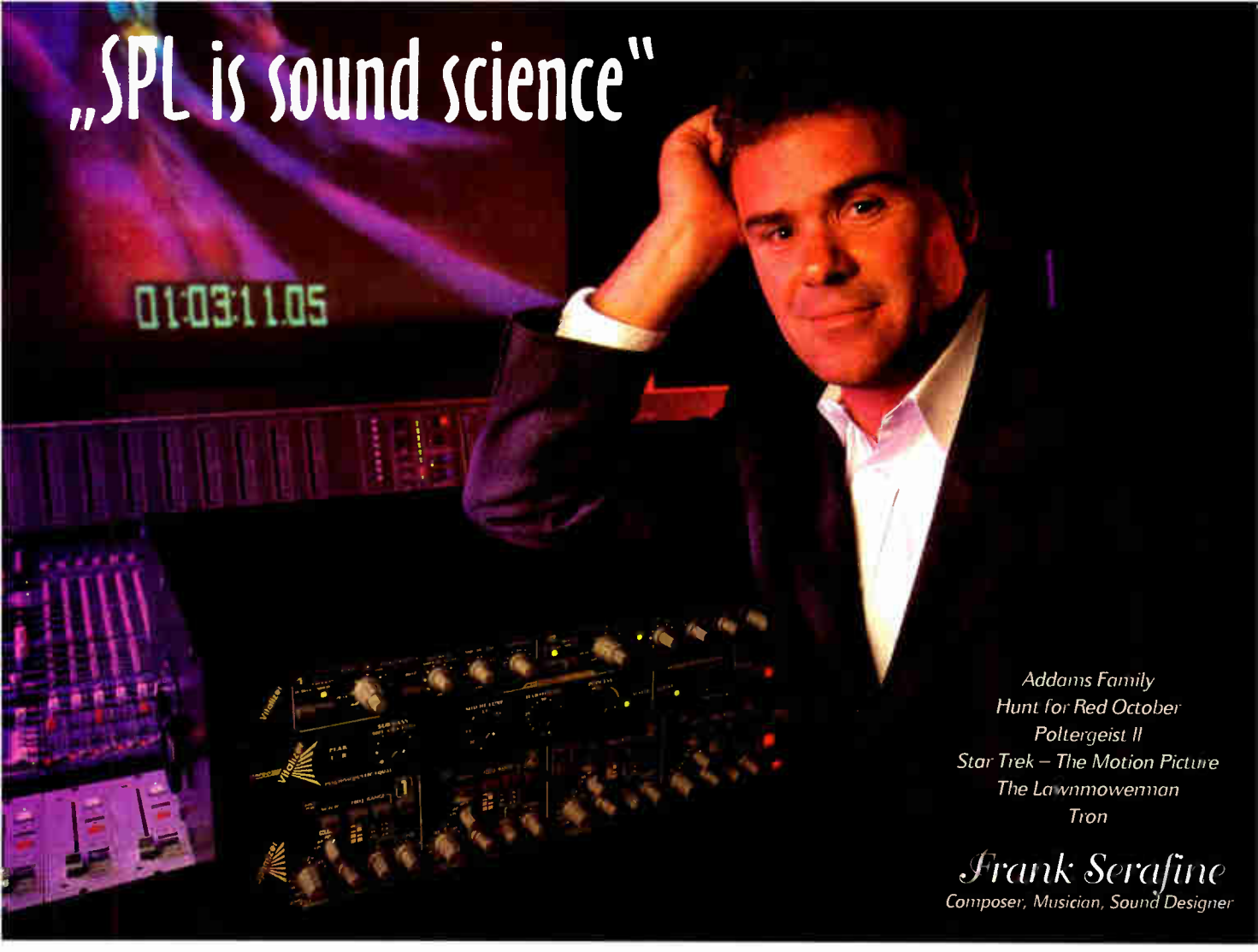

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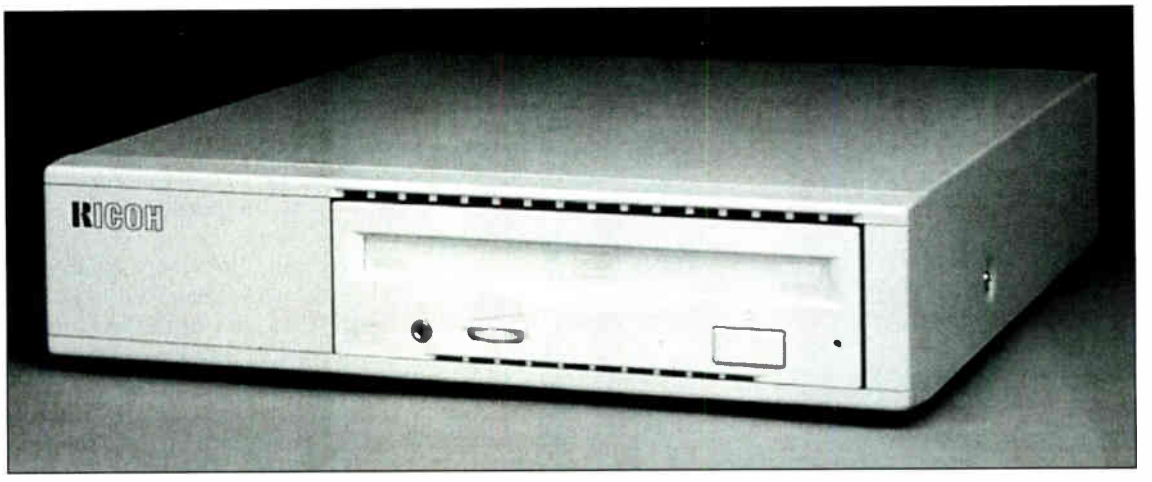
by George Petersen

RICOH RS-1060C CD RECORDER

CD-recorder drives have been around for several years, in stand-alone audio recorder form, as well as peripherals for computer systems. The prices of both CD-R writers and blank CD-R media have plummeted over the past 12 months, making this an excellent time to add one of these useful devices to your studio toolkit. I decided to investigate the Ricoh RS-1060C, which, at a list price of $1,295, is one of the least-expensive drives on the market. Would this unit be suitable for serious audio applications? I had to find out.



Housed in a compact 10x11x2-inch enclosure, the RS-1060C contains a Ricoh-built, double-speed CD recorder/player with a 512K data buffer. Bundled with the drive are six pieces of Ricoh CD-R media and a Windows version of Incat Systems CD Workshop, along with Mac and Windows versions of CD-Print software. The latter is Ricoh's proprietary software for writing CD-Audio or CD-ROM discs. You supply your own hard disk, SCSI cable and Macintosh, DOS/Windows or UNIX computer.

I tested the system using a Mac Quadra 650 with a 270MB internal drive, a 2GB external hard disk and 24 MB of RAM. All of the audio tracks were prepared using Digidesign's AudioMedia II card running Sound Designer software.

Setup was uneventful. The CD-Print software installs easily (and even runs on a system with only 8 MB of RAM). I used a standard 50-pin Centronics SCSI cable to put the drive at the end of my SCSI chain, using an active terminator. The RS-1060C has a row of five DIP switches on the back panel, and one of them provides internal termination, but somehow I always feel more secure seeing that glowing LED on an active terminator. The manual explains that three of the DIPs are reserved for future use, while the fourth DIP switch sets the drive into Mac mode to "settle the specification regarding UNIT ATTENTION," whatever that means. I later made a call to a friendly rep at Ricoh, who explained that setting the Mac switch was only important when using the drives with pre-SCSI II computers.

By now I was ready to make a disc. The CD-Print software uses a

straightforward "drag and drop" interface for creating song playlists; however, Version 1.1.1 of CD-Print doesn't recognize Sound Designer II files. So before cutting an audio CD, I had to save all the files in AIFF format. CD-Print has a few other limitations: mixed-mode discs are not supported, and the timing between audio tracks is preset at two seconds—if you desire a longer pause, you'll have to add silence to the end of the previous track. According to Ricoh, the forthcoming Version 2.0 CD-Print software will add support for SDII files and add the ability to create mixed-mode discs; unfortunately, there was no definite word on when 2.0 will debut.

In the meantime, Digidesign has added support for the Ricoh RS-1060C in Version 1.2 of its MasterList CD software ($995), which provides all the nuances and goodies that serious CD premastering applications require, including extensive PQ editing, subcode and subindex point writing, user-definable track pauses, onscreen peak-hold metering, audio peak search and separate attenuation control of the left and right channels on each track. Both CD-Print and MasterList CD can make high-quality CDs using the RS-1060C; however, the depth of control makes MasterList the choice for working pros.

Back to the process of making a disc. I first tried to make a CD of an album I had just completed for Russian release. The CD-Print software checks all functions before cutting a disc, and each time I tried to make a disc, I got a curious error message:

9/28/95 11:07 PM: AIFF file conversion requirements exceed temporary buffer size for AudioStore:Russian Album:B-4-Working Girl.aiff.

The CD-Print manual was no help. The section on cutting audio CDs is only four pages long and offerred no clues. As this occurred during a late session, calling Ricoh wasn't an option, so I surmised from the word "buffer" that the RAM allocation was inadequate. I changed the RAM allotment to 16 MB and got a similar response. "AudioStore" is the name of the hard disk; "Russian Album" is the Folder name; and the name of the track is B-4-Working Girl.aiff (the fourth song on the "B"

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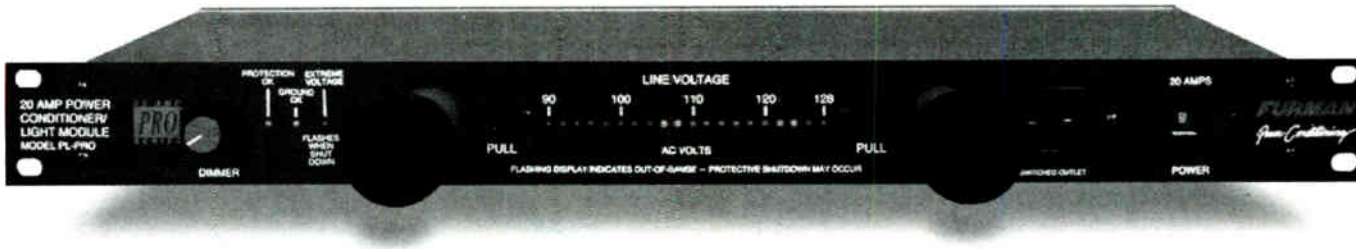

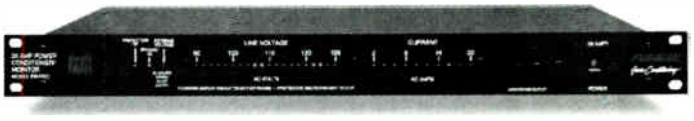

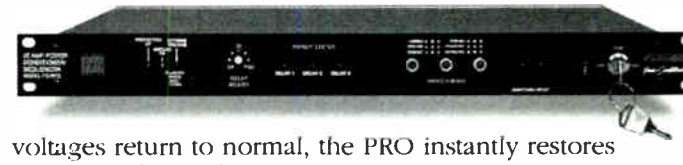

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There's a new Furman PRO for every need: The PL-PRO (top) features an AC voltmeter with flashing alerts for marginally high or low voltages, and new precision-machined, dimmer-controlled rack lights that automatically switch off when either light tube is pushed in. The PM-PRO (left) is for applications where lights aren't needed — it adds an RMS-reading AC ammeter along with the voltmeter. The PS-PRO (right) applies and removes power from its outlet groups in a variable timed sequence, and alerts you to wiring faults with neon indicators.

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side is a jazz-rock tune entitled "Working Girl.") This particular track is eight minutes (78 MB) long, while the rest of the songs on the album are four-minute pop tunes. I assumed that the drive (or software) couldn't handle long files, but I later noticed a line in the Setup Preferences screen that asks you to specify a drive for placing temporary files. It defaulted to my internal drive (which only had 55 MB of free space); once I changed the default to my 2GB external drive, everything ran fine.

Although the RS-1060C is a double-speed writer, that figure only applies to the actual time of writing to discs; other time requirements—such as AIFF-to-Red Book format conversion and the "fix-up" time to write a final TOC on the disc—can make the process somewhat longer than 2x. However, this is true of any CD-R drive.

Over a period of weeks, I tried the drive with a variety of media, including those from Ricoh, MTC, TDK, Kodak and HHb, with excellent results. A Ricoh rep I spoke to reported that the RS-1060C had problems with Taiyo Yuden discs. Taiyo Yuden is the OEM supplier of CD-R blanks to Sony, BASF, Maxell, Philips, Plasmon and other companies, and though I have used these discs on other CD recorders without problems, I took Ricoh's advice and avoided these when using the RS-1060C.

The CD-Print software also supports writing CD-ROM files, which is ideal for doing computer backups or for archiving or transporting large files (particularly audio or graphics files) in a convenient, universal format. The RS-1060C allows writing files to disc in several sessions or in a single pass. Both worked fine; however, when creating masters for mass-CD replication, the disc must be written in a single pass to ensure continuity of the subcode information.

At a retail list price of $1,295 (street prices are even lower), the Ricoh RS-1060C CD recorder is an excellent addition to the studio or post-production or broadcast facility. The unit is easy to use and flexible enough to handle multiple chores.

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MIX

by Gregory A. DeTogne

SOUNDCHECK

System designer Kit Bond with Rockette friends

ROCKETTES IN VEGAS: THE GREAT RADIO CITY MUSIC HALL SPECTACULAR AT THE FLAMINGO HILTON

The Great Radio City Music Hall Spectacular—part of a $130-million expansion at the Flamingo Hilton—opened in early February. The stars of the show are The Radio City Rockettes; the 24 high-steppers are led through two showings of song-and-dance pageantry, six nights a week, by Susan Anton. The production marks the first time that the classic numbers produced for New York City's legendary Radio City Music Hall can be seen regularly in Las Vegas.

Christopher 'Kit' Bond recently moved to Vegas to become the show's senior production manager. He also plays an instrumental role in maintaining the Flamingo Hilton's state-of-the-art, digitally processed sound system, which he designed expressly for the show. His current gig at the Flamingo Hilton began after The Great Radio City Music Hall Spectacular completed 15 months on the road. "When it comes right down to it, I didn't have a choice in the matter, as I've been working with this company for a number of years. The job was mine if I wanted it, and I was happy to step up to the plate."

