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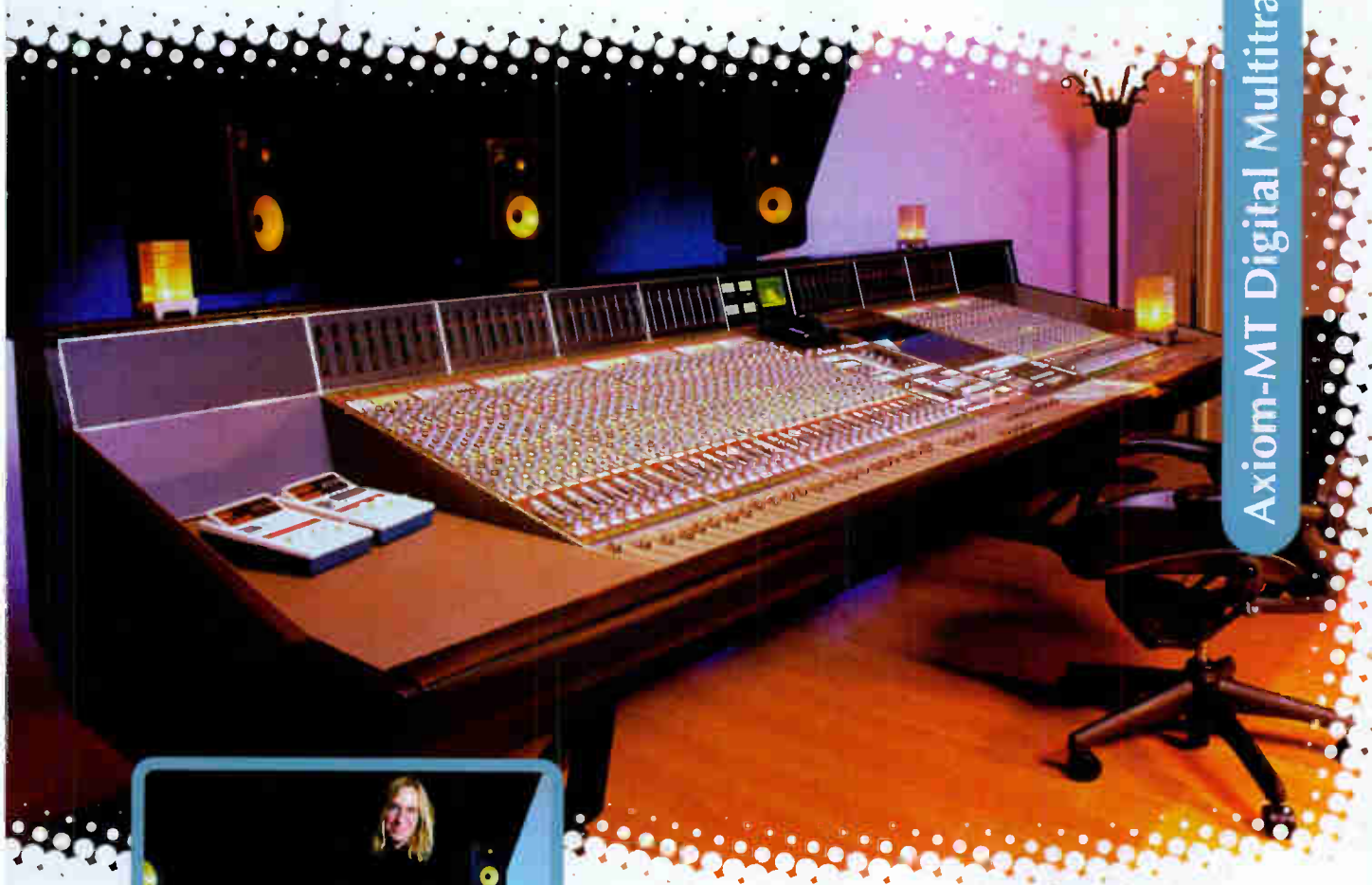
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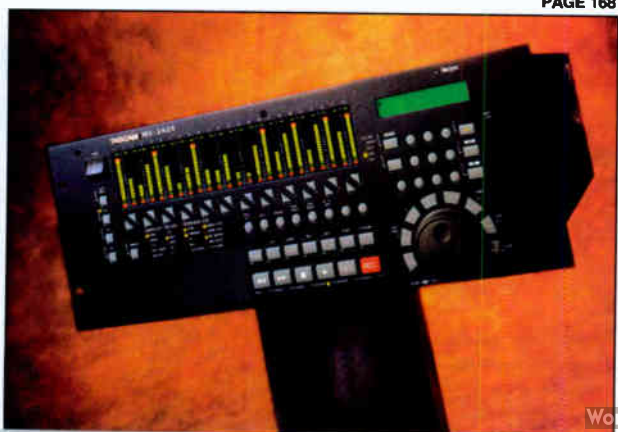
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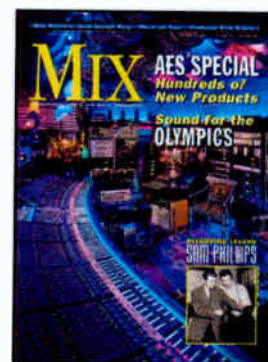
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On the Cover: Cutting-edge engineer Jack Joseph Puig has been ensconced in Ocean Way's Studio A for five years running. The room is equipped with a modified Focusrite console and a vast collection of vintage and modern gear amassed by Puig and studio owner Allen Sides. For more, see "Mix Masters" on page 58. **Photo:** Ed Freeman. **Inset Photo:** Courtesy of Sam Phillips.



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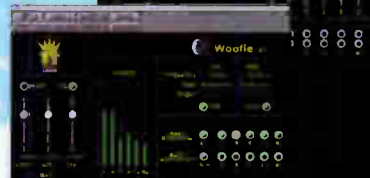
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FROM THE EDITOR

AES: LOOKING FORWARD, LOOKING BACK

AES is here, and thousands of audio pros from around the world will pack into the L.A. Convention Center to pay homage at the temple of technology. There is no doubt that new products drive pro audio, but there's also something very comforting about an industry where classic gear is not merely appreciated, but also put into everyday use alongside the techno-widgits of today. As an example of this approach, one needn't look much farther than this month's cover, showing a glimpse of hitmaker Jack Joseph Puig's private retreat, which combines cutting-edge new technology with the best tools from the past.

This trend is also well represented on the AES convention floor, where what appears to be a record-setting number of new retro products will be unveiled. In the microphone department, Neumann's M150 is a reworking of its vintage M50 omnidirectional tube condenser, while the revered Telefunken 251 will be brought back in the form of the Lawson L251 and the Soundelux ELUX 251. On the mixer front, Trident is back, Neve will debut its 88R (profiled in this issue) analog desk and TL Audio is now shipping its VTC large-format Vacuum Tube Console. Universal Audio—which wowed us with its LA-2A and 1176 reissues last year—follows it up with the UA 2610 dual tube mic pre-amp. And anyone looking for that classic sound should check out Demeter's Real Reverb, which features dual Hammond/Accutronics spring (!) tanks.

An alarming trend that's emerged in recent years is a over-dependence on technology in studio production. These days, it's all too easy to reach for a rack, when in an earlier era, engineers relied on inspiration—and occasionally perspiration—to create new textures, whether running two tape transports in close sync and pushing a thumb against one tape flange for phasing/flanging effects, using tape echo, singing through a cardboard tube or whatever. A young engineer friend recently lamented that he didn't have enough reverbs for a mix project. When I asked why he didn't route a send into the studio speakers and mike the space to create an acoustic chamber, he said that had never occurred to him, although he was intrigued by the idea.

I'm not sure all of us would like to return to the "good old days" of 3-channel Ampex multitracks and 8-input consoles with huge Bakelite rotary faders. However, in this age of unlimited virtual tracking, it's fun to occasionally do a little direct-to-2-track work, or at least do a project requiring fewer than 72 tracks. The Beatles cut their first album in a day, and as I recall, it charted pretty well—maybe there's a lesson there for all of us.

In keeping with this issue's AES theme, our annual New Products Guide features nearly 400 pieces of audio gear, including both retro and neo flavors. Speaking of the latter, the availability of affordable, high-quality tools opens up opportunities for audio producers at all levels, and perhaps the next Jack Joseph Puig, Rick Rubin or TEC Hall of Fame inductee Sam Phillips (all interviewed in this issue) will emerge as a result of accessible technology stemming from this AES.

That's what this business should be about.

See you on the show floor!



George Petersen

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FEEDBACK

THEATER SOUND DESIGNERS DESERVE A TEC AWARD

I was delighted to open up this month's *Mix* magazine to find an article by Jonathan Deans ("Time for a Change in the Orchestra Pit," August 2000 issue). As I got to the end of Jonathan's article, I stumbled upon a little bit of serendipity: He mentions that "the most recent Tony Award winner for Best New Musical is a show called 'Contact.'" What he doesn't mention is that of all the Tony Awards the show received, it did not get one for Sound Design. They don't give Tony Awards for Sound Design. Then I flipped to the Official TEC Awards Voting Ballot attached to the front cover of this month's issue and found that under "Outstanding Creative Achievement," *Mix* magazine doesn't recognize the work of theater sound designers either.

I guess *Mix* magazine and the Tony Awards both agree that the contributions of these theater artists don't merit the same recognition as a mastering engineer.

*Rick Thomas
Purdue University*

OR, WE COULD JUST FORGET THE WHOLE THING

I just read the article "Time for a Change in the Orchestra Pit" in the August issue. The idea of moving the musicians to another room may solve acoustic problems in the theater, but it also begs the question of why there should be live musicians at all. Deans says that "the audience for musical theater is becoming increasingly sophisticated." At what, listening to canned music? With all the technology that these listeners use, it seems the human race is evolving to a state where we don't know how to listen to acoustic music anymore.

To add to your argument, acoustic musical instruments are really holdover relics from another age. If these listeners are so sophisticated, there is really no place for these ancient instruments in modern theater, especially if the patrons cannot appreciate the sound they make in the acoustic space they are placed in. Certainly, this sophistication dispenses with the fact that the performance experience is the human interaction between actor, orchestra and

audience. Sophisticated audiences may not know, want or understand this experience anymore anyway.

Placing musicians in another room is the first step in placing them into the alley next to the theater. Next to go will be the actors when someone devises a way to project holographic images from a central transmission location. After all, theater acoustics are not designed to effectively project the human voice like 5.1 or 7.1 surround sound can.

Why even have theater anymore?

*Bill Koggenbop
via e-mail*

SETTING THE CLASSIC TRACK RECORD STRAIGHT

Thank you for the Classic Tracks article ("Classic Tracks: Johnny Cash's 'Live at Folsom Prison'") of July 2000 that took me back to Folsom Prison. I was there working for Wally Heider Recording and am on the far side of the stage with a cigarette in hand in the picture you used for the article. As Barbara Schultz mentioned, "There weren't a lot of records kept regarding the technical aspects of this recording." Some of those technicalities are in the memory banks of guys like me who were there in that prison cafeteria/echo chamber. On July 13, 1968 (32 years ago), I was a second engineer and truck driver at this recording and many other electrically charged live recordings, such as Chuck Berry Live at the Fillmore. I had serious doubts and serious anticipation as I drove through the imposing iron gates toward a huge prison in the middle of nowhere.

I'd like to add my memories to Jim Marshall's. I was at a little table with intercom so I could move mics or respond to any other problems that might come up as we recorded. Wally Heider Recording had a Bill Putnam-designed UA 12-position, 4-track console with EQ (± 3 @ 100 Hz, and ± 3 or 6 @ 7.5 kHz). Wally didn't like compression to tape live, so we used no limiters. The vocals, amps and drums were all Shure 546, except overhead drums which were both Sony C-37 condensers. We preferred not to use a Shure windscreen, but instead the one on Cash's mic is an Electro-Voice 666 windscreen. We had one Scully

4-track and one Ampex 351 4-track.

Columbia Records had union engineers, so neither Wally Heider Recording nor I received any credit for our work on that day, as is true for many other wonderful musical events. My part is now only in my memory, since Wally's death in the '80s.

Again, thanks for reminding me I was at Folsom Prison 32 years ago. Without a doubt, it was a memorable day.

*Bill Halverson
Producer/Engineer
Portland, Tenn.*

SOMETIMES I WONDER

Hey, St. Croix: great column. I really look forward to it every month. However, may I correct you a tad? That was Blue Cheer that did "Summertime Blues" and not the Blues Magoos. But I don't know why they bothered, since we already had Eddie Cochran's. On second thought, it was kind of a pioneering grunge record. Keep up the good work, man.

*Woody Wilson
Woody's Studio
Jasper, Ala.*

CORRECTION

I want to clarify one detail in Barry Rudolph's Field Test review of our KM180 Series microphones in your August issue. In the description of the differences between the current KM184 and the older KM84, Rudolph points to the fact that with the newer mic, "dynamic range is increased by 21 dB, self noise is reduced to 25 dB (CCIR)..."

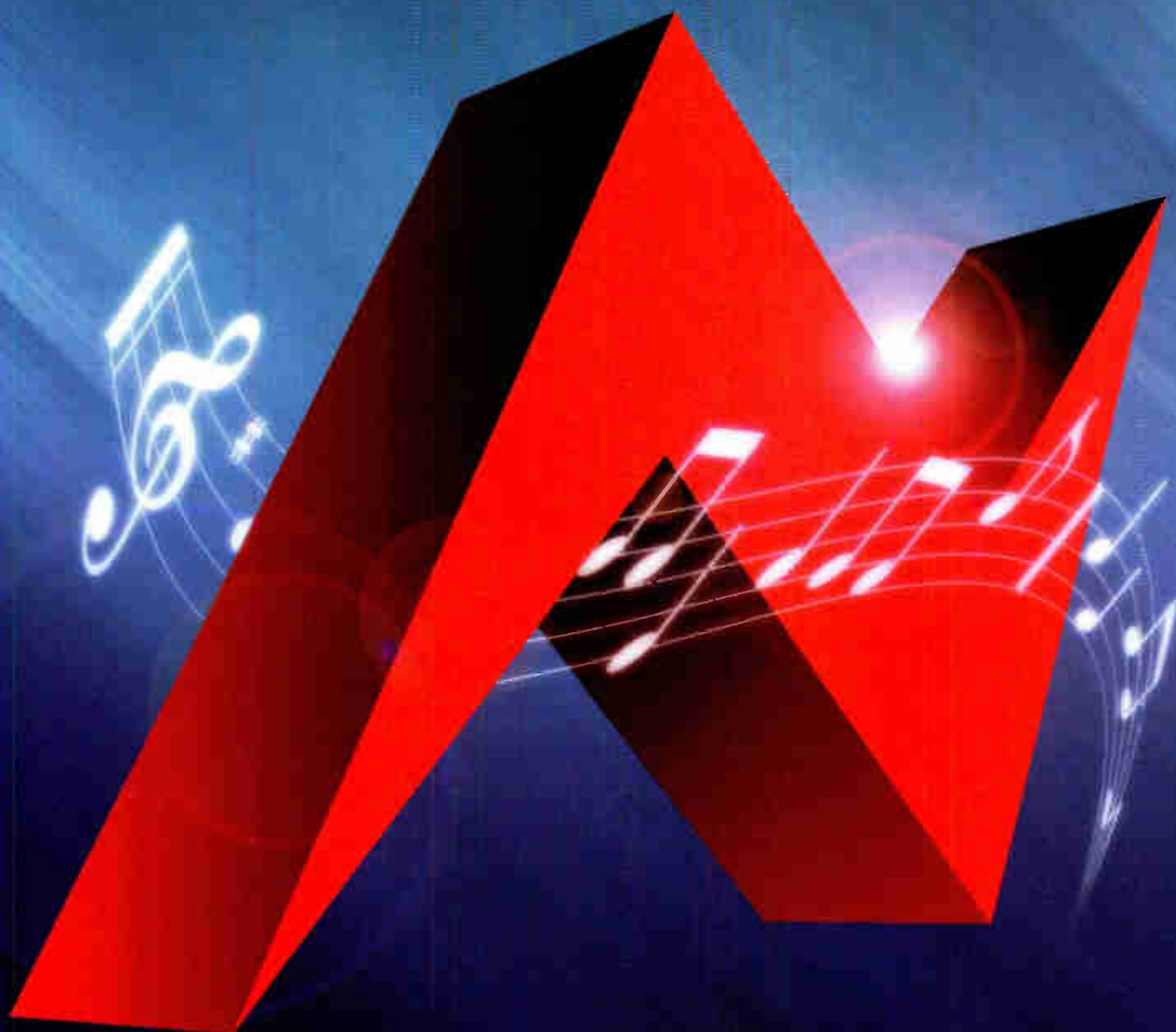
I felt it important for the readers to know that the KM184 has an A-weighted self-noise of 16 dB, which is impressively low for a small-diaphragm condenser microphone and indeed quite low for any microphone.

*Karl Winkler
Neumann USA*

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CURRENT

VR2LMUSIC.NET OFFERS SECURE MUSIC ONLINE

VR2Lmusic.net Inc. is a new company that offers a secure format for access to music on the Internet through its parent company, VR2Ltrade.net. Sean O'Brien, CEO of trade.net, and Stephen Cox, president of music.net, developed MediaPlayer as a by-product of a contract with the U.S. Department of Defense. Designed to offer greater protection against piracy for copyrighted music distributed on the Internet, it can be downloaded in the beginning of October, and music will become available at the end of October. According to O'Brien, "It was a desire to get secure computer platforms so that the data could not be copied."

To avoid the usual pitfalls of downloading music off of the Internet, the MediaPlayer does not have a file format, per se. According to John Pokorny, CEO of music.net, the technology delivers raw data, which reduces the number of holes to which hackers and viruses can attach.

The MediaPlayer is free to download; users must either pay for the music (CD \$16.99) or watch advertisements. O'Brien said the company is also talking to long-distance phone carriers so that users may be able to purchase CDs by adding the cost to their phone bills. Cox said that users who do not pay for the music will have to answer a simple, one-button, permission-based marketing question that is personalized to demographics. Users will then see the MediaPlayer morph into different advertisements.

"The user gets a higher-quality CD that they can buy or listen to for free," O'Brien says. "The artist's work is virus-protected, and they still get paid because either the consumer or the advertising agency pays for it. This also adds revenue streams for the artists and the recording labels. The advertising agency gains tracking information about what is being sold on the market."

The way MediaPlayer works, music is downloaded to the computer's memory—not onto the desktop—and can then be transferred to any portable device. "It is a one-way process," Cox says. "It goes

from the memory of your computer to the memory of the portable device. It's not copying it; it's transferring it."

The available music is offered through the providers' record label, Popdrop Publishing. "We've begun negotiations with various recording companies and content providers," Cox says. "Our real focus is to become a back-end company."

The company is also expanding into different media outlets—video, film, games, 3-D—with different versions of MediaPlayer by the end of the year. "We can produce the same results with video in a 3-D environment," Pokorny says. "We want to revolutionize e-commerce."

For more information, contact John Koenig at 407/650-9494, or e-mail jkoenig@VR2Ltrade.net.

WELCOME TO AES

The 109th AES convention, dubbed "Surrounded by Sound," takes place September 22-25 at the Los Angeles Convention Center. Featured workshops include "Audio Watermarking for Packaged and Network Media," "Digital Libraries, Preservation and Metadata," "Mastering for the Internet" and

"Perceptual Audio Coders—What to Listen For," among others. According to Van Webster, workshops co-chair, the "workshops identify emerging trends and present the latest information on the full spectrum of audio technologies." Products to be debuted at the convention are previewed in this issue's "2000 AES New Products Directory," beginning on page 185. A review of the show will appear in next month's *Mix*.

SOUND EFFECTS SEARCH ENGINE

Looking for an elephant trumpet or a cough? FindSounds.com is a recently launched search engine for sound effects and samples. By typing in a general search command, the user can find links to other sites that offer the particular sound effect.

According to Steve Rice, president and CEO of Comparisons Corp., the new search engine operates in the same fashion as other Web-based search engines like AltaVista, Excite and Snap. "A spidering mechanism locates content on the Web, and links to that content are stored in an index," Rice says.

—CONTINUED ON PAGE 16

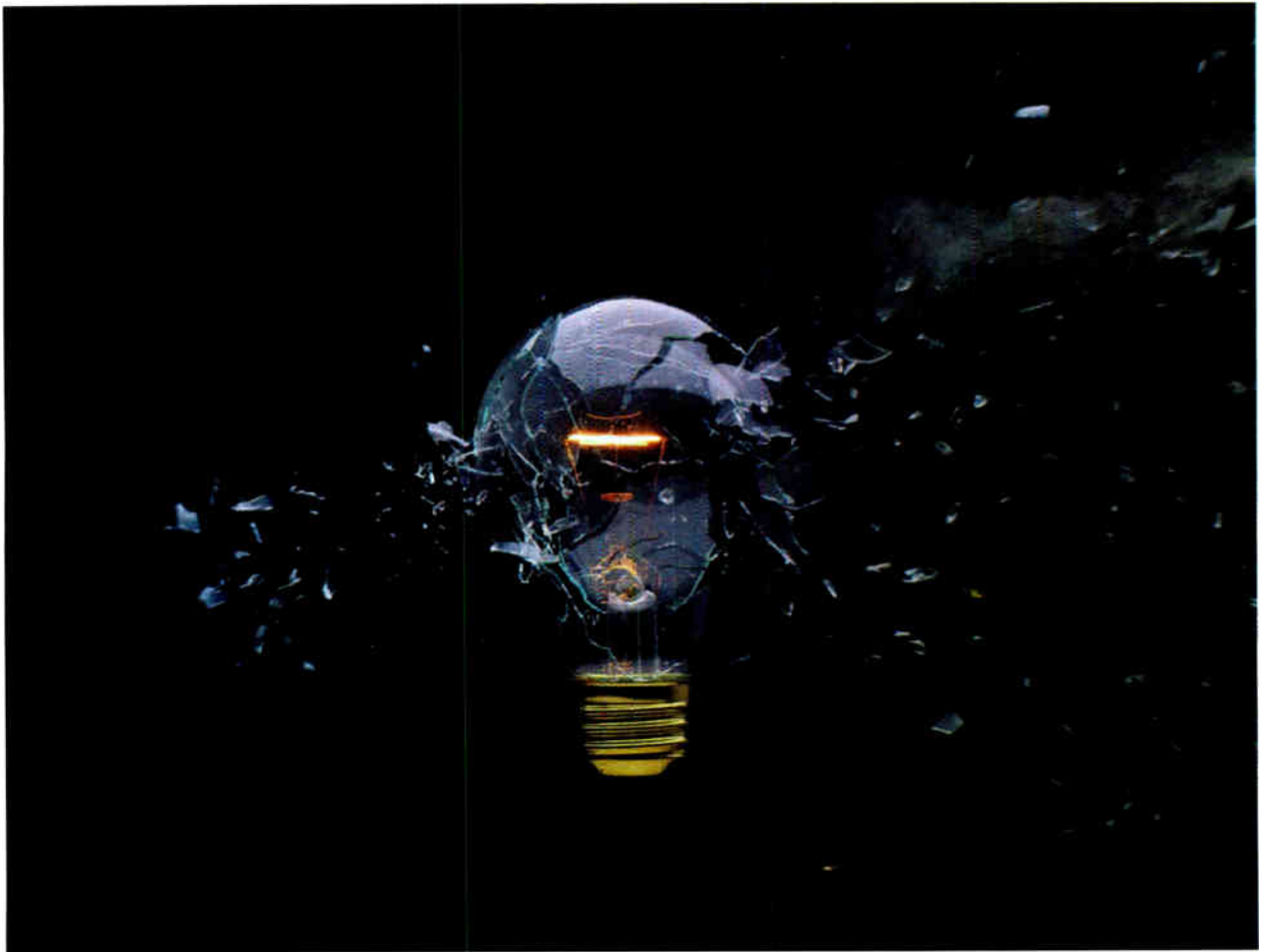
MERGERS AND ACQUISITIONS

MACKIE BUYS ACUMA LABS LTD.

Mackie Designs Inc. announced the completion of the purchase of Victoria, BC-based Acuma Labs Ltd. According to executive VP of engineering Peter Watts, "Acuma provides focused digital technology resources to Mackie's engineering group, enhancing our development of increasingly sophisticated professional audio products." For more information, call 425/487-4333 or check out Mackie's Web site at www.mackie.com.

UNIVERSAL AUDIO ACQUIRES KIND OF LOUD

Santa Cruz, Calif.-based Universal Audio has completed the acquisition of Kind of Loud Technologies. The two companies will be based out of Santa Cruz and share the name Universal Audio Inc.; the company's new slogan will be "Analog Ears, Digital Minds." According to a press release, the combined company goal "...is to bridge the best of classic analog recording technology with the flexibility of the modern digital studio. The company is developing an entirely new product line merging the best of its technical capabilities." For more information, call Suz Howells of Universal Audio at 831/454-0630, or e-mail suz@uaudio.com. ■



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INDUSTRY NOTES

John Andrews has been named the new broadcast development director of Solid State Logic (Oxford, England), taking him back to his roots at the BBC; meanwhile his position as group marketing director will be filled by a familiar face, Colin Pringle...Tascam (Montebello, CA) general manager Gene Joly joined the board of directors for TEAC American. The company also announced a number of new appointments: Danielle Cheek, graphic designer for the new in-house marketing and advertising agency; Daniel Switkin, software engineer in the Palo Alto Research Center; and Sean Halley, product specialist. In other company news, customers can access Tascam's new Web site at www.tascam.com for resources and product information...TGI-Tannoy (Kitchener, Ontario) unveiled an addition to its corporate offices and warehouse facilities, located just down the street from its current home. The company also announced multiple appointments: Brian Denomme, director of operations; Marc Bertrand, director of sales; Barry Fox, marketing manager; and Marci Mudfor, finance manager...CM Sales (Redford, MI) received AKG Acoustics' (Nashville, TN) manufacturer's representative of the year. In other company news, AKG appointed Sarita Stewart to the position of marketing manager...New additions at Apogee Electronics (Santa Monica, CA): Judd Levison, Western regional sales coordinator at Santa Monica headquarters, and Luke Baldry, European sales manager at the London-based European office...Soundcraft (Nashville) national sales manager Tom Der will also serve in the same capacity for the company's sibling mixer company, Spirit (Nashville)...DSP Media (Studio City, CA) promoted Steve Fehir to head of customer service at its manufacturing facility in Sydney, Australia...Jerry D. Spriggs assumed the roles of president of Beyerdy-

namic North America (Farmingdale, NY) and senior staff member of Beyerdynamic (Heilbronn, Germany)...Resulting from a joint venture between Euphonix Inc. and Audio Export, Euphonix Europe Ltd. (London) named Miles Roberts as new managing director. He will be based out of the London headquarters. Euphonix Inc. (Palo Alto, CA) named David Hansen as director of product marketing...Telex Communications (Minneapolis) corporate headquarters moved to 12000 Portland Ave. South, Burnsville, MN 55337; 952/884-4051...Loudspeaker company Klipsch Audio Technologies (Indianapolis) announced that its chairman and CEO, Fred Klipsch, was named Indiana Heartland's Ernst & Young 2000 Entrepreneur of the Year in the marketing category...Sony Music Studios (New York) hired Jerry Puente, Andrew Brooks and Jim Naisby Jr. as general assistants...Clive Green & Co Ltd. (Bedfordshire, England), manufacturer of Cadac mixing consoles, appointed Group One Limited (Farmingdale, NY) as its North America distributor...NewWave Technologies (Gaithersburg, MD), distributor of digital equipment, added Zapex Technologies (Mountain View, CA) to its roster for Zapex's MPEG-2 encoding product line...Mitek Corporation (Phoenix) welcomed Joe Andriano to its family as the new senior graphic artist and Paul Jagoda as graphic designer...Mixer Rob Chiarelli joins Nettwerk Management's (Beverly Hills, CA) roster...Papeete, Tahiti is the new home for Bag End's (Barrington, IL) distributor and dealer Posi-Lectric. Posi-Lectric can be contacted at P.O. Box 144, Papeete, Tahiti 68713, French Polynesia; 11/689/42-9256; fax 11/689/42-1946...Allen & Heath (Penryn, Cornwall, UK) expanded its headquarters with a two-story facility that will house sales and marketing, R&D and technical support departments. ■

—FROM PAGE 12, CURRENT

Similar to other search engines, FindSounds.com does not make copies of, save or host the content found at other Web sites; it merely points the user to that content using standard HTML-based links. Additionally, once a user finds a sound he or she likes, the site offers a link to find similar sounds.

"FindSounds.com is a state-of-the-art audio retrieval system providing unprecedented access to sounds on the Web," Rice says. "It is a valuable resource for videographers, filmmakers, musicians, Web site developers, hobbyists and students."

RIAA, ARTISTS REACH AGREEMENT

The Recording Industry Association of America and representatives of the Artists Coalition, AFM, AFTRA, AmSong, the Music Managers Forum and NARAS announced that an agreement was reached on a legislative recommendation to resolve the "work made for hire" copyright issue.

Last November, Congress reformed the Copyright Act to add sound recordings to the roster of copyrighted works that can be considered as "works made for hire." However, concerns were raised about its effects soon after.

"We said from the beginning we did not intend to change the law and have worked diligently to assure that the issue of work for hire is resolved without prejudice to anyone's position," says Hilary Rosen, president and CEO of the RIAA.

"The book needs to be closed on this so we can get back to a united industry on so many important challenges of the day. The resolution is a good one."

According to AFM president Steve Young, "The AFM and AFTRA were committed to reversing this change in the law when we discovered it had passed."

The recording industry and the coalition of artists plan to request that Congress pass this legislative recommendation before the end of this congressional session.

For more information, contact the RIAA at 202/775-0101, or visit www.riaa.com. ■

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They mix and submix in most of the world's top recording studios (we know of one 1202-VLZ™ PRO that's actually built into the control surface of a \$1,000,000 digital console). And VLZ™ PRO mixers are in more basement, garage and back-bedroom home studios than you can shake a patchcord at.

XDR™. The finest microphone preamplifier design ever built into a compact mixer.

Because the preamps in mixers have long been considered a poor second to \$1000 to \$2000-per-channel outboard preamps, Greg and our Analog Engineering Department spent two years of meticulous experimentation creating a sonically comparable mic preamp circuit.

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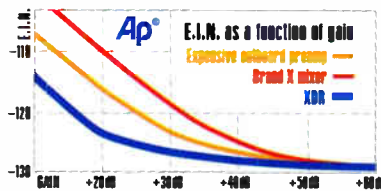
One reason is the advanced 2068 op-amps that are a foundation of the XDR design. They blow away our competitors' 4580 op-amps in terms of noise and distortion. Consider these real, measurable XDR™ (Extended Dynamic Range) microphone preamp specs:

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"A quality replacement for a far more expensive mixer brand." J.C., Arlington TX

"I was contemplating a couple of '-----' outboard mic preamps (\$2000+). The new XDR preamps let me make my next purchase a CD burner or an outboard processor instead." M.M., Miami FL

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"Great product. XDR's are a great innovation and the value's unbeatable."

J.K. Boise ID

"I hooked up my brand spankin' new AKG 3000 and all I can say is 'cool'."

T.D., Waukesha WI

"I've been through numerous small consoles that were noisy. This one isn't, so it's a keeper!" J.F., Boca Raton FL

"Gorgeous preamps. Nice job, guys."

J.C., Provo UT

"Nothing comes close to the quality/price." P.K., Spokane WA

"Excellent frequency response... excellent mic preamp. Worthy of our Neumann mics." C.M., Atascadero CA

"Killer mic preamps!" R.A., New York NY

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ILLUSTRATION: ROBERT MEGAWICK

WHY ARE WE ALL DIVORCED?

Okay, those of you who are still married, before you rush to your computer to e-mail a letter to *Mix* telling us that you aren't divorced, take a second to consider that, statistically, you eventually will be.

Now your next thought may be, "Well, that's a pretty stupid question anyway. We are divorced for the same reason that any professional is, because we must give a large portion of our lives to our careers if we truly wish to 'succeed.'" Yeah, well. Professionals. Doctors. Lawyers. Us.

DOCTOR, DOCTOR, IT HURTS HERE...

Doctors go through medical school forever and then leave their wives and girlfriends behind as a natural

step toward a lucrative practice. That way, they don't have to pay them back for all those years they worked to put them through medical school. Besides, spouses that were around through all that are usually not amused with the official transformation from human to self-proclaimed Deity, not to mention the bore of tolerating those late nights, the drugs and the women. Neurosurgeons and plastic surgeons are the worst; neurosurgeons believe their own hype and feel that anything they want to do is justifiable as critically needed decompression, while plastic surgeons simply get a new 24-year-old trophy to re-justify their hype every spring.