The previous musical variety show in the room, "City Lights," had a permanent ice rink in the stage floor that was used for a skating sequence. The sound system consisted of a motley collection of outdated gear, including hand-me-downs from Steve Rypka at the Las Vegas Hilton on the other side of town. When Bond first walked into the showroom, he found a dinner theater capable of seating 750 people. All of the walls were covered with a heavy fabric that eagerly absorbed sound.

Bond sat through a show. "While central-cluster designs certainly have a function and purpose, this one was creating problems because, although the audience was seated at roughly the same level as the performers onstage, the sound was coming from high above. The central cluster was drawing the audience's attention up to the ceiling all night instead of toward the action onstage."

Because the action takes place down low and close to the stage, The Radio City Spectacular needed a design that would bring the sound up-front and down-to-earth. "What I really wanted to create from the beginning was a wall of sound with high articula-

—CONTINUED ON PAGE 163

Michael Martin, FOH engineer, and the Yamaha house deck. Outboard racks are in the background.

PHOTOS: CHERYL PENDLETON

TOUR PROFILE

Santana & Jeff Beck

by Chris Michie

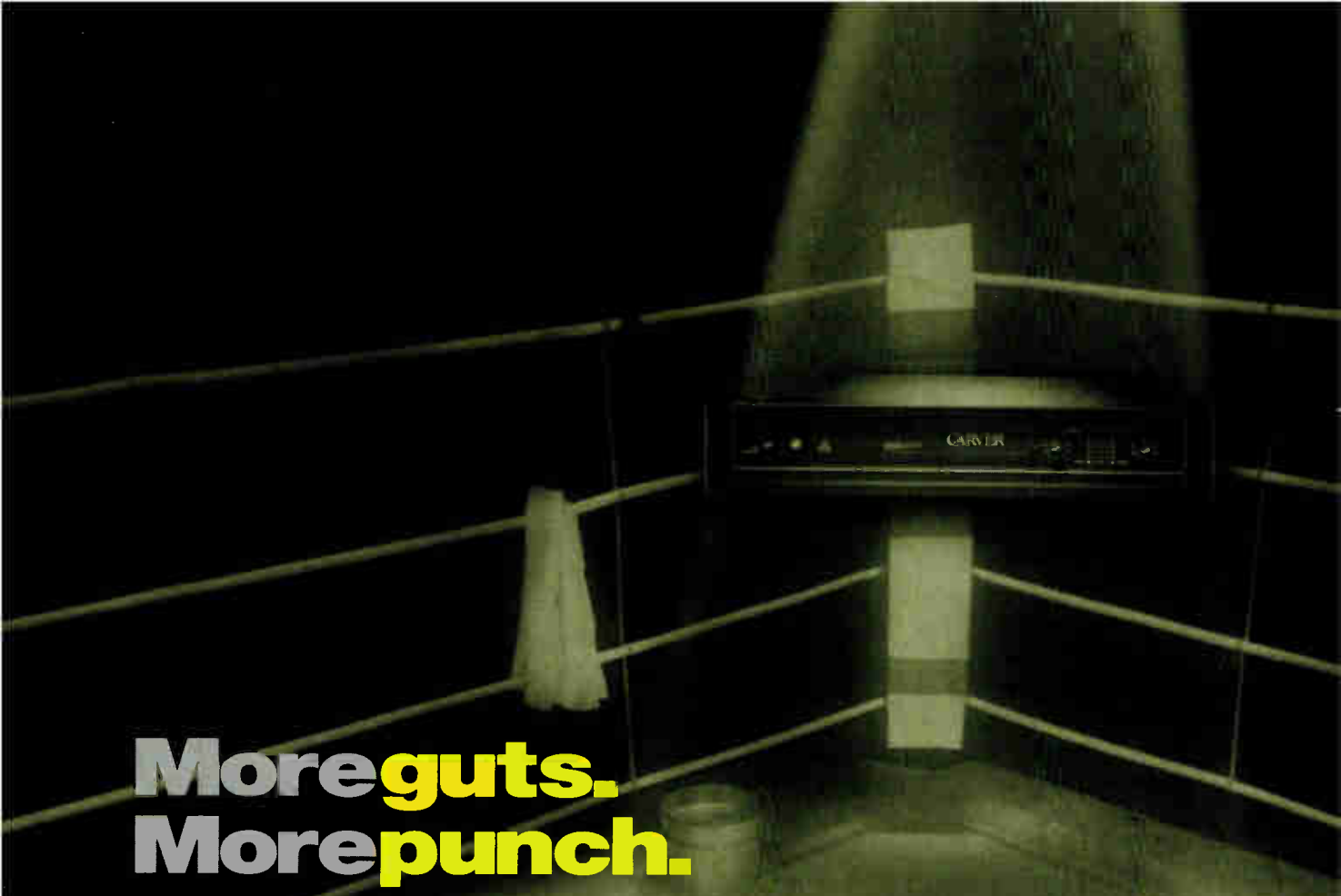
In the early days of touring, the package tour offered promoters a varied bill designed to appeal to a wide audience. With the artists traveling by bus and using house sound and lighting systems, the packages were relatively cheap to stage, and the format remained popular with managers and promoters until the late '60s. But by the early '70s, most major acts had enough commercial clout to tour under their own names and often selected support acts based on factors unrelated to their ability to sell extra tickets. Some acts, unable to find musically complementary support or unwilling to compromise their increasingly elaborate stage productions, did without opening acts altogether.

Though some of the artists who became popular in the '60s and '70s can still sell out stadiums, the list of such acts today is short. With the business now "soft," if not actually in a slump, promoters and artists have been forced to devise new marketing approaches, and one result is the revival of the package tour, albeit in a streamlined form. At the suggestion of Santana's management, Santana and Jeff Beck teamed up this summer to tour the shed circuit, dividing billing and production expenses equally.

According to production manager Rick Fantl, the three-month tour has been an unqualified commercial success, and the two shows I saw in the Bay Area in mid-September, at the 8,500-capacity Concord Pavilion and the 20,000-capacity Shoreline Amphitheater in Mountain View, were both sell-outs.

(L to R) Lou Barrere (Santana monitor mixer), Bruce Jones (Santana FOH mixer), Bill Sheppell (Jeff Beck monitor mixer), Chris Hill (Jeff Beck FOH mixer)

PHOTOS: STEVE JENNINGS



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When I met Santana FOH mixer Bruce Jones at Concord, he was busy positioning mics on the drum kit. He immediately showed me an as-yet-unreleased Shure Beta kick drum microphone that he had been using since late August. Jones praised the new model's sound, although he chose to back the mic off from Shure's recommended placement position, which is six inches from the beater. Shure also had made available some other prototype Betas, which Jones described as similar in appearance and sound to the current Beta 57 but warmer than both it and the old 57. He was using the new Beta on snare, in conjunction with what he termed "the condenser *du jour*," in this case an AKG 414, positioned between hi-hat and snare. AKG 414s were also in use as overheads, and the rest of the three-man Santana percussion department was miked with Electro-Voice N/D 408s and Shure Beta 57s. Individual conga mics were clamped to their instruments with LP Claw mounts, ensuring consistent coverage. Vocal mics for lead singer Tony Lindsay, Carlos and three other bandmembers were Shure Beta 58s.

The other half of the Santana sound crew was monitor mixer Lou Barrere, a veteran of such "hot seat" monitor gigs as the Engelbert Humperdinck and Julio Iglesias shows. Mixing through a Ramsa S840 monitor console, Barrere distributed mixes to either Showco BFM 600 or SRM wedge monitors. (SRM stands for Stage Reference Monitor; BFM is apparently an acronym for a more colorful designation.) Though the SRM contains a 12-inch driver and the BFM a 15-inch, Barrere preferred the low-end sound of the smaller cabinet and tended to use the larger units to placate musicians he suspected of being impressed by size. The three-way BFMs (a 15-inch and a 2-inch driver, plus two tweeters) were driven with Crown Macrotech 1200 amplifiers; the 12-inch/2-inch SRMs were powered with Crown 3612 amps. Barrere has been known to run sidefill mixes through Showco "Frog boxes," rectangular cabinets loaded with two 12-inch woofers, a 2-inch midrange and tweeters, but at Concord these were considered unnecessary or unsightly. (The thrust stage, soon to be removed, means that any onstage P.A. obscures sight lines.)

Out front, Jones mixed on a Harrison HM-5 with extender panel, and he used all 52 inputs. Twenty-four were dedicated to drums and percussion, seven to keyboards and bass, six to vocals and four to effects returns. Of the nine mic channels used for Carlos' guitar inputs, one was for an acoustic, one was a clean direct line, and one was a miked Fender Twin used for guitar effects. Four mics were aimed at the 12-inch and 15-inch speakers of two Fat Boy amplifiers, and the remaining two mics monitored a Boogie. Jones explained that he used the multiple inputs to create a wide stereo image, though at Concord it was impossible to judge the effectiveness of this approach, because the output of the Harrison was fed direct to the mono JBL house and lawn systems, while the Showco Prism™ system stayed in the truck.

Jones' effects rack contains an Eventide H3000, two Yamaha SPX 900s and two SPX90s, a Lexicon 224, and various gates and limiters, which he had patched across kick, snare and timbales (gates), and keyboards and bass (limiters). Also in the rack was a small Mackie mixer feeding cassette and DAT recorders. Apparently, Santana insists that every show and soundcheck is recorded, and he subsequently listens to every tape, either to monitor performances and mixes or to recall successful improvisations. Jones' recording system used various auxiliary bus outputs from the Harrison to feed the Mackie. Using the last two open channels on the Harrison, he also added ambience from a pair of CK8 shotgun microphones positioned either side of the stage and pointed at the audience. Jones explained that

by placing the audience mics physically in line with the instruments rather than in the audience, he eliminated the need for time-correction delay.

Chris Hill, Jeff Beck's FOH mixer, has been working with the artist for two decades, since the glory days of power trio Beck, Bogert & Appice. This time out, Hill opted for a Yamaha PM4000, which, as he pointed out, is more commonly available in Europe than the Harrison. A staggering 26 inputs on the PM4000 were devoted entirely to drum futurist Terry Bozzio's monstrous kit, an all-black assembly of no less than 12 tom-toms, four kick drums, four hi-hats(!), and innumerable cymbals. Bozzio endorses AKG, and his kit was miked entirely with that company's products: D112s mounted inside the double-headed bass drums; 408 for snare; 451s for hi-hats; 409s on toms; and 414s for overheads. The 409s, which feature a six-inch gooseneck between the mic capsule and mounting clip, provided an eminently practical solution to the problem of close-miking such an extraordinary and crowded kit.

Bassist Pino Palladino was assigned three channels, and keyboardist Tony Hymas fed Hill a stereo mix of his MIDI'd keyboard rig, an arrangement that Hill found less than ideal but coped with by strapping limiters across the pair. Beck's main amp, a Marshall, was miked with an AKG 409 and a Shure Beta 58. Beck also briefly used a Fender Princeton for the opening bars of "People Get Ready." The remaining open channels under Hill's right hand were used for effects returns, most of them different delays for Beck's guitar. In addition to two TC2290s, two Lexicon PCM80s, a Yamaha SPX900 and an Alesis MidiVerb, Hill's effects rack contained 10 dual-channel Drawmer gates, which he had patched across 20 channels of drum inputs. Hill also made use of the Lexicon 224 in Jones' rack and ran the output of the PM4000 through the Harrison HM-5 to the Showco Prism system inputs; otherwise, the two FOH and monitor systems were entirely separate.

Onstage, monitor mixer Bill Sheppell used a Harrison SM-5 to create in-ear mixes for Beck, who has opted for Future Sonics in-ear monitors rather than risk further damage to his hearing. Bozzio has also heard the hearing damage wake-up call and appeared onstage wearing earplugs and with only moderate amounts of guitar in his wedge monitor mix. Palladino and Hymas apparently found the in-ear monitors' isolation and lack of visceral oomph unsatisfying and reverted to the wedge option in rehearsals. Sheppell uses various effects on guitar for Beck's in-ear mix, though as Hill says, many of the strange sounds the guitarist creates are entirely the product of his fingers and the whammy bar on his custom Stratocaster.

The Concord show was enjoyable enough as spectacle and sounded no worse than many of the shows I've heard there, but both FOH mixers were unhappy without their usual P.A. system and could do little to overcome the justly controversial acoustic character of the covered-shed design. I therefore hied myself to the Shoreline show the following day, where Showco system technicians Randy Wille and Monty Curry had set up the full Prism system. Four rows of five trapezoidal Prism cabinets were hung from metal "bumpers," forming a quarter-cylinder array either side of the stage. Just under each array, stacked six abreast on five-foot risers, were the sub-bass cabinets. This "off the floor" sub-bass arrangement was at the request of Jones, who has found that the front portion of the permanent seating section at Shoreline acts as a bass trap, leading unwary FOH mixers to pulverize the front section with bass in an attempt to get a balanced sound at the mix position.