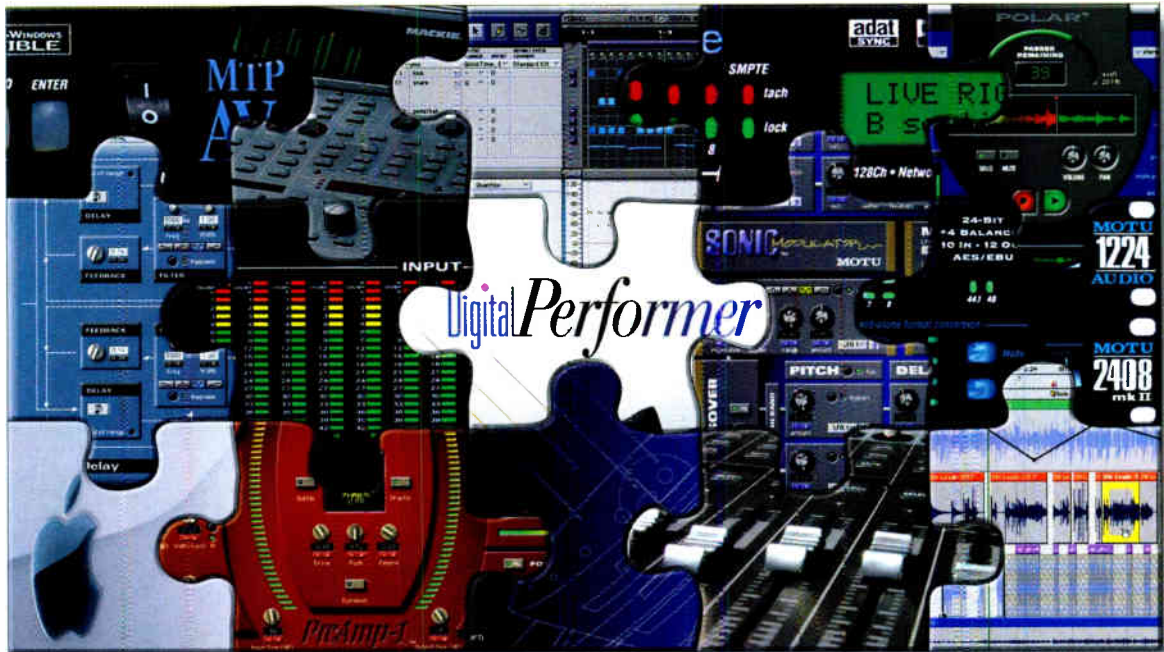
BY STEPHEN ST. CROIX

AND THE GUY THAT HURT ME IS OVER THERE...

And lawyers, well, they deserve to be divorced. Besides, it gives their lawyer buddies work, and since most don't have any buddies that aren't lawyers, this is an important consideration. Oh, yeah—we can't forget those late nights, the drugs and those pesky prostitutes.

Now it comes to us, we who record audio for a living. We are certainly subject to the same pressures and demands as in any high-intensity vocation, but I think an additional component applies to us. We are driven to create, and the public ultimately judges our efforts. To further pressurize our careers, the very nature of our industry is *blatantly* competitive.

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World Radio History

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JBC/ROD2893F/EM/MIX

Neurosurgeons don't actually get gold-plated awards for doing a better job than other neurosurgeons, but we do. Plastic surgeons are occasionally held responsible for carving their initials in their work in order to get public recognition (and the increased fees that come with it), but not us. We actually fight to sign our work.

We compete *openly* for recognition, and we have even designed our own industry to support that competitiveness. The more Gold and Platinum that we produce, the more work we get and the more we can charge.

This, of course, makes us work even harder to produce those hits. So we spend more and more time working and less time at home. We work in a deadline-oriented industry, and as continuity is crucial, we tend to work in saturation until each project is complete. This doesn't even count deadline bonuses and deadline penalties.

The cliché is true: You are only as good as your last record (or movie or spot). If we don't hit with today's project, we work even harder to get the next one, as our survival depends on it. Even worse, if we get a hit, we can charge more for a while until we miss, so we book as heavily as possible to ship as many projects as we can at the higher rates. Each hour we bill when we are hot pays so much more than what we can bill when we are cold that we simply can't afford to go home. More hours in the studio.

We see less and less of our real-world friends and families and slowly replace them with industry acquaintances. We then eventually convert these acquaintances to "friends," even though we compete with them daily. After all, they do understand us, our goals, our obsessions and even our temptations.

And our mates? Well, they don't. How can they? We stopped telling them what our world is like years ago, when we started telling our industry friends instead.

WHY WE GET FAST CARS AND BIG GUNS

Midlife crisis? Well, maybe. But for us, the creators in the recording industry, perhaps there is another inevitable compensation at work.

Simply put, we need exposure to raw, visceral power and, of course, we need to control that power because we no longer have that control at work. Making a record, a TV show, a movie or

a commercial is so technical now, so high-pressure and so political, that no one person really has total creative control. The client has the ultimate say as they provide the funding, but even they don't actually have real control, as they must rely on the creative work of others. And as we, the engineers and producers, must satisfy the client, we have those frustrating time, budget and creative constraints that we all know and love.

I mean, come *on*. We know the client is always wrong, and our job is to fix it, to make it right, without the client ever discovering that he was dead wrong. We must gently suggest those changes that take the piece from bad to good, and make the client feel that his concept and ideas were great, but that we simply made them even greater. He has to love the end result, and it has to do well. But

The more Gold and Platinum that we produce, the more work we get and the more we can charge.

he can't feel embarrassed by how dumb his original vision was or he won't come back, no matter where we land him on the charts.

And obviously the more people that are involved in the creation of a product, the more committee-type averaging takes place and the less satisfying the project is to each creative and technical person involved.

So we buy 500-horsepower cars and sit in the same traffic as the 16-year-old kid with his 92-horsepower Kia. And this, of course, is why we need the big guns.

NO WAY OUT?

It seems that we get a choice: a high-maintenance studio life or a high-maintenance relationship. There is only so much time and energy to spread around. But it also seems that many of us, mainly the artistic and creative ones, seem to gravitate toward *both* the high-maintenance studio *and* the high-maintenance relationship. This I believe is a genetic flaw; nobody can actually fly two lives at the same time—not indefinitely. Lots of us can do 1.8, but not two. Unfortunately, 1.8 is nowhere near two, so one eventually collapses.

And the answer? *Don't*. Eliminate both the high-maintenance studio and the high-maintenance mate? Close your facility and leave your wife? Maybe.

If you will allow me to get more serious than I have ever before been in all the decades that I have been writing this column:

Each of us, short of those in prison or otherwise truly denied freedom of choice by other unfortunate physical or socioeconomic circumstances, is *doing what we want*. Starkly stated, if we find ourselves in the situation that this column is about, there must be some need within us that the situation satisfies. Any shrink will tell you this for \$45k or so (\$67k in L.A.).

The answer lies in discovering what made us this way, what need is being met so that we may in turn work to eliminate that need, thereby freeing ourselves to restructure our lives in a balanced, sane manner. Then, and only then, can we enjoy both a creative and productive career and an actual functional family life.

SURPRISE, SURPRISE!

Clichés exist after all is said and done, because they are true. When one finally discovers what fear or drive is behind all this and in turn lets it go, the results can be staggering. Sometimes you must stop fighting to win.

I can think of at least ten major success stories (personal acquaintances) that have gone through this and are leading producers and engineers in the Los Angeles area. And here is the good part: They are actually happy. They have great careers, wonderful homes and, here it comes: healthy, functional families. I have asked many how much work it is to maintain both their studios and their marriages, and the answer is always the same: "No effort at all." When these same people were asked how much effort it took before, when they were still caught up in the game, again I got consistent answers: "Infinite," "Impossible," and the best, "I can't even relate any more to what it was like."

SO WHY DID I WRITE THIS?

The question of why we in this industry suffer such high rates of personal relationship failure was presented to me yesterday and, of course, I had an opinion. In the words of one of America's great commentators, Gomer Pyle: "Surprise, surprise!" ■

Stephen St. Croix dictated this column to a 24-year-old in the passenger seat of a supercharged Prowler.



voice

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WHY WE'RE MISSING THE REAL PROBLEM WITH DIGITAL DOWNLOADING



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My experience in the music business began in 1960. Even though I've recorded over 25 records, I cannot support my family on record royalties alone. I recorded a CD that sold 500,000 copies worldwide. Except for a modest advance, I have received no royalties from that project. In 1977, I had a song that was a Top 40 hit, but the only money I received from the record company was in the form of a modest advance. The only benefit I got from releasing albums was that people would like them and come to my shows."

Are these the words of an old, uneducated Delta blues singer,

forced by some greedy promoter in his youth to sign an exploitative contract that would haunt him all his life? Or are they the plaint of a jazz pioneer, driven by lack of airplay, record company support and racism to live overseas? Or some innocent singer/songwriter from Brooklyn sucked into a lousy lifetime deal with an unscrupulous, midtown-Manhattan talent agency?

None of the above. That's Roger McGuinn, leader of The Byrds, arguably the most influential American rock group of the '60s, who, before his band sold millions of records for Columbia, was a back-

BY PAUL D. LEHRMAN

up musician and musical director for big-name artists like The Limelites, the Chad Mitchell Trio and Judy Collins.

Even more remarkably, these words were spoken not in a *Rolling Stone* interview, but in the chambers of the United States Senate Judiciary Committee, during a hearing on "The Future of Digital Music: Is There an Upside to Downloading?" (You can read his whole statement at www.senate.gov/~judiciary/7112000_rm.htm.)

Later the same day, McGuinn told a newspaper reporter, "For years, the labels had all the power, and the artists were pawns. The artists were cattle." And when it

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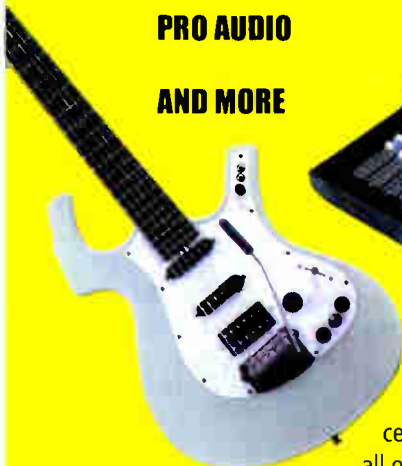
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comes to the major labels, little has changed; although McGuinn worked out a new royalty arrangement some years ago with his old label (now part of the Sony empire), the bulk of his record income today comes from sales of new recordings through an organization that the large record labels view as a Jolly Roger-flying bastion of anarchy. It's one of the new companies and technologies that EMI/BMG/Warner, etc. would love to see be put out of business, either by litigation (well under way) or legislation (thus, the Senate hearings): the notorious MP3.com.

"They offered an unheard of, nonexclusive recording contract with a royalty rate of 50 percent of the gross sales," McGuinn continued. "I was delighted by this youthful and uncommonly fair approach to the recording industry. MP3.com not only allowed me to place these songs on their server, but also offered to make CDs of these songs for sale. They absorbed all the packaging and distribution costs. Not only is MP3.com an online record distributor, it is also becoming the new radio of the 21st century."

I know you've heard it all before—I've even written about it once or twice—and perhaps you've already taken sides on the issue, but things are moving very fast on the downloadable music front, so it's worth taking another look at what it all means. Like it or not, MP3, Napster, Gnutella and whatever new file-swapping technology gets invented between the time that I write these words and the time you read them are changing the way that music is distributed in the industrialized world.

For anyone who isn't Britney Spears (or a member of the foodchain that lives off of her products), it's about time. New labels are cropping up all over the place, offering artists similar share-the-risk/share-the-profits deals to McGuinn (I just signed one myself), many of whom use MP3 files as come-ons: Download this song, maybe for free, maybe for a small charge, and if you like it, order the CD through our online shopping cart. They provide a glimmer of hope that as playlists of radio stations become increasingly tight and formulaic, radio (and the shrinking number of corporations who control the stations) will become decreasingly relevant. As the larger record companies continue their quest for risk-free, innovation-free, appeal-to-everyone, milla-vanilla "talent," they hopefully

will—like the TV networks in the face of competition from cable, home video and the Internet—steadily lose market share to independents and alternative delivery systems.

The record companies, naturally, are scared out of their pants about all this, but it's their own fault. They should have seen this coming and are only now scrambling to put the genie back in the bottle, trying to figure out how they can exercise some control over what may well be uncontrollable. And while they were screaming, "Theft!", they got caught recently with those same pants down around their ankles: In May, the Big Five labels settled an antitrust suit by the Federal Trade Commission that accused them of forcing retail stores to sell CDs at inflated prices, ripping consumers off for some \$480

Gnutella reported its hit count went from 30,000 to 1.3 million the first day after the restraining order. When one technology is squashed, another will rise up instantly, like mushrooms during a wet summer.

million. (By the way, if you look for this story in the normal media outlets, you may have trouble finding it—it ain't on the *New York Times*' site or *Wired* magazine's or *Bloomberg News*. It took me a half-hour of Web searching before I tracked it down at www.ftc.gov/opa/2000/05/cdpres.htm.)

This realignment of the record industry is good news. With the top-down orientation upended, a lot more artists and producers can participate and hopefully earn a decent, if not always spectacular, living. In the old structure, it normally took hundreds of thousands of sales before a record company could make a profit (or at least, that's what they tell the artist who's supposed to be receiving royalties), and an artist whose first record sells 2 million but whose second album sells "only" half a million is discharged like so much bilge water. The Britney Spears,

'NSyncs and Ricky Martins of the world would continue to multiply, while innovative groups would never have a chance. (And the irony—pun unavoidable—of Metallica, who built their entire original fan base on metalheads swapping live concert tapes—screaming about Internet "piracy" is almost too absurd to be true. Almost.)

But if an artist can spend a couple thousand dollars producing a song in a studio, upload it to his/her site and charge 50 cents to download it, even if he/she splits the royalties 50/50 with the site owner, it will take fewer than 10,000 people—the average drive time audience for a second-rate radio station in a third-rate market—to listen to it before the artist breaks even and can go on to record another song. And maybe 5% of those people will buy CDs—there's another couple of thou in the bank. Maybe it's not going to buy him/her a villa on St. Barts, but there are a lot worse ways to make a living.

But that's fiction. There is no World Government (although Bill Gates is certainly trying) and suppressing technology is almost impossible today (ditto). When the RIAA succeeded in getting a restraining order against Napster (which was overturned a couple days later), people just went somewhere else: Gnutella, which represents an even greater threat to the RIAA since there's no central corporation behind it and therefore no one to sue. Gnutella reported its hit count went from 30,000 to 1.3 million the first day after the restraining order. When one technology is squashed, another will rise up instantly, like mushrooms during a wet summer.

Which doesn't bother me, because I think the RIAA is writing fiction, too. There simply is no objective data that supports its position that downloading hurts CD sales. The surveys it has commissioned has been deeply flawed (just like the one years ago that Warner/Elektra commissioned that tried to show how blank tape sales were killing LP sales), and surveys from less-biased sources have shown quite different data: That in fact, in the few months right after Napster appeared, CD sales at major retail outlets actually increased.

Despite all their jabbering about artists losing control over their creations, the record companies—like the large book and newspaper publishers and broadcast/media networks—are not really concerned with that at all. They're concerned with their losing control over their artists' creations. As I

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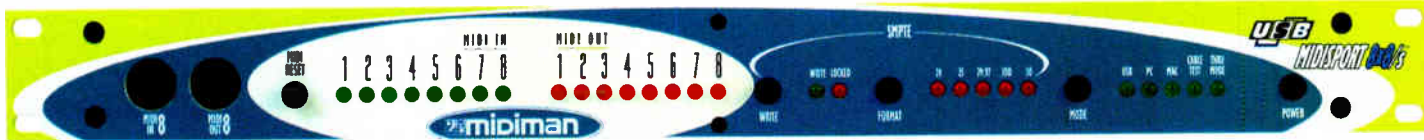
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write, the labels' lobbying organization, the RIAA, is pushing to get the words "work for hire" written into the part of copyright law that covers sound recordings, which means that even those piddling artist royalties that Roger McGuinn can't live on would disappear completely. (You can check this out at www.hitsdailydouble.com/news/newsPage.cgi?news00873m01, but be prepared to go through a fairly painful registration process.)

Also, witness the pickets at *The Boston Globe* protesting a new agreement that freelance writers are being forced to sign, which not only gives the newspaper the right to re-publish on the Web—or anywhere else—anything the writers create for that paper, but it instantly gives the paper the right to re-publish anything the writers have ever created for the paper. *The Globe* is now owned by *The New York Times*, which according to one source is using this as a testing ground before they try to force the same agreement on their own contributors.

For us as producers, studio owners, engineers and artists, I'm optimistic that the net result of all this chaos will be positive. People who like music will continue to pay for it, if the music is what they want and the price is reasonable. Folk singers, rappers, garage bands, jazz players, world musicians, techno heads and anyone else who wants to make a living in this business without turning their music into zillion-selling pabulum can't possibly be harmed by technologies that make it easier to get more music to more people, and we as professionals, helping them make their dreams into reality, will always be needed.

Maybe that sounds naive, but remember, despite dire predictions in our own industry, Fostex ¼-inch, 8-tracks didn't kill the commercial recording studio and neither did ADATs or Sound Forge. Our business realigned itself to accommodate a larger number of players (albeit operating at smaller margins), and by most accounts, we're healthier than ever—as subscription figures for this magazine and hit counts on our Web site demonstrate well. Even the giant studios who do lots of major-label work have known for years that they can't be dependent on that forever and have diversified into post-production, film scoring, multimedia and other areas. I really think we in the recording business (as opposed to the "record"

business—and we could all do the industry a favor by sending a little note to the editor every time we see a newspaper article that calls the RIAA "the recording industry") have a lot to gain by this little civil war.

Of course, it does need to be said that not everyone's hands are all that clean on the "pirates" side, either. The folks behind MP3.com stand to make a fortune on their piece of the downloading action, as well as advertising and promotion on the site, and the venture capital has been flowing into them. It's also been flowing into, amazingly enough, Napster, which since it doesn't charge for anything and has no e-commerce side, has no possible revenue source. Where's the investment money

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coming from? One could assume it's from people who hope to make a killing when some large corporation, like one of the Big Five labels or Microsoft, buys up the company, either just to put it out of business or to get exclusive rights to the technology.

And that, to me, is the greatest danger in all of this: Not that the technologies exist, but that somehow they will be co-opted by the existing media conglomerates to serve their own ends. Already Microsoft (surprise!) has come up with an "alternative" to MP3 that can easily be controlled, metered and watermarked and has entered into a distribution agreement with Sony Music. MP3.com, in an effort to settle some of the lawsuits that threaten it, has signed agreements with several of the major labels, allowing music in their catalogs to be downloaded for a price. That's all well and good for the larger labels, but what about the smaller ones? Do they have to sue to get a piece of the action as well? Or are they simply going to be shut out of this distribution channel?

There's one more side to all this that needs to be looked at. The cudgel that large companies are using against file

sharing has another target, and that's the concept of "fair use." Fair use is the age-old tenet that allows anyone to comment, satirize, share for personal use and create "derivative works" from copyrighted works. It's what lets me quote that newspaper story back in the fifth paragraph, or tape an episode of *The Simpsons* off the air, or write a research paper based around someone's autobiography or take a CD out of my public library. The media companies are salivating at the idea of media being digitized and available from a centralized source, because then it can be controlled every step of the way. If they could somehow get those pesky fair use "loopholes" closed, they could get their gram of flesh every time a book is read, a movie is viewed or a song is heard. And they're working on it—and they have lots of friends in Congress.

Island Records, some years ago, forced Negativland to bulldoze thousands of copies of a parodistic CD in a lawsuit that, if it had ever been brought to court, would have been thrown out on fair use grounds. But because the low-budget experimental band didn't have the legal muscle that the record company did, they couldn't afford to go that route. The idea that this practice might actually be legislated into existence is rather chilling.

As you listen to the RIAA and the MP3 community shriek at each other, keep in mind what the original purpose of the copyright law was. There was a very astute article on this subject recently in *The Nation* which says it nicely: "Copyright allows users—that's citizens to you and me—to enjoy the benefits of cultural proliferation at relatively low cost through a limited state-granted monopoly." It doesn't say "no cost," nor does it say anything about an "unlimited" monopoly. It's there to protect the public, as well as the copyright holders. Let's hope that the current skirmish, which has tipped the balance at least temporarily one way, doesn't cause a backlash that will permanently skew it the other way. And in the meantime, just be grateful that you don't yet have to throw a nickel into the Disney-meter attached to your console the next time you complain that the guy who fixed your tape deck did a job that was strictly "Mickey Mouse." ■

"Insider Audio" columnist Paul D. Lebrman is the editorial director of Mix Online, mixonline.com. His innermost thoughts (and some tunes) can be downloaded at antheil.org.

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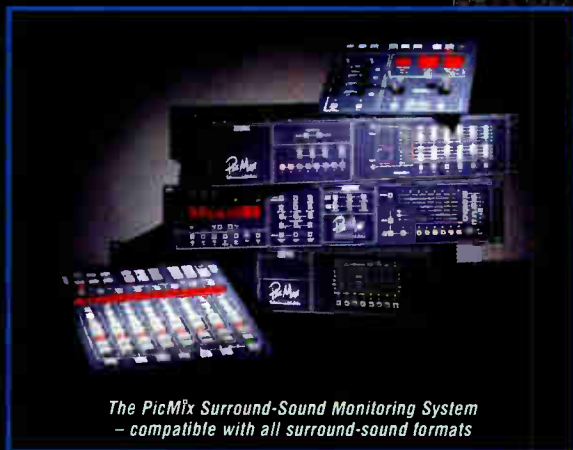
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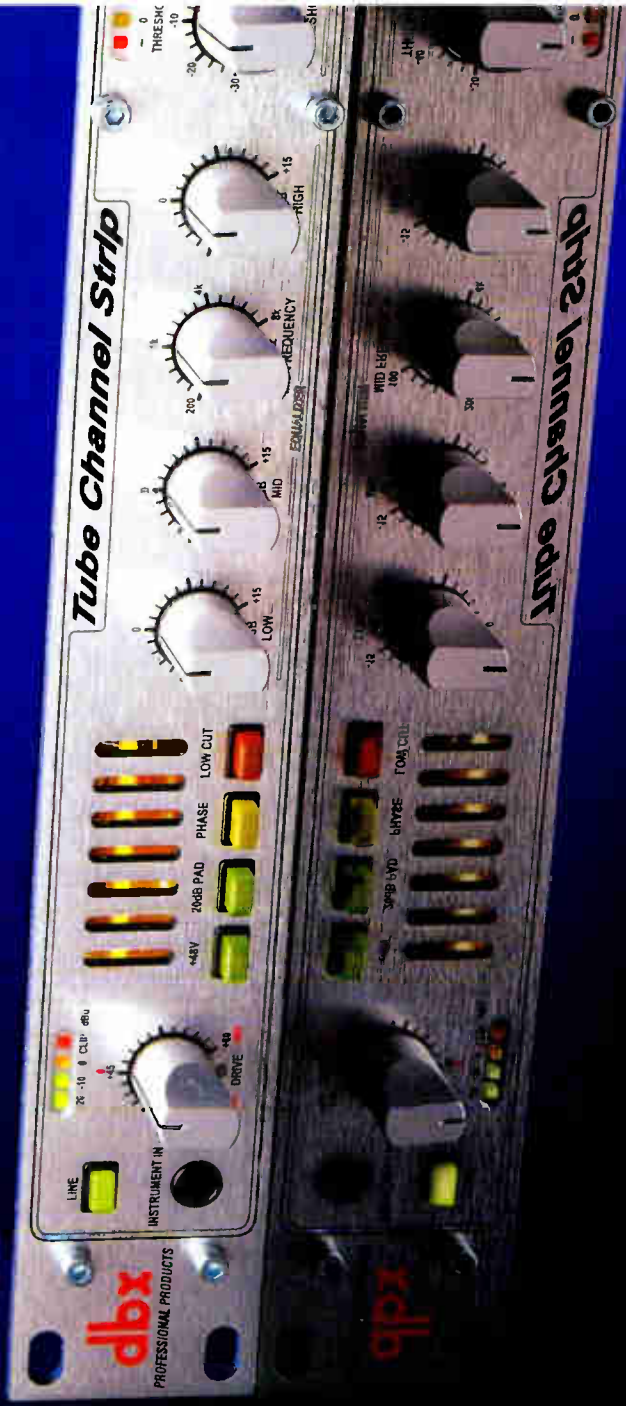
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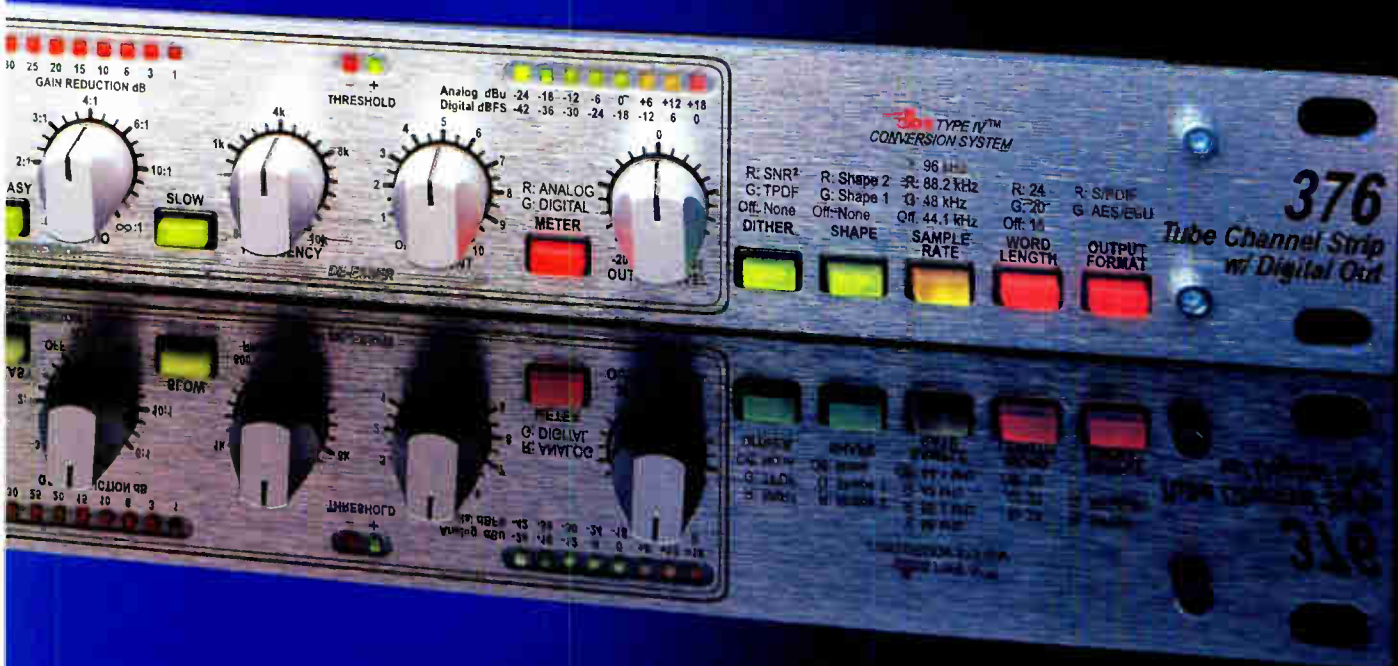
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World Radio History

SAM PHILLIPS

THE BIRTH OF ROCK 'N' ROLL

When a baby is born, everything kick-starts in that first breath: heart thumping, lungs pumping, feet kicking, voice howling. Rock 'n' roll got its first gulp of air in 1951 when a young engineer named Sam Phillips—proprietor of the town's first studio, the Memphis Recording Service—recorded an artist suggested to him by Ike Turner. Jackie Brenston's Chess Records single "Rocket 88" had a contagious, driving beat and a raw sound that set it apart from other records of the time. "And that takes nothing away from Bill Haley or anybody that came later," Phillips says. "It's because you're talking about automobiles, and everybody—and I'm talking about young people—everybody wanted one. And the rocket age was coming in, so the subject matter is right, the



ALL PHOTOS COURTESY SAM PHILLIPS

Born in Florence, Ala., in 1923, Phillips was the youngest of eight children in a family of tenant farmers. "I probably didn't really know it then," he says, "but my being associated with black people and other poor white people who didn't have much in the way of worldly goods was, I think, one of the reasons I became so interested in what could be done with so little.

"I was also impressed with preachers in the South, both black and white," he recalls. "And by courtroom tactics, which, of course, in the old days involved unbelievable speeches to the jury, and the ring and the sound you'd have in some of the old court-houses with the hard benches. Sound is something I've been fascinated with as far back as I could remember."

Phillips began his professional career as a radio engineer and DJ,

which eventually landed him at CBS affiliate WREC in Memphis. The more he heard of local talent, the hotter he got to capture it. In the liner notes to Rhino Records' *Sun Records Collection* box, he says, "I didn't set out to revolutionize the world. I wanted to see if what I had thought all of my life—that there was something very profound in the life of people with less means when it came to money, less means when it came to social acceptance—was right or wrong. When I opened the studio, the main thing I wanted to do was keep it open until I had the opportunity to do some of these things



Top: Phillips today. Above: in the Sun days with Jerry Lee Lewis.



sound is right, and in my opinion it is the first rock 'n' roll record." "Rocket 88" went to Number One on the R&B chart. Later that year, Phillips made the first recordings by unknowns B.B. King and Howlin' Wolf. But, of course, that was only the beginning...

that I had in my mind since I was a child in Alabama."

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BY BARBARA SCHULTZ



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 Input left Threshold
 -90 30 24 18 12 10 8 6 4 3 2.5 2 1.5 1 0.5 0
 -dB 07.5
 Bypass
 Input right Threshold
 -90 30 24 18 12 10 8 6 4 3 2.5 2 1.5 1 0.5 0
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phy, *Cash*, Johnny Cash writes "I have so much respect for Sam. He worked so hard and did so much good for people like me. If there hadn't been a Sam Phillips, I might still be working in a cotton field."

I want to talk about how you became a recording engineer and a producer. How did you know how to do it?

Instinctively. I started out in radio in 1942 in Florence, in Muscle Shoals, Alabama. There was only one station there at that time, and I went from there to a little town 40 miles east of the Shoals area in Decatur, to another 250-watt station, from there to WLAC in Nashville, as an engineer and an announcer.

So, you knew about audio equipment from your experience in radio?

Yeah, mainly, and I took an extension course during the war from Alabama Polytechnic Institute, which is in Auburn. Really it was over my head, but I passed. It was an advanced electrical course, but so much hung on that for



Sun Records artist Johnny Cash

me and my family that somehow or the other I got through it.

I don't classify myself as a real technical engineer in terms of knowing the actual makeup of the electronic gear, but I do know quite a bit about that, and I am an expert in what I hear. So, I came to Memphis—that was in '45—



PHOTO: SKIPPER GERSTAL

An '80s Sun reunion (l to r): Johnny Cash, Roy Orbison, Jerry Lee Lewis (seated), Carl Perkins and Sam Phillips.

and the WREC studios were in the Peabody Hotel, and here I am 22 years old, and I'm mixing the bands that go on the CBS Network every night, six nights a week, and I never thought two years before that I'd ever see a big band.

What was a typical day like for you at that time?

I never thought of it as being a work day, although it was sometimes hard getting up in the morning. I was at the studio every morning by 7:30, because I had to record a program off of the CBS network, a news program, and that was before we had tape. This was on the 16-inch disc.

Then I had to be there until 11 at night. By the time I got home it was close to midnight, so the hours weren't what you'd call optimum, but I loved every minute of it. I loved the big bands. And the bands seemed to really like what I was doing in the way of a mix. Everybody has a different notion of what they want a band to sound like. A lot of times, I would play around with it just a little bit. I got fussed at sometimes, but most of the times I was complimented on how I would be able to hear what they wanted to be emphasized in the recording, so I became known as one of the better mixers. I also learned a lot about microphones, because I had to set up the microphones, and we only had four for the whole 12-, or 16- or 17-piece bands.

So, what did you do with them?

One of the most fascinating things is setting up microphones. I mean, you might think, "Grab a mic, take it over here, get some sound," but I could never do that in my life. Whether my boss was looking over my shoulder or not, I

couldn't do that, because I was fascinated with how, for example, I could get woodwinds with the brass and rhythm and piano and this sort of thing, and that was a challenge. I did that for six-and-a-half years.

Was that unusual at that time, do you think, to spend a lot of time on mic placement?

Yeah. People usually had a standard setup on programs like that, but if there was anything unusual about a particular band that I found out, I would always make a note of that, and at the time I was ahead of the game.

It sounds like a lot of what you learned about mic placement was from working with it on your own.

That's right, because I never had a course in any kind of audio. The engineering course that I passed in Alabama was more about the electrical circuits—light bulbs and transmission lines and transformers and that sort of thing. But I needed to take it. It was a good basis for understanding electricity.

When did you make the break and stop working in radio to focus on the studio full time?

That was in the middle of '51. I had been at WREC since June of '45, and I quit in June of '51. That was after I had a nervous breakdown. I opened the studio on January the 2nd, 1950. I had worked on it with saw and hammer and nails and paint for almost three months before we actually were in position to start recording.

I loved radio and I loved the big bands, but when I saw all the potential here in the Delta region, I was totally amazed at the confirmation of all the things I had heard on a small basis in Alabama. I heard all the great rhythms

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THE SUN SPACE

INSIDE SUN STUDIOS AND PHILLIPS RECORDING

Memphis is the home of rock 'n' roll and the blues, thanks in large part to the recordings that Sam Phillips made of Elvis Presley, Carl Perkins, Jerry Lee Lewis, Charlie Rich, Howlin' Wolf, Rufus Thomas, Roy Orbison, Johnny Cash and many others.

Besides the legendary artists who have recorded there at 706 Union Avenue, Sun Studio has attracted artists from all over the world who have wanted to catch the vibe of that space. A short list includes U2, Ringo Starr, Def Leppard, John Fogerty, Tom Petty, Paul Simon and Bonnie Raitt.

"The major thing about 706 Union to remember is that when Sam Phillips had it, all the great recordings were literally made with five microphones," says producer Jim Dickinson, who has worked at both Sun and Phillips Recording studios, and whose credits include Bob Dylan, the Rolling Stones, Ry Cooder, The Replacements and more. "So even when Sam was using the RCA as a vocal mic, it was a room mic, if you get my point. The instruments were clustered around them, so the major character that you hear in those recordings is the room, or sometimes the room with slapback added.



Rock 'n' roll history just oozes out of the walls inside the live room at Sun.

"Beyond a question of a doubt, the room is really the thing with 706 Union Avenue," Dickinson continues. "The room sound, even with the gear they have in there now, is still special. It has to do with that old asbestos square acoustic tile, which covers everything but the floor. The ceiling is no longer flat. Sam made it into these kind of V-shaped rows with the acoustic tile and straight pins. When you speak, you can feel the air pressure in the room. The more volume that you put into that room, the more the midrange compresses. It is sort of like the Phil Spector principle of putting in too much in too small of a space, and the whole room becomes a compressor."

In 1958, Phillips began constructing Phillips Recording at 639 Madison Avenue, just a few blocks down from the old Sun Studio. After the move to Phillips Recording, the



The humble storefront exterior at 706 Union Avenue.

706 Union Avenue address turned into a scuba shop, and then into a garage where sports cars were stored, until it was reopened as a studio in the mid-'80s.

At the time Phillips Recording was built, it was designed to be a stereo facility with a custom-made console, and it had an Ampex 3-track recorder. There were also three live echo chambers. The tracking space had an isolation booth and stair-stepped risers that were designed for setting up guitar amps. Phillips had also custom-built reversible acoustical wall panels that are reflective on one side, absorptive on the other.

"Sam was very much involved in every detail of the design of this studio. He put a lot of thought into it, and he's still very proud of it today," says studio manager and chief engineer Roland Janes. Music history buffs might note that Janes was the guitarist on many of the Sun classics, including Jerry Lee Lewis' "Whole Lotta Shakin' Goin' On" and "Great Balls of Fire," Billy Lee Riley's "Red Hot" and "Flying Saucer Rock & Roll" and Charlie Rich's "Lonely Weekends," among others. He has been at Phillips since 1982. "This was probably one of the best-built studios in the world when it was built," says Janes. "It was state-of-the-art."

Over the years, classic hits were recorded at Phillips, including the Amazing Rhythm Aces' "Third Rate Romance," Jerry Jeff Walker's "Mr. Bojangles," Sam the Sham & The Pharoahs' "Woolly Bully," as well as more arcane cool sessions, like John Prine's album *Pink Cadillac* and The Yardbirds' "Train Kept A Rollin'" and "Mister, You're a Better Man Than I." The studio is still an analog facility with a Studer A80 multitrack and a DDA 36-in/24-out console.

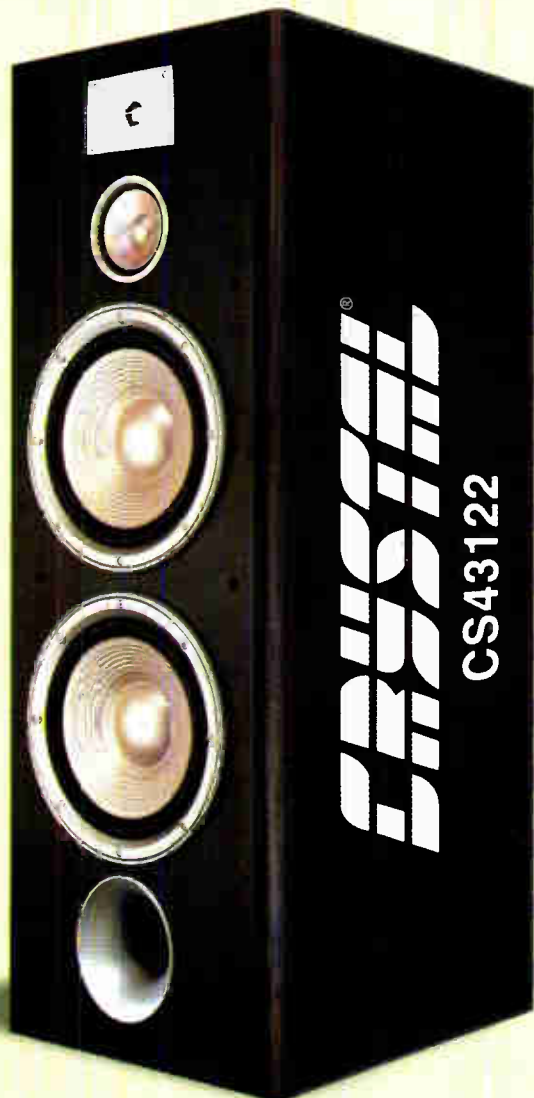
"We totally retooled the studio about five years ago, and we labored over whether to take the studio digital or not, and we finally determined to stay analog," says Janes. "We did get a new Dolby SR noise reduction unit, which I don't always use." Today, both Phillips and Sun are active studios, and artists come from all over the world to experience some of the historic magic.

—Rick Clark

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that the black musicians seemed to have in abundance, without having any formal training whatsoever, and so I thought you just didn't hear that [on the radio]. Black people [on the radio] were people like Duke Ellington, and they had to do the stuff that white people wanted to hear in order to sell records. Count Basie, Nat King Cole...there's nothing wrong with that—they did what they did so fabulously. But there were so many people that had such a great, great feel for the life that many people lived. I knew this, and I just said to myself, "Man, I've got little enough sense to start fooling around with this."

I did both jobs for a year-and-a-half before it got so hard on me that I just couldn't do everything. I had been run down for some time, because I was a hard worker. I don't mean to brag, but I never thought of anything but giving a full day's work for a full day's pay, but

then I got into something I really loved, and I was going to do that regardless. So, I guess it all hit me, and I was given electric shock treatment. I don't guess I was ever crazy [laughs], but I just knew I had to have some help.

When I came back on the job, I went to [my boss] Mr. Wootten and told him that I had the toughest decision I had ever had to make. That was to either give up my little studio—I wasn't making any money out there to speak of—or my job at WREC. I had two very young children, and a deaf aunt who was also blind in one eye and my mother to take care of, and I hope I never have a decision that tough to make again, but I did make it, and it worked out.

You must have been scared.



It was a scary thing, but I had so much confidence in my ability, and I really don't mean that bragging. I just believed in sound so much, and I had such a devotion to what I was doing. I loved what I knew black and poor white people in the South could do with music if only they were *heard*, and I loved the close kinship between the two, between country music and blues music. There's not much difference there. It's such honest music. Each can be very different, but really back then when you got down to a fantastic Jimmie Rodgers' country record and some of the later things from Lightnin' Hopkins and people like that, it was just an amazing inspiration to see what these people had experienced and would write.

And I wasn't just an engineer. I had to be a psychologist, a business person, a family man and totally devoted to sound, and I knew I had to do something different in the way of sound. If I was trying to do the same thing as the records that were on the radio at that time, everybody could do something as good or better, because they probably had better equipment and facilities than I had at 706 Union. But I knew what I had, and that if I did the things that I should do, I could get what I was looking for. I just hoped and prayed that it was what the people would want, if I could get distribution on it.

So this was when you were making records for people in your studio and then leasing the records to a label?

Yes. I really did not want to go into the label business because of the monetary [risks], and you couldn't have just a little regional record label. You had to have a national label. You might not have the power of distribution that the majors had, but you definitely had to get out of a region and expose the records to enough people—north and south, east and west—to find out whether what you're doing was going to be accepted

SAM PHILLIPS ON THE SUN ROSTER

Volumes could be written (and have been) about the artists whose careers started with Sam Phillips at Sun, but we asked Phillips to give us some nuggets about the strengths of some of the greats.

Howlin' Wolf: The Wolf had the most potential of any black artist I ever had. If I hadn't lost him, I just think he probably could have been one of the biggest artists I ever had. I know that sounds odd, but that's true.

Jerry Lee Lewis: Jerry Lee Lewis is one of the greatest talents of all time, but you had to watch his timing. With his enthusiasm for doing things live and doing them instinctively, which I love dearly, he tended to rush time a little bit, and I had to watch that but not kill his spirit.

Roy Orbison: Roy was naturally a ballad singer, and I knew that, but at that time, you have to take into account what was taking place. If I hadn't done this silly little "Ooby Dooby," a huge song, and gotten Roy to where he was recognized by the younger people, I honestly don't know whether Roy would have been around or not. But, of course, nobody could do a ballad much better than Roy.

Carl Perkins: Carl was one of those bare-bones, raw-bones-type persons that absolutely could have been one of the biggest country singers ever. That song "Turn Around" is a country song that I did on Carl before we cut "Blue Suede Shoes." I didn't like converting people—I wanted them to stay in whatever instinctively they felt, but by that time, everybody who came into the studio that had heard Elvis really wanted to rock.

Johnny Cash: The most distinctive voice outside of maybe The Wolf; certainly the most distinctive white voice. His songwriting is so to-the-point. You're going to follow Johnny Cash's narrative on any song that he sings, especially the ones that he writes.

Elvis Presley: Somebody I truly loved as an individual. I wish more people could have experienced the real Elvis. When I heard his voice, it was the sweetest thing I'd ever heard in my life. It was not only pretty, it made you wanna cry, it made you wanna be happy. Elvis knew that the thing that he loved better than anything else in this world outside of his family was music, and it showed in everything that he did. ■

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generally or not. If your dog is barking up a tree and there's no possum up there, you got a dog that ain't no good, you know?

So, [when I started Sun] I had to set up 38 distributors, and I drove before we had interstates to do that. We did a great job of distribution, and that was very important but also tough, because we were so different in what we were doing. Even our blues was different because it was more of what I call gut-bucket. It was more down-to-earth-type blues. There were some good record labels: Atlantic and Specialty and Chess and Checker, but very few of them had any artists that were right down where I thought the grass should grow. That really made me stick by what I felt I had to do to give it a fair trial.

The point was that I really wanted to do something different and give an opportunity to some people that didn't have an opportunity. I was right in the middle of what was happening, and I recognized that. I wanted to prove that there was a market out there for these people and that these people deserved to be heard. I'm not a good guy, or a

sweet guy or anything like that, but you have to be honest to yourself.

Tell me about the studio at 706 Union. I used the old 1-foot-square acoustic tiles, and I knew there were a lot of ways to approach it to make a live-er studio or deader studio. I never truly liked a dead room for what was I going to do with a very sparse number of people on the session—maybe two to four or five was a big band—so all that was taken into account.

I designed some angles in the little studio, about 18 by 32 or 33 feet long, and I designed a V-type ceiling with horizontal and vertical Vs on either end of the studio, and I just kind of played with it. I would go in and clap my hands. It sounds kind of crude, but that was the way a lot of people felt the vibe of a studio. I wanted to have a good sound that I felt was natural.

I never used EQ. I'd reset the mics or exchange mics. I never used EQ until we got to the mastering stage. I had very little limiting and compression. I had a homemade compressor that I made so if something got out of hand it would get it. I never complained about equipment then, even though I had to make quite a bit of it myself. I had an

old, used RCA 70D board that I'd reworked that I got from a little station up in South Carolina, and I just had all I needed. I had six inputs.

I also knew that I had to use the right type of microphones. I couldn't buy some of the more expensive microphones, but I knew what I was doing with what I had. I worked with how each different vocalist would work the microphone. Some I'd work directly in front, maybe six inches back, some I would have work across the mic.

Can you give me some examples? For instance, how did Howlin' Wolf approach a mic? How did Elvis Presley approach a mic?

Well, the Wolf sat down, and he played the harmonica, too. He never liked to stand except when he was onstage. The Wolf liked to have a microphone that was more or less nondirectional, because he was going to wiggle his head regardless. He had played these little spots over in Arkansas trying to grind out a few pennies on the weekend; he always played like he was in a show. So I knew working a directional mic was not going to work on the Wolf. You would lose some of those

—CONTINUED ON PAGE 225



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EQ 1 A - Equalizer



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ANALOG MAINTENANCE AND UPGRADE CONSIDERATIONS

by Eddie Ciletti

I get plenty of e-mail regarding "modifications and upgrades" to recording consoles and other pieces of audio gear. I chose those words carefully to make a point. More often than not, *modifications* can be as expensive as a new piece of outboard gear, or worse, a major detour into oscillation-land. Why modify a console mic pre-amp when there's already a product whose designer auditioned each component for its sound, or lack of same? By contrast, the decision to *upgrade* should be borne from the maintenance history of the console or tape machine.

If you want to know a little more about basic maintenance, enough to make educated decisions or possibly go a little further, ya gotta be in the ballpark to *see* the game and ya gotta practice to *play* the game. So let's find our seats and check out the opening lineup. What better way to demonstrate the process of comparative analysis than by testing a recording console or tape machine, good channel next to bad channel?

CAPACITORS: SQUARE BIZ

Geeks-in-training need to start with maintenance fundamentals, which includes familiarity with test equipment and electronic components. (A list of test gear was detailed in the May 2000 issue.)

Capacitors—the weak link in almost any aged product—are failure-prone over time, making travel for low frequencies difficult. The end result is “thin” sound.

You can test for bad capacitors without pulling a module; the fastest way requires a square-wave oscillator and an oscilloscope. Fig. 1 shows a family of square waves, starting with 1a showing the 500Hz reference wave; 1b indicates the bass roll-off tilt caused by bad capacitors; and 1c shows how bass boost tilts the wave in the opposite direction. (Any midrange frequency will yield similar results.) This test is particularly useful when checking old Pultec and Neve modules or any equalizer that has switched EQ settings. Not only do you want to know that all frequency options are functional, but also that the center *détente* is really “flat” and that the output transformer (if applicable) is properly terminated.

Also included are snapshots of treble boost (1d) and cut (1e). All “visual effects” were produced with a shelving equalizer where the slope is a gentle 6 dB per octave. A lowpass (high-cut) filter has a much steeper slope, at least 12 dB/octave, leaving more bandwidth untouched and leaving a recognizable footprint, as seen in Fig. 1f. Notice how the rise time of the square wave is affected. The images will vary depending on the slope of the EQ curve. Boosting the midrange EQ at the same frequency as the oscillator will turn it into a near-sine wave.

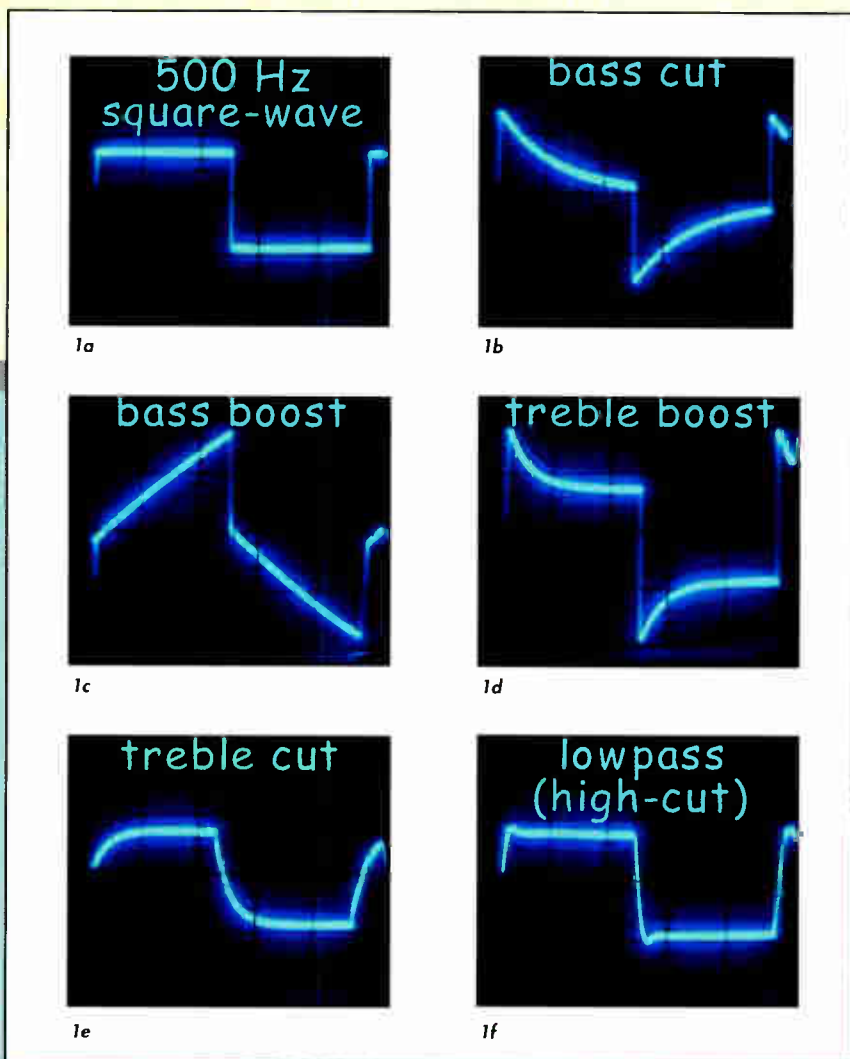


Figure 1: A square-wave family, at 500 Hz.

MODULE ETIQUETTE

Once the bad modules reveal themselves, it's time to find the bad caps. Be sure to mute the speakers and power down the console when removing and replacing modules. An extender card makes it easy to probe individual modules. If you don't have that luxury, pull a few modules to clear some real estate. A schematic will help locate input and output caps—most of the time, the circuit board is silk-screened with part designations. Using a 'scope probe, locate a cap at the input or output of an amplifier and check each leg for the “before and after.”

You might find that many of the same caps in each module have failed. The decision is yours to change only those that typically fail, or go the “wholesale replacement” route. Caps can fail in batches—some are more stressed than others and then some just plain suck. Once you begin to recognize them, order a quantity to have on hand when some down time opens up. Digi-Key (www.digi-key.com) is a good place to buy mass quantities.

I like to replace electrolytic inter-stage (coupling) caps with Panasonic's HFS series, designed to withstand the abuse of switching power supplies and rated for 105 C. The difficulty with selecting replacement caps is that many were originally chosen for their small footprint, which is mostly determined by selecting (some would say compromising) voltage and capacitance values. Construction materials also affect size. The ambient temperature inside the product must also be considered. Heat shortens life, so the 105 C rating is a safer bet than the more typical 85 C.

As a rule of thumb, the power supply rail(s) should be within 70% of cap's DC voltage rating. Quite often, caps ride the rails much closer than that (not good). For example, a 24-volt rail wants a 35-volt cap. Using one rail of a bipolar supply

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as reference, a 16-volt rail wants a 22.8-volt cap, which you're not going to find. Capacitor voltage ratings are stepped—10V, 25V, 35V—so the next highest value is a good place to start. For additional comfort margin, add the bipolar rails together, but remember that larger capacitance values and voltage ratings make bigger caps. Good, compact caps cost even more.

Yes, you can argue that different capacitor materials have a sound. Dave Hill of Crane Song once told me a story about replacing the tantalum caps in an old Neve module. Apparently, the non-tantalum replacements changed the sound of the module. Dave's research determined that tantalum caps contributed more even-order harmonic distortion, not as clean—but pleasing.

OP AMPS

Before considering an op amp upgrade—those little ICs that contain dozens of transistors—other items are worth considering. Just as capacitor ratings are often just a few volts above the rails, many of the “affordable” consoles have power supplies running close to capacity. (Adding a fan, if none exists, is the best life-extending preventive maintenance.) “Speed” is important to sonic transparency—specified as Slew Rate, in Volts per microsecond or V/ μ s—but the most critical parameter is actually current consumption.

If, for example, the board is filled with hundreds of TL072 dual op amps—at 3 milliAmps (mA) per chip—there is no way you can “upgrade” to an OP275, at 5mA per chip, without putting the power supply into shock. If, on the other hand, the board is

stocked with NE5532s (8mA per chip), then the OP275 is an option. See Tables 1 and 2 for dual and quad op amp comparisons, respectively. (The two parameters in Tables 1 and 2 only scratch the surface. Any op amp will behave differently when operating in a unity-gain circuit or in a high-gain application.)

GROUND ZERO

A customer once delivered a mixer to my shop after carefully desoldering the chips, adding sockets and experimenting by ear with different op amps. His techniques and intentions were good, but the end result was intermittent oscillations. Modifications have a way of revealing a product's soft underbelly, idiosyncrasies pushed to the edge, in this case, by the op amp's increased speed and current requirements.

There is no perfect capacitor or op amp; these are just two of many variables, all contributing to subtle variations of sonic character. Since this article is about “global restoration” and not specific to any one product, I welcome questions via e-mail (edaudio@tangible-technology.com). I encourage you to collect schematics, pop the cover to peek, probe and better know your gear. How else will you know how to ask the “right” questions?

In addition to Dave Hill at Crane Song, my thanks to: Greg Gualtieri at Pendulum Audio and Dan Kennedy at Great River Electronics for their input. Next class: op amp upgrades to the UREI LA-4 limiter, plus power and ground distribution improvements to the Trident series 65 console. See you online at www.tangible-technology.com. ■

Table 1: Dual op amp comparisons

Dual Op Amps	Current	Slew Rate	Link
TL072	3mA 1.4 ~ 2.5 per amp	13 V/ μ s at unity gain	www.ti.com
OP275	5 mA	22 V/ μ s	www.analogdevices.com
NE5532	8-10 mA	9 V/ μ s	www-us.semiconductors.philips.com
OPA2604	12 mA	25 V/ μ s	www.burr-brown.com

Table 2: Quad op amp comparisons

Quad Op Amps	Current	Slew Rate	Link
RC4136	5mA 1.25 ~ 2.8 per amp	1.7 V/ μ s	www.ti.com
TL074	6mA 1.4 ~ 2.5 per amp	13 V/ μ s at unity gain	www.ti.com
MC34084	10 mA	25 V/ μ s comp 50 V/ μ s decomp	www.mot-sps.com ; www.onsemi.com

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any and all sibilance will be nabbed. In addition, I usually cut all frequencies below 5 kHz to decrease the compressor's sensitivity to those lower frequencies so that it does *not* kick in when the spectral balance is okay—such as during vowel sounds and nonfricative consonants.

As for compression ratios, I usually start with ∞ :1 to really hear the effect and then back it off to where it sounds right. I might even go as low as 3:1 to perform subtle de-essing on a track that just needs a pinch of control.

BLARING VOCALS

Sooner or later, every engineer is faced with a vocalist who sounds like a trumpet. These singers usually sing primarily from the throat, rather than use chest or head resonances. You try everything to warm up the sound—proximity effect, tube mic, tube pre, tube compressor or even a Kenner Easy-Bake Oven—but such vocalists still sound like an ear-splitting siren on high notes. The solution? Frequency-conscious compression.

For this application, I generally boost somewhere in the 2.5 to 4 kHz range on the sidechain equalizer, cutting other frequencies as needed to further sensitize the compressor to the desired band. The affected band may, in fact, need surgical treatment, rather than a broad-stroke approach. For instance, you may need to boost 2.5 kHz by 6 dB, boost 3.15 kHz by 12 dB and leave 4kHz at unity. It all depends on the singer. In any case, the compression ratio usually needs to be set to a more moderate value than one would set for de-essing, typically in the 4:1 neighborhood.

The above example illustrates the superiority of using a $\frac{1}{3}$ -octave graphic equalizer in the compressor's sidechain. Although parametric and shelving filters will do the job for many frequency-conscious compression applications, I prefer having 31 bands for those situations where multiple frequencies and slopes need to be shaped in the sidechain. This allows the compressor to do multiple tasks, such as keeping a lid on low highs and de-essing, simultaneously.

To set up for this latter application, I might *slightly* boost the 2.5 to 4 kHz band (keeping in mind the high ratio I'm using for de-essing purposes), cut all else below 2.5 kHz by 12 dB and boost heavily from 5 kHz on up. Set this way, the compressor de-esses vigorously during sibilant portions of the performance and reduces peaks a bit during hard "a" vocal sounds (such as during the ubiquitous rock exhortation, "ba-a-a-a-

by!"). A variation on this setup would be to keep the 2.5 to 4kHz band at unity gain on the equalizer, making the compressor act like a non-sidechained limiter on these frequencies only. Just keep in mind that the release time must be kept very short in deference to the de-essing also being performed—unless you want to give the singer a lisp!

WIND INSTRUMENTS

Small wind instruments can also sometimes benefit from frequency-conscious compression. Pennywhistle can sound incredibly piercing, especially in difficult multitrack ensemble situations where it may need to be miked somewhat closely. In this case, I often boost the compressor's sidechain EQ in the neighborhood of 1.6 to 2.5 kHz. The ratio generally ends up being around 10:1, the threshold set high, the attack around .5 ms and the release roughly 200 ms.

**Keep in mind that
the release time must
be kept very short
in deference to the
de-essing also being
performed—unless
you want to give the
singer a lisp!**

Frequency-conscious compression can also be put to good use on effect sends. I once noticed that my Lexicon PCM 70's input level has a tendency to momentarily spike 12 to 18 dB when a certain client's wood flute is sent out to it. To keep the reverb's input level consistently high for the best resolution, I placed a compressor before the PCM 70's input. Patching an equalizer into the compressor's sidechain, I boosted the nasty midrange frequencies (315 to 500 Hz, in this case) that were causing the spike and robbing me of headroom. Problem solved.

DEBOOMING

Debooming is the basement buddy of de-essing, standing guard over bass frequencies rather than highs. Electric bass guitar can be deboomed to put a lid on

isolated, boomy notes. The offending frequency is usually the fundamental of the boomy note being played. For debooming duties, set the compressor's attack time to less than 1 ms. The release time should usually be set for no faster than 1/10 ms to avoid distorting the waveform. (At quicker release time settings, the compressor's envelope gets superimposed on a single cycle of the longer wavelengths of bass frequencies, often causing audible distortion.)

The same technique works for cello, but for a slightly different reason. Many times, it is not the fundamental but rather the formant of the cello that is causing the boominess. No matter. The formant is being excited by whatever fundamental pitch is being produced at the time you hear the boominess. Remember, unlike with splitband compression, you are not attenuating select frequencies. You only need a trigger—any trigger—to compress the entire signal when the problem occurs. Boosting the fundamental in the sidechain equalizer will result in the compressor kicking in whenever the boomy note is played, reducing the excited formant that occurs along with it. Fundamental pitches are easy to identify quickly. If you'd rather go hunting, however, you can sensitize the compressor's sidechain to the formant, and the results will usually be roughly the same.

Up to this point, we've only discussed the processing of monophonic or melody lines. Debooming acoustic guitar can be a whole other ball game, because broadband spectral content is involved. That is, it's difficult to attenuate boomy bass notes without pulling down the level of higher strings that are ringing simultaneously. This is made all the more difficult because of the slower release times that debooming requires. Lower ratios are a must when debooming acoustic guitar. I generally find that 1 to 3 dB of gain reduction is all you can get away with before the compression starts punching "holes" in the track.

Likewise, the broad spectral (and often percussive) content of stereo program mixes presents an insurmountable challenge to frequency-conscious compression. For such tasks, as well as for debooming the most stubborn acoustic guitar tracks, your best recourse is to use splitband compression. But that's a subject we'll have to leave for another article! ■

Michael Cooper is a Mix contributing editor and owner of Michael Cooper Recording in Sisters, Oregon.

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JACK JOSEPH PUIG

RESPECT FOR THE PAST, CREATING THE FUTURE

Words like “dull” and “ordinary” are never found in the same sentence with the name Jack Joseph Puig. A sonic legend since his groundbreaking production and mixing work on albums for cult faves Jellyfish (*Spill Milk, Bellybutton*), he's been riding high recently with Platinum mixes for singles such as The Verve Pipe's “Freshmen,” Goo Goo Dolls' “Iris” and Semisonic's “Closing Time” and albums by Tonic (*Lemon Parade*) and Goo Goo Dolls (*Dizzy Up the Girl*). A cutting edge mixer whose roots are firmly planted in the classics, Puig has been ensconced in Ocean Way L.A.'s Studio A for the last five years, where he's also worked with Beck, Hole, Counting Crows and Remy Zero. There he has created a private mixing world comprising the best of vintage and new gear, all housed in an other-worldly environment that's part funky spaceship, part '60s pipe dream, part gothic castle, curio shop and musicians' rehearsal hall.

Entry into the sanctum, past the “closed session” sign, is through a hallway papered with hundreds of console tape strips saved from projects Puig has worked on. In the control room: a winged Focusrite console, mountains of outboard gear, two Sony 3348s, masks and carvings, colored lights, black lights, glowing vacuum tubes and, in front of the patchbay, a good-size snakepit of cable.

In the studio, a long medieval-style banquet table, complete with candelabra, is set up in front of a tiki bar (a gift from the Goo Goo Dolls). A red velvet chaise sits beside a drum kit. A top-of-the-line Pro Tools system fills one corner, a Universal Audio tube console another, a bass rig still another. There are rows of vintage guitar amps, funky keyboards, stacks of percussion instruments. The walls are softened with batik tapestries and posters of The Beatles, Brian Wilson and Led Zeppelin. The overall



PHOTO: DAVID SOGGIN

vibe? A musician-friendly altered state where anything can happen.

Catching up with JJP for this interview wasn't easy. While watching his mixes for No Doubt's *Return of Saturn* album climb the charts, he was finishing up Green Day's latest (*Warning*) and also deep into mixes for Collective Soul and new bands Electracy, Killing Heidi and SR-71. I finally pried him away from the console and we adjourned to the table in the studio. A faint scent of incense filled the air, and KROQ played from a boombox as we sat down for our chat.

Is there always a radio playing in your studio?

All day. I like having music out here. It's part of creating an environment that I feel is conducive to creativity. The radio, actually, comes from when I worked with the Black Crowes. They'd turn on a blaster out in the studio between takes and listen to CDs. It was inspiring to all of us.

Besides, I like hearing the records

that I've either produced or mixed on the radio. It's like a tool; I get to hear how it sounds on the station and think, “Okay, what can I do to make it better?” Because, in terms of singles, we *are* mixing for the radio.

You're very knowledgeable about radio in general. And not just about playlists—you know the names of station personnel and how their broadcast setups affect the sound of your records.

Definitely. I've come to know program directors, and I find it interesting to listen to the different sonic qualities [of the different stations]. The concept of sitting behind a console listening to a mix on NS10s, Tannoys or Genelecs—whatever—only makes sense from the standpoint that it's a reference. But that's it. It's not realistic and representative of the whole listening world.

The truth is, given the different systems it gets played on and the environment it gets heard in, when that record leaves the control room environment, the half dB you may have concerned yourself with for an hour means nothing. Take a CD

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and go to Frys [Electronics]. Walk down the row, play it in each blaster and listen to the difference in how that song sounds. It will tear your head off. One could be left on the jazz setting, one's got the bass boost in—what's important is the whole picture. How does it make you feel emotionally? One of the arts of great mixing is being able to put a song together so that wherever you hear it, the heat of the song comes through the speakers.

You're notorious for your collection of equipment, yet it doesn't seem to be technology that truly inspires you.

Yes, songs have inspired me first. Think about all the eras we've gone through—hair bands, bands with flannel shirts, ska, punk, rock, metal—whatever. After all these eras, the song, which is the main common element with all of them, still stands as the king. Song is king!

Making that song come out of those speakers with that kind of power is what we're responsible for. We're communicating with people. As far as all the equipment, to me they're just tools. I can have a box of eight Crayolas or a box of 64; I prefer to have the box with 64. Can I take a red crayon and a green one, mix them together and make a color? Yes. But I can also make even more shades with the 64-box.

But, I've also made records with very little equipment. Either way can be right. I just, in general, prefer the larger palette.

When we had finished the Tonic record [*Lemon Parade*], the A&R person, the band and I felt there were two songs that needed to be on the record. One problem was in our way: no money. So I said, "Pick the cheapest studio, tell me what time to be there, and we will nail the two songs to completion in two days." I walked into that studio on a Saturday. The assistant introduced himself to me and asked, "What mics would you like on the drums?" I looked at him and asked, "Do you have a mic locker?" He said, "Yes." "Walk into the locker, grab whatever ten mics are on your left. Those will be for the drums. The seven mics on your right will be for the bass, guitars and vocals. One of the two songs became everybody's favorite, and the rest is radio history.

Okay, but with your current setup, there is so much to choose from. How do you decide what to use?

It's just instinct. One day you're listening to a track and something inside you



Puig and the members of Green Day

says, "You know, that would sound great if such and such was on it."

So you have this giant equipment inventory catalogued in your brain, and the proper piece of gear for each application just pops into your mind at the proper moment?

I feel everybody has what I call a "preset"—something they default to. The preset is developed by the synthesis of all your experiences as you've grown up listening to music. Maybe your parents played a certain kind of music, or you lived in a city that was famous for a certain kind of music. Then there's your education and your experience. This synthesis is an endless list that creates the preset that you don't even realize you have.

What's important is to put yourself in "manual." Manual mode means that you are in operation from your gut and current instinct. You will do your best work in manual!

Lot's of times when I'm working, I'll think to myself, "Oh, I better save this mix," and I look up at the computer and it's already saved. But I don't remember doing it. That's when you're on. At that point, you're not thinking about it. It's the same thing for the equipment. You just reach for an EQ or a compressor the same way a musician would go for a Stratocaster or a Les Paul. It's what makes sense for this song.

When you're a busy mixer, it becomes difficult to avoid going for that preset, that thing that you know will work and that also gives you an identifiable "sound." You, however, don't seem to have an identifiable sound.

Keep in mind that the identifiable or

commercial sound isn't always a great sound. It's just what is popular at the time, because it was attached to a hit record. That's where commerce and art meet. Life is a compromise.

What I do for a living is make commercial records; that's my job of choice. We are in a service-oriented business. It's true that some people want their CD to be done as fast as possible and for it to sound like everything else. In other words, they like McDonald's, where they're in, they're out and they know what they're gonna get. And yes, it's possible to develop systems where you don't have to change anything and you can move very quickly.

I also have had A&R and bands come to me for sonic creativity. Who wouldn't want to have the luxury of listening to the song, talking to the band, discovering what they're about, what they're going through, what CDs they've been listening to and why they wrote those songs?

You prefer to have input from the band while you're mixing?

Of course, when it's possible. Because you're working with them for only a few days or a few weeks. You haven't made the record, lived with the record like they have. Instead, you've gotta get up to speed—0 to 180, *now!*

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That's great, assuming you're working with great artists.

Of course. But I believe at some point in the '80s, people who do what I do for a living—mixers or producers—became the stars. It was the beginning of us having managers, percentages on records; everything started to change. And it was no longer the guy recording the record who was mixing it.

I'll give you an example. Take Janet Jackson's "What Have You Done For Me Lately?" Hear that record in your head, then try playing it on a piano. You can't come close to it feeling like the song you remembered. It's all about the sound of the backbeat—the attitude, the arrangement—the way it's put together. The real true artist there...

Was the production.