Reversing the playing order from the previous night's show, Beck opened the Shoreline con-

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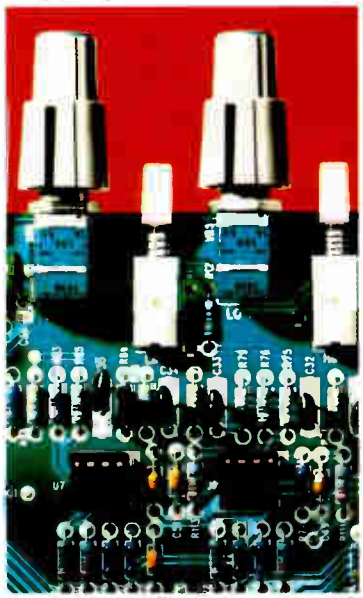

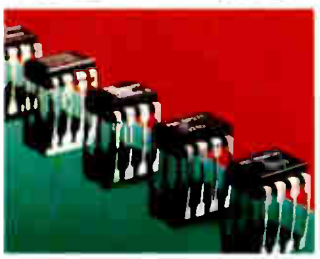

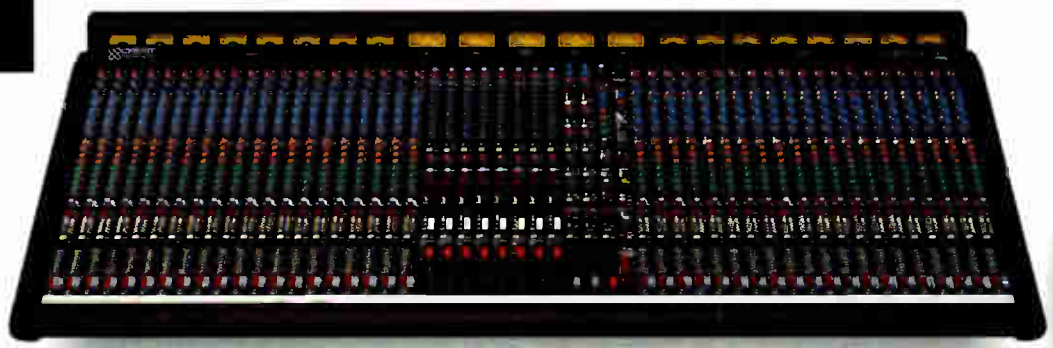

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cert in daylight. Hill treated the seated portion of the audience to a loud and present mix that consistently measured 110dB SPL (C weighted) at the mix position, which is situated halfway back in the permanent seating section. Despite Jones' raised sub-bass solution, Palladino's contribution remained somewhat indistinct, and Hymas' keyboard mixes seemed a little unrefined, though Hill made good use of the stereo P.A. for various delay effects. Tirelessly athletic, Beck and Bozzio showed off enough chops to fuel a college curriculum as the band ran through a baker's dozen of Beck's more recognizable tunes. At Concord, Beck had played two encores, finishing an aggressive version of "Going Down" by tearing the strings from his guitar, but at Shoreline, he ended his set with one encore, "People Get Ready." Beck's vocal mic got its only workout of the day as the guitarist mumbled his band members' names before leaving the stage and returning to the backstage compound, where a lineup of hotrods and a restored woody had joined the obligatory stretch limos to brighten the rather utilitarian surroundings.

Santana's portion of the show opened with Carlos appearing in a colorful full-length robe, but this soon disappeared as the band warmed to their task. Jones took full advantage of the Prism system to deliver a dynamic and detailed mix as the band interspersed old favorites with new, including a version of Bob Marley's "Exodus." Coverage of the seated audience was more than adequate, though the side walls of Shoreline tend to create a web of hot spots and nulls. On checking the sound at the back of the lawn, I was surprised to find the SPLs considerably lower than at comparable positions at Concord. As far as I know, Shoreline has a delayed lawn system available, but I could not tell if it was on, or on at such low levels as to be redundant. The lawn audience, many of whom appeared to have serious party agendas, seemed happy enough, but I communicated my findings to production manager Fantl and Showco's Randy Wille. As we go to press, I have been unable to discover the status of the lawn system on that night, but since the Concord Pavilion is undergoing a complete renovation and expansion this winter, I promise to return to the topic of shed acoustics and delay systems in the future. ■

Chris Michie is the technical editor of Mix.

—FROM PAGE 156, ROCKETTES

tion," Bond explains. "But I had to be very careful, because I didn't want the sound to have overly distinct left and right channels, or be right in the audience's face."

The show room closed on New Year's Day, with only 25 days to complete renovation of the room and installation of the new sound system. Columbus-based Stage Tech was brought in to handle the installation. "When we arrived, the room was in the early stages of demolition," Stage Tech's Dave Mead relates. "While the audience area was being renovated, the stage and its ice deck were being ripped out." Stage Tech unraveled the mysteries of the previous system's undocumented wiring scheme, while 60 other people were installing a new electrical system, putting up wallpaper, laying carpet and constructing the new stage. "The original system's wiring was in good condition," Mead says. "There were 160 mic lines to the front-of-house position, and over 60 drive and communication lines from front-of-house to the amplifier room on the third floor." New wiring and conduit was required, as the intercom and wireless racks were moved from the amplifier room to the stage manager's position.

Kit Bond's wall-of-sound theory was put into practice with speaker arrays from Community. Centrally located in the design, and serving as the point of origin

—CONTINUED ON PAGE 187

New Sound Reinforcement Products

TELEX PRO STAR WIRELESS
The Pro Star™ Series 2 wireless systems for instruments and microphones from Telex Communications Inc. (Minneapolis, MN) include Posi-Squelch™ auto suppression squelch circuitry that discriminates between useful audio and annoying RF. The new system also features Telex's Posi-Phase™ diversity system that uses both antennae to deliver a 3dB-stronger signal, and is now available in a rackmount configuration.
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KLIPSCH KP-3002-C LOUDSPEAKER
Klipsch Professional (Hope, AR) announces the KP-3002-C two-way vented loudspeaker system. Featuring a 15-inch woofer and a 2-inch compression driver on a 60° by 40° horn in a trapezoidal carpeted cabinet, the KP-3002-C includes the KLiP™ HF protection circuit and fuse protection for both LF and HF components, and carries a limited five-year warranty.
Circle 213 on Reader Service Card

SPIRIT LIVE 4 MARK II
Spirit Corporation (Sandy, UT) has introduced a second generation of its Live 4 FOH and recording console. Available in five frame sizes—12, 16, 24, 32, and 40 mic inputs—the Spirit Live 4 Mark II also features four stereo inputs and four stereo effects returns, plus a 10x2 A/B matrix output derived from the four subgroups and four mute groups. Input strips include 4-band EQ, six aux sends and -10dBV outputs for recording. New features include phase reverse and 66 dB of input gain range, enabling the input to accept low-level mic inputs and line-level signals without a pad.
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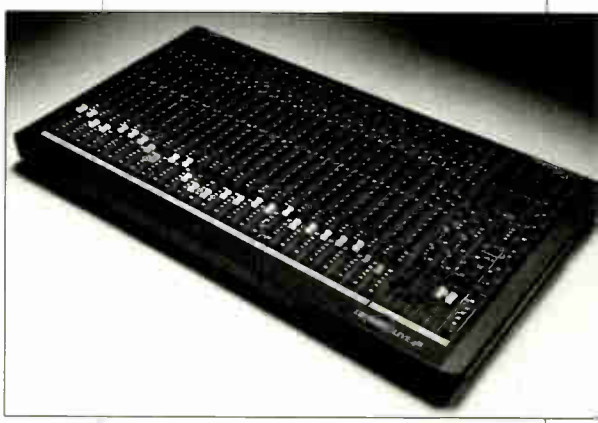

NADY IN THE EAR MONITORS
Nady Systems (Emeryville, CA) introduces two new VHF and UHF wireless stereo ear monitoring systems. Designed for live sound, theater, and film and video applications, the SEM-6000 VHF and SEM-7000 UHF offer two independent stereo broadcasting channels. The SEM-7000 offers four switchable UHF frequencies and will support any number of SEM-R7 4-channel UHF wireless bodypack stereo receivers. Similarly, the SEM-6000 VHF system supports any number of 2-channel SEM-6R VHF receivers. Effective operating range is claimed to be at least 250 feet and up to 1,000 feet line-of-sight.
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CORRECTION: FURMAN POWER CONDITIONERS
A description of the Furman Pro Series power conditioners in the September *Mix* erroneously referred to them as signal processors. Also, the PM-PRO power conditioner/monitor is designed for applications where pull-out rack lights are not needed, not the reverse, as stated in the description. We regret any confusion this may have caused.

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BY BLAIR JACKSON

RECORDING NOTES

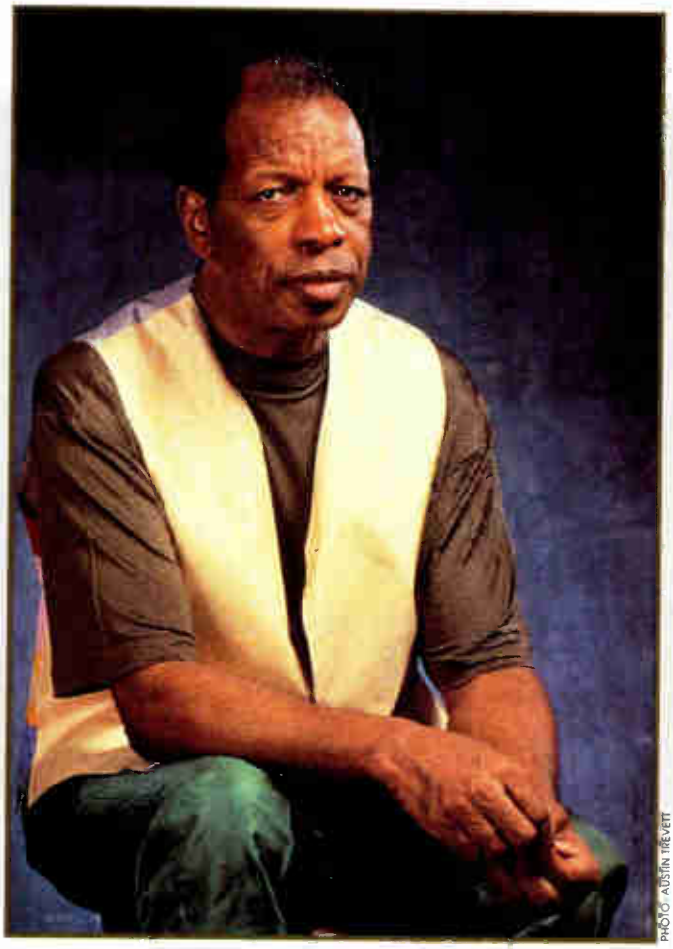

PHOTO: AUSTIN TREVETT

The Harmolodic World of Ornette Coleman

by Blair Jackson

At the age of 65, Ornette Coleman's energy and vision remain undiminished. A pioneer of "free jazz" more than 30 years ago, Ornette continues to carve a singular path through 20th-century music—flirting with jazz, rock and various world music forms at the same time he creates a new, virtually undefinable form he calls "harmolodics." In Ornette's world, rhythm, melody and harmony are given equal weight, and the players in his bands are encouraged to blaze completely independent trails simultaneously, often not even united by key or time signature considerations. It's tough to write about coherently, and it's not exactly an easy listen, either. This is dense and challenging music, but it is also suprisingly tuneful and unquestionably full of spirit, and the careful listener is rewarded for embarking on Ornette's sonic adventures. Ornette has made a handful of records with his group Prime Time—*In All Languages* and *Virgin Beauty* are the best known. But his new disc, *Tone Dialing* (on his own Verve Records subsidiary, Harmolodic), may be the strongest—and the most conventionally accessible, while still being "out"—of the bunch.

The 16 instrumental pieces on *Tone Dialing* cover an amazing range of moods and styles, from polyrhythmic, pan-cultural romps like "Guadalupe," "Street Life" and "Miguel's Fortune," to the compelling ballad "If I Knew As Much About You (As You Know About Me)" (which features at least four different tempos going at once), the poetic, rap-inspired "Search for Life," the joyous, highly textured "Badal" and the title track, which features some of the wildest, but most precise, dissonant playing you're likely to hear. It's quite a stew, steeped in the rich flavors of this unique octet: Ornette on saxophones, and some violin and trumpet; Badal Roy on tablas and other percussion; Ornette's son Denardo (who also produced the disc) on trap drums and electronic percussion; guitarists Ken Wes-

—CONTINUED ON PAGE 171

Engineer Greg Mann

Brian Wilson and Van Dyke Parks

"ART" HISTORY

by Adam Beyda

Toward the end of the 1960s, Brian Wilson and Van Dyke Parks were hard at work on a new Beach Boys album, tentatively titled *Smile*. As bootlegged session tapes and existing fragments reveal, *Smile* was a would-be epochal sensation, a work that was set to drastically reinvent American popular music with astounding feats of imagination and boundless musical invention. But as the artists met with resistance, the work foundered, until finally, under circumstances of personal distress, Wilson abandoned the project, leaving it to *Sgt. Pepper's* to blow the minds of a generation and relegating the golden era of the Beach Boys to a premature end.

Thirty years and a world later, Wilson and Parks are back with a juicy slice of Americana, the newly released *Orange Crate Art*. The flavor this time is quite different from *Smile*, evoking not burgeoning psychedelia but rather the pre-rock 'n' roll era of pop. Parks' lovely melodies and beautiful arrangements join with Wilson's poignant, athletic voice (singing five-part harmonies reminiscent of original Beach Boys inspiration the Four Freshmen) to create wonderful music often suggestive of the '40s.