The production team. Meaning producers, engineers and the mixers. They were really the artists. The computer, which was a large part of the technical '80s revolution, was coming in. Everyone got very engrossed with the manipulation of what we could do to the music. So the focus was not on the artist.



PHOTO DAVID SCOGAN

Taking a break with the Goo Goo Dolls during the sessions that produced the smash hit "Iris."

Artists became, in many cases, interchangeable.

We were the artists in those cases. And that's not the total perspective. It got a bit out of control, and that's why it's so important to understand whose wedding it is. Now, I'm not talking about being a wimp. You have to have confi-

dence, and you have to realize your contribution. The artists are the diamond in the rough, and it's their wedding.

But great production is also art.

Of course. What's *Thriller*? There's no production in *Dark Side of the Moon* or *Kiss from a Rose*? Or *Abbey Road*? I mean, George Martin's a genius. Or

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what about Led Zeppelin? That's not what I'm saying. I'm pointing out that those records happen when all the parts are in the right relationship. Where they all come to the party. What a great record is about is people coming together making that indescribable chemistry. When it really works on a huge level, it's bigger than all of us, and you don't even know it's happening. *You're lucky to have experienced that; it doesn't happen to everyone.* I've never taken this for granted. I will be able to look back and say I appreci-

ated every moment of it, with respect. *C'mon, you never have those moments when you put your head down on the console and go, "I cannot do one more pass of the song"?* The business doesn't owe us anything. We're very, very fortunate to be a part of it. I get to work at Ocean Way Studios, one of the best recording studios on the planet, with phenomenal artists. They write great songs. They can sing and play, and they have something to say. What's wrong with that? *Who were your mentors?* I had three. The first one is Bill Schnee, who was like my Obi Wan Kenobi. And

... says loc. Marlin as band's first rec... the roof, and you... ating their sound, y... aspire to ultimately... print! That separates... boys. Certainly all three... I came up in the late '60s. I how those records were... wanted to know how rec... made in the '60s and '70s and... The three of them gave me that... tion. Each of them gave me a di... perspective, and I continue to pull... them all the time. I actually hear th... voices in my head sometimes when I'm doing things.

What do you hear Glyn Johns saying? "Nothing is precious." True rock 'n' roll is not precious. Glyn was very much against the idea of becoming anal over any aspect of a record—down to placing a microphone on a guitar amp. Glyn was like, "Whack it! Just move it 'til you think it's right!"

I remember once, engineering for Glyn and spending a lot of time miking a guitar, trying to find the exact spot where it would sound amazing, because I wanted to blow him away. Finally, he said, "Are you done?" "Yes, what do you think?" "It's great. But let me show you something." We walked out of the control room into the studio. He walked up to the amp and looked me straight in the eye. Our eyes were locked, and he took his leg and knocked the mic over. And he kept looking at me, waiting for my response. Which was, in my mind: "You're a dick. You're an asshole!"

And that's when he looked at me and said, "Nothing is precious. Use your instinct. Use your gut. Mike it again and use your instinct." He was right. In two seconds, I had it sounding better.

As simple and mundane as that sounds, it's one of the greatest lessons I learned in this business. That's why rough mixes and demos are so often amazing. You're not thinking about it, you're just doing it.

You seem to have a special affection for music of the '60s.

Actually, I feel all the decades had great qualities to them. I want to take the best of all of them and create the future.

The '60s were innocent; the records were bright and vulnerable—splashy and roomy with so much character. They were blazing a new way, and no one knew where they were going. That mentality was in the artist, it was in the people making the records, the people

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*Mark Mangini
 Weddington Productions*

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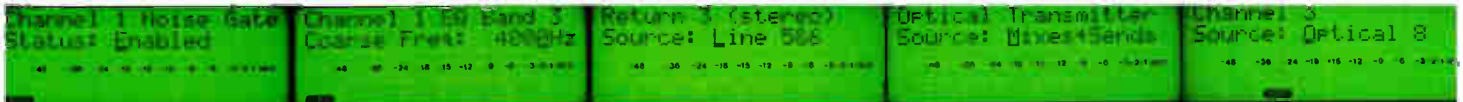
EZbus™

Computer Audio Recording Interface

Software Control Surface

Stand-Alone Digital Mixer





When a tune hits you need to respond *fast*—

before the magic moment is lost forever. So when inspiration strikes, grab an EZbus, and hot-plug the latest and greatest recorder/processor/controller/mixer into your computer's (or laptop's) USB port and get busy making music.

(Or you could use a traditional interface and bust open your computer, wrestle with IRQ conflicts, and troubleshoot a couple of failed driver installations.)

May we suggest Option #1?
Your creative juices will thank you....



Computer Audio Recording Interface



Because it's really (*really*) EZ to use.

Because it makes getting precision 24-bit audio into (and out of) your computer a no-brainer.

Because it's got a ton of gozintas and gozoutas, and you've gotta ton of things that need gettininta and gettinouta. (Just look at the huge variety of connectors on the front and back panels—the EZbus can accommodate just about any source signal—analogue or digital—you can imagine.)

Because you can create, store, and instantly recall custom mixes designed exclusively for your computer audio recording environment.

Because everything you need—from precision 24-bit/96kHz microphone, instrument, and line inputs to realtime, zero latency dynamics processing and EQ (use it while you're tracking!) to dual MIDI ports to remarkably flexible mixing, monitoring, and routing options—are all built-in, and available at the touch of a button.

(Cue 50's teen movie dialog track) "It's positively dreamy...."

ate instantly recallable
ups for recording into
ur computer. Up to 32
ly-programmable mixes
n be stored and recalled
the fly from the front
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Each EZbus channel and
Main Mix bus offer super
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four bands worth, with high
and low shelving plus two
fully parametric bands.
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you exceed maximum
digital levels and point you
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having to worry about
clipping that perfect vocal
take. Make your synths
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since the full complement
of dynamics processing is
also available on the Main
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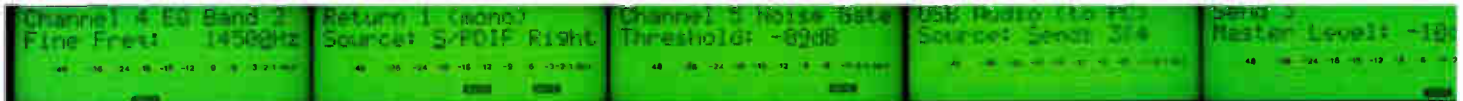
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freedom—you can even
mix signals with different
sample rates. Plus our
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can each accept up to
three analog input
signals, so it's EZ to
accommodate multiple
synths, or a rack of
outboard effects—or both.

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than hot-plugging the
EZbus into your
computer's USB port
and getting your
musical ideas recorded
fast? No PCI cards to
install. No IRQs to
configure. No DMA
channels to mess with.
Just plug it in and go.
(Sorry, you still have
to provide the creativity.
But we'll make sure that
when inspiration does
strike, the hardware
won't get in the way.)



Sample-Rate Mix 'n' Match

The EZbus supports asynchronous sample rates (i.e., two different sample rates at the same time), performing high quality sample-rate conversion behind the scenes. Why do you care? So you can record at 44.1 kHz, for example, and simultaneously bring in DAT tracks via S/PDIF that were recorded at 48kHz. So *now* you care.



Software Control Surface



Because you get to control your MIDI/audio sequencing software with its hardware controls.

Because it comes loaded with presets for controlling said software.

Because you can customize the MIDI command and control set to the nth degree.

Because you get full-featured transport controls for easily navigating through your projects.

Because those same transport controls can also generate MIDI Machine Control commands for operating your digital multitrack recorder.

Because you can set and recall multiple locate points.

Because the data encoder wheel can control just about any inc/dec operation your sequencer supports—even audio scrubbing.

Because you get random access to fader banks.

From Audio Mixer to Control Surface and Back Again

You're probably wondering, "How in the heck do I switch back and forth between audio control and MIDI control and still know where I am?" Fortunately, we have the answers: First, there's the front-panel Localizer™ button that provides instant access to either mode. Then, to let you reconcile between a fader's position and its actual value (assuming you've moved a "virtual" fader while doing some audio mixing), we let you select from four modes of fader operation: Actual, Relative, Null, and Smoothing. Each offers a different operational advantage—one of which is sure to match your creative approach.



Get Plugged in with TSI™

EZbus analog inputs five, six, seven, and eight feature our exclusive TSI™ (Triple Summed Input) architecture, so you can connect up to three audio sources to a single input channel. You could, for example, bring the signals from three stereo synths into inputs 5A and 6A (synth #1), 5B and 6B (synth #2), and 5C and 6C (synth #3). You could then bring the stereo returns from three external effects devices (or three more synths) into inputs 7A and 8A, 7B and 8B, and 7C and 8C.

All together, that's 12 audio signals brought into the EZbus using only four audio channels!

A single button-push is all it takes to instantly transform the EZbus from an Audio Recording Interface into a Control Surface. Then operate your favorite MIDI and audio software using the EZbus's hardware controls—even scrub audio tracks with the data wheel! (Software dependent.) Customize the controls with your own command set, or use the convenient factory presets—support for major software programs is included.



Total Control

The EZbus provides full-featured transport controls that let you easily start, stop, record, rewind and fast forward through your projects.

The same transport controls can also generate MIDI Machine Control commands for operating your digital multitrack recorder(s). You can also set multiple locate points on the fly, and recall them at the push of a button.



Stand-Alone Digital Mixer

EZ

Because it's got enough ins and outs to hook up your entire rig.

Because it lets you do amazingly sophisticated audio processing with zero hassle (and zero latency!).

Because you can slip it into a gig bag and run your whole live show with it.

Because you can create multiple, instantly recallable custom mixes—one for each tune, for independent live feed and stage monitor mixes, for headphone cues, for just about any audio application you can imagine.

Because its precision 24-bit/96kHz microphone, instrument, and line inputs and multiple format digital inputs let you interface with practically every piece of gear on the planet.

Because its word clock out provides sample-accurate clocking for your entire audio system.

Use Virtual Synths Live...

Simply connect the MIDI out of your controller keyboard to either of the MIDI inputs on the EZbus, then connect your computer to the EZbus via USB. Now, when you play a note on your controller, that MIDI signal goes out of EZbus via USB and triggers the virtual synth. Here's where it gets fun: The audio from the software synth comes back into a couple of EZbus channels via USB, and that signal is mixed with your regular hardware synths (which are plugged into other EZbus channels). Your entire keyboard rig—real and virtual—is now a single, integrated system.

...and Record Your Show!

At the gig, you send the EZbus Main Mix outputs to the nightclub's house console, while the EZbus Aux outputs feed your on-stage monitor system. Now you route the output of the house console back into the EZbus, and send that signal out USB to your laptop, on which you record your whole show. (Of course the recording becomes the CD you sell at the next gig!)



Four independent S/PDIF outputs let you route analog to your digital audio processor while the same time sending the full mix to your trusty DAT recorder. In the meantime, use the Aux and Send jacks to send 24-bit, 96kHz signals to your esoteric mastering gear.

With four Sends, each independently configurable pre- or post-fader, you can easily create monitor and headphone mixes, patch into your outboard effects, and more. Sends can be routed to any analog or digital output—even to USB—so interfacing with all your outboard gear, old or new, is a snap.

In keeping with the EZbus design philosophy of ultra-flexible audio routing, the four Returns can accept audio from any EZbus analog or digital source. Those signals are then automatically routed to the Main Mix bus. Need more inputs? The EZbus Returns provide you with four extra inputs to call on whenever you need them.

Generate independent control room, stage monitor, and front-of-house console mixes. Or create a four-bus setup for multitrack recording. The EZbus lets you route any signal from any source to the Main or Alternate (or both) Mix buses, with full control over level, bus assignment, and in the case of the Main Mix, EQ and dynamics processing.

Capture your live performance on your MDM by routing the individual EZbus channel outputs to it via a single optical cable. Now mix the tracks to stereo (using the EZbus, naturally) and burn a CD to sell at your next show! (Yes, the optical outputs can also be used for Send and Mix signals. What, you think we'd limit you now?)



Specifications

Computer Recording Interface

- 18 analog inputs (16 TRS balanced line inputs, two mic preamps with +48V phantom power, two instrument/line inputs)
- 24-bit/96kHz analog-to-digital and digital-to-analog conversion
- Optical I/O for ADAT Lightpipe and S/PDIF (automatically senses source type)
- Coaxial S/PDIF input
- Two independently assignable coaxial S/PDIF outputs
- Eight independent analog outputs (Main Mix Output L/R, Aux Output L/R, Sends 1 & 2, Headphone Output L/R)
- Audio recording via USB on Macintosh or PC computers; USB operation provides full-duplex two-channel 24-bit/48kHz recording/playback
- Two independent MIDI inputs and outputs, plus a third virtual I/O port for EZbus-specific communication
- Word clock output
- Programmable footswitch jack (punch-in, Mix advance, etc.)
- Hot-swappable; requires no IRQ (just plug it in and go!)

Control Surface

- Fully programmable front-panel faders, switches, encoder knob, and transport controls for sending MIDI Controller data via USB and the dual dedicated MIDI outputs
- Presets for Cubase UST (Mac/PC), Logic Audio (Mac/PC), Nuendo (PC), and Cakewalk (PC) included for controlling most mixing functions, including volume, pan, send levels, mute, and solo
- Front panel Localizer™ (Local On/Off) button for instant switching between on-board audio mixing and control surface mode
- Four selectable fader response operation modes (Actual, Null, Relative, and Smoothing)
- Transport controls with jog/shuttle wheel for controlling sequencers as well as any MMC device
- Set and recall up to eight Locate points

Stand-Alone Digital Mixer

- Eight primary audio channels; source signal from any analog or digital input
- Four virtual audio channels (source signal: EZbus Returns)
- Four multi-input analog channels; accept up to three independent source signals per channel
- EZbus Audio Routing Matrix™; provides super-flexible input/output routing
- 4-band EQ on each primary audio channel and on Main Mix; sweepable high and low shelving plus two fully parametric bands
- Programmable dynamics (compressor/expander/gate) on each primary audio channel and on Main Mix
- Mute and Solo on each primary audio channel
- Save and recall 32 internal snapshots of all mix and system parameters
- Two mono Returns and one stereo Return; Returns may be used as additional inputs
- Four Sends per channel, independently assignable pre- or post-fader
- Supports multiple bit-resolutions and sample rates up to 24-bit/96kHz
- Asynchronous sample-rate support via S/PDIF with high quality sample-rate conversion.
- AudioAlert™ function notifies user of errors, such as overloading an analog input, digital dropouts, or clipping due to excessive EQ
- ADAT Lightpipe output functions as direct outputs for primary audio channels (for use as a front end for an ADAT or Lightpipe-equipped audio card); Lightpipe output channels can also be independently assigned as Main Mix outputs, Alt Mix outputs, and Sends
- USB port can be used for Main and Alt Mix buses, Channel inputs, Sends, and Returns



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If you think the EZbus sounds interesting, just wait 'til you hear it. Better yet, wait 'til you use it—either with your computer, or live at the gig. (By the way, it's available for less than most single-purpose digital audio interfaces.)

the
EZbus—get on it.

Specifications subject to change without notice.

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Where the Creative Community Meets

who were making equipment, the people who designed studios—everybody was excited.

Then the '70s happened: multitrack recording, a collection of mono tracks and the beginning of control. The initial concept was the ability to change the arrangement later. The first mix session came, and someone asked for the drums to be taken out. But they didn't go away—there was leakage! The result was to create more isolation.

And that led to blankets on the pianos. Now you had drum booths, isolation rooms and gobos. And that begot the '70s sound. It was thuddy, warm, thick. It was dry and in your face. People were taking a microphone that used to be five feet away and putting it five inches away.

Then the '80s came, a board came into the business called SSL and everything changed. What I just described about the '70s, in terms of that kind of presence, now was done further with gates and compressors on the SSL. It



Puig (left), Courtney Love and Hole guitarist Eric Erlandson

was a new kind of thinking.

What was great about the '80s was hearing a new impact to the front of the note that you'd never heard before—a

new attack, a new kind of punch. The '80s had this exciting power to it. But it was what I call implied power, where when you listen to it, your brain tells you it's big and powerful. Unlike '60s or '70s records that had real power and tonality.

Then, the '90s came, and everybody bought an SSL, a pair of NS10s, two Studer tape machines, a REV 7, SPX 90, two LA2s, two 1176s, a Panscan, and they could now charge \$2,000 for the room. It could be in a skyscraper in New York or in a strip mall in Van Nuys, and you could walk into either one of those places, thousands of miles apart, and make it sound exactly the same. The concept of the personalized studio was gone.

Ah, now I see where we're going.

What I want to do is merge the decades together. This is why the cover of this magazine looks the way it does. The room that I created, and am currently working in, has gear that ranges from the '60s to the '90s, to the newest pieces that aren't even out yet. A UA tube console and the latest Pro Tools rig are available. I use a United Artist tube console for my digital reverb returns and the latest 24-bit Pro Tools rig for its cool digital plug-ins.

Not very many people are as passionate as you are about both music and equipment.

Well, this is not a hobby. I'm very, very serious. This is not a 9-to-5 job. If you want to be great at this, and you want to have a great reputation, you must earn it. It's a lifestyle.

The crew here are all top gun or they're out. The engineers in my room—

JACK JOSEPH PUIG: SELECTED CREDITS

PRODUCER

Tonic: *Lemon Parade* (Atlas/Polydor, 1996) (also recorder, mix engineer)

Jellyfish: *Spilt Milk* (Virgin, 1993) (also recorder, mix engineer) and *Bellybutton* (Charisma, 1990)

The Black Crowes: *America* (American, 1994) (also recorder, mix engineer) and *Three Snakes & One Charm* (American, 1996) (also recorder, mix engineer)

The Verve Pipe: "The Freshmen" *The Freshmen* (RCA, 1997) (also recorder, mix engineer)

Abra Moore: "Trip On Love" *Cruel Intentions* soundtrack (Virgin, 1999) (also recorder, mix engineer) and *Strangest Places* (Arista, 1997)

Taxiride: *Imaginate* (Sire, 1998) (also recorder, mix engineer)

Pushstars: *After the Party* (Capitol, 1999)

MIX ENGINEER

No Doubt: *Return of Saturn* (Interscope, 2000)

Goo Goo Dolls: *Dizzy Up the Girl* (Reprise, 1998) and "Iris" *City of Angels* soundtrack (Reprise, 1998)

Hole: "It's All Over Now Baby Blue" *The Crow: Salvation* soundtrack (Koch International, 2000), "Be a Man" *Any Given Day* soundtrack (Atlantic, 2000) and "Hit So Hard" *Celebrity Skin* (DGC/Geffen, 1998)

Semisonic: "Closing Time" *Feeling Strangely Fine* (MCA, 1998)

Counting Crows: "Mrs. Potter's Lullaby," "Hangin' Around" and "Four Days" *This Desert Life* (DGC/Geffen, 1999)

Days Of The New: "Weapon and the Wound" *Days of the New 2* (Interscope, 1999)

Weezer: *Pinkerton* (Geffen, 1996)

Talk Show: *Talk Show* (Atlantic, 1997)

Big Wreck: *In Loving Memory Of...* (Atlantic, 1997)

Robbie Williams: *The Ego Has Landed* (Capitol, 1999)

Remy Zero: *Villa* (Interscope, 1999)

Collective Soul: "Blender" (Atlantic, 2000)

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Jim Champagne, Daren Moro, Richard Ash—have all been great and are top gun. They have to be; there is too much riding on it. You've got to deliver greatness. That takes 100 percent dedication. I have never understood 90 percent. Good enough? Ocean Way has always had technical excellence, and [chief engineer] Bruce Marian is a technical wizard.

The business doesn't owe us anything. We're very, very fortunate to be a part of it. I get to work at Ocean Way Studios, one of the best recording studios on the planet, with phenomenal artists.

It wasn't an accident of fate that you ended up working at a recording studio.

No, I always knew. I knew at 10 years old that I wanted to be in the music field. At the same time, I played in bands as a bass player. One day when my band was doing demos and there was a problem in the control room, I went into the control room and realized I was much better on this side of the glass. It was so natural for me; so I switched to this side of the glass.

How did you get your first studio job?
I was offered a job through a friend, at Whitney's [MCA Whitney in Glendale]. But I really owe my career to Bill Schnee. He took me in. He's a fabulous talent, and I will always be indebted.

Do you ever turn down projects?
If I don't get it, absolutely. I only do something if I feel that when I step up to the plate, I'll know how to hit the ball. If I feel like I don't understand the artist, or I don't understand the music, or it doesn't make sense to me, I don't do it.

You're so into feel; don't you think Pro Tooled perfection does away with it?
A large number of operators don't think

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like musicians. They think like technical computer people, and they'll line things up to be exactly the same whether they should be or not. When you mix a record that hasn't been Pro Tooled, depending on which parts, which musician you favor, you can create different feels. When they line it up all perfectly with Pro Tools, some of those choices are taken away. A great Pro Tools operator is sensitive and aware of the musician's feel that he is manipulating, but those people are rare.

What format do you mix to?

I mix to half-inch, DAT and DA-88.

What are some of your pet peeves about tracks you mix that other people have recorded?

I can't stand it when I get something that's been recorded on Pro Tools, and they've gone through and erased all the sound between the tom fills, because a drum kit is the sound of all the drums vibrating. If there is too much ring in the toms, I would like to deal with the problem with the millions of easy solutions there are.

What else?

Over-compressed tracks, poor track sheets, mislabeled tape boxes combined with a lack of creativity in the recording process leaves me disappointed sometimes. These are problems that have always existed. However, I'm fortunate to work in a day and age where technology allows for easy solutions. But I do live for those days when I push the faders up and say, "Wow!"

Why do you like the Ocean Way Focusrite console so much?

Because it has all the bells and whistles of any modern console. This console is truly one of a kind. It's been so radically improved and customized by Ocean Way that it bears little resemblance sonically to a stock console. The ISA 110 EQ in this console has top-end air and altered frequencies that don't exist in the original.

What do you monitor on?

Primarily NS10s. Why? Because I can get off the plane in New York, France, Egypt, Japan or Mississippi, and they're everywhere. I've learned to make them work. They have become a monitor standard.

"Iris" was a breakthrough period for Goo Goo Dolls; one of those instances where all the components work together. Can you describe some of what you did on it?

When we did that record, we talked about wanting to make the drums have a '70s vibe. We wanted a wide, full and

—CONTINUED ON PAGE 250

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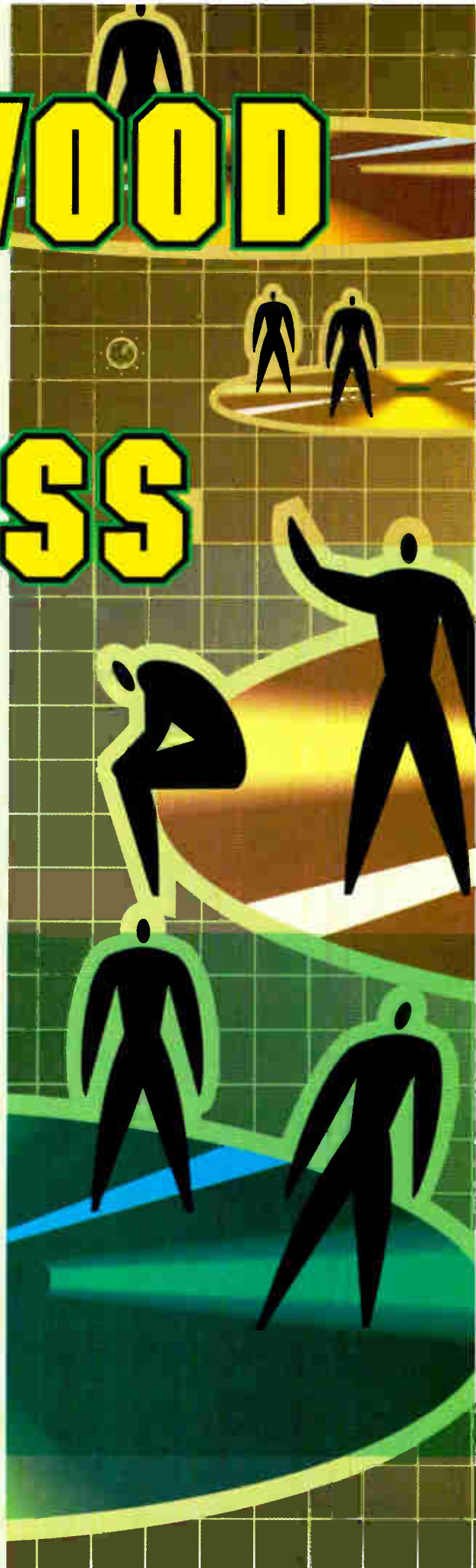
For the past few years, the global business economy has experienced an almost nonstop metamorphosis. One corporation after another has sought to acquire or merge with its competitors, usually in order to strengthen market position in today's rough-and-tumble business climate.

To most of us in the music and sound production industries, these mergers seemed like events off on the distant horizon. When Daimler-Benz acquired Chrysler, the only concern for many motorists was whether or not the local dealer would remain operative—no one wants to drive too far to have a vehicle serviced. Similarly, the pending consolidations of United Airlines and US Air, or Northwest and Delta, will likely mean little more than the fact that travelers have fewer carriers to complain about.

CONSOLIDATION STRIKES CLOSER TO HOME

But now, consolidation has hit the audio post-production industry in a big way, though perhaps less visibly than in the

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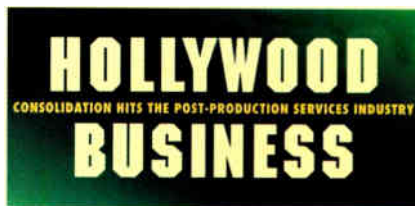




mergers mentioned above. In June 1999, Burbank-based 4MC (Four Media Company) acquired Digital Sound & Picture for \$7.2 million in cash. The next month, the newly formed Liberty Livewire, a subsidiary of Liberty Media Group, announced its intention to acquire 4MC, Soundelux and Todd-AO. Meanwhile, the consolidations continued with Todd-AO's acquisition of New York's prominent Sound One.

But the real clincher came on June 12, 2000. Todd-AO Corporation announced that it had changed its name to Liberty Livewire Corporation. The change took place with the closing of the company's transaction with Liberty Media Group, through which Liberty Media acquired a controlling interest in Todd-AO.

Immediately following this transaction, Liberty Media contributed to Liberty Livewire 100% of the capital stock of 4MC. (Liberty Media had completed the 4MC acquisition in April.) Then in July, Liberty Livewire announced its completed acquisition of Soundelux's post-production and sound-related business operations for approximately \$90 million in cash. By the time all was said and done, Liberty Livewire's transactions were valued at more than a half-billion dollars—with still more acquisitions in the offing.



Libewire also announced an agreement to acquire 100% of the stock of Video Services Corporation of Northvale, N.J., a deal valued at approximately \$125 million.

As the dust settles, Liberty Livewire now has the infrastructure to provide the full spectrum of post-production, video and Internet distribution services. Liberty Livewire can now offer a "one stop shop" for the talent and resources needed in the rapidly emerging fields of interactive television and computer multimedia delivered via new broadband technologies, DVD and the more traditional broadcast television and film markets.

SMALLER INDEPENDENT SHOPS CONVERGE

The significance of the Liberty Livewire consolidation has prompted some industry observers to refer to it as "elephants mating," but Liberty has not been the only consolidator in the post industry. In 1998, Pacifica Media Affili-

erty Livewire fold, Pacifica Media Affiliates focus almost exclusively on sound editorial. According to H. Galen Walker, president and COO of Pacifica Media Affiliates, "Pacifica is based on sound editorial. Our strength lies in the quality and talents of our sound designers and editors—the people who are the meat and potatoes of this industry."

Of course, not every post house has been swallowed up by a larger one. A small, select group of high-profile companies are independent and likely to remain so, including Skywalker Sound/Lucas Digital Ltd., The Saul Zaentz Film Center and The Outpost Film Center in the San Francisco Bay Area, Wilshire Stages/EFX and SoundStorm in Los Angeles and C5 and Sync Sound/Digital Cinema in New York. And, unless there are surprise mergers among the major film studios, Universal, Disney, Warner Bros., Sony/Columbia/Tristar and 20th Century Fox will all continue to operate their own sound editorial and mixing stages. In addition to their own projects, the film companies also market their services to outsiders and are in competition for much the same business as everyone else.

THE NEW LANDSCAPE

What are the factors that have brought about all of these mergers and acquisitions in the post industry? Two major issues are the continuing migration of work to Canada and a downward trend on the pricing of projects. Compounding these concerns is the fact that to keep their own facilities booked, the major film studios are courting independent projects more aggressively than ever.

Rick Larson, CEO of Pacifica Larson, says, "Our industry has experienced a heavy downward pressure on pricing. Whereas we may have charged \$70,000 for our work on a movie of the week five years ago, that same type of project in today's market is typically generating roughly \$50,000. That makes matters very tough."

H. Galen Walker agrees: "The trend toward downward pricing has made the business very challenging for everyone. Without being able to get suitable monetary compensation for its projects, it becomes difficult for a facility to remain competitive, from both a personnel and an equipment perspective.

AS THE DUST SETTLES, LIBERTY LIVEWIRE NOW HAS THE INFRASTRUCTURE TO PROVIDE THE FULL SPECTRUM OF POST-PRODUCTION, VIDEO AND INTERNET DISTRIBUTION SERVICES. LIBERTY LIVEWIRE CAN NOW OFFER A "ONE STOP SHOP" FOR THE TALENT AND RESOURCES NEEDED IN THE RAPIDLY EMERGING FIELDS OF INTERACTIVE TELEVISION AND COMPUTER MULTIMEDIA.

Later in July, Liberty Livewire completed its acquisition of Triumph Communications Group, a major force in the design, engineering and implementation of video transmission services. The Triumph deal was valued at \$29.4 million, with Triumph shareholders receiving more than \$5,684,483 in cash and 705,554 shares of Liberty Livewire Class B common stock. Further, Liberty

ates, led by Harold Katersky, Dana Arnold, Rick Delena and H. Galen Walker, began to assemble some of the best-recognized independent companies. Presently, Pacifica Media Affiliates includes Weddington Productions, Digital Soundworks, Hollywood Recording Services, Echo Sound and Larson Sound Center.

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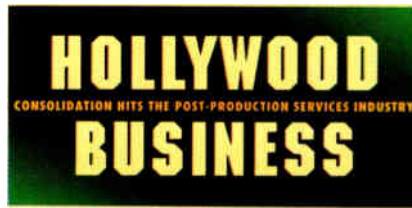
Without creative, capable and experienced people, you can't attract the types of projects that you want, nor can you get the kind of compensation you need to remain profitable. This, in turn, impacts your ability to stay on top of technological changes. It all figures into the equation.

"I also believe that the ongoing migration to Canada is an additional factor contributing to the consolidation among the independents," he continues. "Many of the shows produced in Canada are made by independent production companies, and these projects were previously available to mid-level firms such as Echo and Larson. With so many projects migrating to Canada, I believe the post-production community needs to band together. You can't operate in an environment where someone else is forever undercutting your bid on a project."

In recent years, the major studios have become yet another competitor for the independent filmmaker's projects. Many of the independent audio post-production companies opened during the 1980s, a time when the major studios did not yet have their own facilities up to technological standards. During this period, the studios were making deals with independent producers to produce their shows off-site.

Several of the smaller, independent shops priced their work lower than many of the firms that remain in business today, making it hard for mid-level facilities to maintain a grip on their previous pricing structures. As the major studios upgraded their facilities, matters became even more difficult. And now that the studios are financing more independent projects, they have the clout to keep the production work on their lots.

"These factors created a situation



where many independent facilities not only experienced a decrease in revenue, they also saw far fewer opportunities," notes Walker. "Given these pressures on their business, several of the mid-level companies were confronted with the prospect of facing a very challenging marketplace or becoming part of a larger organization; thus, Pacifica Media Affiliates was born."

THE IMPACT OF NEW MEDIA

While pricing pressures, the migration of work to Canada and the more aggressive efforts of the major studios have all figured into the equation, the consolidation at the high end of the post-production services industry has also been fueled by the Internet and emerging broadband technologies. Liberty Media, whose interests include Time Warner, USA Network, Fox Sports, News Corp., MTV, the Discovery Channel, Starz Encore Group LLC and Black Entertainment Television, among others, has ambitious plans to move the traditional post-production business into a position where it can capitalize on these new technologies.

David Beddow, founder and CEO of Liberty Livewire, is focused on the future of interactive content. "If you focus on consolidation, you're focusing on the wrong thing," he says. "Consolidation is simply one necessary element of what is a more exciting and productive strategy. The consolidation that has occurred is purely a mechanism to assem-

ble a critical mass of talent, skill and facilities necessary to realize our long-term vision. It's really nothing more than that. It gives us a means of being able to accomplish what we want and to execute our strategy quicker than if we actually built the facilities from the ground up. It's a make vs. buy decision more than anything else.

"Our strategy is one that defines the production, post-production, archiving and distribution of what is referred to these days as Internet content—and particularly as it relates to interactive media—as not being substantially different from the normal production and post-production systems currently in use," he continues. "By assembling this group of companies, we are able to establish a consolidated company that has an excellent reputation with its client base, as well as an excellent reputation for quality work. This 'new' company is a trusted player in the theatrical, long-form TV, commercial production and music video communities. We're involved in literally every facet of production."

It is that same client base that now needs interactive services. By assembling the required production elements up front, Beddow believes, the process of producing interactive content for the Internet, DVD and emerging media formats will be that much more streamlined and efficient.

"It has been our supposition," notes Beddow, "that the production of Internet content in an interactive environment is best handled if that material is produced, post-produced, archived and distributed in the same chain and under the same creative control as the video content. Under our plan, there will be people focusing on the interactive aspects of material from concept through final delivery. By planning for and in-

WHILE PRICING PRESSURES, THE MIGRATION OF WORK TO CANADA AND THE MORE AGGRESSIVE EFFORTS OF THE MAJOR STUDIOS HAVE ALL FIGURED INTO THE EQUATION, THE CONSOLIDATION AT THE HIGH END OF THE POST-PRODUCTION SERVICES INDUSTRY HAS ALSO BEEN FUELED BY THE INTERNET AND EMERGING BROADBAND TECHNOLOGIES.

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corporating these various elements during the normal stages of production, you then have all elements under the same creative control as the original product."

THE DISTRIBUTION PIPELINE

Having major post-production companies under its belt places Liberty Media in the enviable position of being able to accommodate Hollywood's creative community in every aspect of production. In the distribution area, Liberty Media has a particularly strong deck of cards. To grasp the scope of the consolidations outlined above, it is crucial to understand the relationships among the various players.

Liberty Livewire is a partially owned subsidiary of Liberty Media Group, which owns approximately 85% of the company. The balance of Liberty Livewire trades publicly on NASDAQ under the symbol LWIRA. As mentioned earlier, Liberty Media Group has investments in a huge number of companies. If Liberty Media were a free-standing corporation, it would have a market capitalization of approximately \$77 billion. In practice, Liberty Media doesn't produce anything; it acts as a holding company of media interests. While there are instances where content produced by one Liberty property is purchased by another (such as by Time Warner or Fox), Beddow describes these transactions as "arm's length relationships." He was also quick to point out that "there are some cases where companies that we have investments in compete with other companies that we have investments in." Liberty Media is also a tracking stock of AT&T. (A tracking stock is a special type of stock issued by a publicly held company—in this case, AT&T—to track the value of one segment of the company, enabling investors to value the different segments of the company independently.) Through its relationship with AT&T, Liberty Media has established an arrangement whereby the company now provides a very cost-effective means of hosting Web sites that are associated with interactive content. Given AT&T's access to approximately 45% of the homes in America, this gives Liberty Media an unprecedented delivery

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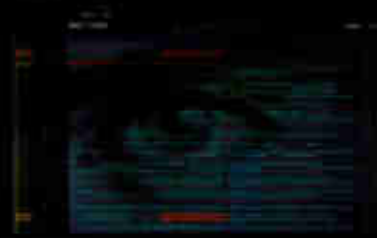
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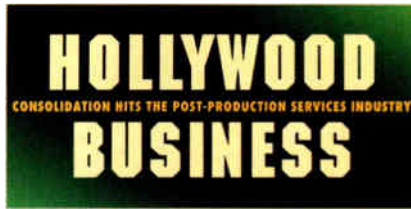
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mechanism for its material. In Beddow's words, "Just as today we have access to satellite and fiber capacity for the distribution of material, we now have access to the full AT&T IP (Internet Protocol) backbone for the worldwide distribution of Web content—and that's what makes this whole business exciting."

**EXCITING TO SOME,
A CONCERN FOR OTHERS**

The scope of Liberty Media and its Liberty Livewire subsidiary is huge compared to anything the music and sound services industries have witnessed thus far. For the most part, industry observers and professionals alike are optimistic about the recent activity, though there has been speculation that Liberty Media will at some point make an offer to acquire a major studio. Should this occur, some people have voiced concern that Liberty Media and AT&T could find themselves in the position to define and control content all the way from production through distribution.

When asked about this scenario, Beddow emphasized, "The fact of the matter is that none of this falls under the control of a single entity. The companies are all operated as separate in-



vestments, and the relationships that exist between the companies are all arm's length relationships. We have no call or first-priority right to any AT&T distribution. Our content companies deal with AT&T for distribution just as any other company would. The people who run the broadband distribution make their own decisions as to what type of content they put on the cable systems—as they rightly should.

"If you look closely, you will find cases where our content is not being carried by the broadband cable systems. It is not a whole set of assets that are managed as one company, because they in fact, are not. The Liberty board has a fiduciary responsibility to Liberty, and the AT&T board has a fiduciary responsibility to AT&T. Likewise, we own about 12 percent of Time Warner that happens to be a non-voting interest. We have absolutely no say in what

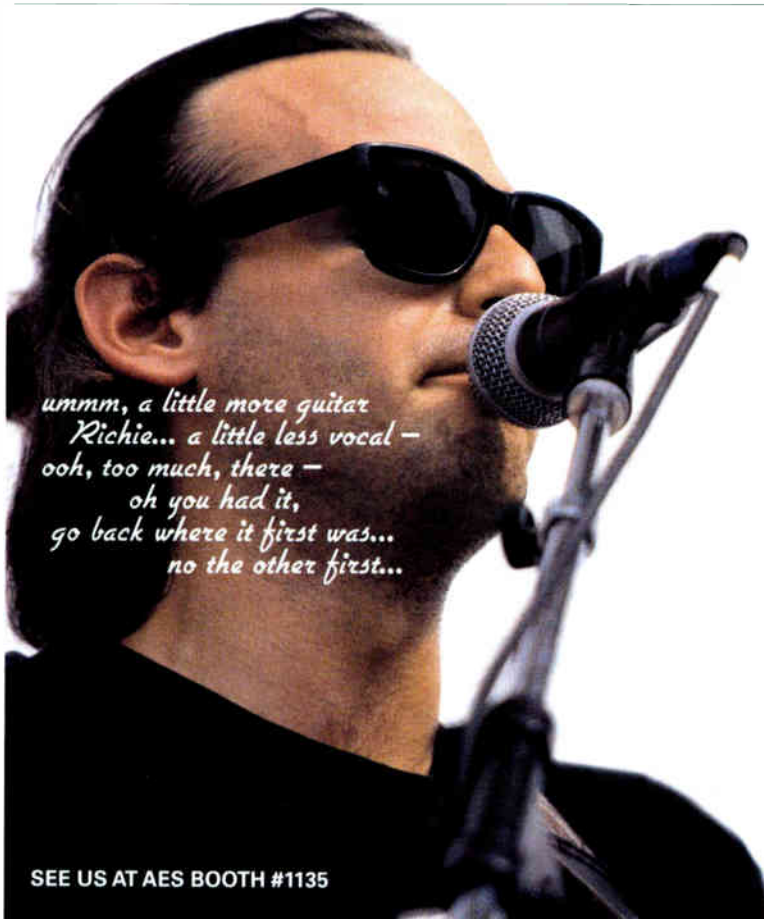
Time Warner does."

REACTION FROM THE TRENCHES

With so many companies, facilities and people involved in the Liberty and Pacifica consolidations, everyone expects the nature of the business to change. That change, however, is expected to be gradual, with both organizations streamlining their operations in order to add the greatest value for their clientele.

Jonathan Porath, chief engineer at Liberty Livewire, expressed enthusiasm over recent events. "What we have now that we didn't have before is mixing talent from both coasts working in facilities on both coasts," says Porath. "I think we'll see more shifting of talent, which, I believe, will be good for all of us. By learning how to accomplish various tasks in a more effective manner, this sharing of knowledge makes us all that more competitive."

With the Internet and various interactive mediums poised for an expanding role in the post-production process, Porath echoed Beddow's vision of the future. "Ultimately, I would expect the organization to make an effort to exert greater influence over how a project is



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produced—both to better control costs and to make the content available in a wider number of media.”

THE REALITY OF THE “ONE STOP SHOP”

While the considerably smaller Pacifica Media Affiliates expects to concentrate its efforts on building the sound editorial side of its business, Liberty Livewire is now positioned to operate as a “one stop shop.” In a business that is very relationship-based, there has been concern that the “corporate view” could interfere with the creative process.

Burbank-based SoundStorm, one of the few remaining independent sound editorial facilities has, thus far, not experienced any negative fallout from the recent consolidations. Daniel R. Chavez, VP of client service and sales, shared his take on the changing nature of the business. “The primary concern for SoundStorm is to address the needs of our clients,” says Chavez. “Companies that are vertically integrated and can offer the ‘one stop shop’ may at some point find themselves unable, in what is a very relationship-based business, to go outside the company for various aspects of production. When you own your own stage, you are under tremendous pressure to keep that stage busy as there is a huge capital expenditure involved. As a result, a project may be

forced onto a particular stage when, in reality, it is not the best choice for the filmmaker.

“Often, it’s the filmmaker’s feeling and past experience that to achieve their sonic vision, they not only want their particular sound supervisor overseeing the project, but they may also want a particular mixer that they have worked with in the past who quite often resides at a separate facility,” Chavez adds. “We will package with anybody, enabling a project to have sound editorial performed at SoundStorm and mixing elsewhere. I will arrange a deal for any mixing facility where the client would like to go.”

Rick Larson echoes Chavez’s sentiments. “Our sister company, Echo, has been very successful by not limiting their clients to one set of stages for mixing,” notes Larson. “In many respects, Echo pioneered the concept of taking a project to be mixed at whatever facility was best for the producer and the project itself. As a result, they arrange deals where the project can be mixed at Sony, Universal or whatever other facility is best suited from a creative standpoint.

“While Echo now has dubbing stage facilities through its affiliation with Larson, we are not limiting the way they conduct their business,” he continues. “We certainly like to handle the project in-house, but if it is best served by being mixed at another facility, then by all means, we want to ensure that the project goes where it belongs.”

Walker concurs, “Pacifica is in no way looking to compete with Liberty. Interestingly, while we are one of their largest competitors, we are also one of

WITH SO MANY COMPANIES, FACILITIES AND PEOPLE INVOLVED IN THE LIBERTY AND PACIFICA CONSOLIDATIONS, EVERYONE EXPECTS THE NATURE OF THE BUSINESS TO CHANGE. THAT CHANGE, HOWEVER, IS EXPECTED TO BE GRADUAL, WITH BOTH ORGANIZATIONS STREAMLINING THEIR OPERATIONS IN ORDER TO ADD THE GREATEST VALUE FOR THEIR CLIENTELE.

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their largest clients. We dub on a number of their stages for much of our television work. Weddington works on their stages with some of our feature projects. Our strength is in sound editorial—this is where we will remain focused.”

The Wilshire Stages in Hollywood is another independent facility that contin-

ues to thrive in the current business environment. Paul Rodriguez, senior VP/Advanced Digital Post Group, is optimistic about his company's status and offered the following thoughts: “I believe that though ownership has changed, the physical structures and the people who work in the various facilities remains largely the same. As a result, not too much has changed—at least yet. Right now, it's more of a conceptual ‘strength in numbers’ issue than anything else.

“Ultimately, there's still the same amount of choices, it's just that many of these companies are operating under a

common name,” he adds. “This business is largely based on relationships, so producers are going to continue working with people they know and feel comfortable with.”

KEEPING THE STAGES BUSY

While the studios' slates may be somewhat reduced, the success of films such as *There's Something About Mary*, *Good Will Hunting* and others have led to a greater amount of independent product, though these days, with Disney owning Miramax and AOL/Time Warner owning New Line, it's often hard to say just what makes a project “independent.” These independent projects have inspired filmmakers, and both the independent facilities and members of the Pacifica Media Affiliates believe we will continue to see an increase in smaller projects.

This, in turn, makes one wonder if the increased number of independent projects will be enough to sustain the smaller companies. Paul Rodriguez believes the volume exists. “Our stages are running day and night with a number of very interesting projects, and traditionally, summer is the slow period. We don't limit ourselves to just sound for TV and film. We're also involved in video games, large-format shows, special venue assignments such as theme parks and other projects. We look at all segments of the market in order to keep our stages and our people busy. Ultimately, this gives us a much broader base in the market.”

The audio post-production business is experiencing dramatic changes throughout all levels of the industry. While a fair amount of uncertainty exists, the opportunities presented by the Internet and interactive media, combined with a resurgence in the market for independent projects, is fueling far more optimism than pessimism.

What this all boils down to is the fact that the post-production industry needed to address the evolving marketplace—and accomplishing this required a reshuffling of the deck. The changes that have occurred are expected to provide a significant expansion of both capability and work that should be a very positive turn of events for all involved. With more streamlined operations, a pooling of resources and talent and the public's never-ending thirst for new forms of entertainment, the post-production industry stands at the threshold of opportunity. ■

Roger Maycock is a Mix technical consultant.

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NBC BUILDS PIPELINE FOR **Olympics** Audio

By Paul Verna

While it's true that the Olympics occur every two years, don't tell that to NBC's Philip Paully. As director of graphics engineering and operations at the network, he knows that working on that biennial sports extravaganza is a year-round, full-time job.

"We get back from Sydney with equipment at the end of November, and then we have under 13 months to go before we do Salt Lake," says Paully, referring to the upcoming games in Australia (scheduled for Sept. 15-Oct. 1, 2000), and the 2002 winter contest set for Utah. "We have a month and a half off. From a planning perspective, we're already on Salt Lake. We're way past Sydney."

And with an Olympics contract that extends until 2006, Paully is already thinking Athens and Milan, which will host the 2004 and 2006 Games, respectively. But from now until the aftermath of the 2000 Olympics, he is entrenched in Sydney.



To carry off the Herculean task of beaming the games to tens of millions of viewers—and listeners—in the U.S., NBC has built a state-of-the-art International Broadcast Center with an impressive array of audio recording, mixing, post-production and routing equipment.

"When we build this IBC, we're one of the biggest facilities in the world for a two-week period," says Paully. "And we're not alone—every other country is in the space around us, sending this thing out to close to 3 billion people around the world. Everything comes into the IBC live, we pull it together and retransmit it from there."

The IBC consists of two control rooms, A and B; a pair of small editing suites, C1 and C2; and an audio-production room positioned between C1 and C2. The remote audio and video recording devices at the various Olympic venues feed each of these studios. Sound signals

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from the field are gathered in a Yamaha 02R digital console at the IBC and distributed to the appropriate audio mixing or post-production systems on site. These include Calrec boards in Control Rooms A and B, Zaxcom Aria consoles in C1 and C2 and a new Fairlight FAME system in the audio-production room, which also contains an isolation booth used for last-minute voice-overs. A fiber optic network links all the systems, allowing audio and video operators to perform nonlinear edits to virtually any material and then send it on to the final broadcast destination.

The networking aspects of NBC's production system are not only critical to the workflow at the Olympic venue, but they also allow operators back at headquarters to control machines located on-site. Such was the case in the 1996 Games, where playback devices in Atlanta were controlled from the New York facility.

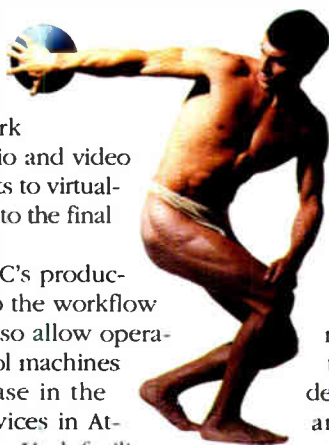
While the technical and creative standards for all broadcast audio have increased over the years, audio for graphics has evolved at a particularly dramatic pace, according to Pully. "Audio plays more of a part in graphics in the last couple of years than it ever has," he says. "I mean, it's always played a part, but I remember at the 1996 Olympics in Atlanta, someone said to me, 'This is graphics, there's no audio in graphics.' But there was a tremendous

amount of audio, and there's even more this time around. Most of our segments, shorts and everything else have to have audio and music."

Pully adds that NBC has transcended the cheesy sound effects used on many sports broadcasts nowadays. "It's more than just the male-oriented, special effect of a piece of gear getting hit fast, like a *whoosh* sound with a puck," he explains. "It's more than that. I doubt you would see a golf ball in our NBC Sports coverage turn red and go *whoosh* as Tiger hits it toward the hole. Our graphics are there to convey information about the events themselves, as opposed to highlighting things for shock value."

From a technical standpoint, handling the multitude of digital audio and video formats that are used in broadcast is a monumental undertaking, but one that NBC has honed to a fine art. "We never met a format we didn't like," quips Pully. "We have audio on Digicarts, DATs, DA-88s, hard disks, etc., and we back up to CD, Exabyte or whatever else we need. Most of the audio is 24 bits, and it's all routed digitally through AES/EBU connections at 48 kHz. In fact, we've had our Denon CD players modified to output 48 kHz."

Computer file formats have also multiplied in recent years, and NBC needs to have a grip on all of them in order to meet its storage criteria, as well as its Internet needs. ("Any audio that's going to get in,



SYDNEY TO NEW YORK

there's going to be one program that's going to read it and translate it to any other program," says Paully.)

In order to assemble, mix, edit and broadcast audio elements in various formats coming from several locations around the clock, NBC needed a powerful, rugged and intuitive digital console. It chose the Fairlight FAME, which complements NBC's existing Fairlight MFX3 system. (The FAME and MFX3 are networked together, with the latter essentially serving as a librarian.)

"We were looking for a system that could handle the rigors of what is essentially a post environment," says Paully. "Because of the 16-hour delay from Australia to the United

the whole thing in advance, which is the safest way to do it," he says. "We already know every single cross-point, every single fader location. We know we have to take live feeds into this room as well, so if a director or a producer says, 'Look, track and field's going on, get me some crowd noise for this event,' we can do it instantly."

Audio signals come in through the 02R and are distributed throughout the IBC as needed. Any audio element that will be used in graphics production is channeled to the FAME, while sound for audio pre-production is sent to the Arias. Ultimately, the main broadcast feed goes to the Calrecs in control rooms A and B, which send it out to air.

Although NBC is not broadcasting this year's Olympics in high-definition or surround sound, the network is technically

—CONTINUED ON PAGE 90

WE ALREADY KNOW EVERY SINGLE CROSS-POINT, EVERY SINGLE FADER LOCATION. WE KNOW WE HAVE TO TAKE LIVE FEEDS INTO THIS ROOM AS WELL, SO IF A DIRECTOR OR A PRODUCER SAYS, 'LOOK, TRACK AND FIELD'S GOING ON, GET ME SOME CROWD NOISE FOR THIS EVENT,' WE CAN DO IT INSTANTLY. —PHILIP PAULLY

States, the fact is we have time to finish up and post a lot of different things. And also, we're bringing our artists and operators in a little bit earlier than we did for Atlanta, so they have time to prebuild a lot of the bumpers, the stingers, the little shots to get off air, all the billboards, etc. So we're no longer just the control room with audio mixes that takes in live studios' feeds or announcer feeds. What we're doing is a lot of voice-over work and a tremendous amount of music editing to whatever types of animations we have in there. So what we decided to do, after looking through half a dozen systems at a recent NAB, was go with the Fairlight FAME."

Besides its high-audio specs, the Fairlight offers an ease of use that appealed to Paully and NBC director of audio implementation Bob Dixon, who oversees the entire audio operation, from microphones to recorders to consoles.

"We needed to have a system here that we could train on and have operators get used to before the Games," says Paully. "The learning curve for a guy who's worked every system but a Fairlight is three days, maximum. As engineers, we basically are tasked with integration, making sure it works, coverage of it, maintenance of the unit itself. But we're not the guys who have to sit there 12 hours a day working it. So you want your high-end operators to have a system they're happy with to get stuff done quickly."

For Fairlight, NBC's choice of a FAME was particularly meaningful, given the manufacturer's Australian roots. "We're very proud to be a part of this," says Fairlight VP of broadcast Michael Mueller. "It's especially important, because our plant is in Sydney. Participating in this event meant a great deal to us."

With the FAME installed at NBC's New York headquarters well ahead of game time, the network was able to train its staff and configure the system according to its needs. That allowed Paully to hand-carry the configuration info (on a floppy disk, no less) to Sydney for the IBC's FAME. "We configured

MIXING THE EVENTS

By Tom Kenny

Dennis Baxter landed in Sydney on August 7 and was not scheduled to leave until long after Closing Ceremonies in early October. As an audio consultant to NBC and the Sydney Olympic Broadcasting Organization, he had logged countless miles back and forth, beginning with an initial site visit in 1997. In conjunction with Bob Dixon, director of audio for NBC, and Al Craig, director of audio for SOBO, he is responsible for all miking schemes and signal flow—from each venue to the International Broadcast Center, from the IBC to the satellite, then back to New York.

Baxter filled much the same role in Atlanta in 1996 and in Barcelona the Olympics before that. He learned a couple things in Atlanta that informed his decisions in Sydney. One had to do with the weather, where flooding in Atlanta took down most of his boundary mics ringing the track until he could dry them out. The other had to do with the desire for stereo shotgun mics, knowing that Sydney would be the first true-stereo Olympics broadcast for NBC.

—CONTINUED ON PAGE 90

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SYDNEY TO NEW YORK

—FROM PAGE 88, OLYMPICS AUDIO

equipped to handle 5.1-channel mixing, or even 6.1, according to Paully. The Fairlight FAME is surround sound ready, as are the other boards used for the Olympics telecast. Furthermore, all the control rooms in New York and on-site could be easily configured for multiple monitors.

Having invested untold millions building a production facility for the Olympics' broadcast, NBC is well-poised to repurpose the gear for other uses, including transferring some of it to its affiliates. However, given the year-round production schedule for the Olympics, it's likely that the FAME and most of its supporting equipment will remain on duty for Salt Lake City and beyond.

"When we return from Sydney, we'll regroup in New York, switch everything back to NTSC from PAL, reassemble the Olympic pre-build area and start on the graphics for Salt Lake City. We had a year and a half for Sydney; now we have 13 months. There are days when you wish you had 18 arms!"

Asked how the production process for the Olympics broadcast has evolved in recent years, Paully notes that the speed of execution has increased exponentially. "The equipment is faster and has anywhere from 15 to 20 times the



storage capability of what we had even four years ago," he says. "We've gone from 1 gigabyte to 36 gigs of storage, and our access time to that information is faster."

Another element that has increased productivity in the Olympic Village—and back at headquarters for that matter—is the software orientation of the new gear, which allows for e-mail-distributed upgrades and manual addendums.

"Every bit of equipment that we have now is getting updated through e-mail," says Paully. "Vendors are now attaching to us software and hardware upgrades. This is wild. I'll get a PDF now on a manual that tells me how to do changes. We get an attachment to put into a laptop, and then the laptop plugs directly into the console. How can you beat that?"

If the technological development on the production side is tangible to the engineers and operators who bring the broadcast into people's homes, the final product also reflects the increasing sophistication that goes into it.

"This is not like the old days, where graphics were nothing more than a piece of paper with black letters on it rolling under a camera," says Paully. "I mean, now with all the 3-D work that we're doing, we've got to put an equally high standard of audio on it, because standing alone by itself it just doesn't sell the same way. Our job is to put eyeballs on the screen." ■

—FROM PAGE 88, MIKING THE EVENTS

stereo Olympics broadcast for NBC.

"Coming out of Atlanta, there were very few stereo shotguns on the market," Baxter says. "Myself and Bob Dixon went to Audio-Technica and said, 'Guys, we have to get serious about these stereo mics.' They spent about 18 months putting them together, and now we have about 600 handmade stereo shotguns here in Sydney. These aren't even in production yet; they'll be released at AES."

The stereo shotguns, model AT815ST, will likely be mounted on cameras and are used primarily for crowd ambience and rejection of rumbling P.A. In all, Audio-Technica supplied well over 1,000 mics to SOBO for use at the Games. Many incorporate new developments in housing (weather-resistant) and capsules, both to maintain low profiles and to ride through inclement weather, which is expected. In the case of rain and wind, Rycote has developed a Shaggy Dog with more viscosity, and in some cases, they will have double- and triple-wind shear protection.

"We've looked at all kinds of ways to get away from the distant-miking, shotgun sound," Baxter says. "From shotgun mics in Barcelona to boundary mics in Atlanta to miniature hypercardioid mics the size of a pencil mounted along the lip of the track in Sydney. For jumping sports, we've taken contact mics, put them on a piece

of Plexiglas, then buried them in the sand pits so that you hear the impact as the athlete lands in the long jump or triple-jump. We've put lavaliers on the high bar in the pole vault and in the mats, and we've placed them in the field to hear the shotput and discus fall. We put as many as possible where we expect sound to be. If there is action in a certain part of the field, the mixer will know he can raise that mic. It's very much close-miking and focused mixing.

"Gymnastics is a classic example of that," he continues. "Before '96 in Atlanta, we used shotguns—long, short, lavaliers. Gymnastics is a running, jumping sport, and they don't wear shoes. We sent A-T boundary mics to the Federation in '95, and now boundary, flat-plate microphones are the only thing acceptable to the Gymnastics Federation for podiums and fields of play. They don't care where we put them, because they have such a low profile. In '96, we went crazy with the boundary mics.

"The sound, in general, is very much layered," Baxter says of the sound design. "There is the sport-specific sound, very close to the action. And then there is the general ambience of the room, the atmosphere, the event, the crowd—we want to capture hugeness there. And then on top of that, you have announcers and music and tape machines. We provide two of the three layers, and my favorite sports are those where we can kick it up a little bit." ■



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THE RIGHT CONNECTION

Choosing the Best Cable for Your Application

BY E. VICTOR BROWN

One of the most cost-effective ways to improve a recording setup or live sound system is to upgrade the cables. Microphone cables, patch cords, multicores and return snakes are all critical to a system's overall performance. Even the best cables can wear out or become damaged when in constant use, and bad cables lead to down time and lost performances.

Many criteria are used to judge cable types and brands, but let's focus on materials and construction, which include conductivity and shielding and operational concerns, such as sonic quality, flexibility, durability and reliability. Cost is important, but you don't need to read this article to find the lowest-cost cables. Finally, appearance is worth considering, but appearances can be deceptive. It's important to understand the difference between the "look" of quality and actual quality construction/materials.

MATERIALS AND CONSTRUCTION

In general, the more copper in a cable, the better its conductivity. While copper has a certain amount of resistance to signal flow, steel and aluminum have significantly more. This resistance dissipates in the form of heat, one reason why steel and aluminum alloys are used as heating elements in toasters but not as signal conductors in cable. However,

cable manufacturers sometimes use aluminum wire clad in copper for the center conductor, a design that improves performance while reducing cost.

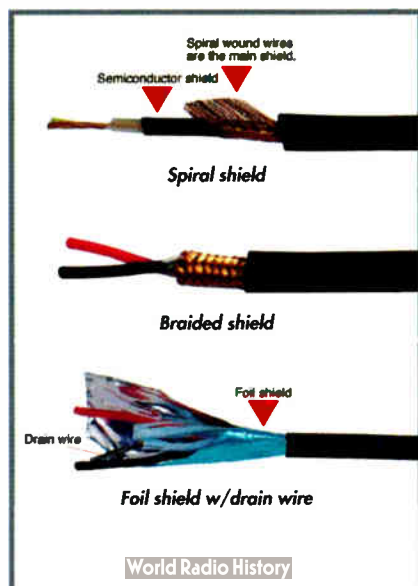
Cable must be matched to the electrical load, and the more electrons you need to move, the larger the conductor. Unlike instrument and mic cables, which typically carry currents of only a few milliamps or less, speaker cable has to move a substantial amount of electrical current. For instance, a 600-ohm input driven by a line-level output only pulls about 2 mA, whereas an 8-ohm speaker driven by a 100-watt amplifier will pull about 3.5 amps of current.

Resistance limits current flow, and even pure copper conductors have a certain amount of resistance. If a cable with a resistance of 1 ohm is connected to an 8-ohm speaker, the load seen by the amplifier is 9 ohms. That translates to a power loss of more than 10%. Long cable runs add resistance and further decrease current transfer.

This brings us to "damping factor," referring to an amp's ability to accurately move a speaker cone. When we hear tight, punchy bass, it means the amp is accurately moving the speaker cone. The higher the amp's damping factor, the better it can control the speaker. As the resistance of the cable can impede the damping factor of the amp, we say that it lowers the damping factor. This is why speaker cables work best with larger wire gauges. According to the AWG (American Wire Gauge) system, conductor area doubles with each reduction of three in AWG. For example, a 13 AWG (13-gauge) conductor has twice the copper of a 16 AWG conductor, while 10 AWG has twice the copper of 13 AWG, and so on.

SHIELDING

The conductors inside a cable need to be shielded from noise, of which there are two distinct types. The first is handling noise, which can take the form of the crackling, scratching, popping, buzz or hum that's heard when the cable is plugged in, but there is no audio signal. Handling noise can be due to bad electrical termination at the connectors, in-



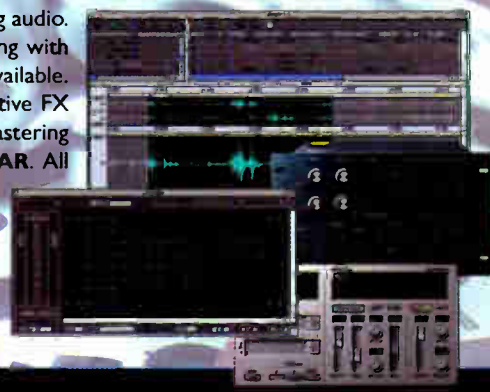
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ferior wiring or worn or partially broken center conductors.

The second type of noise is interference—again, with two common types. Radio frequency interference (RFI) is caused by very high radio band frequencies. You may actually hear a radio station through your speaker with this type of interference, or it may just be high-pitched squeals or hiss. Electromagnetic interference (EMI), usually heard as low-frequency buzz or hum, is caused by transformers, power lines and other devices that use or transport large amounts of electrical current.

To protect against RFI and EMI,

audio cables require shielding. As loud-speaker signals operate at a much higher voltage than mic or line level, the signal-to-noise ratio is vastly better, and RFI and EMI noise picked up by a speaker cable is virtually inaudible, or at least tolerable. In fact, shielding in speaker cables causes a nasty effect known as system oscillation, so speaker cables are not commonly shielded.

There are essentially three types of shielding used in different combinations, depending on whether the goal is to eliminate RFI or EMI. In descending cost of construction and materials, they are: braided wrap, spiral wrap and foil

wrap with drain wire.

Braided shielding consists of copper strands woven into a braid pattern. An inner insulator jacket surrounds the center conductor, and the braided shield wraps around this inner jacket. Thanks to its low inductance, braided shielding works well for microphone cables. But due to the small holes between the braid's pixels, the cable is slightly susceptible to RFI and cannot give better than 96% shielding. However, EMI is effectively eliminated, as the process of counter-wrapping the two groups of strands creates a closed circuit impervious to electromagnetic interference. Braided cable is the best type of shielding, but a dense braid tends to reduce overall flexibility.

Spiral wrap shielding is more flexible than braid and is commonly used for instrument cables. Lying flat, spiral wrap rejects RFI, but when the cable is looped, one side of a spiral wrap cable compresses while the other separates, like a Slinky toy; RFI can enter between the separated strands. Also, when looped, spiral wrap becomes a coil that can act as a pickup for EMI.

To compensate for less-than-ideal RFI rejection, some companies use a spiral wrap as a secondary shield, which employs carbon as a semiconductor. (In this context, a semiconductor is one that only works over very short distances.) Rather than being formed as a solid sheet, the carbon shield is made up of microscopic bits of carbon mixed into another, more flexible material. The carbon conducts current from bit-to-bit, and the spiral wrap effectively shorts out each semiconductor's bit-to-bit transfer, effectively guarding against RFI.

To reduce costs, some manufacturers produce cable with less than 50% coverage in the spiral wrap, which improves flexibility but makes the cable more vulnerable to interference. With only a 50% coverage ratio, a spiral wrap cable is heavily reliant on the semiconductor layer to short out induced EMI.

Foil wrap shielding is the least expensive of the three methods, and it is 100% effective against RFI. A drain wire, which runs next to the foil, works the way a spiral wrap does but without the EMI susceptibility. Foil wrap shielding is most often used in the construction of multicore cables or snakes.

CONNECTIONS

Although this article is primarily about cable, connectors are also important. Ideally, all plugs should have a copper



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center conductor. If possible, open the connector and check for quality soldering. Ensure that there are no blobs (too much solder) and no contamination from loose braid wires. The solder should have a smooth, slightly shiny surface. A dull solder joint usually results in a poor connection. Another technique—ultrasonic welding—vibrates the center conductor and the connector together at a high speed while being compressed, causing them to actually intermingle and become one. The process results in a very strong and highly conductive termination.

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A cable's useful life depends on how and where it is used. Instrument and mic cables are often subjected to foot and wheel traffic, which can shred many types of shielding, internal insulation and even the center conductors, all without causing noticeable outer jacket damage. Dirt is extremely abrasive, so multicore snakes should be cleaned, particularly after outdoor events. Regular testing and inspection of cabling systems can detect problems before they develop, and an inventory of cable types/lengths helps determine if and when cable replacements should be scheduled. Cost is also a factor, but even a small budget can be maximized by making an informed buying decision. ■

E. Victor Brown is a Michigan-based freelance writer for the pro audio/video industry.

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RICK RUBIN

LIFE AMONG THE WILDFLOWERS


PHOTO: MAUREEN DRONEY

Rick Rubin is a tough guy to figure out. First off, there are those publicity photos: The ones that show him looking mysterious and menacing, hidden behind mustache, beard, longer-than-shoulder-length hair and those ubiquitous dark glasses. Biker? Hippie? Some kind of weird guru? The message isn't clear.

Then there's his background: Simultaneous stints as both law school student and outlaw rock and rap producer. A vegetarian who studies Eastern mysticism, Rubin also owns a Southern wrestling circuit. A four-time Grammy nominee for Producer of the Year and the producer of 1996's Grammy-winning Country Album of the Year, he's more than once championed albums considered so offensive that their labels refused to release them. In print, he's been called elitist and arrogant, as well as sweet and sensitive. So, what is he really? Demanding? Difficult? Dark? Dangerous? Or just a pussycat in disguise?

Probably the only thing 100% certain about Rick Rubin is that music is his overriding passion, the filter he sees the world through. He's done landmark albums with Run-DMC (*Raising Hell*), the Beastie Boys (*Licensed to Ill*) and the Red

Hot Chili Peppers (*Blood Sugar Sex Magik*, *Californication*). His shotgun marriage of rock and rap—Aerosmith and Run-DMC's smash collaboration on "Walk This Way"—revitalized Aerosmith's stalled career and started a revolution in rock itself. His continued involvement with Tom Petty (*Wildflowers*, *Echo*) and Johnny Cash (*American Recordings*, *Unchained*) helps keep these artists vital and current. He thinks nothing of working with Slayer (five albums) and Danzig (four albums) on one hand and Donovan (*Sutras*) on the other. And, after all his success, Rubin still does hang in ratty rehearsal halls, not letting his bands near a proper studio until the songs are great. He's an enigma, a cipher, but his love of music is clear as day.