But though Parks' compositions may hearken back to another era, *Orange Crate Art* is unmistakably contemporary. For one thing, at the album's heart is the very present-oriented motif of longing for a California of days-gone-by (thematically, it's as though the vision of surf paradise so famously mythologized by the Beach Boys has yielded to a nostalgia-tinged realism). Also, the album was recorded in a particularly contemporary way, combining a hy-

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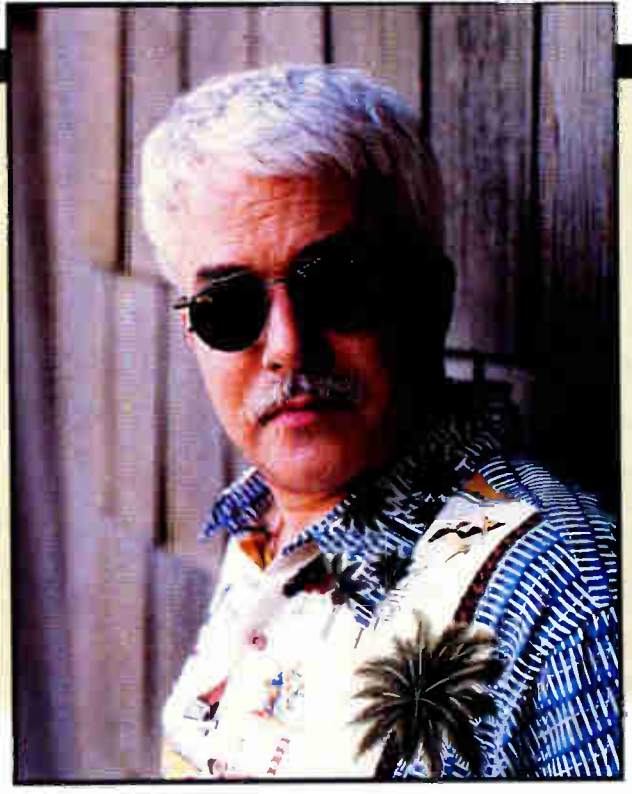


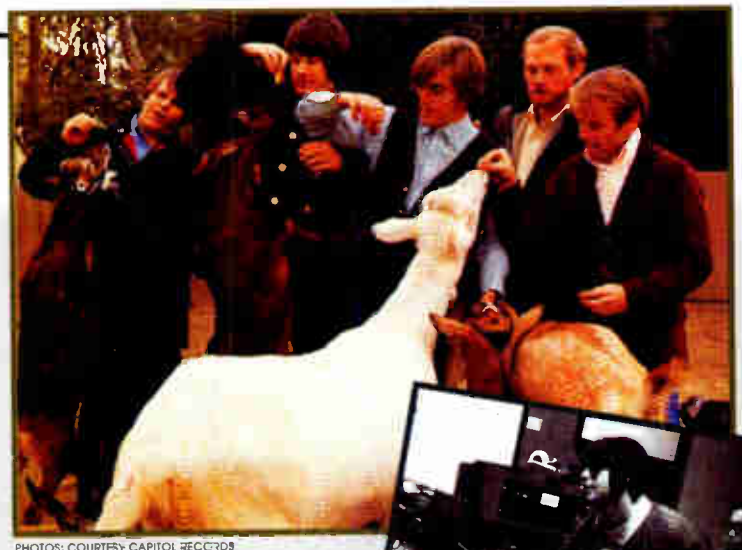
Van Dyke Parks

CLASSIC TRACKS

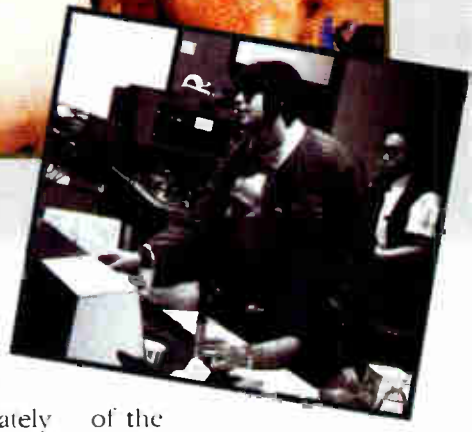
The Beach Boys' "God Only Knows"

by Blair Jackson

By the fall of 1965, Beach Boys leader Brian Wilson knew that simply-arranged, three-minute songs about surfing and hot rods were not going to keep his band at the vanguard of popular music any longer. The Beatles, Dylan and the Stones had upped the ante, creatively speaking, and as Wilson matured as a songwriter and arranger with each Beach Boys album, he increasingly saw himself as a serious artist on that exalted level. His vision for his band broadened with each passing month. That vision was also significantly affected by a couple of other factors: Wilson's nearly worshipful admiration for the work of Phil Spector, and his copious consumption of mind-expanding agents like pot (beginning in '64) and LSD (1965). In November of '65, Wilson told a writer, "Musically I'm still searching for a new thing, a new bag, a new field. I don't know what's coming, but I know what's here. The Dylan cult is now a realization, and...the Phil Spector approach to production, the Burt Bacharach style of writing...I think The Beatles' influence is so far-reaching that it's hard to say what their influence is to date."



PHOTOS: COURTESY CAPITOL RECORDS



Though still written around a traditional Beach Boys theme, "California Girls," written immediately following Brian's first acid trip, foreshadowed some of the interesting places the

—CONTINUED ON PAGE 176

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—FROM PAGE 167, WILSON AND PARKS

brid of synthesizers and real players in a lavish showcase for Wilson's voice. A stunningly beautiful number such as "Hold Back Time," for example, has an ageless quality, but its sound locates it firmly in the present.

In the '40s, these songs would perhaps have been recorded with a roomful of musicians and one mic in the space of a week or so. But the material that became *Orange Crate Art* was recorded discontinuously over a three-year period (some of the music even dates back as far as 1990). Sometimes a couple of years passed between the tracking and mixing of particular cuts. Of course, this wasn't a high concept, it was just the way the project evolved, due to economics and circumstances.

The album began at home with Parks, who also produced, recording himself on a microcassette player and creating notation. Though very much oriented toward live musicians and the sounds of real instruments, Parks has done a lot of music for film and has become accustomed to using synths and MIDI in his composition and recording. So, after getting something down at home, Parks says, the next step was to "take this basically self-documentary effort to a synthesizer programmer, always relying on a whiz kid with Performer."

Sequencing and recording began at Muscletone Studios, the Santa Monica home project studio of Ira Ingber, who, in addition to programming, plays guitar on the album. Ingber's studio includes a Quadra 650 running Performer, two Mackie 1604 boards, an ADAT, some sweet-sounding outboard and mics (modified by Jim Williams), and a host of MIDI gear. "Van Dyke would come over here," Ingber says, "sometimes with an arrangement written out, sometimes not, and we would start entering data into the computer and ultimately create a synthesized track. I would end up doing some drum programming with it and occasionally some guitars at that stage of the game."

Parks, Wilson and executive producer Lenny Waronker

For Parks, creating MIDI realizations of songs was inspired partly by economic considerations (at first Warner Bros. was funding the album one song at a time), but it was also a process that suits his way of working. A highly regarded arranger, Parks has a keen sense of how parts contribute to the overall structure of a song. When recording *Orange Crate Art*, he made changes and added and subtracted parts all the way up to the mix. MIDI versions served as writing tools, giving Parks a concrete representation to respond to. While still in the MIDI stage, he could readily change variables such as tempo and key and begin reworking and embellishing songs to great creative effect. "His melody lines are elegant and memorable in their own right," Ingber points out, "but all the underlying, interplaying parts are peculiar to him because of the fact that he has this arranger's sensibility. That's one of the strengths of this record."

Parks and Wilson at The Bakery in North Hollywood

After completing MIDI work at Muscletone and at Steve Deutsch's studio, Mars, Parks would track at one of several larger facilities, though he predominantly used The Bakery, a three-room facility in North Hollywood. MIDI programs, either realized in the studio or prelaid to ADAT with SMPTE, were transferred discretely to analog multitrack, then mixed to a slave machine in stereo. It was at this point that Wilson would lay down vocals.

"The first song I wrote was [title track] 'Orange Crate Art,'" Parks says, "and I thought the best person in the world to sing this song was Brian Wilson. We had this failed effort that we attempted some 30 years ago, and I had to abandon the resignation that I had operated under for 30 years and at least make an effort by calling Brian to see if we could create our relationship without public interference once again. (The only reason I had the nerve to call him was I heard that he had sung on a Linda Rondstadt album. I said, 'Well darn it, if she's a friend of his and he'll sing for her, maybe he'll sing for me on this album.') He came down [to Pacifique], and in 2½ hours, he got five doubled

voices on tape. It sounded great immediately, he took possession of it.

"Once we started getting five or six tunes in," Parks adds, "and I realized Brian was very much interested, the ante went up for all of us." Wilson's involvement galvanized the project. Though still sporadic, work began more in earnest and gained greater focus, as Wilson's vocal parts came to be the centerpiece of the album (five tracks of doubled vocals are about the minimum on any song). "The signal chain for Brian's vocals was all discrete," says studio owner and engineer Jon Baker. "We had a U47 that we ran into an API mic pre, we used a Summit tube limiter as the compressor, and then that went straight to tape. That was the combination that sounded good."

With Wilson's vocals largely in place, Parks would begin instrumental tracking. The elaborate instrumental palette on the record includes guitars, piano, a slew of keyboards, exotic percussion, strings, horns, steel drums, harmonica and hammer dulcimer. Baker says that Parks continued developing songs while tracking. "Each day, he would take a tape with him representing the day's work, and it would give him new impetus for orchestration ideas and arrangements." Ideas and inspirations from the musicians also figured heavily in the articulation of songs. "For example," Baker says, "Van Dyke would maybe bring in a vocal group to do background vocals, and they would be working on the arrangement as they were all listening to the tape. He would have certain key ideas about what he wanted, but he would usually open up the floor to the singers. If the singers would come up with a lick or a voicing, he would always want to have the flexibility to go with it."

Each song was its own evolving organism, and Baker had to stay on his toes in order to manage all the material. "I'd have to keep prodding Van Dyke for his vision—'okay, we've got a full 24-track now, do you envision doing a string date or horn date?'—because that obviously would determine how I laid my tracks out. He couldn't foresee oftentimes what was going to happen until he got certain talent on the tape, so I learned in the course of the years that I had to assume that we would need another couple of tracks always in reserve.

"When we finished the instrumental aspect of a song," Baker continues,

"Van Dyke would go back to the original multitrack that was a transfer [of the MIDI material] and systematically make decisions about 'okay I like that, I don't like that, I'm gonna replace that with a human.' The things that were really indigenous synth sounds were the ones that usually made the cut. Anything that was like drums or bass or piano more often than not was replaced with a live tracking date." Given the style of the music and the abundance of lush live instrumentation, it may seem incongruous that Parks chose to incorporate MIDI tracks. But when programming, Parks and his collaborators always tried for as organic a sound as possible, mixing and matching modules and keeping quantization to a minimum. And, as Parks points out, "integrity in sound design is equally applicable to these new areas."

Parks gave this abundant hybrid (in fairly finished form) to Ed Cherney and Michael Frondelli, who mixed the album at Brooklyn Recording. Because Wilson's vocals are so important to the album, the mixers spent a lot of time balancing and fitting them together. "Brian was an instrument," Frondelli says. "his vocal components really make a whole orchestral sound. We had to make the track fit Brian so that he didn't overpower it and so that it felt like he was in with the band." Wilson was often singing a melody in chords, "and when you're working on five-part harmony," Frondelli says "a lot of times you're really looking for who's got the lead. You have to dig that out and make sure that whatever voice that is is in the melody. Van Dyke and I had to sit there and sort that out, and that was probably our most painstaking chore."

In terms of vocal treatments, Frondelli says, "We were working with the Spatializer quite a bit, spreading the vocals as opposed to using panpots on Brooklyn's 8078 [which has GML automation]. That gave it a quality of depth without washing the vocal out, because it's not really a wet-sounding record. We wanted to give Brian's vocals a presence without sounding electronic, keeping his dynamics and his vocal intimacy."

If Wilson's vocal parts are the main focus of *Orange Crate Art*, it's as elements of Parks' gorgeous aural paintings that they achieve their impact. In this sense, the album is a true collaboration. Still, Parks says, "I do know that I've brushed up against a great opportunity as a songwriter with the vocal centrality of Brian Wilson. I believe it's the singer, not the song," he adds, with characteristic humility, "and I believe a successful record production can show that." ■

—FROM PAGE 166, ORNETTE COLEMAN

sel and Chris Rosenberg; keyboardist Dave Bryant; and *two* bassists—Al MacDowell on electric bass and Bradley Jones on acoustic bass.

I like this description of harmolodics by Gary Lambert, writing about Ornette's performance at the S.F. Jazz Festival a year ago: "Throughout the piece ["Bach Prelude," which appears on *Tone Dialing*], Chris Rosenberg plays a lovely etude on the guitar, but Denardo is playing a loud, seemingly incongruous funk counter-rhythm on the drums. Various instruments dart in and out of the scene at varying tempi and in a cacaphony of styles. It's exactly like you're walking down the street in New York City, a little Bach tune in your head. Suddenly a car roars by, blasting Snoop Doggy Dog out the window. Now over here a dog is barking, over there children laugh and scream, on the corner the guy at the fruit stand is arguing with

a customer. You still have the tune in your head, but you're taking in everything else. You run into some friends, you spend some time talking, some stick around, some split. Some talk louder than others, some just listen. Paths diverge, paths converge, and still you hear that song. All those many songs. That's harmolodics."

Tone Dialing was the first record cut at Ornette's new studio—also called Harmolodic—in the Harlem district of upper Manhattan. Before it was converted into a studio in the fall of 1994, the space served as a rehearsal studio for Ornette and Prime Time for more than three years. Ornette financed the studio himself,

Ornette started out in the studio doing it like he does in the live show: He plays the sax, puts it down, picks up the trumpet, puts it down, picks up the violin. He likes everything to go down live.

—Greg Mann

equipping it with an automated 56-input Harrison MR2 console, Studer A800 recorders, UREI and Yamaha monitors, and a slew of top outboard equipment. For this project, he brought in rented Sony 3348 digital recorders.

To engineer and mix the new record, Ornette called on veteran engineer Greg Mann, who has been his live mixer on and off for several years. Mann's impressive resume includes several years as an assistant and a staff engineer at Media Sound in New York, five years as the head of the audio department at Harlem's historic Apollo Theater (where he mixed everyone from Ray Charles to James Brown), and touring work with New Edition and others. Recording began in January of this year and continued, with breaks for touring, for the next

six months. Why so long to make a record that was basically cut live?

"As you might expect, Ornette is a real perfectionist in the studio," Mann comments. "He hears this music in his head, and he knows exactly what he wants, and if he's not happy with a performance, he can't just let it go. His ears are really, really good. The way we worked on this album, we'd record for two or three weeks, take two weeks off for a tour and then come back and work in the studio some more. Sometimes when we'd come back, Ornette would hear new things in the music, and we'd do new takes. After we finally got the takes we needed, we started the mix, and that's a whole 'nother involved thing with Ornette." More on the mix later.

A peculiarity of the way Ornette works that is also time-consuming is that he spends a great deal of time *talking* to his band, articulating his vision of his compositions. "They might sit around for a couple of hours, with Ornette going over the different parts and discussing what he wants to get out of the piece," Mann says. "They might literally talk for two or three hours and then only play for an hour or so, then stop and talk some more. Ornette wants everyone to be real clear about his music."