We met for this interview in the peaceful library of his Hollywood Hills home, surrounded by books on Eastern mysticism, psychology and Sufi poetry. Incense burned, wind chimes jangled faintly and Monday, his Hungarian puli, curled quietly at our feet. Outside the library door, there was plenty going on: Rubin had just finished a record for new artists Paloalto on his own Sony-distributed American label, as

well as projects for Eagle-Eye Cherry and Mel C. Currently, he is producing a new Johnny Cash effort, a collaboration between System of a Down and Wu-Tang Clan, and dealing with the ongoing projects of the other eight acts on his American Recordings imprint. All of this, by the way, while preparing to go into the studio with Rage Against the Machine. And as we sat down, guess what? The first thing he wanted to know is what I'd been listening to.

You've been both a record company owner and a producer from the very beginning of your career. Do you find the business part of the job creatively satisfying?

It can be. I prefer the strictly creative endeavors over the business endeavors, but to me, the business part of it is being able to follow through on the project.

You mean having control?

I wouldn't call it control. It's just the vision of the project. I don't feel that my job is done once the music is finished; it can also be my job to be involved in other aspects of what a band does. Depending on the band, I'm often involved in artwork and videos, marketing approaches—how people perceive the band. It's continuing on with a project instead of just passing it off.

So your involvement in business evolved out of your desire to make music?

It's hard to say. I kind of started where I am; I'm really just doing the same things I've always done. I didn't come up through the business. I've never been an engineer, I've never worked in a studio, I've never done the things that a lot of people have done to become producers. I started as a producer, I'm still a producer. And I've always, from the beginning, run a record company. The first records I made were on my label. I've worked with other labels along the way as an independent producer, like for

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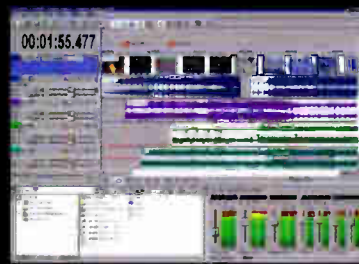


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Red Hot Chili Peppers for Warner Brothers. But I also produce for my company, and then I'm more involved, like with Johnny Cash and System of a Down.

It's always been that way, so it's hard for me to judge what I do vs. what other people do. Because I don't know what other producers do.

Well, they're all different anyway.

I know a lot of producers were engineers who graduated to being producers, but I can't imagine what qualifications an engineer would have to be a producer. To me, it's just a different job, but there are some great engineers who become great producers. Again, I don't know what they do. I only kind of know what I do, and I'm not too sure of that. [Laughs]

You've been fortunate that your personal taste has struck so many chords with the public. How do you think you developed that taste?

I was lucky enough to grow up with The Beatles. What little I know about music is from them.

Ah, the gold standard. But you were attracted to more hard core, rebellious music, which The Beatles really weren't.

But they were, because they became the biggest band in the world, and because they don't exist anymore, you don't look back on them as being this outlaw band. But they really were.

Like back in Hamburg?

When they started, they were really a punk rock band—playing with toilet seats around their necks, trying to stomp hard enough to break through the stage. Really punk.

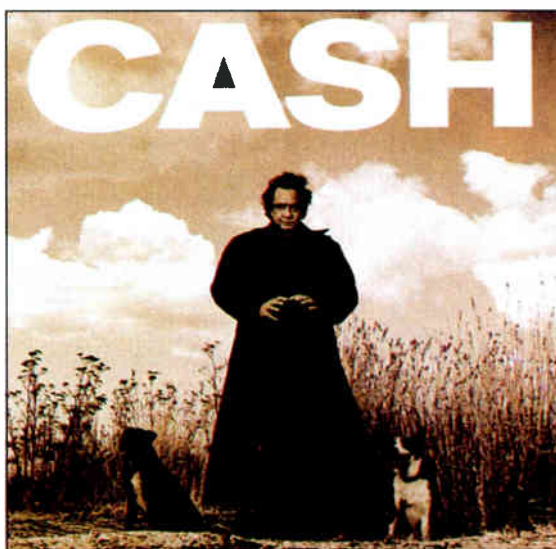
Do you think being a suburban kid from Long Island made you gravitate toward harder music?

I don't think it's just that. But I think, being suburban, there's less of a pretentiousness. I'll give you an example. I grew up an hour outside of Manhattan. One of the bands I worked with early on was the Beastie Boys, and their musical taste was radically different from mine. I liked bands like AC/DC, Led Zeppelin—they hated those things. Because being cool kids in the city, those things were too commercial, too mainstream. So the Beastie Boys liked really underground stuff, which served them well. It was cool, and it made them who they were. But I think it was the collaboration between

my more suburban, mainstream taste and their more eclectic, underground taste that made our working together so successful.

Growing up, I always wished I lived in the city, instead of on the Island, but, in retrospect, I learned a lot about the culture that I wouldn't have learned had I grown up in Manhattan. I feel like I had the best of both worlds because I was close enough to be in the city, but far enough away that I didn't have what I'll call a "holier than thou" attitude. It's not that I don't like those things, but I'm not bound by those things.

Another thing that affected my taste is that I'm an only child. Typically, people learn about music from older brothers and sisters, and I didn't have that, which forced me to create my own taste and really know what I like. When you're 11, whatever your 14-year-old brother or sister listens to, whether you like it or not, it's a starting point. It's a point of view, and I never had that. So it was really searching for things that appealed to me, without any kind of filter. Which is why I got into punk rock. I really liked it. But I know I didn't get my taste from anybody else.



Also, I often liked things that other people didn't like, and then they would come around and like them. When I was in high school, I loved AC/DC, and they were not popular yet. About two years later, everybody liked them. That's always been the case—like with rap music. I loved it when nobody liked it. *That's a blessing, but in some ways it's also a curse, because what you liked often changes when it gets popular, and sometimes you see what's great about it gets to be not be so great any-*

more. Which is sad, but then you move on and find other new things, which is good.

An engineer who works with you told me that once, while checking mixes in the car, you said, "The radio is my musical instrument." If that's your instrument, how do you play it with the artists you're working with?

In working with a band, I find what's good about them and help bring it out. Also, songs are a big deal for me. I'd say that my biggest contribution to bands is helping them get their material together. I know that some producers are more concerned about what it sounds like. And I'm clearly involved in what it sounds like, but it's almost more like I join a band when I produce a record. But, I'm unlike all the other members of the band, who each have their own personal agenda. The bass player is concerned about the bass part; everyone is concerned about their own part. I'm the only member of the band that doesn't care about any of those particulars. I just care that the whole thing is as good as it can be. I want to say it's less about the details, although it's all about the details, so that's not quite right. But it is a grander vision.

Most artists only hear their own instrument. Not all, of course; Tom Petty is a good example of someone who doesn't. He really is a record-making craftsman. He hears the whole thing. Some of the things I'm most proud of are things I've done with Tom. Like the *Wildflowers* album. I really like it a lot; it sounds like it was made on a weekend. Of course, it took us two years to make it sound like it was made on a weekend—the right weekend!

Do you ever make records fast?

Definitely. I often make records faster than a lot of other people. It usually has to do with how prepared we are in advance. The last Chili Peppers [*Californication*], I think, we made the whole record in like six weeks. Top to bottom. We recorded 20-something songs. But it's the pre-production time that really makes the difference. Sometimes that's a couple of weeks, sometimes it's a few months, sometimes it's a year of getting ready to go into the studio and cut the whole album in a week. The preference is always to get as much done before you go in the studio as possible.

Is it true that you actually hate working in the studio?

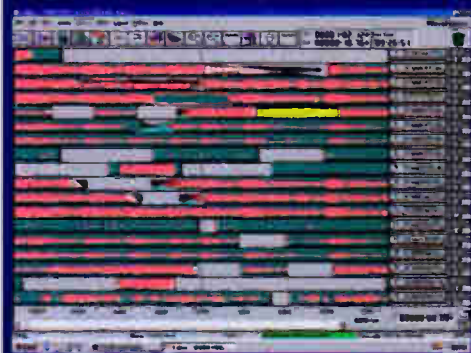
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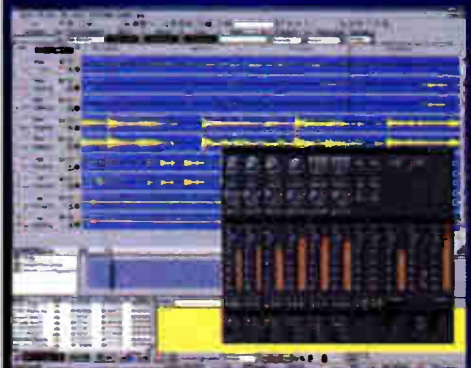
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PRODUCER'S DESK

So, to get people to actually purchase a whole album, there will have to be better albums.

Everybody's wondering what the new sound is going to be. What I'm wondering, or hoping, is that maybe there won't be a new sound, but, instead, the quality of music will get upped. I think there are several records that have come out that have done that, like the Travis record [1999's *The Man Who*].

The Travis record doesn't sound new in any way. It's just really good at what it is, and it's consistently good at what it is. You can listen to the whole album and enjoy it. And you can buy into their trip and want to see them. I'm hoping that music will get less about, "Well, we have a single and now we can put whatever else we want on the album." And more about making a whole great record.

One of the things I like about the Paloalto record is that the songwriting is consistently good. You can listen to the whole album and like all the songs. That's also what we tried to do with the Chili Pepper album [*Californication*]. And I think that's one of the reasons

they're enduring when so many of their contemporaries, or even the crop of groups after them, are less significant. The quality of the material is really high, and ultimately that is undeniable.

What do you look for in new artists?

It's really about falling in love. I'm not looking for any type of anything or to fit any mold. I'm not looking for the next Prince or something. It's really an emotional connection that transcends any genre.

But what? It makes you smile, nod your head to the beat, what?

Just listen to feelings. You just know. You don't even have to think about it. When you listen to music you know what you like and what you don't.

Yes, but you seem to have a more immediate grasp of what you like and what you don't than most people.

Sometimes yes, sometimes no. Some of the things that I love the best when I first heard them, I laughed at them and thought that they were crazy. I remember when I first heard The Ramones; I just laughed. I thought they were ridiculous, and they became one of my favorite groups.

When something is revolutionary, it's hard on first listen to accept it. There's a

shocking period there where you don't know. A lot of the things that you hear once and you love may fade faster... sometimes it's the stuff that takes a little while to get around before you realize how good it is that really stays with you. Because that's the stuff that's different.

How, out of the immense amount of aspiring artists out there, did you find Saul? And Paloalto?

A Paloalto tape was given to me, and I liked it enough to ask them to play for me. Usually when we go to a showcase there's one good song, otherwise we wouldn't be at the showcase. And maybe there's a second song that's okay. This band played ten songs for me, and every song was good. And unlike each other—it didn't sound like the same song done different ways. So it was an unusual experience—to find a young band that had that level of quality in writing.

And Saul, I was in a record store in London and I heard a hip hop record. It sounded like it had vocals sampled from an old '60s record, because the words were too intelligent for something written today. It sounded like The Last Poets, Gil Scott-Heron—something important, not disposable. I found out

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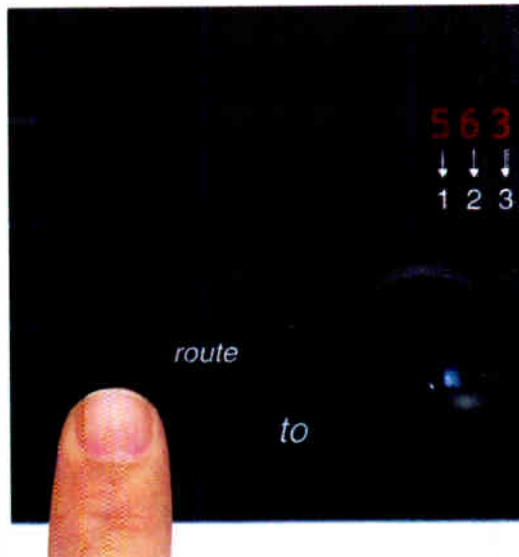
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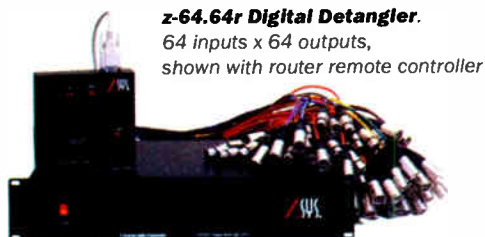
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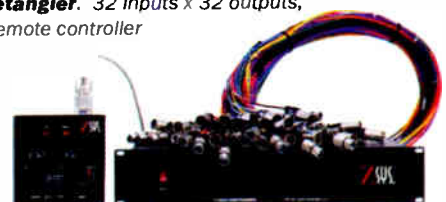
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who made that record and it said, "Vocals: Saul Williams." I figured maybe Saul was the guy that they sampled from a long time ago, but I did research and found out he was 25 years old. And I hadn't heard a voice like his, a meaningful voice, in a very long time.

Part of a producer's job, usually, is to help guide a band, which, given the nature of band politics, can be difficult. Did you think you deliberately developed a persona that was a little intimidating to make the job easier?

No, it probably was a device to survive life more than being a gimmick to present an image. It was probably just to live in the world and be okay.

So how do you help guide a band to a great record?

There's nothing better than telling the truth. When I start working with a band, I explain, "Look, I'm just going to tell you everything I think. I'm telling you that, not in any way to criticize what you do, but to do my job."

Do you think consciously about how to present your opinions?

Of course. That's really important. But I let them know that I'm going to say what I think. And they can listen to what I say, accept it and try it, or they can say, "You know what? What you don't like about this is what I like about it. F**k you, it's fine."

If they fight hard enough you'll give in. Always. But I always ask. Because what we do is really a big experiment, and there's no reason not to try different things. If it doesn't work, we all know it doesn't work. Usually. And we get in the habit of trying a lot of different things. You get everyone thinking in terms of "nothing's in stone, there's the potential for more." Usually.

It's really a completely collaborative effort. Anyone who's got a good idea, if it makes the record better, we use it.

You were that easygoing even back in the beginning?

In the beginning—I don't remember, but I've been told—I was much more the tyrant.

I know now to pick my battles. If I think something can make or break the song, I'm more emphatic. But ultimately, it is the artist's record. Their name is on the front of it, and they have to be the one who is happy with the record.

And there are certain artists that I've worked with that I would probably not work with again, just because it seemed like we were on too far different pages. It wasn't that much fun, for them or for

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PRODUCER

Red Hot Chili Peppers: *Californication* (Warner Bros., 1999)

Tom Petty: *Wildflowers* (Warner Bros., 1994) and *Echo* (Warner Bros., 1999)

Various Artists: *Chef Aid: The South Park Album* (Columbia, 1998)

System of a Down: *System of a Down* (Sony, 1998)

Johnny Cash: *Unchained* (American Recordings, 1996)

Mick Jagger: *Wandering Spirit* (Atlantic, 1993)

Andrew Dice Clay: *The Day the Laughter Died, Part II* (Warner Bros., 1993), *40 Too Long* (American, 1992), *Dice Rules* (American, 1991), *The Day the Laughter Died* (Warner Bros., 1990) and *Andrew Dice Clay* (Warner Bros., 1989)

Beastie Boys: *Licensed to Ill* (Def Jam, 1986)

EXECUTIVE PRODUCER

Various Artists: *Big Daddy* soundtrack (Sony, 1999)

Sir Mix-A-Lot: *Return of the Bumporsaurus* (Warner Bros., 1996), *Chief Boot Knocka* (Rhyme Cartel, 1994) and *Mack Daddy* (Def American, 1992)

Public Enemy: *Yo! Bum Rush the Show* (Def Jam, 1987)

The Black Crowes: *Shake Your Money Maker* (Def American, 1990)

Danzig: *Danzig III/How the Gods Kill* (Def American, 1992)

Slayer: *Undisputed Attitude* (American, 1996) and *Divine Intention* (American, 1994)

Dan Baird: *Love Songs for the Hearing Impaired* (Def American, 1991)

Various Artists: *Private Parts* (Warner Bros., 1997)

me. Usually, it also has to do with a band's confidence. Interestingly, the more confident a band or an artist is, the easier they are to work with.

The more insecure they are, the more they tend to hold onto things that don't really matter. Before Roy Orbison died, I did a track with him, and he was willing to try anything. Because he knew, no matter what I had him do, it wasn't going to take away from him being Roy Orbison. Sometimes young artists, or insecure artists, hold onto things that don't matter because they feel, "This is what makes me 'me.'" They have this image that some little thing they do makes them what they are. But it doesn't.

I'll give you a good example, when I started working with the Chili Peppers the first time, which was on the *Blood-SugarSexMagik* album. Up until that time, Flea's bass playing was a particular style. He was famous for it, considered one of the best bass players in the world because of it. But when we started working together, that bass playing that made him one of the best didn't necessarily serve the songs in the best way. It was more about the bass being great. And, the song is more important than the bass.

I think, starting with that record, he

changed the way he played. Not that it was so different stylistically, but it was more about playing the parts that supported the song. Instead of playing the parts that he liked the best or that were the coolest.

It was a very interesting part of the change in the Chili Peppers' sound, from being a, let's say, "traditional" funk band to being more of a songwriting band.

Was it as difficult as I've heard to get them to record "Under the Bridge," their "big ballad"?

Anthony [Kiedis] had shown me the lyrics when we were looking through his lyric book. I said, "Oh, what's this?" and he said, "It's a song I wrote, but it's not Chili Peppers." He sang it to me and I thought it was beautiful. But he was emphatic: "No, this isn't what we do!" I said, "It's you, though, and what you, Anthony and the Chili Peppers band create is what you do. It doesn't have to be limited to funk jams; you are allowed to do different things. It's just a question of 'Do you love the song?'"

I read a quote where you said that you approach music and producing as a fan.

Very much so. [Laughs] If you have no technical skills or knowledge or ability and you just know what you like...I just try to get it as close to what I like as pos-

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sible. I have a strong opinion and I explain it clearly. Actually, the way I got started making records was going out to hip hop clubs in the early '80s, then hearing the rap records that came out that sounded nothing like what was going on in the clubs. I was a fan of what was really going on, who went out and got all these records and none of them sounded like they were supposed to...

So you said, "I'm going to make my own record"?

Just to document what was going on. I was really just a fan wanting to chronicle what I went out and heard. I never thought this would be a job. I always liked music, but it never seemed like a way to support yourself. Everything happened very accidentally for me. The way it was supposed to, but I don't feel that I chose the things that happened.

You have had some pretty public battles over putting out music that some people find offensive. Morally and philosophically, do you think there is any record that shouldn't be made?

People should be free to do whatever they want to do, and people should be free to listen to what they want to listen to. If someone makes something that you don't like, don't support it, don't listen to it.

No matter how down, dirty, low and nasty the sentiment; no matter how far down on the spiritual plane something is, if somebody wants to say it, it should be said?

One hundred percent. If you're for freedom of speech, you're against censorship. The same thing that will protect somebody fighting out against injustice protects the person saying something radically negative and terrible. You can't limit censorship to the things that you think are okay. You're either for it or you're against it. And if you're against it, everything goes.

I don't think people should hurt other people, and I don't think that the influence of music is such that it does. I've been involved with some very negative records that I'm proud of. I think that those records resonate with people who need to hear that energy, and I know that music doesn't cause people to go out and do bad things. I think if anything, it defuses them. There are a lot of people out there who are angry, and there's no reason that angry people can't be entertained as well as others. I think it's fine, I think it's a service. I think everybody should get to enjoy whatever it is that resonates with them. ■

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you had a crackling sort of noise going on, you'd be reaching for the panpots, trying to pan it around and find out which mic was doing it, while the string section were shouting at each other and making a lot of noise. It was a great relief when the transistor mics first came in.

But to answer your question, there's nothing intrinsically amusing about electronic repair, nothing at all. If you know a bit about electronics, it's not difficult. The hardest part is to carry it out whilst you're convincing the artist and the client that it's "just routine. Everything's going to be okay very soon." That's the hardest one.

When you started as a staff engineer at Decca, pop records not made by self-contained groups were often recorded with session orchestras. Is that a style of music and/or recording that you remember with any fondness?

When I started in '62, blues and soul music were penetrating England, or just about. Those pop records might have had orchestras, but the rhythm section contained people like Jimmy Page and John Paul Jones, John McLaughlin, Her-



George Martin and Bill Price in session at AIR.
Price is about to drop in using the 3M multitrack's remote.

bie Flowers, Clem Cattini—guys that ignored the charts in front of them and played like they were in a rock band anyway. So it was still like working with a band, even in 1962. The only difference was that everything was done live. I don't know if you've ever seen a '60s desk. I know a few people have got them lying around in Los Angeles, but I don't know if you've noticed that they're a few inches higher than today's average SSL. Have you noticed that?

No, I haven't. Why was that?

Measure a few. You'll find that they were definitely higher in those days. I

think it's purely that when you're doing a big session straight onto 4-track, it's not something you could do sitting down. It wasn't a leisurely process. You would definitely be on the balls of your feet at all times whilst recording. Not sitting back in a comfy armchair.

INTO THE WILD WEST END

Did you have any hesitation in leaving Decca for AIR?

Wild horses wouldn't have stopped me going to AIR. A bit of history—AIR Productions, Ltd., was George Martin, Ron Richards, John Burgess and Peter Sullivan as four independent producers. The first three were employed by EMI. Peter Sullivan, the fourth, was employed by Decca, and I was Peter Sullivan's engineer. They all formed a company and went freelance, but carried on contracts with EMI and Decca respectively for several years in order to get the finances together to build the studio. This was the dream of these four producers, to build a studio, that I had been aware of for many years before it finally came to fruition. When eventually they started building the studio, I gave in my notice at Decca, and I

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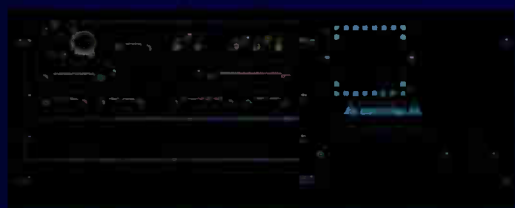
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This spray can art piece measures about 10 feet square and was painted on the outside wall of Wessex by a graffiti artist named Futura, whom The Clash had befriended in New York.

time in that little room on the other side of the corridor, and quite often, the microphone would be turned off and we'd be doing something else. We wouldn't see Harry for hours. He'd just be asleep in that little funny room across the corridor. He'd done a vocal two hours ago and nobody'd thought to speak to him. Good chap, though, Harry Nilsson.

That was just one of the craziest projects I did loads of strings, vocals and Robin Cable did a lot on it, at Trident and at AIR, I think. I did mixes on it. I did this, that and the other, but I never put an album together. I don't know when the album was put together and what I'd done on what.

The other great mystery, of course, is who did what on Never Mind the Bollocks, Here's the Sex Pistols? You and Chris Thomas wound up with a joint credit, without it ever being clear who did what.

That's absolutely true. It was totally down to [the group's manager] Malcolm McLaren. The simple facts of the matter were that Chris was hired by Malcolm to do a series of singles for the Sex Pistols. I was hired by Malcolm to do a series of album tracks with the Sex Pistols. Life got slightly complicated, because I did a few album tracks that Chris remade as singles. Also, Chris started a couple of tracks, which got abandoned as singles, which I remade to be used as album tracks. On quite a large number of songs, when we'd finished the album, we had two versions of the song. We went to the cutting room at least three times with different running orders. I couldn't quite understand why Malcolm kept chopping and changing between

different versions of different songs. It slowly dawned on Chris and myself that Malcolm was trying to slip between two stools and not pay Chris or me. So we said, "I'll tell you what, Malcolm. Whatever's on the Sex Pistols' album, it was either done by me or Chris, and you can pay us and we'll divvy it out amongst our little selves." Which is what we did. But it did force that very strange credit, simply because the sleeve was printed long before it was finally decided which version of each individual song was on the record.

If we'd known, it would have said "produced by Bill Price" or "produced by Chris Thomas." That's how you ended up with that credit, "produced by Bill Price or Chris Thomas." [Laughs.]

You recorded the Sex Pistols at Wessex Studios, which was very much your studio. You redesigned most of it at some time or another and did the bulk of the engineering work there for a significant period. Can you tell us something about its history?

Wessex was actually built by the Thompson family, who used to have a studio in Bournemouth, which was in the Ancient English county of Wessex. That's where the name came from. It was subsequently taken over by Les Reed, the writer of Tom Jones' "Green Grass of Home." The studio had been designed to cope with the pop records of the '60s, 4-track live sessions, possibly with rhythm sections, strings, brass, woodwind, choir, like a Tom Jones' record. So it was a large, dead room. We used to talk about something called "separation" in those days, when we had to record all of these things at once. By 1975, with the development of 16-track, those sort of pop sessions weren't done live. Although Mr. Thompson's son Robbin actually engineered the first two King Crimson albums at Wessex, so the seeds were sown for it being a rock studio. I had worked at AIR London from 1970, and by 1975 I was chief engineer. In that year, Chrysalis had bought both AIR and Wessex studios.

Separately? They weren't connected?

They were in no way connected. Chrysalis decided, "Let's go out and buy some studios." So they bought quite a

lot. Wessex was a bit in the doldrums and about a year after they'd purchased it, the managing director of Chrysalis, Terry Connolly, gave me the chance to turn it around and become studio manager. So I moved over to that from AIR, because it was a good opportunity to see what I could do.

But because the Thompson family had converted it—pretty much themselves—on a small budget in the '60s, it wasn't really what you'd consider up-to-date soundproofing. This meant that when they were recording bands, they had to stop recording at 10:30—which is, back in the '70s, about when bands got going—because the neighbors used to complain. It also meant that you couldn't record strings in the rain because of the pounding on the roof. That was one of the major things. We hired the great Ken Shearer . . .

Who had designed AIR?

Indeed. He was the original acoustic architect of Britain, if not the world. He designed a heavy concrete ceiling to go under the pitched Victorian roof, which is what was so leaky, soundwise. And this did the trick with the neighbors. But, unfortunately, it reduced the actual volume of the room by about 30 percent, which didn't do much for the string sound. So we got Keith Slaughter, who used to be manager of AIR Studios, to re-jig the acoustic treatment. He managed to recover most of the RT60 that we'd lost. That was the main structural job we did on Wessex.

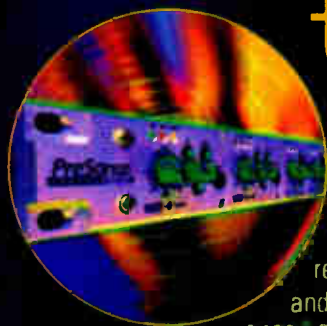
You wore two hats at Wessex—chief engineer and studio manager. How did the two roles complement each other and when did they conflict?

Originally, when I took over at Wessex, they had a staff of engineers, which included Mike Thompson and Tim Friese-Green. Later in Wessex's history, we had Gary Edwards and Jon Walls from AIR, Jeremy Green, Jeremy Alom, Mike Shipley, Mark Freeguard, Kevin Matthews and Stuart Storeman. Bookings were very good. But as the decade progressed, it became the era of the freelance engineer. It was very hard to get a band to work with a house engineer when they could go and hire their own. We had great difficulty attracting freelance engineers to Wessex, and I couldn't quite understand why. So I had to act as a studio manager and hang about, lurking in the doorway on a few freelance engineers' sessions. It didn't take me long to discover what the problem was; it was the Cadac desks. Have you ever come across them?

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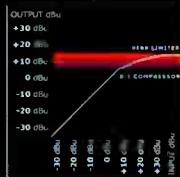
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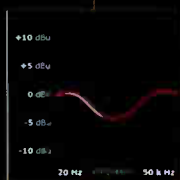


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was that they were unfamiliar?

Yeah. I think Clive Green's desks are the cleanest, best-sounding signal chain that's ever been built. I don't think they've been topped yet for actual sonic quality. But they were like no other desks in the world. Clive had a totally eclectic approach to layout and routing and logic and that sort of thing. The Cadacs bristled with several hundred miniature toggle switches, a random number of which were capable of producing totally silent loudspeakers. It was really very embarrassing. I was looking in to the control room, which was silent apart from the clicking of VU meters on their pegs, and there's a freelance engineer in there groping for the right toggle switch. But he's got to save face, and he's not going to ask this smirking Wessex tape op in the corner of the room how to get out of the problem.

So it was really as simple as that, because when you're a freelance engineer, you've got to look like you do know what you're doing in front of the client. To turn round to the tape op and say, "Excuse me, I don't seem to be able to get any sound out of the desk..." People just did not like to do that. That was what was stopping them. So I knew that we just had to get an SSL in there. *And that's what you did?*

In 1984, I think, give or take a year. And that was very successful. For quite some period after that we were literally booked 24 hours a day. The mix room was upgraded with an SSL a couple of years later.

We managed to get an interview with Chris Thomas last year [see Mix, January 1999], and Blair Jackson asked him a question about using a P.A. in Wessex, and he said, "Yeah, I had to do that because I wanted to get a live sound and they wouldn't let me pull up the carpet. So I brought in a P.A. and put the drums through it." That was presumably on sessions that you were engineering for The Pretenders.

There was quite a movement towards that. Wessex was a large, dead room. One of the things was that, because it had been a church hall, it was, for a young band doing gigs around the country in church halls, a very familiar acoustic. You could actually set a band up at one end of Wessex and it would sound very like the band on their previous gig wherever they'd been playing around the country. It somehow seemed to make the bands very comfortable. We did have a phase, which Chris instigated, where rather than screening them all off and giving them headphones, we set them up a little bit more like they would be set up onstage and put the vocals through a P.A. so everybody could hear without having to wear cans. It was to do with getting a vibe for the band, as well as livening up a carpeted room. Again, because it was a fairly dead room, suited for '60s live recording, you could get away with setting the band up in that way and not screening them off in different booths. You could get reasonably good separation between them. So it worked quite well.

Because you entered the business in the early '60s, you were a witness to the transition from live mixing to mono to multitrack recording and the much more complex and time-consuming mixing process that it necessitates. Are there any direct-to-tape mixes that you can think of that are better than painstaking mixdowns of comparable material?

I can't answer that question. Even when we used to go straight to mono, we always wanted more control. We used to run two mono tape machines at Decca, and if there was something like a guitar that we didn't think was very good, we could stop it going to machine B and get the guitarist to overdub it by doing a mono-to-mono copy. [Laughs.] So from when I started, I've always wanted more control over everything. I guess you could say now, what with Pro Tools and everything, we have absolute total control. I don't know whether the results are superior or not. Sometimes fate just took the upper hand and you got happy accidents. You can't have a happy accident now. That's the downside, really. You've got so much control it's hard to get flukes.

Next month: Price talks about Guns N' Roses, the Sex Pistols, Elton John and Pete Townshend. ■

Chris Michie was Bill Price's tape op when AIR Studios officially opened for business in 1970.

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SETTING THE WORLD ON FIRE(WIRE)

This month, I still haven't jumped off the local bus. I'm hangin' on there, exploring the ramifications of...I know, you're at AES in L.A., and you'd rather hear about great eating spots than dweeby computer jive. Okay, for lip smackin' fish tacos, go to Señor Fish. For rich and hearty convergence technology, go with FireWire.

FireWire begins to meld the concept of device-attach protocol and serial bus into a true plug 'n' play package. The 1394 Trade Association, a collection of 170 computer, peripheral, pro and CE A/V vendors with a FireWire axe to grind, has ten groups working on topics from industrial control and automotive applications to compliance and interoperability—my favorite. And yes, little Danny, there's one for audio and video, too.

FireWire isn't a network, per se, but it does play one on your digital set-top box. Its low-cost, flexible powering, dual asynchronous/isochronous modes, backward and forward compatibility—as well as the ability to autonegotiate a comfy seat on the local bus along with 62 other peers—make it the perfect choice for networking of everything electronic. This means that, over time, we'll see FireWire in ever increasing numbers of CE, prosumer and reinforcement audio gear as well.

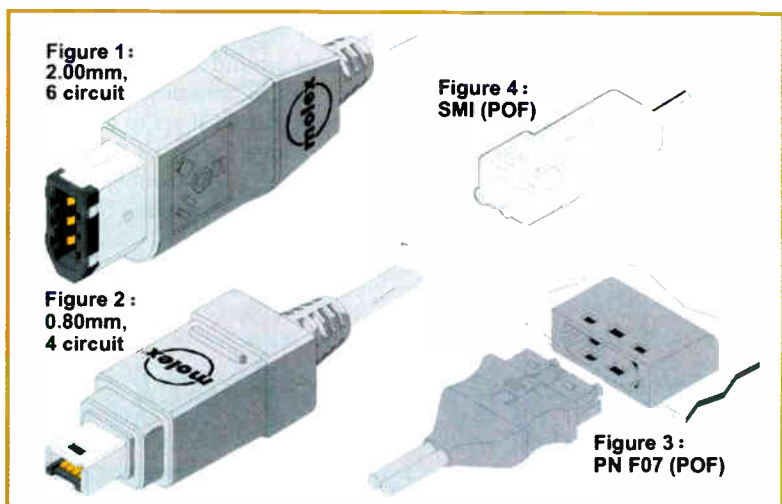
Since the introduction of sliced bread, SCSI has dominated the performance-peripheral scene. For consumer applications however, SCSI is too costly. Enter FireWire, which started life at Apple with the moniker "ChefCat" before it became an international standard. The IEEE created the first vendor-neutral standard version of FireWire in 1995. The original called for a four-wire unpowered or six-wire powered bus that went a long way toward trading off convenience and low cost for speed.