Even though to the untrained ear Ornette's music sometimes has an almost random feel, as if the musicians are just making up their parts on the spot, Mann stresses that "everything is written out to a degree, meaning all the main melody parts are written. Then Ornette allows everybody to make variations on the main melodies as they see fit, but Ornette writes out everybody's part, and they all read it in the studio—except for Al [MacDowell], who's got everything memorized! If you play something Ornette doesn't like, he'll hear it and make you change it."

Mann had the two percussionists in iso booths, and the other six players in the main recording room, with Ornette set apart about ten feet away from the others. "I used baffles and blankets to build little isolation pods for the guitarists," Mann says. "I used 57s on the amps, and since Kenny is in stereo, we double-miked him. For [acoustic bassist] Brad Jones I created a space out of baffles and blankets that was wild—you couldn't even see him! But it worked out well. For him I used an old RCA 77

and a Neumann 44. I sat Ornette on the other side of the room in a nice space so I could really capture the room with him. For his horn I used tube 47s, or a Telefunken, and AKG 451s for the ambience."

Mann says that with Prime Time, "each take has its own character, but they're pretty similar; they're *all* good. With the exception of one song [the heavily layered and manipulated rap song, "Search for Meaning"] what's on the album are all complete takes and all live, except for a couple of trumpet overdubs, where Ornette didn't like what he'd done. But even there, he started out in the studio doing it like he does in the live show: He plays the sax, puts it down, picks up the trumpet, puts it down, picks up the violin. He likes everything to go down live, even the electronic drums—what we did was pre-stripe all the tape and make offsets for the sequencing gear, and then Denardo played the drums and drum machines live."

Mixing music this dense and complex was no easy task. After all, the relationship between the instruments in Ornette's music bears almost no resemblance to what you hear on conventional jazz or rock records. According to Mann, "The mix was harmolodic also. Generally, when you mix a record, kick drum is at the center, both speakers, snare drum is center, toms are panned stereo left and right. Well, what I'd do was put the kick drum in one speaker, put the snare drum completely in the opposite speaker, do different panning for the whole mix, so the mix somehow had the character of the songs. Some I mixed straight—mix the piano in stereo and all—but others we moved things in places you wouldn't expect."

Mann notes that Ornette was quite active at the mix stage: "What he wanted was a way of having every fader move he made recorded. He wanted it to be captured. Traditionally, you set up the whole mix, then put on the [console's] computer and refine it. Well, that wasn't working for Ornette. We tried that, but it didn't work. So instead we turned the computer on at the beginning, and instead of him coming in at the end of the day after I'd been working on mixes, he came at the beginning, and he put all the little subtleties he wanted into the computer:

'I want this guitar to go over here. I want this kind of panning.' Once he got his moves in, I'd take the rest of the afternoon refining everything, like the EQs and the effects, and then Ornette and Denardo would come back at the end of the day.

"They let me have control over most of the effects and delays and reverbs, but if I added too much or too little, I'd hear about it. Ornette's amazing—he remembers every little sound. You might think to yourself, 'Oh, there's so much going on in this music, he won't notice I changed the reverb on this one tabla drum,' and then he'll come in and say, 'What are you doing with the reverb on that tabla?'" Mann says with a laugh. "In general, Ornette likes more reverb than me, so he'd always want to add more. I like to keep it a little drier. But every song was different, every song was like its own little world." Mann says his main outboard tools on the record were the Eventide H3000, Lexicon 480, PCM42 and PCM70 and Yamaha SPX90.

To add ambience on some tracks, Mann says, "I had this room in the back and I'd feed [a track] through some aux sends to two Bose speakers back there, and I miked the room with a pair of 87s. I could really blast it in there, so the sax or the drums or anything I wanted to sound bigger or get an ambience outside from the natural ambience of the room, I'd [record] that."

There are a few little sonic tricks here and there on the record—for instance, the song "OAC" emerges from what sounds like a tinny transistor radio before exploding into glorious high fidelity (an effect Mann achieved by playing the song through a broken Auratone speaker and recording it)—but mainly the approach on the record is fairly straightforward, and clarity takes precedence over gimmickry. Ornette wants to communicate his musical ideas, and the crispness of the recording certainly facilitates that. A lot of hard work clearly went into making this record, but it doesn't sound fussed-over in any way. Instead it has a natural, almost organic feel to it.

"Ornette said he felt like he never had enough time to do an album before," Mann says. "On his other projects, for instance, he could never spend five days on a song. But by having his own studio, he could take

as long as he wanted. It gave him an opportunity to record in a situation where there wasn't a lot of pressure on him, and he could really refine his work. I was lucky to be a part of it because it gave me the opportunity to really be with him and give him everything he needed. I'm really happy it came out sounding so good." ■

—FROM PAGE 167, THE BEACH BOYS

group's music would go in the next couple of years. And when, right after The Beatles' awesome (and to Wilson, intimidating) masterpiece *Rubber Soul* was released in late '65, Brian became determined to find the "new thing" inside of him, and to write internally, rather than externally, for a change. He called in a lyric collaborator, Tony Asher, and in January of 1966 began work in earnest on the album most Wilson acolytes point to as his great masterpiece, *Pet Sounds*. (Actually the song "Pet Sounds" was recorded in November '65.) "I was obsessed with explaining, musically, how I felt inside," Wilson wrote in the CD liner notes for *Pet Sounds* in 1990. "This, I thought, could be the beginning of a new sophisticated-feeling music. I definitely felt the need to compete with The Beatles."

Tracking sessions, with Wilson presiding over some of the best studio players in L.A., took place mainly at two locations in the winter and spring: Gold Star Studios and Western Studios. Wilson would write the music first, starting with piano, and build the arrangement from there, often actually in the studio, depending on what sort of timbres and textures he heard in his head. Lyrics (and thus, vocals) always came last, and sometimes they might materialize weeks or even months after the music was written. This was a period of intense musical experimentation for Wilson, and he didn't hesitate to add and subtract instruments and put them in unusual combinations to satisfy his muse.

For me, the song "God Only Knows"—even more than the better-known and more complex "Good Vibrations"—best exemplifies what was most interesting about Wilson's writing during this period. It has a lilting, sing-song quality that emphasizes the melody above all; beautifully arranged

vocals, from brother Carl Wilson's lovely near-falsetto lead vocal to the complicated choral round at the song's close; unusual percussion effects that show the Spector influence (sleigh bells, cracking trap drums); a very distinctive blend of instruments, including harpsichord, french horn, piano, organ, very prominent electric bass, and a string section; and introspective lyrics with a spirtual quality to them. As Brian wrote in his 1991 autobiography, *Wouldn't It Be Nice*, "No one had ever recorded [the word God] before in a popular song. I was concerned that with God in the song we wouldn't get any radio airplay. Tony [Asher] understood, but he was adamant about not compromising the artistic integrity." He also wrote, in the *Pet Sounds* CD liner notes, "Carl and I were into prayer. We'd pray together, and we prayed for light and guidance through the album. We kind of made it a religious ceremony."

In keeping with the Phil Spector, Wall of Sound tradition, the instrumental track was cut live in a single day (March 9, 1966) at Western Studios in Hollywood, with Brian's favorite engineer, Chuck Britz, handling the recording, cutting to 4-track. "People who were at the 'God Only Knows' sessions tell me that they were the most magical, beautiful musical experiences they've ever heard," Wilson wrote. "I gathered 23 musicians in one studio, an extraordinary number for a pop record. Everyone played simultaneously, the different sounds bleeding into one another, producing a rich, heavenly blanket of music." (Some early takes and a different mix of the song can be heard on a "bonus disc" in the *Good Vibrations* boxed set that came out in 1993. There is almost no studio trickery on the song; just strong arrangement ideas and the big Western Studios echo chambers in action.)

The day after the instrumental tracks were recorded, work began on the vocal contributions by Carl, Brian and Bruce Johnston. A second vocal session a month later completed the track. According to Britz, quoted in the *Good Vibrations* box, "They would rehearse to the [instrumental] track, which was actually better for them because then they could hear all the different pieces that were going on that enhanced the voices, because that's the way Brian would write." Usually, the music would be mixed down to a single track and then the vocals would be put on as many as seven tracks, later to be mixed down to a single track. The entire *Pet Sounds* album was mixed to mono.

The song was released as the back side of a single with "Wouldn't It Be Nice" on the A side, but it picked up some momentum of its own, making it up to Number 39 on the Billboard charts. It was a smash in L.A., and also in England where it went all the way to Number 3. *Pet Sounds*, as a whole, was a great commercial disappointment for Brian and the Beach Boys, and its relative "failure" had an incalculable effect on Brian's sensitive psyche. Wilson could always take pride in the knowledge, however, that *Pet Sounds* had a huge impact on The Beatles, who were hard at work on *Revolver* when Pet Sounds was released. Paul McCartney said in 1990, "*Pet Sounds* blew me out of the water. I love the album so much...I played it to John so much that it would be difficult for him to escape the influence...It was the record of the time." He went on to say that "God Only Knows" was one of the most beautiful songs ever written: "It's a big favorite of mine; very emotional, always a bit of a choker for me, that one." Still is, too. ■

C O A S To

L.A. GRAPEVINE

by Maureen Droney

With his usual against-the-trend style, producer/remixer Richard Wolf (Bell Biv Devoe, Prince, Seal, Ce Ce Peniston) has moved his home studio out of his home. His new space, still called Red Chamber, has room for the live recording he's been doing with new Atlantic/Wolf's Gang signees Budahat. Wolf calls Budahat a combination of Rufus, Sly & the Family Stone and Tribe Called Quest—funky and soulful with a '90s attitude and a hip hop sensibility. "These are young musicians who grew up listening to everything from Jimi Hendrix to De La Soul," he says. "The band has a core membership, but there's an association with seven or eight people, and the vision is to build a kind of Stax. Ricky Bell (Bell Biv Devoe, New Edition) has started his solo album for MCA, and we're cutting the first tracks with Budahat—so they're kind of the house band, but with sampling, looping and DJs. I think there's a whole new generation, people originally influenced by rappers and hip hop, who have had their appetite whetted for that old-school sound."

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At Richard Wolf's Red Chamber (L to R): Ricky Bell and Wolf with Charlea Boyer, Mike Elizondo and Lattrice Murray of Budahat.

PHOTO: MAUREEN DRONEY

SESSION SPOTLIGHT

by Adam Beyda

VELOCITY GIRL, OZ STUDIOS

After releasing two excellent albums of guitar-driven hard pop, Washington, D.C.'s Velocity Girl have been busy again devising another corker. The band recently spent seven weeks tracking and mixing their third Sub Pop LP (due out in March '96) with producer/engineer Clif Norrell at Baltimore's Oz Recording Studios.

Velocity Girl at Oz Studios (clockwise from top left): Kelly Ries (guitar, bass), assistant engineer Mike Rippe, singer Sarah Shannon, drummer Jim Spellman, Archie Moore (vocals, guitar, bass), producer/engineer Clif Norrell and guitarist Brian Nelson.

Oz opened in 1990, when owners Steve Palmieri and Joe Goldsbrough converted an old warehouse into a commodious recording facility, and has since hosted a national music-recording clientele. The studio is a favorite destination for Washington-area bands with a brain (such as Shudder To Think and Jawbox), and it was a great place for Velocity Girl to get away to, escaping distractions while staying close to home.

The studio was also very well-suited to the way the band recorded. With several years of touring

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COAST

STUDIO SPOTLIGHT

MUSIC MILL, NASHVILLE

Nashville's Music Row landmark The Music Mill recently reopened its mix room after extensive renovations. The room was gutted and rebuilt and acoustically redesigned by The Russ Berger Design Group (Dallas), which served as the consultant on every aspect from the floor plan to interior finishes. Chris McCollum of Forum Contractors, Franklin, Tenn., oversaw construction, working closely with Berger, while studio manager Kimberly Keen guided the interior decorating: The offices and lounges were redecorated to reflect the studio's rustic exterior, creating a "warm lodge" feel with a Western motif and Adirondack-style furniture.

The facility has all-new equipment, including Nashville's first API Legacy Series 56-in console, with GML automation installed by George Massenburg. Other new equipment includes a Sony PCM-3348 48-track digital recorder, Genelec 1033A monitoring system, Lydkraft compressors and TC Electronic M5000 and Lexicon 300 processors. A PCM-3348 was also added to the studio's Focusrite Studio Console room.

PHOTO: ALAN L. MAJOR

In its present location since 1980, Music Mill's recent sessions include Toby Keith, George Jones, Beatles tribute album *Come Together*, Martina McBride and John and Audrey Wiggins. ■

NY METRO REPORT

by Dan Daley

Despite its thorough concrete covering, New York City does indeed have a spring floral blooming period. And while the leaves may fall come October, this year's AES convention in New York saw another kind of bloom in town. In a city that once was home to radio and television networks that built much of their own equipment, pro audio manufacturing had withered somewhat over the past few decades. But the show floor illustrated a renaissance of sorts for the kind of creative technical venture that once thrived here—a sort of boutique approach to pro audio equipment design that nicely matches the bluesy, acoustic and fiercely independent grass-roots redux of contemporary pop music.

Greg Hanks, a long-time independent maintenance technician for Metro area studios, found that the evolution of black-box technology was lessening the dependence of facilities on maintenance, replacing it with what he calls "Support through selective replacement of systems rather than repair." Hanks took 26 years of experience and began designing his own systems, the first of which is the 1650T Mic-Pre/Limiter, which is being manufactured and marketed in partnership with dbx. Is New York a good place to start a hardware venture? "It's fertile ground here," Hanks asserts, with an optimistic intensity that quickly replaces the dour look that accompanied talk of the local maintenance business. "There's so much diversity here that you can use New York as a proving ground for anything."