Since this is the Year of the Bus Upgrades, I'm here to extol the

virtues of 1394b, an interesting long-distance, high-speed extension to the 1995 original. 1394b, or "Beta" for short, adds so many new features it boggles my addled mind. Although the copper physical layer with two twisted pairs hasn't changed, the transmission is now dual simplex, with each pair continuously transmitting in each direction. Improved channel coding, employing the same 8B10B method used in Fibre Channel and

second. Then there's the six-pin version, a new compact, keyed, 110-ohm latching design that carries up to 30 VDC along with the data. The max rate for this puppy is 3,200 Mb/s.

Another low-speed alternative is the tried-and-true team of UTP decorated with RJ-45s. This yields 100 Mb/s over a 75-meter distance and shares the same connectors, cables and tooling that are used for old-school Ethernet.



Gigabit Ethernet, means that copper links radiate very little noise, a pleasant surprise in this RFI-enriched world. This also simplifies the analog design, making end-user products less expensive. Cleverly designed, dual-shielded, compact connectors allow hot plugging and protect against ESD (electrostatic discharge) damage.

Intended for more than 1,000 mating cycles, the connector comes in two flavors. There's the familiar four-pin miniature version (Figure 2) that appears on consumer DV camcorders. This 1394a-2000 S200 connection, usually called 1394AV or iLink, doesn't carry the extra power pins and is intended for battery-powered products operating between 100 and 400 Mbits per

Getting back to its roots, 1394b's support for glass and POF (Plastic Optical Fiber) enables really long runs. Apple had originally envisioned ChefCat as being carried on glass fiber, but that was deemed too expensive at the time. Though glass can handle 3,200-megabit data rates over long distances, duplex POF is a great way of getting 400 Mb/s around your crib, car or project studio. Besides, it's a breeze to terminate and connectorize. For POF, there are two connector types. One is a PN FO 7 series (Fig. 3), which looks like two AES Type II optical connectors superglued together. This guy runs at a max speed of 250 Mb/s. The other is a latching connector, the SMI or Small Multimedia Interface (Fig. 4), which employs either laser or LED transceivers and runs at 400 Mb/s.

BY OLIVER MASCIAROTTE

ANALOG TAPE 101

PART THREE, BIAS MAGIC

Welcome to the final part of this series on analog tape recorder maintenance.

Wrapping up each section has been a bit like making yogurt or sourdough bread: There's always a bit left over to start another batch of tips. This time, bias is scrutinized in greater detail because it is the most critical parameter and, second only to input level calibration, the most inconsistently implemented on semipro (narrow format) machines.

BIAS MAGIC

Bias is like an electronic bribe to the tape's magnetic particles—without it, analog tape would sound like a digital children's toy. It is basically a minimum distortion adjustment—sort of like tuning an

BY EDDIE CILETTI

old-fashioned AM radio; too little bias makes the sound bright on top and fuzzy on the bottom. Excessive bias results in dull and dirty recordings. Bias is a Radio Frequency (RF) signal—anywhere from 60 kHz (for cassette decks) to 432 kHz (for the Ampex ATR-100 Series)—that is mixed with the audio signal. As with digital sample rates, the higher the bias frequency, the better (for lower high-frequency distortion).

The correct amount of bias current is determined by the size of the gap in the Record head. The “complications” are tape oxide type, tape speed and the type of distortion being minimized. Mag-

netic tape does not have the same sensitivity at all frequencies, but when adjusting bias current, high-frequency output is most affected, hence its use in achieving the most precise adjustment.

If you followed the first two parts of the series, by now you should have aligned repro and/or sync (Playback) with the alignment tape. Now, put up a blank tape, set the oscillator to 10 kHz and press Record on all tracks. On a three-head machine, if the high-frequency tones waver more than 1 dB, do *not* pass Go! Don't even waste your time until the problem is solved, either by thorough scrutiny of the tape path or by having the heads relapped. Remember that many narrow-format machines have only two heads—Erase and

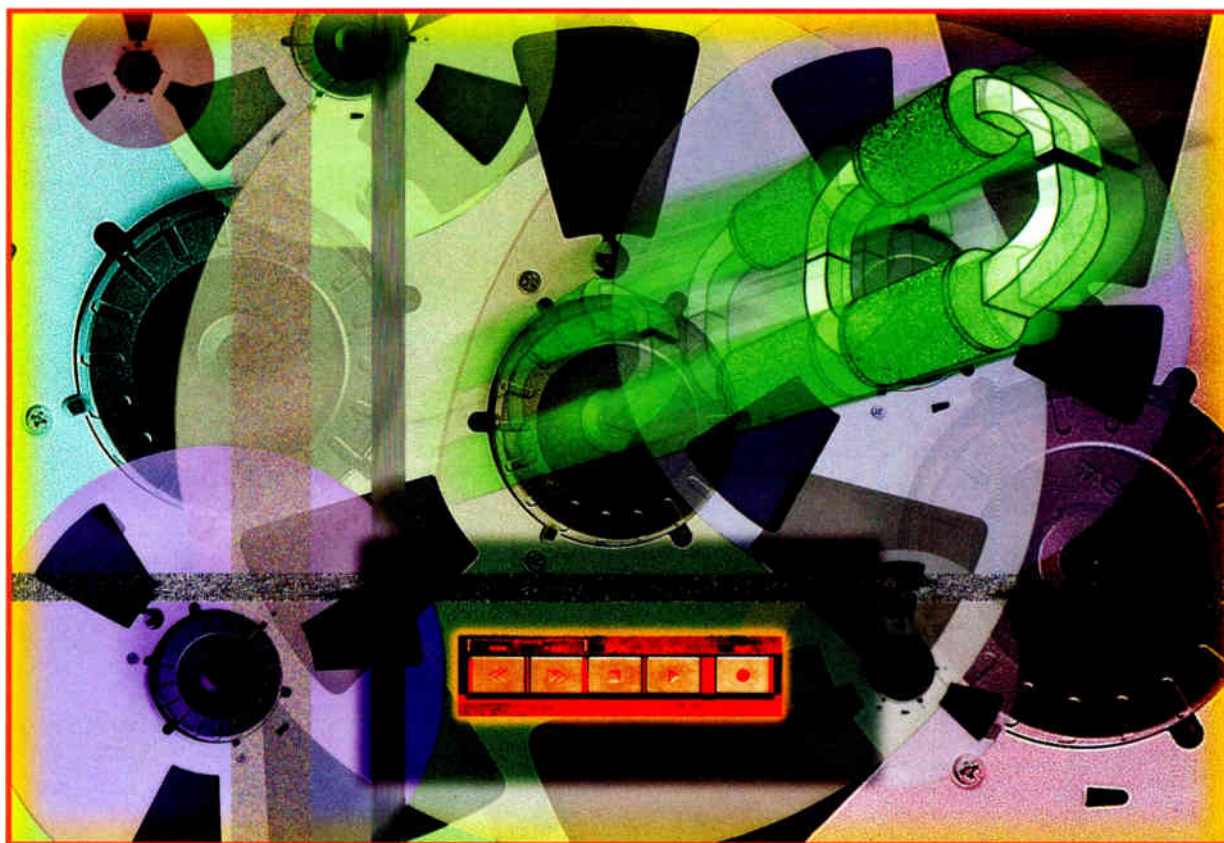


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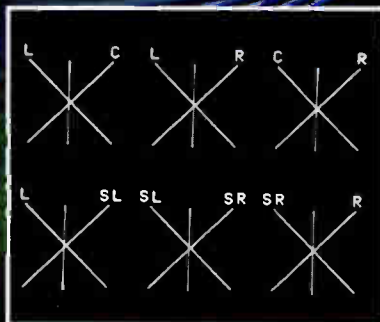
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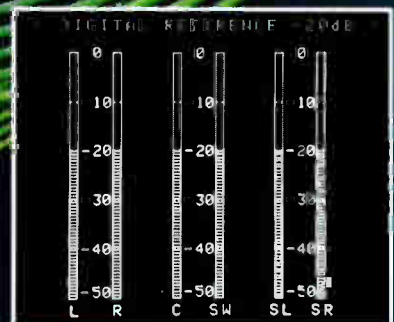
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(See the example in Table 1.) In many cases the service manual will show how to set bias by measuring the voltage at a test point. This method works assuming you have a voltmeter that is accurate at bias frequencies (the Fluke 8060A) and that the heads are new or recently relapped.

If you are reasonably sure that the machine was never misaligned, then the "factory" bias setting should be better than attempting to readjust bias and potentially make things worse. If you're not happy with the sound, the "Good Vibra-

tions" section will be revealing. But first these cautions...

I do not recommend using high-output tape on narrow-format machines. Mechanically, they are heavier, less pliable and more likely to accelerate head-wear. In their heyday, Tascam's MS-16 and Model 38 would become sluggish over time using the recommended tape (Ampex 456, 3M 226). Having the reel motors rebuilt will improve performances and extend the life of the motor drive amplifiers. Electronically, some narrow-format machines are not capable of full erasure. Also, as some machines absolutely must be run with the built-in

noise reduction, there really is no need or no point to pushing the levels.

**GOOD VIBRATIONS:
THE MAGICIAN'S SECRET**

I saved this technique for last because it's more complicated. If you are uncertain about how much over-bias is required, or just want to satisfy your own curiosity, record a 40Hz sine wave at 30 ips. Listen to what happens as the bias is varied. (Hint: If the fundamental is filtered with an equalizer, you'll hear only the distortion artifacts; the changes will be more revealing.) Adjust to minimize the fuzz and low-frequency harmonic distortion. (Congratulations! You've just used your ears as a distortion analyzer.) Switch to 15 ips and then 7.5 ips, making the adjustment each time and notice that the "window of relative cleanliness" becomes wider as the speed is cut in half. Also, try this on a digital machine and notice how there is no obvious distortion.

At 30 ips, the narrow window is perfect for getting the most precise adjustment, but it is important to perform this "test" over several channels. Now, switch the oscillator to 20 kHz, note the level on the VU meter (A), then reduce the bias until the signal level peaks, again noting the new output level (B). Average the results. The difference in dB from (A) to (B) is the optimized over-bias. Use this amount to align all channels.

Phew, now we can get on with the Record calibration.

RECORD LEVEL: 1 KHZ

As mentioned, Input and Record level calibration are inconsistently implemented on professional and semipro machines alike. On some pro machines, the two might interact. Older Tascam machines have separate meter calibrations for Input and Repro, as well as level adjustments. Read the manual. Make the adjustment at 1 kHz so that Input and Repro both read "0 VU" (PAR, if applicable).

RECORD EQ: 10 KHZ

For this adjustment, it is important to confirm that the oscillator is flat, so check input after switching to 10 kHz, then go into Record and adjust the Record EQ so that 10 kHz also reads "0 VU." Sweep up to 15 kHz and check the level—it should be within ± 1 dB—and again at 20 kHz, where ± 2 dB is acceptable. Of course, flat is the goal. The head condition is most suspect if the level drops as the frequency

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SNAPSHOT PRODUCT REVIEWS

SENNHEISER MKH 800 ▼

Studio Condenser Microphone

Nearly a decade ago, Sennheiser introduced the MKH 80—a condenser mic combining the successful RF technology of earlier models in the MKH line with a medium-diameter-diaphragm, multipattern capsule in a side-address package. The MKH 80 soon caught on with an appreciative audience of classical recordists and audiophile engineers.

Earlier this year, Sennheiser followed up with the MKH 800, a model with a similar feature set but improved noise performance, greater SPL handling (now at 142 dB) and more than double the bandwidth—beyond 50 kHz. It looks like just the ticket for

allowing accurate mic placement in any position or angle. Besides tight spots like crowded drum kits, it's perfectly suited for MS miking or other near-coincident applications.

Despite the MKH 800's extended bandwidth, this is one mic that does not come off as excessively bright sounding. Don't get me wrong: In all pat-

terns, the HF performance is certainly not dull, and the mic does an exemplary job of imparting a smooth airiness to upper frequencies, especially on harmonic-rich sources

such as hammer dulcimer, grand piano and orchestral bells. Interestingly, the three cardioid-variant patterns are nearly ruler-flat to 20 kHz, while the omni pattern shows more HF color in the 10kHz-and-higher bands than the cardioids—the opposite of what I expected.

With its 142dB SPL handling, the MKH 800 was a natural on drums (it's a killer—if somewhat pricey—snare mic), hi-hat and overheads, as well as horn ensembles (sax and trumpet).

Another surprise came from the mic's ability to capture an incredible amount of detail, even at distances of ten feet and more. This can, however, be a dou-

ble-edged sword—while the mic will capture every performance nuance, it also faithfully documents flaws such as chart turns, fret noise and air handling rumble with frightening realism. Don't blame the mic—it's just capturing what lesser mics may have left out. However, if you have the ears and great players are willing to spend a little time placing music stand towels and tightening that squeaky piano bench, you will find the MKH 800 an awesome performer.

Sennheiser USA; 860/434-9190; www.sennheiserusa.com.

JOHNSON J-STATION ▼

Guitar Processor

Taking the acclaimed guitar amp modeling technology from its line of "digital" guitar amps, the Johnson J-Station puts that same power into a desktop unit that's ideal for recording applications. Retailing at \$449.95, the J-Station also adds bass and acoustic guitar simulation, 30 factory and 30 user presets, compression, modulation, pitch shifting delay and reverb effects, six gain and tone knobs for tweaking effect parameters, MIDI control (via a sequencer, external controller or included Windows-based editor/librarian software) and stereo analog and S/PDIF coaxial outputs.

The coolest aspect of J-Station is its simplicity. Without getting knee-deep into menus or subpages, you

BY GEORGE PETERSEN



96kHz/24-bit media such as DVD-Audio.

Housed in a light-colored, anodized 7-inch-long, 1-inch diameter cylindrical housing, the MKH 800 holds few operational surprises, with four rotary switches for setting: the five polar patterns (omni/cardioid/supercardioid/figure-8/wide cardioid); attenuation (0/-6/-12 dB); HF emphasis boost (0/+3/+6 dB at 10 kHz); and high-pass filter (0/-3/-6 dB at 50 Hz). A bright LED indicates the presence of 48 VDC phantom power and marks the front side of the capsule. The MKH 800 retails at \$2,995 and now includes a flight case, foam windscreens and MZS80 shock-mount. The latter is brilliantly designed and not only effectively isolates external vibrations, but incorporates a double-swivel mount

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AUDITIONS

home in the studio or onstage as a personal cue mixer for wedges or in-ear monitors.

Priced at \$699, the rackmount HDS-16 forms the core of the system, routing four-stereo and eight-mono signals, patched in the control room via the HDS-16's front-panel TT or 1/4-inch jacks. The system uses 25-foot multipair cables—terminating in 50-pin Centronics plugs—to connect to each (six or more) of the \$599 HRM-16 mic-stand-mounted headphone stations. Power to drive the headphone mix stations is routed along with the multipair audio, so no external power requirements, wall warts, etc. are needed.

The HRM-16s allow players to create their own mixes from the stereo and mono sends, while each user can talk back with other musicians or to the control room. Other features on the HRM-16s include effect send/returns, master bass and treble pots, talkback level (with stomp-to-talk footswitch jack) and a main volume control.

Overall, the HDS-16/HRM-16 system is a winner. I like the versatility of



having TT and 1/4-inch connectors on the control room unit. The headphone output on the mix stations is not only clean but loud enough to satisfy musicians and drummers. And these days, everybody (yeah, even the artists) wants more inputs, and the system provides plenty of knobs to keep the "talent" busy while engineers can attend to more important duties like ...doing anything *but* cue mixes. I like this one!

Furman Sound; 707/763-1010; www.furmansound.com.

HOLLYWOOD EDGE "Sounds of a Different Realm"

Long regarded as one of the industry's finest film sound designers, the late Alan Splet helped change the way we all experience movies. In 1970, Splet began his long-term relationship with director David Lynch and created memorable audio for films such as *Eraserhead*, *Dune* and *Blue Velvet*. Splet was awarded a special Oscar for his work on *The Black*

Stallion in 1979 and a year later, the Academy added sound effects editing as an Academy Award category.

Now, Hollywood Edge has released "Sounds of a Different Realm," a 3-CD set featuring effects created by Splet and his widow—and long-time collaborator—Ann Kroeber, finally making public a few highlights from the couple's library. Priced at \$295, the collection has two discs of "Unusual Presences," mostly longer ambience cuts and "Common Sounds Heard in Uncommon Ways," which has more traditional effects—i.e.,

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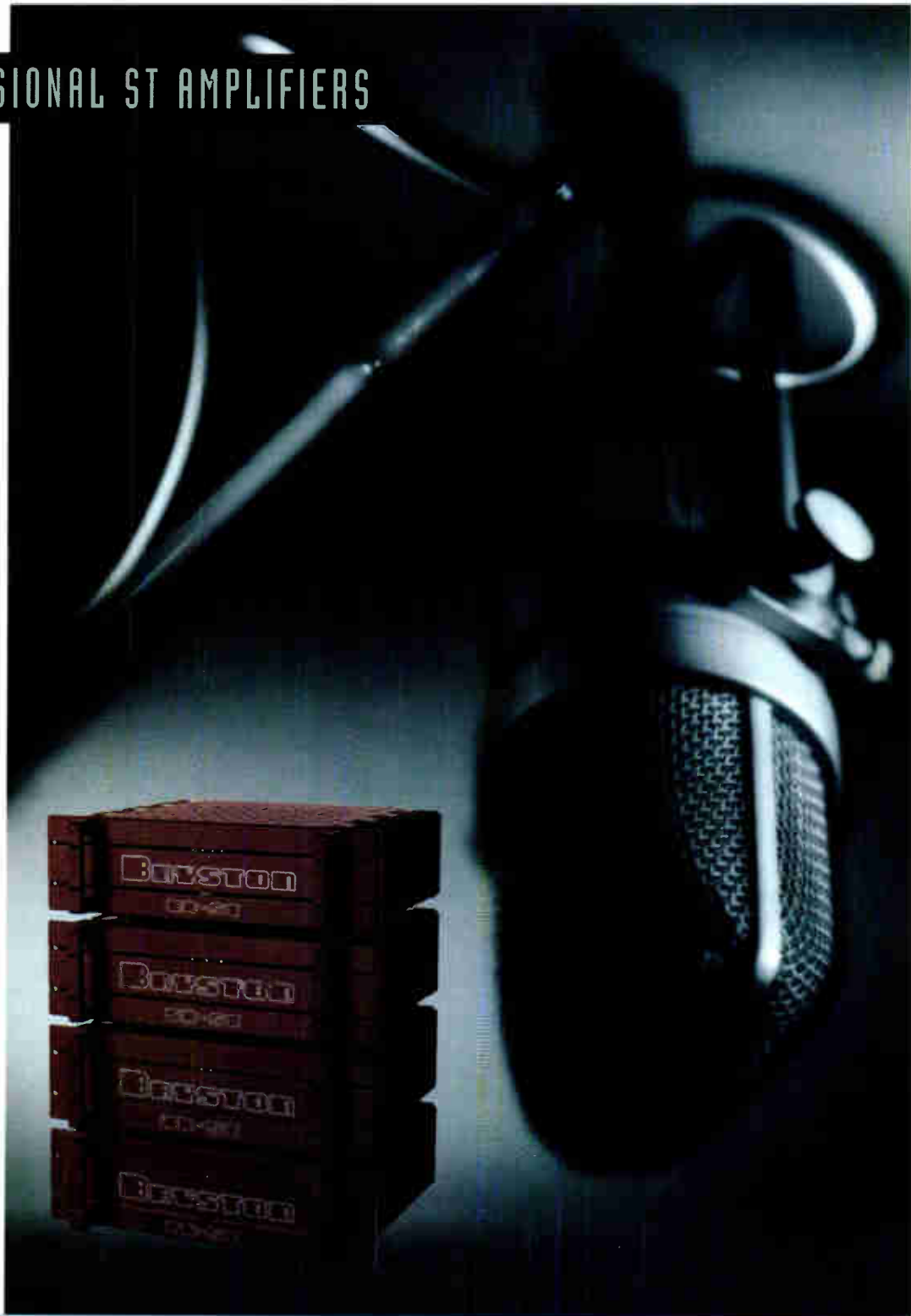
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everyday sounds—but in a way you've never heard them before.

Most of the cuts on "Unusual Presences" are dark, brooding, mysterious ambiances that combine musicality with tone-setting atmospheres: ethereal presences, ambient hums, swirling winds, industrial pulsing, etc. For example, the "Melodious Foggy Ship Horn" drips



with intrigue, while stepping away from the clichéd "ship in distance" approach. Other tracks—"Ambient Intense Tonal Gas" or "Ambient Doppler Pulsing"—are less location-specific but provide brilliant background textures for science fiction/action/mystery scenes in film, theater or commercials.

The last disc, "Common Sounds Heard in Uncommon Ways," consists of new recordings by Ann Kroeber, for which she recorded the sounds of ordinary objects and devices on two tracks, with a conventional mic on one channel and a custom contact mic on the other. This technique allows the end user to select from either track (adding processing of their own if desired) or simply use the sounds as-is for a HUGE stereo effect. It's hard to believe that a mere bottle opening or soda-pour-into-glass could sound so much larger than life—perfect for commercial spots! Other devices—such as a soda machine, steam iron or VCR—take on an otherworldly character, bringing up sonic images of Martian invasions, alien landscapes or evil medical devices.

Anyone looking for sound effects

that are distinctly different would do well to check out "Sounds of a Different Realm." It's a wild ride!

The Hollywood Edge; 323/603-3252; www.hollywoodedge.com.

MINDPRINT EN-VOICE ▼

Workstation Front-End

With a huge number of multitrack recording/editing/mixing workstations on the market, it's little wonder that traditional console sales ain't what they used to be. However, for all the power that DAWs typically offer in terms of mixing and file manipulation, they often lack some of the basic tools that nearly every production requires.

Priced at \$749, the En-Voice from German manufacturer MindPrint is a versatile, single-channel front-end for workstations. En-Voice provides inputs for mic, line and DI (instrument-level) sources with a wide range of gain control and also includes switchable high-pass filtering (50 or 100 Hz), 3-band EQ (with fully parametric midrange, a compressor/limiter and a 12AX7 tube saturation stage. The line input and output are both provided as balanced XLRs or TRS jacks—definitely analog, although the DiMod, a 24-bit digital module with 44.1/48kHz S/PDIF co-ax input/output, is available as a \$249 option.

In the studio, the En-Voice proved itself useful in all sorts of situations. The discrete, transistorized mic preamp is clean and offered ample headroom, though I didn't like the phantom switch position on the rear panel! The front panel-mounted DI jack came in handy when cutting a bass part in the control room, and the EQ and compressor proved to be lifesavers, when on a late-night session, someone absolutely *bad* to cut a funk bass part when the only bass available in the studio was my Epiphone El Capitan acoustic. A little midrange digging and a ton of LF boost, combined with some compression to keep the popping in-line, and the track ended up sounding like a '63 Precision—and with a smidge of En-Voice tube compression, picked up a hint of a 50-watt '66 Bassman.

Overall, the EQ is smooth and nice, and the individual in/out switches on each band both bypass unnecessary circuitry and simplifies A/B comparisons of different settings. The EQ bands overlap and the sweepable HF extends to 22 kHz for a nice touch of "sheen." While I'll stick to my fave Focusrite Red 3, the En-Voice compressor is good enough for most typical tasks, although control of the attack/release time is limited to a "normal/slow" switch. A useful compression sidechain filter switch keeps any sub-300Hz signals (bass, kick, etc.) from causing undesirable pumping.

At \$749, the MindPrint En-Voice is versatile, affordable and offers a big studio sound.

Distributed by Steinberg; 818/678-5100; www.us.steinberg.net.

CAD DSM-1 ▼

Drum Mic Mount

Drum miking can be arduous when it involves lots of mics in a huge, cramped kit. In larger studios, there's usually enough room to do it right—sometimes requiring 11 boom stands—but even then, getting the exact placement you need in a sea of cymbals, drums, pedals and hardware can be nearly impossible. If you're working onstage on a packed drum riser, the problem is worse.



New from CAD Professional Microphones, the DSM-1 is a heavy, die-cast drum mic mount with a slick, locking cam that attaches securely to any standard drum, yet removes easily. Thick rubber pads protect the drum finish, while a neoprene-surround insert (threaded for standard mic clips) offers additional shock isolation. Priced at \$24.95, (with a 3-inch extender for more placement options) the DSM-1 is cheaper and easier to haul than a truckload of boom stands and is an ideal addition to anyone's gig bag or mike locker. Highly recommended!

CAD; 440/593-1111; www.cadmics.com.



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JBL VERTEC

LINE ARRAY SYSTEM

Introducing a new P.A. system always involves an element of risk. Yet, to introduce its new VERTEC line array speaker system, JBL Professional picked one of the highest-profile events of the year—the Democratic National Convention (DNC), held during the week of August 14th in the Staples Center, Los Angeles.

Event sound designer for the DNC was Patrick Baltzell, who designed a distributed sound system made up of numerous satellite arrays, an effective method for coping with the cavernous venue's acoustics. In all, Baltzell used 68 of the new VERTEC Series VT-4889 enclosures.

Fourteen of the VERTEC line arrays were hung from the ceiling. Three six-box arrays were flown more than 50 feet above each side of the oversized rostrum, covering the main floor and forward seating rows.

Another eight four-box arrays, distributed in an arc farther back, were aimed to cover back and side seating areas of the arena. Immediately noticeable to anyone who has seen other line array systems deployed was the rather extreme angles at which the VERTEC arrays could be flown, due to a unique, rigid rigging system.

Sound services for the event were provided by Audiotek

Corp. (Burbank, Calif.), whose chief engineer, Scott Harmala, supervised the temporary installation. ATK (a 2000 TEC Award nominee) specializes in sound reinforcement for televised events, especially those which include live music. The company is no stranger to line arrays, having previously purchased systems from two different manufacturers.

ATK was assisted at Staples Center by members of I.A.T.S.E. Local #33, which includes a number of veteran, audio-savvy individuals like David Velte, who had praise for the



VERTEC system's design. "Whatever JBL has done to make the boxes this lightweight, I guarantee stagehands don't mind a bit!" noted Velte.

SYSTEM DETAILS

The VERTEC system incorporates the latest in component and materials technology. Each box is made of a composite material similar to that used in JBL's HLA subwoofer, and each VERTEC enclosure weighs only 152 pounds. The box measures about 20 inches tall and deep and only about 47 inches wide. These dimensions allow boxes to be stacked on end, two high, even in the smaller, non-trailer trucks used by many concert sound companies. In fact, 100 of the boxes can be stacked in a 24-foot truck body.

The enclosure's back panel is slightly shorter than the front dimension, allowing up to 10 degrees of vertical splay angle between one speaker in an array and the next, while keeping the front edges of the enclosures coupled tightly together.

A tubular frame on either side of the enclosure has integral, captive rigging hinges that slide out and couple one enclosure to the next with single-degree resolution. This reportedly saves both time and cost, as additional "loose" rigging parts are not required. The manufacturer advises that up to 18 of the VT-4889 enclosures can be suspended from the 4889-AF (Array Frame), made of high-grade, lightweight aluminum, with a 7:1 safety factor.

The box geometry has a number of advantages when multiple units are arrayed, as a greater vertical coverage angle can be achieved with fewer boxes. In many situations, such

BY MARK FRINK



“I want it that way.”



Tim Lamoy (left), House Engineer for the Backstreet Boys, and Monitor Engineer, Chris Holland

Introducing the ATW-7373 Handheld Condenser Wireless System

Tim Lamoy and Chris Holland, sound engineers for the hugely successful Backstreet Boys, know exactly what they want from a wireless system. That's why they switched to the new Audio-Technica ATW-7373 handheld condenser system for the group's all-critical vocal sound.

Lamoy put it this way: "This system has the best rejection and sound quality I've heard to date. It's got a warm, full-bodied 'wired' sound. Everyone loves it."

The handheld transmitter features the same element used in the legendary AT4033 microphone. It provides a real step up in wireless audio quality, delivering rich sound, natural top end and superb off-axis rejection.



The ATW-7373 true diversity UHF frequency-agile wireless system.

The best news? The ATW-7373 wireless is a major touring system that won't blow out a modest equipment budget.

Outstanding sound. Solid RF. Great price. Who wouldn't "want it that way?"



STUDER D950 M2

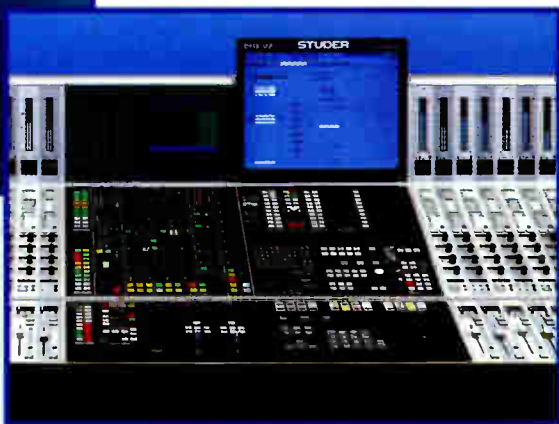
DIGITAL MIXING SYSTEM

During the past two years, Studer's D950 flagship digital production console has been an enormous success for the company, as more than 80 systems have been sold worldwide. Studer took an innovative approach to console design, and the D950 features 24-bit converters, 40-bit floating-point internal processing on a 32-bit bus and new advances in signal processing, such as Studer's proprietary Virtual Surround Panning (VSP). VSP tech-

metics, the knob sections feature new rotary encoders, each with a 21-LED ring that shows each knob's position at a glance. Each knob also now has an alphanumeric display, indicating the function or exact value of every rotary controller in the system. Another ergonomic upgrade comes from the placement of the Solo and Mute buttons, now optimized for those hectic, hands-on, "hey-I-gotta-push-several-of-these-at-once" sessions.



The D950 M2 comes standard with the Central Assign Section (CAS), one of the more popular options on the original D950. The CAS is a complete, expanded channel strip in a straightforward, intuitive layout that's easy to use, while bringing "stay in the sweet spot" mixing capability. Above this expanded center section are some appreciated new touches such as a color 8-channel surround meter and a new, larger 15-inch TFT color display.



nology allows the modeling of a 5.1 soundfield, with all parameters under the operator's control. Modifying the characteristics of the room, including size, ambience, absorption, pan location and distance of the sound source within or beyond the room, allows any natural—or imagined—space to be re-created.

The D950 M2 makes its U.S. debut at AES this month. Based on the existing architecture, the M2 incorporates some popular options developed for the D950 and adds a few new tricks of its own.

Like all models in the D950 family, the M2 Digital Core is fully configurable, allowing the console to be set up with as many channels and buses as needed. Console capabilities can be expanded at any time by simply installing additional DSP cards, allowing for a console size anywhere from 12 channels to well over 100.

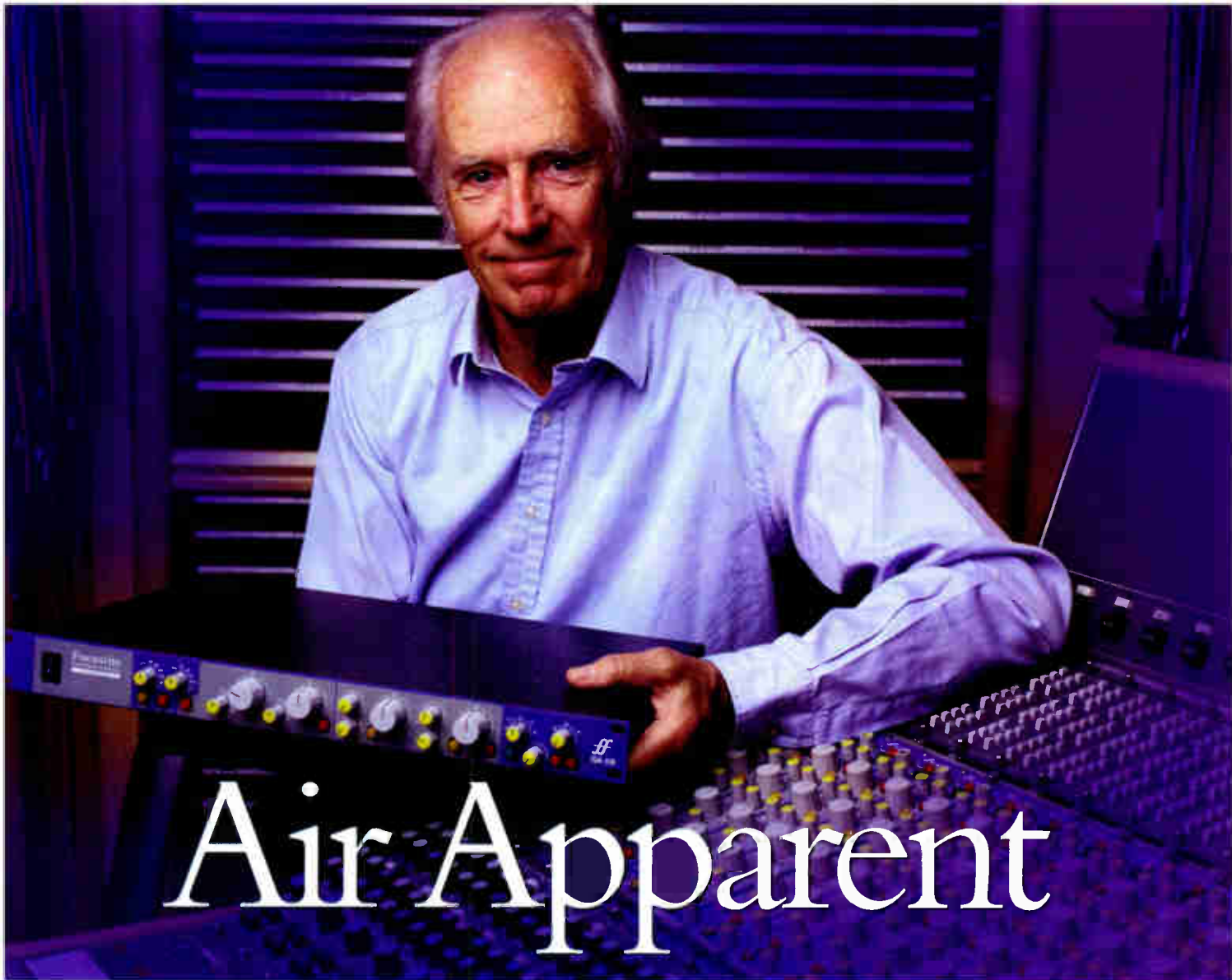
At first glance, the most obvious difference is the M2's color scheme. Described by Studer as a "graphic design language," this new look uses colors to better define the various sections of the channel strip for faster, more efficient operation. With a nod toward long-term owners, Studer has added a top-surface plastic laminate over the channel sections to prevent wear of the channel markings over time. Beyond simple cos-

Under the hood, the new console has numerous subtle, but important upgrades. The touch sensors, power distribution and the moving fader servo amps have all been enhanced; the VSP architecture has been extended for smoother, more natural early reflections, as well as the addition of late reflections (reverberation); and the M2 offers a revised Auto-Touch dynamic automation system, now with complete offline editing and expanded online functionality, such as Write-to-End, Static Objects, enhanced Trim mode, Audition Punch mode and more.