Anthony DeMaria, of ADL in upstate New Paltz, which manufactures an array of signal processing gear, says that though New York is no

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SESSIONS AND STUDIO NEWS

SOUTHERN CALIFORNIA

Orange County marauders Rocket From the Crypt mixed their Interscope debut at Lighthouse Recorders in North Hollywood...Coolio mixed his upcoming Tommy Boy release at Larrabee North (Universal City) with producers Chris Hamabe and Devon Davis and mixer Rob Chiarelli; Ryan Arnold assisted...Toto (yes, Toto) tracked and mixed their newest Sony International release in Capitol's Studio A with producer Elliot Scheiner...Madonna was at Brooklyn Recording in L.A., collaborating with producer/songwriter David Foster on two songs for her new *Something to Remember* on Maverick/Sire. Dave Reitzas engineered. Bonnie Raitt and producer Don Was were also in with engineer Ed Cherney mixing Raitt's new Capitol live set, *Road Tested*. Cherney recorded the shows last summer with facilities provided by David Hewitt's Remote Recording Services...*Beverly Hills 90210* phenom Brian Austin Green mixed his new record for Babyface's Yab Yum label at Skip Saylor Recording in L.A. John Barnes produced, and Rick Clifford engineered, assisted by Rod Michaels...

NORTHEAST

Producer Dave Fridmann camped out at Sweetfish Recording (Argyle, NY) recording Bar None artists The Wallmen, trip-hop combo Research (their Elektra debut) and remixing a Warner Bros. single for The Flaming Lips...Studio 4 Recording in Conshohocken, PA, had Anthrax and Cyndi Lauper in over the past few months, working with Joe and Phil Nicolo, while Randy Cantor recorded the upcoming Ruffhouse Records debut of The Trip, mixing with Joe Nicolo...Gee Street artists PM Dawn overdubbed orchestral parts in Clinton's (NYC) Studio A. Troy Halderson engineered with assistants Mark Agostino and Adam Blackburn...The Gigolo Aunts recorded their next RCA LP, slated for a mid-'96 release, at BearTracks in Suffern, NY, with producer Fred Maher, engineer Lloyd Puckitt and assistant Steve Regina...Not such Bad Company after all: Paul Rodgers recently spent a week working at Pie Studios in Glen Cove, NY, with producer Eddie Kramer...Producer Lamar Lowder recorded and mixed the upcoming WaxTrax/TVT debut of Chainsuck at Squid Hell in Jamaica Plain, MA. Engineer Jeff Madison manned the studio's API Legacy...The Zydecats were at Trod Nossel Studios in Wallingford, CT, recording their second album, *Smokehouse Zydeco*, for Allicat Records...

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PHOTO: TERRY MURRAY

Producer Larry Anschell and artist Joe Sather were at work on an album for Canadian band Sex With Nixon. The two are pictured at the Neotek 1E aboard Turtle Recording's Vancouver, BC-based control-room-on-wheels—a remote truck used for location recording that also serves as the control at Turtle's Vancouver tracking rooms.

Alice, 30 years later: Arlo Guthrie and son Abe were in Derek Recording (Dalton, MA) remaking Guthrie's '60s classic, Alice's Restaurant. They also cut an album of new material, Mystic Journey, out next month on Rising Son Records. In front of Derek's Amek TAC Scorpion 2 are Abe and Arlo Guthrie, with studio owner/engineer Greg Steele.

—FROM PAGE 178, SESSION SPOTLIGHT

and recording behind them, Velocity Girl are writing and playing better than ever. Because they really seem to be feeling their oats as a combo, it made sense to do a lot of live tracking. It's no coincidence that Norrell (whose credits include R.E.M., Paw, Gin Blossoms and Jeff Buckley) likes to record this way, focusing on getting good performances. He set the band up in Oz's large tracking room, putting the amps in one of the adjacent iso booths. Norrell says the tracking room is a "real live-sounding brick room—the drums sound huge in there, which is great for this record."

Velocity Girl are a guitar-ocentric band (members own about 30 guitars between them), and the sessions benefited from Oz's large collection of vintage amps. Norrell kept the chains pretty straightforward, tending to use SM57s and Demeter tube mic pre's on the guitar rigs. But he came up with crunchy sounds by mixing and matching the array of guitars, amps and pedals.

Well-equipped in general, Oz features a fully automated, 32-channel Trident Series 90; a Studer A827 24-track; Genelec, Yamaha and Tannoy monitors; and a good collection of mics and outboard equipment. The studio's "great-sounding" John Klett-customized 2-track (an Ampex ATR102 ½-inch) is also a big draw.

"A lot of studios are very sterile in terms of being locked inside," Norrell says. "One of the reasons that we picked this studio is that it's got big windows in it, and we can actually see a little light from outside." One of the songs on the new LP, "Same Old City," is about being in the city for too long, and when they were cutting it, Norrell opened the blinds to reveal the city view and said, "Okay, you guys, be looking out the windows as you play this so we can get the right feeling." ■

—FROM PAGE 180, SESSIONS

NORTH CENTRAL

New Music vocalist/composer Jade Maze tracked her new CD at Chicago's Sparrow Sound Design. Suzuki co-produced, Sparrow and Patrick Halliwell engineered, and Joanie Pallatto mixed...Producer Brian Anderson tracked and mixed the upcoming IMI Records release for the Falling Wallendas at Smart Studios in Madison, WI...Citizen King recorded a song for the Cartoon Network at Walls Have Ears Studio in Milwaukee, WI. William Stace produced...Mammoth/Atlantic artists Kill Creek tracked and mixed their upcoming release with co-producer/engineer Ed Rose and assistant Chris Wagner at Red House Recording in Lawrence, KS...

SOUTHEAST

Renowned blues guitarist Bob Margolin recorded and mixed his new Alligator release at Reflection Sound Studios in Charlotte, NC. Margolin produced with Kaz Kazanov and the main Alligator himself, Bruce Iglauer. Mark Williams engineered, assisted by Rob Preston...Trey Black remixed an MCA Records single at Atlanta's Doppler Studios with producer David Hobbs, engineer Mike Wilson and assistant Al Layne. Debra Cox was also in tracking for Arista with producer Darryl Simmons, engineer Thom Kidd and assistant Alex Lowe...Recent sessions at Nashville's Sound Emporium included Hank Williams Jr. tracking for Curb Records with producer Chuck Howard and engineers Bob Campbell Smith and Craig White. Trisha Yearwood was also in with producer Garth Fundis and engineers Dave Sinko and Ken Hutton...Producer Phil Ramone mixed pianist Raul DiBlasio's latest at Miami's Crescent Moon Studios. Eric Schilling engineered with assistant Marcelo Añez...Tracy Bonham mixed her Island debut with producers Paul Kolderie and Sean Slade at Miami's South Beach Studios, the newest member of SPARS...Recent activity at New River Studios in Fort Lauderdale, FL, included gospel singer Jennifer Holliday working on preproduction in Studio A with engineer Riley J. Connell...At MusicLab Recording in Jacksonville Beach, FL, artist/producer Michael Fitzgerald recorded his latest Chain of Fools project for Rimshot Records. Fitzgerald engineered with studio owner Roy Love...

NORTHWEST

MCA nouveau new wavers Dance Hall Crashers recorded and overdubbed in Studio A at Fantasy in Berkeley, CA. Stoker Growcott produced and Frank Rinella engineered. Master musician Ali Akbar Khan recorded in B with engineer Chris Haynes and assistant Ben Conrad...Mark my word: Recent projects at San Francisco's Hyde Street Studios included solo albums from Mark Eitzel (American Music Club) and Mark Kozelek (Red House Painters), both mixed by Mark Needham...Immortal/Epic recording artists Far recorded their major label debut at Prairie Sun Recording in Cotati, CA, with recordist Brad Wood and engineers Wes Sharon and Eric Stenman...Twelve-year-old singing sensation Seabron recorded his Atlantic debut at Studio D Recording in Sausalito, CA, with producer Preston Glass, co-producer/engineer Joel Jaffe and assistant Mike Cresswell. Michigan band Verve Pipe were also in tracking their BMG debut with producer Jerry Harrison, engineer Karl Derfler and assistant Larry Brewer...

SOUTHWEST

Interscope recording artists The Toadies and Reverend Horton Heat recorded songs for an MCA compilation at Planet Dallas Studios (Dallas). Ralph Sall produced, Peter McCabe and Rick Rooney engineered, and Adam Zimmermann and Amado Carrasco assisted...Reelsound's 48-track audio truck was in Austin, TX, to record Antone's 20th anniversary show. Eddie Stout produced for Antone Records, and Malcolm H. Harper Jr. engineered, assisted by Greg Klinginsmith and Dennis Walls...Producer R. Chris Murphy was in Stepbridge Studios in Santa Fe with engineer Kyle Johnson recording new-music soprano Joan La Barbara for a compilation CD for the International Computer Music Conference. ■

—FROM PAGE 179, NY METRO

better or worse than anywhere else for the actual manufacturing of equipment, it offers accessibility that few other locations can, and it in turn feeds the creativity of the design and refinement process. "You get access to producers, engineers and studios at a level of density that you probably can't find elsewhere," he says. "I can run a piece of gear

STUDIO SHOWCASE

Dolphin Recording Studios

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▪ STUDIO SHOWCASE ▪

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CATSPAW
PRODUCTIONS

over to a studio and get almost instant feedback on it. In that respect, New York is unique."

Andrew Barta, founder of Tech 21, noted for the SansAmp product line, agrees that New York is not necessarily a great place to actually make stuff, considering the degree of regulations and the cost of space. But as far as getting input and creative design stimulation, there's nothing quite like it. The city always intrigued him, he says, noting that when he came here from his native Hungary, "All you heard about was Mike Mathews and Electro Harmonix. New York was the center of not only music but the equipment that was being used to make it. It's a great place to test out your assumptions."

Barta originally set up shop in the rear of Midtown's Rogue Music, a sales and repair shop on West 30th Street. "A lot of professional audio equipment gets tested out in the club by musicians before it winds up in studios," he says, "and the club scene in New York is very interesting. You have places like the Scrap Bar with very good sound systems, where you can check out equipment under stressful but sophisticated technical circumstances. And in a place like Manhattan, word gets around quickly about what's going on. People knew what I was doing in a back room on West 30th Street pretty quickly. I mean, where else can you have Lou Reed just walk in and ask, 'What's up?'"

Fax New York news to 212/685-4783 or 615/646-0102, or post to DANMIX on the Allied Pool BBS at 212/674-7375. ■

—FROM PAGE 178, L.A. GRAPEVINE

Wolf's production setup is both 24-track analog and digital, with a Session 8 hardware interface and Logic Audio software. He says, "I record the live music directly into the digital. Or sometimes I may record to tape, then transfer it into the digital. With drums, it's amazing what you can do. Particularly with hip hop or R&B, people are used to the machines that have very punchy, clear snares. You get leakage with live music, and with the Session 8, you can eliminate the leakage without gating—because when you gate things you lose certain nuances. With the Logic Audio, you find the kick that's leaking into the snare and eliminate it. So you get all the subtleties of the ghost notes, because funky drummers have a lot of ghost notes when they play snare that you would lose if you gate it. You can keep the subtleties without compromising the sound of the individual drums. It's funny, the reason I bought the system was to quantize live drums, but I haven't used that feature because the drummers I've been working with have been so good!

"I think the combination of live players and digital music is exciting. It takes sampling, which is probably the most stunning technical contribution in the last ten years in music in the way it's revolutionized making records, to a whole other level—with how much freedom you have to manipulate sound. We've only scratched the surface so far."

Wolf also has a partnership with Ricky Bell in the production company called Slick Wolf. Says Wolf about the company: "We are developing acts that are trying to stretch into what you could call genre-bending music. Someone said, I think it was Thomas Mann, 'Music is a theological business.' And my interpretation of that is that people have very parochial attitudes toward the way they categorize and think of music, and very orthodox definitions of what music has to be. But I love to just throw everything in there. I feel that real musicians listen to everything. Duke Ellington said, 'There's only two kinds of music—good music and bad music.' And the groups that we're working with integrate all kinds of music—from hip hop to rock. I mean, the Rolling Stones were an R&B band—they were a great English band that covered Willie Dixon and Bobby Womack. Right now, there's a deep segregation between different styles of music, but I think you are going to find those barriers coming down."

Wolf takes that same non-parochial attitude toward the way he makes records. "I like to use every color on the palette," he says. "A kick drum mic through a SansAmp on vocals—I've seen that work." Another objective that's important to Slick Wolf is cultivating artists with writing and producing abilities of their own. "Right now, R&B is a producer-driven genre," Wolf says, "where the producers write everything, play or sequence everything, and the artist just comes in and

sings. They're basically puppets. I've always been against that. The artists that we sign all write or play—in the tradition of the great soul artists like Marvin Gaye, Stevie Wonder and Prince. They're not puppets."

Boom, b-boom kak, boom, b-boom kak: Chatted with engineer **Boris Menart** who had just finished tracking some Phil Spector-produced songs with Celine Dion on vocals. The three tunes were cut at Ocean Way's Studio One with Spector's original engineer, Larry Levine, overseeing the dates. Spector apparently was familiar with Studio One from sessions he'd done there in the '60s (Allen Sides never was one to change something that was already working well!) and felt comfortable in the large space with the 25-piece band that he used on two of the cuts. The band included two drummers, Jim Keltner and David Kemper, playing similar parts, and two bass players, both acoustic and electric, playing different parts. Other instrumentation: four to five guitars, two pianos, electric harpsichord, Michael Lang on keyboard strings, five horns and four to five percussionists playing vibes, marimba, congas and various hand percussion.

Working from charts orchestrated and conducted by Jim Haskell, the band cut one song per night with Celine singing live in the room. The recordings were made to a 48-track Sony digital with live mixes going down on two tracks of the 48. Engineer Menart, who had worked with Spector on various projects, says they'd start setting up at 1:00 each afternoon for the 7:00 p.m. downbeats, and were ready to roll when Spector and the musicians arrived. "I think Celine was a little overwhelmed when she first walked in and saw all the people sitting there waiting," Menart says, "but she really seemed to enjoy it. And all the musicians were really impressed with her."

Spector was a writer on the songs as well as producer, making the tracks a real return to his legendary "wall of sound." Hope we don't have to wait too long to hear the cuts on CD!

Ever since Tim Jordan personally bailed me out some years ago on a Herbie Hancock video project that was hurtling toward international timecode disaster, I've thought of Tim Jordan Rentals as the primo Los Angeles (and beyond) sync experts. Recently, I chatted with Rodney Pearson, who has collaborated with Jordan for ten years and has now taken over the company. "Tim and I had a lot in common," says Pearson. "We were both into custom software and really supporting our rentals. We don't rent (signal processing) outboard gear—we're a machine rental company with an emphasis on tech support." Pearson, who started his career in 1963 with the BBC and who toured as FOH engineer with the likes of Paul Simon and Liza Minnelli, got heavily involved with synchronization in 1979 when he helped build Rumbo Recorders. "Daryl Dragon was kind of a pioneer in sync," he explains. "He used two 16-tracks on his TV show. And Rumbo was the first studio running two Studer A800s, with a customized Neve board designed to handle 48-track mixes." From there, Pearson went to Audio Kinetics, manufacturers of the Q-Lock synchronizer, where he sold Jordan his first of those early units. Later, he worked for Audio Intervisual Design and sold Jordan his first six Lynx units, thus cementing their relationship.

Pearson, who is an accomplished technical writer, is author of the user manual for Sony's 3324 in addition to manuals for Yamaha, JBL, UREI and Spatializer. About Tim Jordan Rentals, he tells us, "The company was founded on tech support and development—if it's a complicated setup, the other rental companies will often refer clients to us. We thrive on challenges. We help with digital transfers, conversions and problem-solving. Not long ago, we had eight 3348s out. Michael Bolton alone had four at the Record Plant—two in both rooms he had working. And just about every recent film made in town has used us—*Waterworld*, *Batman Forever*, *Under Siege 2*, (which had three 24-tracks synched) and *Crimson Tide*. Over at Todd-AO, we were doing 20-bit, 16-channel D-to-A for *Dolores Claiborne* with a Yamaha converter."

New areas ahead for TJR? They've been evaluating the Studer 48, which they used successfully on the MTV Movie Awards, and the VMOD-100 magneto-optical video recorder. "We're also heading into digital workstations," Pearson says. "They are all different, and they need more support in rentals."

Fax your L.A. news to Maureen Droney at 818/346-3062. ■

—FROM PAGE 163, ROCKETTES
to which every other speaker element is delayed, is a three-way RS 220. Suspended directly above the proscenium, this serves as a front-fill loudspeaker for the area closest to the stage. Above this RS 220, in the old central cluster position, lie two more Community RS 220s and a single RS 880. These devices are complemented by two left and right side-stacks, each with two RS 220s, two RS 880s, and one of Community's VBS 415 subwoofers.

Bond's design separates the show into orchestral and vocal elements. Orchestral signals are delivered using RS 880s and VBS 415 subwoofers, while RS 220s handle vocals. "The 880s and the 415 subwoofers are equalized expressly for the orchestra. They provide us with orchestral sounds minus the headaches of having to worry about taking care of the dynamics of the human voice," he points out. "On the other hand, we don't have to worry about bringing up the bottom end on the 220s, because there is no bass, it's all vocals." Based on tests conducted while on the road with the show, Bond found the RS220s ideal. "The RS220s are great for voice, they produce a very natural sound, and that's something which many loudspeakers don't do today. Design goals called for sound reinforcement which is transparent, just like a person's voice who is seated six feet away, along with smooth, even coverage and intelligibility."

In the amplifier room on the third floor are four Crown CT-800s, four CT-1600s and four MA-3600VZs, all located in two racks which also house the Community controllers. The previous system required seven amp racks and produced considerable thermal energy. Bond points out that the decision to use Crown was influenced by his touring experiences. "Many of the equipment choices I made here were based upon having banged this stuff around out on the road."

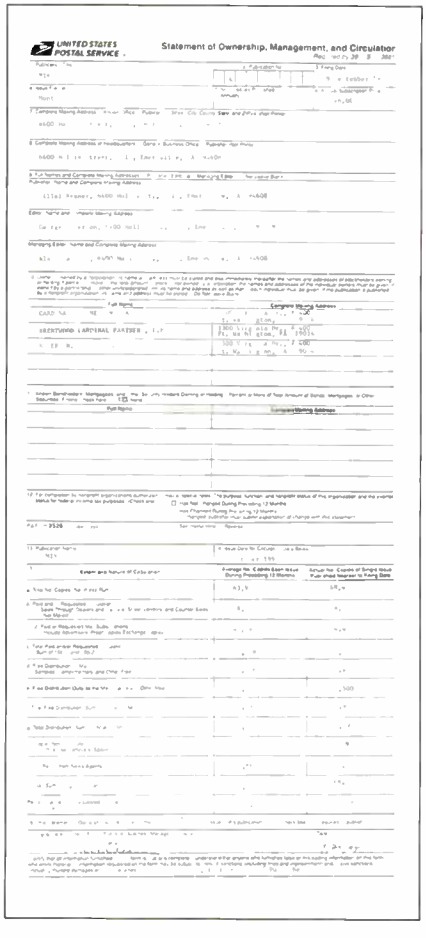
Within easy reach of the FOH position's short-loaded 40-channel Yamaha PM4000, the outboard racks contain most of the system's processing components, including a Furman PD-plus power center, two Sony MiniDiscs, two Sabine 1802 feedback exterminators, two Yamaha SPX990s, a dbx 160, a Lexicon PCM80 reverb and an Audio Logic 1030 spectrum analyzer.

Six TOA DACsys II digital signal processors are used for delay, EQ, peak compression and system tuning. The DACsys II units have proven to be space-savers. "If we hadn't chosen the DACsys II units, we would have run out of rackspace trying to squeeze in all of the individual EQs, delays, and limiters," Bond points out. "The delays alone would have nearly wiped out our space, and we knew we were going to have to delay the system from the beginning, because of the balcony, front-fill location and the side stacks."

The "orchestra" supporting the show is a program of sampled instrument recordings created by Paul Hackert. The program is played through three Kurzweil 2000 modules, accompanied by keyboard player and conductor Norm Geller, a real live human. Sequencing is supplied by an Apple Quadra 950 running Performer One software, which resides, along with all the orchestral hardware, in an "orchestra room" hidden from view on the second floor, stage right.

Nineteen audio lines run from the orchestra room to the FOH position. "We found ourselves with a dilemma when we examined the 250-feet-plus distance between the orchestra room and the FOH console," FOH engineer Michael Martin explains, "since you can't successfully run a MIDI cable that far. Dave Mead worked hard and found a great solution in the form of a fiber-optic link, made expressly for this project by Lone Wolf. The MIDI data from the orchestra room is converted into an optical digital message and sent to the main console, and the signal doesn't suffer one bit." Program changes are sent to a Yamaha

—CONTINUED ON PAGE 190



LUNCHING WITH BONZAI

—FROM PAGE 40, ALAN PARSONS

the bass and drums, and I always leave that until last. I always balance up all the rhythm instruments to start with, apart from bass and drums. Then I will consider the drums separately and make sure that they sound good on their own. Then I will add those drums, EQ'd and balanced, to the mix I have of the other instruments. I think you can fool yourself into thinking that a track sounds great because everything in rock 'n' roll is based on drums. If you take the drums away and it's still rocking, then you know you have something that is pretty reasonable.

Bonzai: Any other secrets?

Parsons: I try not to confuse the ear with too many types of reverb. I often find one reverb setting that I am happy with and use it for everything. That certainly worked on *Dark Side of the Moon*. We only had one reverb going, as I remember.

Bonzai: What was it?

Parsons: An EMT plate. I wish I had one myself, but I don't. Today, I tend to favor the Yamaha units, the SPX-1000, or perhaps the Lexicon PCM70.

Bonzai: Are you able to jump from console to console?

Parsons: I'm reasonably comfortable working wherever the project takes me, but I've had the advantage in the last ten years of having my own studio at home. I've got pretty used to my own console, an Amek Angela.

Bonzai: Could you describe your studio for us?

Parsons: Until recently I had a pair of 24-track Sony 3324s, but I've recently disposed of those in favor of a bank of five Tascam DA-88s. That's particularly good for the way that I am now working. The current relationship I have with three other members of my band is that we're songwriting and collaborating on material—working together, and apart. They all have DA-88s as well, so we're doing quite a bit of home course recording, as it were. Not quite phone in your part, bring in your part, you know?

Bonzai: What types of synthesizers?

Parsons: No surprises really. My MIDI system is based around a Roland JD-800. I use an Akai S-3000 sampler, and the usual favorite keyboards, DX-7, D-50, Korg Wavestation. That's about it. But I'm always ready for the next keyboard of the month to come rolling by.

Bonzai: Microphones?

Parsons: Well, obviously with the enormous support that Audio-Technica has given me over the last couple of years, I'm favoring their microphones. It's no accident that I endorse their AT4050 microphone. It is a great mic, and I wouldn't endorse something I didn't believe in. I'm using that a lot. Drum mics—I tend to use AKG dynamics. I've always favored a Neumann 84 on snare drum. But the Audio-Technica mics also sound great overhead on drums.

Bonzai: Do you have any old instruments that you've collected over the years?

Parsons: I have a really good grand piano, a Grotrian Steinweg, from the company that is the only surviving member of the Steinway family making pianos as in the old days. Although it's not an old piano, it's a superb example of how pianos can still be made in this day and age.

Bonzai: You've always seemed like a mysterious character...

Parsons: Yes, but that's been quashed to some extent by the fact that I am up on a stage these days. I still take great delight circulating in the audience before the show because nobody knows what I look like. I go back and check if the T-shirts are selling, have a drink and watch people come in. They never know who I am. I kind of revel in that.

Bonzai: Anything more to come from the Project?

Parsons: No, the Project is no more. A thing of the past. The last studio album I did, *Try Anything Once*, was an Alan Parsons album, as is the latest, *The Very Best Live*. The Alan Parsons project was a two man team, Eric Woolfson and myself.

Bonzai: What's Eric up to?

Parsons: Eric's firmly entrenched in musical theater now. He's got another show running, based on the *Gaudi* album [1987], and that's what he wants to do now. And I want to continue to make rock albums and play live.

Bonzai: Back to Pink Floyd on a business note. Do you continue to get money from that?

Parsons: I never did. I was working on an engineer's staff salary. I definitely didn't get rich on that album. I was too new to the game at that time. But it's certainly no accident that we didn't work together again, because I never again allowed myself to effectively do an album for nothing. It was a management decision

that I didn't work with them again.

Bonzai: Do you have any broad advice for engineers in 1995, with the way the industry has changed so much?

Parsons: I think the way forward now is to get into recording projects however you can. You're always better off if you can get a job at a major commercial studio, just for the versatility and basic overall training that you will get. But there are only so many jobs out there. You have to get going any way you can, by stringing together stuff at home, or going out on the road with somebody. Determination will always win out.

Bonzai: What can we expect from you over the next year?

Parsons: Well, after the tour we'll be recording most into the spring and should have a new album out in April or May.

Bonzai: Any television, multimedia?

Parsons: Well, I think we've made the definitive statement with the World Liberty Concert. It was a major deal with a multimillion-dollar budget; just a colossal undertaking, with six months' work leading up to it. Anything after that in multimedia would come as an anticlimax. You can't go much bigger than taking over an entire city and using the armed forces, having airplanes flying over.

I like to think that if we can build up our audience sufficiently to get the size of venue that Genesis, Pink Floyd and Springsteen can pull, then yes, I would like to go multimedia. The size of our following now and the scale of our show doesn't warrant that kind of stuff. We're playing sensibly sized venues for between two and three thousand people. The advantage there is that you can control the sound, and I think people are coming away feeling that they've heard a well-produced show. The trouble with these stadiums—the special effects may be wonderful, but they are at the expense of the audio.

Bonzai: Any comment about being honored at the TEC Awards this year?

Parsons: It came as a great surprise, and I'm more than thrilled about it. It's absolutely brilliant. I'm very grateful, I really am. I have a lot of friends in this industry, and I will always be an engineer at heart, apart from what I do as producer and performer. The real me has always been a sort of engineering nut.

Bonzai: As you look around today, are there any engineers that knock you out and amaze you?

Parsons: There are a lot of good people out there, and I don't know if I'm narrow-minded, but I think the best work is still done by the old favorites, the Allen Sides and the George Massenburgs of the world. It's rather depressing that the art of engineering is being lost on computerized technology. You plug in rather than use mic technique these days, and that's a criticism of the music itself, I suppose. The great recordings are there to be made, it's just unfortunate that the taste of the public doesn't necessarily go along with that. We need appreciation for the kinds of projects from people who excel in the art of recording.

Bonzai: Are you trying to pass the baton along?

Parsons: Well, I'm passing it along to my son, Jeremy. He's taking advantage of every available moment while I'm on the road to get his stuff going in my studio. He's 18, around the age when I started. He's looking for a '90s equivalent of the job I had when I began. He's only too aware that he can't walk into a production career, and he's unlikely to be able to walk into an engineering career. So, he's writing and doing techno ambient sort of music, and doing very well with it. He's also a fine guitar player and played on *Try Anything Once*, so he's definitely following in my footsteps, as is my younger son, Daniel. He's 15 years old and out here with me on the road. He's learning the live side of stuff. He's a music freak and loves alternative bands, mainly guitar bands, and Jeremy is going more for the electronic stuff.

Bonzai: Do you ever get together with George Martin?

Parsons: Yes, I do, largely at the parties that you guys hold. We have chats at the TEC Awards and other functions. It's always a happy occasion to talk about old times.

Bonzai: Is life treating you pretty good?

Parsons: Absolutely, although I occasionally get complexes about the fact that youth is not on my side. I'm 46 years old and not getting any younger, and I'm doing what is considered to be a very youthful thing: standing onstage and playing rock 'n' roll. But, the comforting thing is that the diehard fans aren't getting any younger either. ■

Roving editor Mr. Bonzai has recently completed a rock opera based on the life of Dr. Ruth Westheimer.

LIVE SOUND

—FROM PAGE 187, ROCKETTES

ProMix 01 automated 16x2 mixer located just to the right of the house console. "When we go into each number, a program change arrives at FOH before the first beat of music," Martin adds. "In effect, then, the orchestral mix runs completely on auto-pilot. However, once it arrives at the main board, I can change it if I feel it doesn't sound right."

The microphone complement includes a variety of lavalier and hand-held Sony 800 Series wireless products. Down on the stage are three AKG 747 shotgun mics and three Crown PCC-170s to deliver the sounds of the Rockettes tap-dancing. Five Shure SM58s handle off-stage vocals, while an SM87 takes the spotlight as Ms. Anton's solo mic. Bond took the time to test a number of different mics on the road. "We tried just about everything we could think of," he remembers, "and wound up back where we started with the SM87. It just seems to be the right mic for her."

Stage Tech's whirlwind installation was completed on time for the show's February 1 opening, with invoices for the entire sound system project totaling $260,000. Although admittedly biased, Kit Bond will tell you that the system sounds good. "The voices don't have a recording-studio quality. They are completely natural. If it's any indication, we've only received one complaint, when we got a little louder than we had intended to. Comment cards left on the show room's tables and sent back by the patrons indicate that 92 percent think the sound system is excellent. Most give it eight to ten points on a scale of one to ten. I think that's pretty good in these times when everyone's a sound expert." ■

Gregory DeTogne is a longtime Mix *correspondent based in the Chicago area.*

INSIDER AUDIO

—FROM PAGE 28, A HOUSE DIVIDED

world, and we use pro gear, because audiophile gear just won't hold up to pro use." Well, I don't know where he got that silly idea (the pro journals?), but my ears told me different. Even my modest playback system at home was routinely revealing more music than the system at the studio. I'd always thought the recording studios would have the best gear because they make the records. Uh-uh. Apart from the questions being raised in my mind, I noticed a certain venom in my teacher's voice when he used the word Audiophile.

My supervisor's attitude was not unusual. The major audio publications, both consumer and professional, responded to the challenges posed by audiophiles by branding them "subjectivists" who made pronouncements devoid of scientific foundation ("sounds good to me, so it sounds good"). But what's so scientific about attempting to quantify an experience like listening to music by reducing it to a set of numbers? Where is the healthy skepticism that any real scientist would apply to his or her own methods and presumptions? What the pros didn't (and don't) realize is that audiophiles have expanded the science by making it verifiable by direct experience.

In fact, while some so-called audiophile journals have drifted toward a subjectivist approach, the best of the breed stand by their original tenet that the sound of "real music occurring in a real space" is a valid philosophical basis on which to build a method of evaluating audio gear. Furthermore, when scrupulously done under controlled conditions by an experienced listener, such evaluations are based upon objective descriptions of how a given piece of gear performs. The musical waveform has a definite shape, and any audio device will alter the shape in some way. Some will alter it more than others, or in different ways. Whether the listener likes the result is subjective, a matter of opinion. Accuracy to its input, however, is not a matter of opinion. Various musically important parameters can be accurately gauged by ear and effectively communicated with descriptive terminology.

The "measurer" magazines continued their ridicule of audiophiles with cover stories touting their own listening tests, which "proved" that all amplifiers sound alike (if they're "perfect,"

they should) and that cables do not make any audible difference. While they were busy telling us that essentially all of the research and discovery made in the field of audio in the last several decades is for naught, our day-to-day experience in the studio had us marveling at the musical magic being made. We changed monitor speakers, moved them around the room, moved the seating around, changed wires and changed more wires, every change yielding an improvement in clarity, in our ability to "hear what we're doing." We wondered why others weren't taking advantage of developing technology, of the prevailing theories put forth by some of the greatest minds in audio. And why were the pro magazines not talking about these discoveries and denigrating those who would hear improvements?

The only new technology embraced to any degree by the major consumer and pro audio and music journals is digital. Forgetting the best interests of their readers, both consumer and pro journals took on the duties of publicists for the manufacturers. "Perfect Sound Forever" was the rallying cry. Perfect frequency response and "unmeasurable" distortion were the proof offered. Again, it took the audiophiles to stand up and say, "This is not only not Perfect Sound Forever, it sucks!" Astute listeners heard problems not reflected in the measurements. The absence of ambience, the spurious re-arrangement of instrumental harmonics and a persistent "hardness" were common complaints. But the big magazines called it more audiophile mania. After all, "bits is bits; it's just reading numbers." One doesn't have to speculate for long on what this means for the credibility of these writers today. What would they say of today's improved digital gear? That it offers better than perfect sound for longer than forever?

Now let's suppose for a moment that there is something to all this audiophile stuff. What if some of that great audiophile gear was used by the pros to make records? You don't have to imagine this, because it is beginning to happen; very sparsely, but that's the way beginnings are.

Now, what if some of the audiophiles' practical techniques were applied as well? What is needed is a fusion of the professional experience with the theoretical and practical techniques of the audiophile. In the world of astronomical science, it is common for professionals to be aided in their work by interested amateurs. Unfortunately, this flow of communication doesn't occur between the audio worlds.

The point of all this is that the division between pro and audiophile is bad for music, and it's bad for our industry. If audiophiles are ignorant of many things a pro sees every day, the same is true for those professionals who shun input from hobbyists (many of whom have systems with much greater resolving power than any studio). The pursuit of knowledge must take the seeker to all sources if the full picture is to be realized. And if we really start listening, who knows? With any luck, by the time we're through, *understanding* will be the order of the day, and we'll all be able to increase the joy in our experience of recorded music. ■

Barry Diament is owner and Minister of Joy at BDA (Barry Diament Audio) in New York City, a company specializing in mastering.

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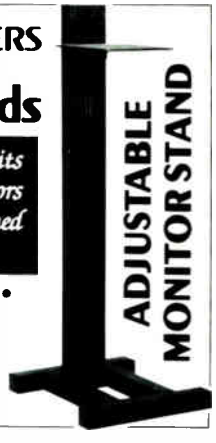

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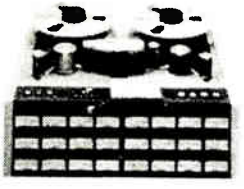

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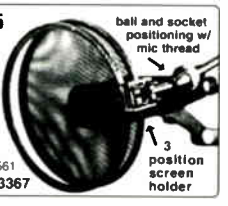

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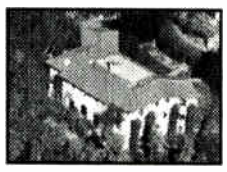

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"I'll also be looking through the classifieds of *Mix* magazine, looking for that rare—and perhaps useless—piece of audio equipment I've been looking for all those years..."
- Walter Becker
Mix interview, April 1995

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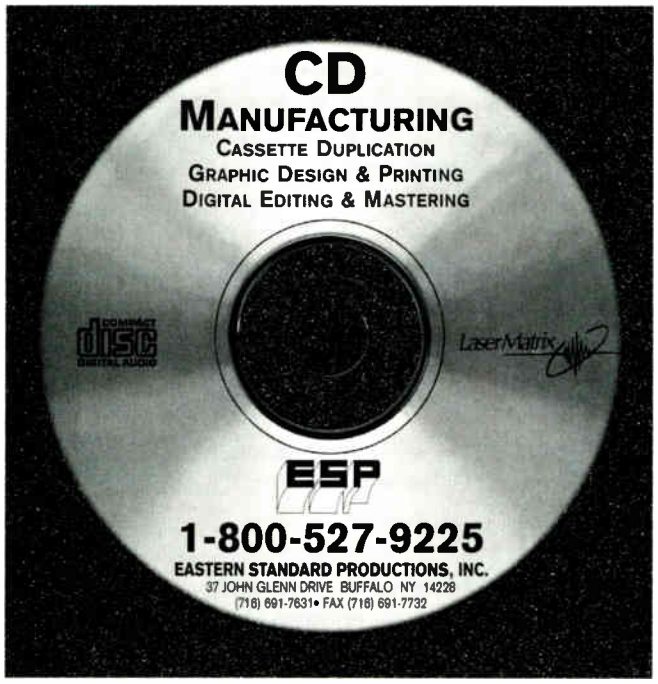

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—FROM PAGE 63, ACETATE GROOVE

program. Although there is often plenty of steady-state noise to be removed, there's usually a great deal of "swish" that these DSP systems can't ameliorate. Short of some radical equalization, there is no process that can suitably attenuate the periodic swishing noise that nearly all old acetate discs exhibit.

While preparing the Glenn Gould acetates, we decided that less aggressive CEDAR DH-1 settings were far more effective than the heavier settings. Our intent was not to make the recording "noise free," but rather to take the abrasive "edge" off of the noise so that it would no longer be distracting. In past years, many people have criticized processes like CEDAR and NoNOISE for their tendency to zap the ambience right out of a recording. When this occurs, it is usually the fault of the operator, not the process. The hardest part of using broadband noise-removal is learning to listen for its artifacts, and in the case of Glenn Gould, we were quite determined to remove as much outright noise as we could without robbing the recording of its essential flavor.

That brings us to the artistic and aesthetic questions that often accompany acetate transfer, and for that matter, all historical restoration. How "modern" should a restored recording sound? With judicious use of EQ, we can remove cutter resonances, add warmth and underpinning to vocals, and generally end up with an acoustical timbre that modern audiences would readily appreciate, but at the cost of removing some of the "charm" of the sound of an old recording. We've all heard remastered product in which the engineer has been far too aggressive with a noise-abatement system, robbing the recording of its ambience, timbre and body. The application of the recording and the likely response of the intended audience must be considered before making any irreversible aesthetic decision. The ethics here are not all that dissimilar from the question of whether it is moral for an art collector to cut an old master to fit a frame. Even if you do decide to process an old recording with electronic sleight-of-hand, be absolutely certain that a flat, unprocessed copy of the recording is preserved in case it is needed in the future.

It's an unfortunate reality that the history of recorded sound is fraught with media that are clearly unsuitable for historical preservation. Although we've all encountered flaking tapes, sticky-shed and warped vinyl, few could argue that any medium is more unsuitable for archiving than the granddaddy of them all, acetate transcription discs. We're lucky in a way that our society's desire to preserve historic documents, be they books, manuscripts or acetates, has kicked in now instead of 20 years hence. Acetates degrade rapidly, and under poor conditions, quickly enter the realm of irrecoverability. I would implore anyone in the possession of any such recordings to arrange to have them transferred to a more robust medium before they are lost permanently. ■

Gabe Wiener is director and chief engineer of New York's Quintessential Sound, where he has restored many hundreds of acetate discs.

FEEDBACK

MORE ON THX

I would like to thank Larry Blake for the vote of confidence in me and my work at Lucasfilm published in his November 1995 column, "Whither THX." I do differ with him about many details, both technical and marketing ones, and a point-by point response is available online at the rec.audio.pro newsgroup.

The basic problem Larry seems to have with THX marketing is that it appears to be overreaching, somehow claiming that THX is responsible for the aesthetic quality you hear in a film mix. As he points out, this is something we have assiduously avoided since the beginning of the program, in every way we can, yet inevitably, an uninformed part of the audience will think "what great THX sound" if the sound is good. When I explain to students the difference between what I do and sound design, I say, "I make it sound good—Ben Burtt makes it sound interesting." I hope Larry could agree to this simplified definition, which doubtlessly leaves holes but gets the idea across. Perhaps "good" in the phrase should be modified with "potentially" to satisfy his requirements for precision.

If anything, I think that the heightened awareness to sound that is brought about by talking about sound systems at all probably helps everyone in production and post-production to do their jobs in an environment that values sound. After all, claiming "Mixed and Recorded in a THX Theater" is very little different from "shot on Panavision equipment," which is on many movies. (It has been conclusively shown—in a classic AES paper "How to Fool the Ear and Make Bad Recordings"—that the monitor system response affects recordings, since mixers balance to what they hear, and therefore, it helps to hear a standardized monitor.) Larry's biggest problem seems to be the Star Wars VHS tapes. I must say that I was reluctant at first, too, but a comparison with older VHS tapes shows these to be truly worth the difference in both picture and sound quality, although there are format limitations, of course.

Tomlinson Holman
Lucasfilm

THE KATZ MEOW

I enjoy reading about new gear and admit to spending time searching for a kernel of wisdom in the writings of Stephen St.Croix, but the latest *Mix* article that most got my attention was "The Secrets of Dither" [October] by Bob Katz. This is the type of no-nonsense, factual information that I and others desperately crave and need.

I suggest that you immediately form a posse to search out Bob Katz, kidnap him, bring him back to headquarters, chain him to a radiator and force him to write an article like this every month.

Lee Blaske
lblaske@aol.com

SHOUT AMEN!

Thanks to Paul Lehrman for writing the article of the decade ["Fear of Frying (My Studio)," September *Mix*]. He put into reasonable terms the truths which I can never safely convey without first strapping on a straitjacket (version 1.0). It should've been a cover story. Paul: Preach on, brother man.

Charley Hardman
White Plains, Md.

LIVE AND LEARN

Hats off to Paul Lehrman for stepping out with his article "Fear of Frying (My Studio)" in the September issue.

Some time ago, we received notice of an upgrade to a sequencing program which we had been using for years. The notice sat for weeks; however when an upcoming project required piano lead sheets—and since the upgrade promised "faster, more efficient music printing"—we opted to pay $100 for the upgrade. The catch was we had to go without the program for a while since the upgrade required us to send back the "dongle" (copy protection device), otherwise we had to front the full cost of the program and get reimbursed later. Great policy for someone who's been using their product since the original program came out in the '80s.

Here's the punch line: When we received the upgrade, the program wouldn't run on our computer at all. Apparently, the upgrade had so many new subroutines in it, it was no longer compatible with the third-party RAM upgrade installed into the computer. (Of course, that was the excuse the sequencer people used, and the third party swore up and down it had to be "the other guy's fault.") We actually had to run out and buy a new computer with a 4-meg RAM upgrade in order to have things ready to go for that session. This has got to be one of the most expensive "software upgrades" on record. The real kicker is that we never were able to get a decent printout of the lead sheets for our client!

My first response after reading Mr. Lehrman's article was to run off copies and send them out to a few choice manufacturers. Problem is, will they ever get read? Even if they do, companies have to react in a positive manner, something very difficult to do in this competitive age where the bottom line is the almighty buck. I'd like to see more honesty and less misleading statements in product literature, but we all know what sells.

Steve Moroniak
Reel Productions
Rolling Meadows, Ill.

Send Feedback to Mix, 6400 Hollis St., #12, Emeryville, CA 94608; fax (510) 653-5142; or 74673,3672@compuserve.com.

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