Ironically, the most amazing aspect of this board has little to do with technology at all: In a radical departure from most new console intros, the M2 is shipping now.

Studer North America, 1947 Leslie St., Toronto, ONT, Canada M3B2M3; 416/510-1347; www.studer.ch. ■

BY GEORGE PETERSEN



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AIR Studios, London: the brainchild of legendary Beatles Producer, Sir George Martin. The Focusrite ISA 110 Mic Preamplifier and Equalizer was designed for the custom Neve console that was installed at AIR Lyndhurst Studios in 1992. It went on to become the most popular outboard mic-pre and EQ in leading studios worldwide.

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STEINBERG NUENDO

MEDIA PRODUCTION SYSTEM

Steinberg has labeled Nuendo its "Media Production System" and with good reason. Open the program, click "New Project," and there's a list of various application templates ranging from Pro Logic Video Mixdown and 24/96 DVD 5.1 Authoring to 32-bit Stereo Master and Audio/MIDI Music Production.

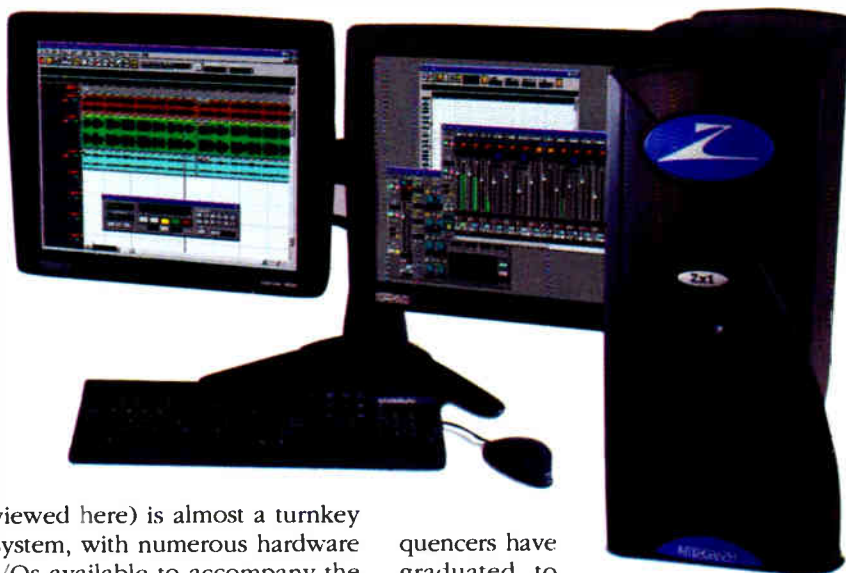
Designed to run on the Windows 98/NT/2000 platforms, the \$1,295 Nuendo software offers a real-time audio engine based on Steinberg's VST and ASIO technology, supporting both VST and DirectX plug-ins as well as ASIO and ASIO2 audio interface (hardware) specs.

Nuendo's capacity for 200 channels of digital audio plus an unlimited number of MIDI tracks is further enhanced by a built-in "window" that can play a local video file, locking picture and audio tracks in sample-accurate sync. The Surround option includes presets for various speaker configurations. Other features specific to video post include an open-framework media asset management system for organizing, searching and archiving media. There is EDL and control surface support (including CM Automation's Motor Mix), loop functions, infinite undo/redo, OMF import, Dolby Pro Logic-compatible encoder/decoder and Timelock Pro.

Priced at \$999, Timelock Pro is an optional hardware synchronizer that generates MTC from LTC and VITC, generates word clock or Digidesign Super Clock (FSx256) from video sync or free-running LTC. It supports 44.1/48kHz sample rates including 0.1% and 4% pull up/down rates and has a low-jitter word clock synthesizer for improved audio quality.

TURNKEY WITH ALL THE TRIMMINGS

Short of providing a computer with everything installed, Nuendo (as re-



viewed here) is almost a turnkey system, with numerous hardware I/Os available to accompany the \$1,295 software package. Priced at \$799, the Nuendo 96/52 for PC provides digital-only, 24-bit/96kHz I/O on a PCI card, with three ADAT Lightpipe connectors, S/PDIF I/O and a 9-pin ADAT Sync port for sample accurate transfers. Included is an expansion board with BNC word clock I/O for continuous resync.

For those requiring analog *and* digital interfacing, Steinberg offers several choices. The \$1,999 Nuendo 8-I/O is an 8-channel single-rackspace breakout box with 24-bit ADCs/DACs, with 8-channel balanced analog I/O (-10 or +4 dB) via balanced 1/4-inch connectors. The built-in 24-bit digital router includes auxiliary ADAT Lightpipe ports and Tascam TDIF I/O (with bit-splitting and copy modes) plus word clock I/O. A more extravagant I/O option is the \$7,699 Nuendo AD-8000, featuring eight 24-bit über-analog channels of conversion designed by Apogee Electronics, which include the renowned UV-22 and Soft Limit features.

Knowing that Steinberg created the popular Cubase sequencer suggests a history of integrating audio and MIDI that should inspire confidence. While many software se-

quencers have graduated to hard disk recording, Nuendo seems to be a digital audio workstation first and sequencer second. This suits me fine, as I primarily work with real sounds and have concerned myself with learning and using those tools, content that the MIDI would be available when I needed it.

INSTALL

At every possible juncture, Nuendo offers tips and suggestions, recommending a self-test each time I/O parameters are changed. For example, taking advantage of an IDE drive's "DMA" feature ensured digital harmony between audio and MIDI tracks. The program was tested on a 450MHz Pentium II with 128MB RAM running Windows 98. (Nuendo's copy protection scheme requires a dongle on the parallel port.)

With an editing project to do, I started with Mastering mode, although it was confusing to set the Auto mode (which should toggle between Internal Sync for editing and processing and External Sync for transferring material from DAT or other outside sources). The interface could be a little more explanatory about self-diagnosing the erratic behavior.

While I was learning the pro-

BY EDDIE CILETTI



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FIELD TEST

gram, still in Mastering mode, the system was unpredictable and crashed several times. Later, after switching to Multitrack mode, I entered the Devices menu and discovered that the "generic" ASIO driver had loaded during the installation, rather than the driver specific to the card I was using. I was impressed with the system's ability to load the correct driver on the fly without rebooting, yet I wish that Nuendo would have been smart enough to find and load the correct driver in the first place. However, once the correct driver was in place, Nuendo behaved as intended, and I was then inspired by its power and no more crashes.

IN SESSION WITH NUENDO

When reviewing any product, I use the trial-and-error approach (i.e., how far can I go without actually cracking open the manual) to indicate whether or not the software is intuitive—Nuendo is! Also, by knowing the right questions, I can determine if the manual can actually be of help. I highly recommend the Adobe Acrobat (PDF) version of the manual, which is conveniently hyper-linked and located on the CD-ROM. Additionally, the latest documentation and software upgrades can be downloaded from the Web site, but to skip the homepage intro, enter www.nuendo.com/index2.html and click on "Support."

OPERATIONS

The difference between reviewing a product and being a power user should not be lost on readers of this review. Having just crossed the threshold from frustration to the smug satisfaction of knowing my way around, Nuendo has the power to satisfy my needs. That's not to say there weren't any problems; I basically looked in all the closets until I found the tools and tweaks to make it work "Eddie-style."

All editors have some sort of Trim and Fade In/Out features. Nuendo integrates these so Trim is accessed at the bottom of the audio waveform while Fade in/out is at the top. I didn't figure this out by myself (another place where a good manual does help). You can select and group sound files just like computer files using the Shift key. The essential tools are just above the sound files, but you can also click into a more elaborate set of tools. I only wish there was a sophisticated version of QuickKeys for PC so that favorite tools from any workstation could be collected and made transportable—be they icons or keystrokes—independent of software or hardware. Dream on!

One example of a small triumph was finding the transport defaults (in the File menu, under Preferences). One simple click and the most annoying default of Nuendo was banished. When editing, my preference is for the "play head," a.k.a. the cursor, to park when stopped. The default—Return to Start Position on Stop—just about pushed me over the edge. In my humble opinion, this shouldn't be a preference so much as one of many button options in the Locator section of the Transport Panel. Another useful Transport option toggles between Stationary and Moving cursor. Select Stationary and the cursor is always centered, making it easy to zoom right in to audition, scroll and trim audio with enough room to see what's on either side.

SIR HOUND

Initiating a new project via any template does not restrict the user from changing course. A perfect example would be completing a stereo mix, then moving on to the 5.1 Surround version, as seen on page 161. The Devices buttons allow any window to be selected Mixer, Effects, Inputs, Video, etc. The Outputs button opens a dialog box (indicated by the blue arrow)

The Mixer: Nuendo offers 200 audio and unlimited MIDI tracks.





Nuendo offers comprehensive surround features. Here, the pink arrows detail "handles" used to trim Start and End points (lower) and Fade In/Out points (upper). The yellow arrow shows dialog box choices. The blue arrow shows output choices.

as the Master (bus) section.

Nuendo supports VST and DirectX plug-ins, a diverse selection of more than 400 signal-processing options that are available from both Steinberg and third-party sources. Besides Apogee's UV-22 dithering, Nuendo's built-in effects plug-ins include reverb, dynamics, delay, chorus and flanging—all of which can be automated. I was impressed by the multiband compression plug-in. The default is three bands, but as many as five bands can be added. Nothing could be simpler or slicker (except dual-monitors, and I'm working on that!)

On a more basic level, I really appreciated the horizontal and vertical sliders for quick zoom-in and zoom-out of the waveforms and timeline. There's even a separate menu for third-party DirectX programs, simple and obvious. Normally I save often, but on one occasion, moving a piece of audio while another was playing caused the program to freeze. After rebooting, Nuendo knew that changes had been made, offering the option of saving those changes as a new version, splitting the difference between the last save and where I had left off.

that selects the number of output channels and their formats.

For stereo, the mixer options are simply buses, but once 5.1 Surround is chosen as the output format, additional routing options can be selected from the bottom of the mixer. (The yellow arrow shows dialog box choices.) It is possible to "hard-pan" directly to any of six outputs. Or, selecting the Surround Pan option changes the left-right horizontal panner to a full, 360-degree joy-

stick panner. The properties of the all panners can be manipulated in the Master Setup Box (shown in the circle in the lower right corner).

IN THE TOY BOX

Pull down the Devices menu to access the primary "windows," such as the Mixer, Transport control and Editor. The VST Mixer window can be simple faders, or via edit button, expanded to reveal the plug-ins (and their options) as well



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BLUE DRAGONFLY

CONDENSER MICROPHONE

In recent years, BLUE (Baltic Latvian Universal Electronics) has achieved recognition as a manufacturer of high-quality, hand-crafted microphones.

BLUE's latest offering, the Dragonfly, has a unique appearance and a very functional architecture, consisting of a round, pivoting enclosure housing the capsule. This enclosure rests on an integrated, shockmounted cradle (with mic stand adapter) attached to its stem.

The Dragonfly is a pressure-gradient, cardioid condenser design with a hand-crafted, 1-inch diaphragm capsule with a single layer of 6-micron Mylar film sputtered with a formulation of aluminum and pure gold. The electronics are Class A discrete, with transformerless output. The mic's specs include a sensitivity level rated at 21mV/Pa (1 kHz into 1 kOhm), while its max SPL handling is a respectable 132 dB. The microphone has a 20 to 20k Hz frequency response, a signal to noise ratio of 87 dB (DIN/IEC 651, A-weighted) and self-noise of 7 dBA.

I checked out a pair of black-stemmed "standard issue" Dragonflies and two of BLUE's 20-foot "Cranberry" high-definition cables. The optional Cranberry cable employs a two-conductor, twisted-pair design that rejects electromagnetic interference. Gold-plated connectors round out the feature set.

BLUE also markets an upgraded green-stemmed, matched pair of Dragonfly mics on special order; these incorporate higher-grade electronics, a slightly denser capsule backplate on the capsule and a wood box. Unfortunately, the upgraded version of the mic can only be purchased as a pair (\$2,800). I'm confident many recording professionals would gladly pay the difference for a single upgraded "Dragonfly LE," if such a unit could be obtained.

Oddly, the "standard issue" Dragonfly does not use a gold-plated XLR connector, though the upgraded version does. While this may not significantly impact signal quality, I can't help but wonder why BLUE opted not to provide a connector on par with those of the recommended cable.

IN SESSION

Setting up the Dragonfly requires removing two brass set screws from the solid metal ring surrounding the grille. The screws secure the capsule during shipment to help prevent damage, and you are encouraged to replace them when-ever the mic is stored.

The Dragonfly has a cardioid response and should be positioned so the grille's shiny side faces the desired sound source.

The Dragonfly's horizontally pivoting capsule, combined with the integrated shockmount support, allows the mic to be placed in an almost infinite number of positions and is, without a doubt, one of its best features. Inside the circular grille, a finely woven inner screen protects the capsule from foreign elements and saliva.

I connected the Dragonfly through a Millennia

onfly is quite sensitive to the letter "P" and other plosive sounds. For close proximity dialog work, a sheer nylon pop filter is essential.

The ability to angle the capsule works wonders for this application. After a bit of experimentation, the mic delivered outstanding takes with plenty of depth and definition, while relatively free of any undesired sibilance.

For vocal work, I followed the recommendation of the Dragonfly's user guide. With the talent positioned roughly five inches directly in front of the mic, a slight upward angle of the capsule captured greater dynamic contrast during those "belting" portions of the hook. The Dragonfly has a fairly broad on-axis range, enabling one to position sound sources at various degrees off-center. This can help compensate for an understated midrange response; but more on that in a moment. With both dialog and vocal work, the Dragonfly was terrific at reproducing the articulation, and playback was every bit as easy to understand as the original performance.

The Dragonfly is not entirely transparent—there is a definite coloration to its sound. The mic delivers a very full, rich bottom end with a high end that borders on the bright side. There's a low-end bump around 90 Hz and another bump about 14 kHz. The midrange, while not bland, is not as emphasized as the high- and low-frequency ranges.

I had a pair of Dragonflies and



HV-3B preamp and began working on a dialog session. The Drag-

was eager to try them as drum overheads. The mics' emphasized low- and high-frequency ranges make these exceptional for this application, yielding a detailed

BY ROGER MAYCOCK

Full Sail graduate **Derrick Perkins** with **Stevie Wonder** in one of Full Sail's **Solid State Logic SL 9000 J** studios.

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-**Stevie Wonder**

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world radio history

TASCAM MX-2424

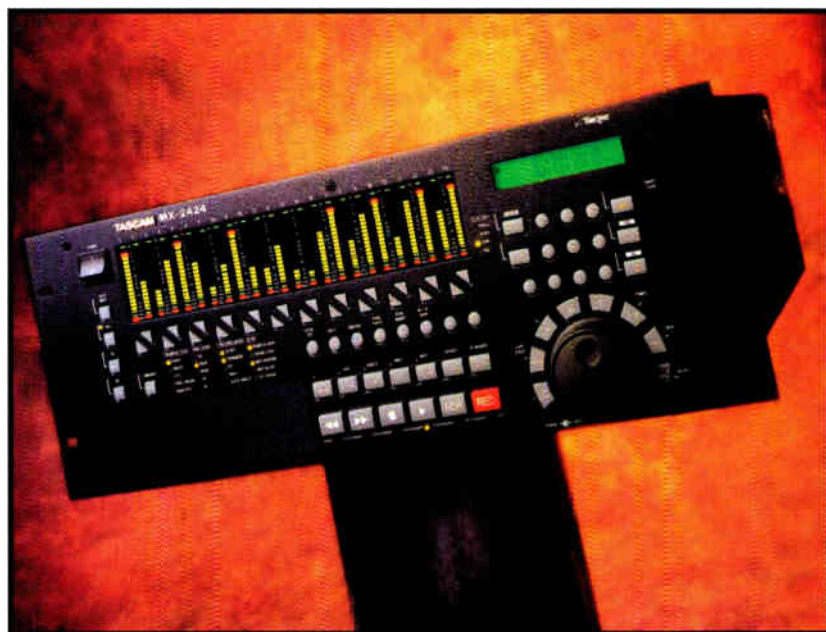
DISK-BASED, 24-TRACK RECORDER/EDITOR

On October 1, 1992, Tascam unveiled its DA-88 8-track, 16-bit, tape-based MDM, which at \$4,499 represented a revolution in the making. Now, eight years later, Tascam is delivering its MX-2424, a disk-based recorder carrying a lower base list price: \$3,999. The MX-2424 not only beats the DA-88's original price, it offers some impressive features. Twenty-four-bit resolution and 24 recording/playback tracks are standard, and the next software release, due this month, will allow the unit to operate as a high-resolution, 12-track/24-bit, 96kHz deck.

Like the DA-88, the MX-2424 is housed in a four-rackspace chassis, and multiple recorders can be locked with single-sample accuracy (1/44,100 sec) if additional tracks are required. However, the MX-2424 makes the DA-88's feature set seem rather primitive by comparison; the MX-2424 includes on-board MIDI and LTC SMPTE synchronization, standard S/PDIF and AES/EBU digital I/O and out-board control capability via the included ViewNet MX software for Mac or Windows.

Speaking of formats, the MX-2424 will support Broadcast .WAV files on FAT-32 formatted disks in the next software revision. Pro Tools Session file import/export is not currently supported, although the unit can record files in Digidesign's Sound Designer (SD2) format to a Mac-formatted disk for import into a Pro Tools session. A software upgrade to allow the MX-2424 to import SD2 files directly is slated to be available this month. The MX-2424 also supports TimeLine's Open Track List (Open TL) format.

Although the MX-2424 has a host of useful record/edit/play/sync features, it should be emphasized that the product is a recorder and has no internal mixing capabilities. The MX-2424 is designed to replace or augment MDMs, analog



or digital multitracks or workstations. When operating in its (soon-to-be-implemented) high-res, 24-bit/96kHz, 12-track recording mode, the MX-2424 will be equally at home as a multichannel mixdown deck for storing surround mixes. The 12-track format should be adequate for both a stereo version and 5.1, 7.1 or even 8.1 mixes—and there'll still be a track or two left for controlling the popcorn machine.

NUTS 'N' BOLTS

Before I began working on the MX-2424, I went through the patented George Petersen "let's-take-it-apart-and-reassemble-it-before-the-session" routine. Popping the top cover, I was impressed by the clean circuit layout. The drive is a 9.1GB Quantum Atlas V, a solid, high-reliability unit that's mounted in the bay above the open slot for a second internal drive. The user can pick from a list of Tascam-recommended drives, ranging from Travan, DVD-RAM, hard disks (HFS+ support is due later this month) or hot-swap-

pable, removable Kingston carrier frames for drives such as Rhino Jr. or Data Express. Additionally, a rear panel wide-SCSI port is provided for external storage and/or backup devices. Also on the rear panel, two empty slots accommodate a variety of I/O options. The analog option occupies the large slot and has 24 quality AKM 24-bit/96kHz ADCs and DACs (one per channel) built into a heavily shielded card cage terminating in six D25-sub connectors wired in the Tascam DA-88-style pinout. Trying to cram 48 XLRs on the already quite full rear panel would have been impossible, so if you're planning to use the analog I/Os, you'll need to put six breakout cables on your shopping list. These are readily available from numerous manufacturers, so there's no need for costly custom cabling.

Key to the MX-2424's appeal is its versatility: The large number of available options allows the user to configure the unit to meet most needs precisely. The "core" MX-2424 is priced at \$3,999, and the aforementioned analog board costs \$1,699. Twenty-four-channel

BY GEORGE PETERSEN

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FIELD TEST

digital I/O cards include the TDIF (three D25-sub ports, \$499), the Alesis ADAT (six Lightpipe sockets, \$499) and the AES/EBU (three D25-sub connectors, \$999). Standard amenities include AES/EBU, and S/PDIF 2-channel digital I/O is routable to/from any stereo track pair. The rear panel also has a punch in/out footswitch jack, MIDI and word clock in/out/thru, TRS balanced LTC SMPTE timecode in/out/thru, a port for attaching the optional \$1,499 full-function RC-2424 remote, a TL Bus for cascading multiple MX-2424 decks, video sync in/thru and an RJ-45 Ethernet connector for connecting a personal computer to the MX-2424 for operating the ViewNet application or for loading software upgrades from Tascam's Web site.

The integrated TL-Bus provides common sample clock and time position

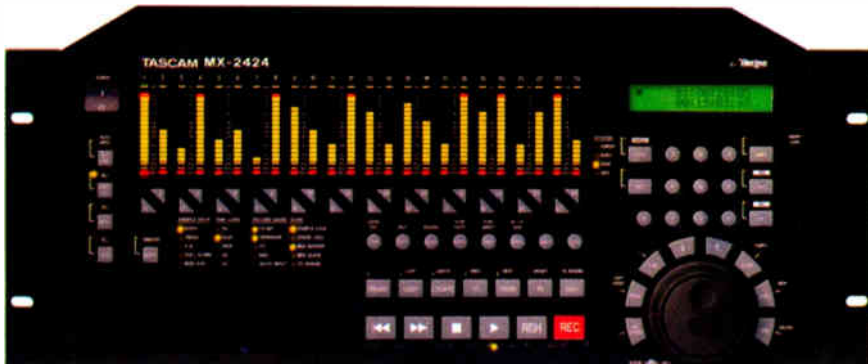
frame, 30 fps drop frame, 25 fps PAL, 29.97 fps non-drop NTSC and 29.97 fps drop frame, along with pull up/down sample rates.

A large front panel contains the bright, 16-step LED meters for the 24 channels and record-ready and signal-present LEDs for each channel. A clever arrangement of triangular track-select buttons makes track arming fast and easy, and four banks of LEDs show the status of sample rate, timecode, record mode or sync status at a glance. A numeric keypad speeds the entry of locate points, take numbers, EDLs, etc. The transport keys (rwd/ffd/play/stop/record) are like those on any Tascam recorder, a familiar environment for most users. Among the other transport functions are rehearse, autopunch, looping and pre/post-roll functions; an offset function operates on both incoming SMPTE and MIDI sync sources. A front panel slot for a Smart Media flash

complicated than on DA-88, there are also a few operational quirks that had me confused until I got used to the unit's operation. For example, to enter the menu system in order to set session parameters (such as timecode modes/rates, sampling frequencies, pre/post-roll times, digital/analog input source select, crossfade times, disk utilities, etc.) you simply press the Setup key. However, to select or change a menu item, you must first press the button marked Trim, which I found nonintuitive. After a while, I got used to it, but it could be confusing for the first-time user.

On the subject of navigating the MX-2424, it should be emphasized that most operations are straightforward and logical. However, to make things simpler, Tascam has thoughtfully provided a laminated Quick Reference Guide to typical recording procedures and the 58 menus; additionally, there are a number of useful written addenda to the manual, which are available in PDF form at www.tascam.com. One of these documents is the complete manual for the ViewNet control application, which comes in at 214 pages. Ouch!

While 58 menus may seem formidable, most (such as the all-important front panel LED brightness control) are rarely used and simply scrolled past while getting through to the screen you want. The menu interface is really a lot easier to use than it sounds, and in most cases, once you've set your machine up to be the way *you* want it, all settings can be stored and ready for the next session. Some of the menus are worth exploring for everyday applications—I particularly liked the dynamic display showing the exact number of recording track-minutes remaining on the disk. The disk utilities that have been thoughtfully included—i.e., disk initialization, low-level format, disk cleanup, backup erasure, disk copy status, etc.—are essential tools for preparing for and conducting problem-free sessions.



The rear panel has a large slot for the analog I/O module (shown) and a smaller slot that accommodates various digital I/O formats.

signals for multiple Tascam MX-2424 units. Up to 32 MX units (768 tracks!) can be chained together using the TL-Bus sync connector to provide sample-accurate synchronization across all tracks on all machines. The optional TL-Sync stand-alone synchronizer provides a link to DTRS, ADAT and Sony 9-pin serial devices, as well as TimeLine's Lynx-2 synchronizer modules. Supported frame rates include 30 fps non-drop

ROM card simplifies reloading the MX-2424's operating system for updates from Internet downloads.

A jog wheel offers audio scrub/locate functions. Surrounding the wheel—just a finger's touch away—are eight function keys (Jog/Scrub mode, Data Up/Down, Nudge/Capture Event, Trim, Setup, Project, and Track View/Unload). Although most basic operations on the MX-2424 are just slightly more

IN USE

Once the MX-2424 is hooked up and record parameters are set (front panel LEDs confirm recording status at a glance), recording can begin. The unit has a small side-mounted fan that creates some noise, which is noticeable in a quiet control room but less of an annoyance when the unit is rack-mounted. To enter record, you simply arm the required tracks and hold down the

Record and Play keys. One-button recording is also an option in the setup menu section.

There is no indication in the two-line, 20-character LCD screen that recording is actually happening—only the lighted Record button LED, the track REC indicator LED and an occasional flash of the status disk light. The only time locator indicator is a line on that same small LCD, so if you're a fan of a larger time readout, you'll have to use large display that is part of ViewNet. Alternatively, you could simply hook up a hardware timecode reader to the SMPTE out on the rear panel. The 24 meters are bright, fast 16-LED ladders with a scale that goes as low as -50 dB. Overloads are held until any transport button is pressed, after which they automatically reset.

The MX-2424 is a Tascam product, but the front panel also clearly says "by TimeLine." This is no surprise, given Tascam's successful previous partnership with TimeLine on products such as the MMR-8 and MMR-16 digital dubbers. Working on this product, the two companies wisely chose to extend the MMR-8's lineage, bringing that unit's disk engine and menu structure to the MX-2424. And in use, the MX-2424 proved to be absolutely rock-solid in the sync department, flawlessly locking to incoming SMPTE and MIDI Machine Control commands.

Besides the usual recorder functions (record/play/locate punch/autopunch), the MX-2424 boasts a variety of editing functions: cut/copy/paste, insert editing, track slipping, wipe/clear and the abili-

new "perfect" takes. Tascam plans to add waveform view editing into a future version of ViewNet, which should ease the editing process, but for now, the MX-2424 is perfectly capable of han-



The RC-2424 remote duplicates all front panel functions.

ty to cut a section while keeping later sections of that track in sync. The user can choose to work in nondestructive (up to 100 levels of undo) or destructive (tape-style) modes. Although limited by the small display, the MX-2424 uses a simple method of clipboard style editing; the desired section is copied to a clipboard and then pasted or inserted into the desired place. Once several edits are made, the track can be "rendered" into a single continuous track, and a project supports up to 999 tracks (24 assigned to outputs and 975 virtual), so multiple takes of solos or vocals can easily be stored and edited into

ding most studio editing chores, such as moving verses/choruses, vocal comping, etc.

As it exists today, the Tascam MX-2424 is a rock-solid, excellent studio recorder that performs well, sounds great and is priced right. Although it's not completely finished now—what disk-based recorder ever is—the planned waveform display in ViewNet, expanded file/drive support and 96kHz upgrades make the MX-2424 a versatile studio tool with a bright future.

Tascam, 7733 Telegraph Road, Montebello, CA 90640; 323/726-0303; fax 323/727-7635; www.tascam.com. ■

TASCAM DM-24

24/96 MIXING GETS AFFORDABLE

As noted in the Tascam MX-2424 "Field Test," a new software release allows the unit to operate as a high-resolution 12-track, 24-bit/96kHz deck. To complete the package, Tascam has developed an affordable high-resolution console, the DM-24. Unveiled at the AES show in Los Angeles, Tascam's DM-24 is a 24-input, 8-bus digital console (or 12x4 operation at 96kHz) that offers full 24-bit performance throughout the signal path. But perhaps the DM-24's most remarkable feature is its \$2,999 price tag.

Despite the affordable price, the DM-24 doesn't skimp on features. In addition to 16 channels of analog inputs, each provided with an XLR mic and 1/4-inch line input, there are eight additional effects return channels. Each channel has its own programmable compressor and noise gate, digital delay and 4-band parametric EQ, and there are TRS inserts on every channel. Two onboard multieffects processors offer reverb, spatial effects and mic/speaker modeling effects by Tascam, Antares and TC Works. All A/D and D/A converters are 24-bit, and a flexible digital interfacing scheme accepts 24 channels of TDIF I/O, eight

channels of ADAT Lightpipe, stereo AES/EBU I/O and two sets of coaxial S/PDIF. Two expansion slots allow for additional analog or digital I/O cards and/or a cascade card to link two DM-24s for 64-channel operation.

Operations are logical. Input channels are switched between two banks of 16 faders. Four rotary controls for EQ (gain/center frequency/Q) and pan use LED ring encoders to indicate positioning. A large LCD screen display flanked by four soft knobs provides control for tweaking aux levels, etc. The surface also includes a jog/shuttle wheel and recorder-style buttons that issue commands to MX-2424s or other MIDI Machine Control-compatible transports.

All console functions are dynamically (or snapshot) automatable, including the 100mm long-throw faders. The automation is built-in—no external computer is required—and up to eight mixes can be stored in the DM-24, with additional storage via MIDI offloads. Once a new mix is opened, the DM-24 automatically enters its automation mode so that any static changes are instantly saved and automation moves from one mixer can control the functions of a cascaded unit.

Initial deliveries of the Tascam DM-24 are planned for early 2001.

—George Petersen

WAVE MECHANICS SPEED

PRO TOOLS PITCH AND TEMPO PROCESSING PLUG-IN

Wave Mechanics was formed by three design engineers who, between them, designed the Eventide H3000 Ultra-Harmonizer and its descendants, including the DSP4000 Ultra-Harmonizer. The company is dedicated to building professional-quality digital audio processing tools, specializing in effects, and Wave Mechanics-designed algorithms can currently be found in high-end effects processors, digital consoles, digital audio workstations and multimedia products. Speed, the latest Wave Mechanics DSP plug-in for the Pro Tools platform, will run under Pro Tools, Digi 001 and any other system that supports the Digidesign AudioSuite plug-in format.

Speed is a pitch processing plug-in capable of tempo modification from 50% to 200% and pitch modification from -1,200 to +1,200 cents (± 1 octave), allowing the user either to change tempo without changing the pitch—or change pitch without altering speed or the length of the audio file. Until now, the Holy Grail for pitch/speed shifter designers has been to develop a product that can process polyphonic audio—such as complete mixes—without introducing horrible-sounding digital artifacts. Speed accomplishes this feat.

Because Speed is an AudioSuite program and not a Real Time AudioSuite (RTAS) program, you must process a sound file to hear the change. However, in a fast TDM system you can preview the change before committing to processing. I ran Speed both in a large TDM system and on a small Pro Tools LE rig with the Digi 001. I can report that the program worked equally well in both systems and provided excellent audio quality.

SIMPLE INTERFACE

The front panel interface is extremely simple and intuitive, and Tempo and Pitch controls are grouped together on a single page. There are three operating modes: Simple, Graphical and Calculator.

The Simple Mode interface offers a pair of mouseable knobs for nudging tempo and pitch values and windows for entering pitch and tempo changes directly. For a tempo change, you can simply enter the total length of the desired



Speed can modify pitch and tempo independently or together.

audio sample as a percentage of the original audio. (Tempo and length settings are the inverse of each other: Thus, a tempo change of 50% results in a length change of 200%.) Pitch changes can be entered as semitones, cents or as a pitch ratio of the original key.

Graphical Mode displays the entire audio sample waveform, easing adjustment of tempos and/or pitches for any selected region of the waveform. I found this feature useful for microscopically tweaking a film score music track so that music hits lined up to picture. Tempo is displayed as white fader data and is superimposed over the waveform. Pitch is displayed as blue fader data. Data can be edited in the

same way as Pro Tools automation data—simply click to add points and drag points up and down.

TEMPO AND PITCH CALCULATIONS MADE EASY

Calculator Mode is like Simple Mode, except that the knobs are replaced by two sets of windows for both tempo and key. The Speed Calculator has two sub-modes: Tempo and Length. In Tempo sub-mode, the tempo of the music is read from Pro Tools' MIDI tempo, as defined at the beginning of the audio file. If you make the assumption that the tempo is constant throughout your audio file (no decelerandos or accelerandos), you just type in the desired modified tempo. Unfortunately, this tempo change does not update MIDI tempo data in the sequencer; you have to do that manually.

Length mode is very useful for film, TV work and sound design. The total length of an audio file is displayed in either samples or seconds. If you want to stretch a 57-second jingle to 58.5 seconds, just type in the new time and the percentage change will show up ready to be previewed or processed. If you are trying to get a drum loop in time, you can use the Sample Length mode and apply the numeric number of samples from an already working loop to your new loop, causing it to stretch or collapse to the proper length.

A Pitch Calculator function also has two sub-modes: the musical Key Mode and Tuning Mode. In Key Mode, you may enter the original key of the music and then enter the desired new key. Tuning Mode relates the whole process to a tuning reference such as A=440Hz. This is useful when a whole orchestra has tuned to A435 and you want to overdub instruments referenced to A440.

BY BARRY RUDOLPH

Stellavox **ST-2** D/A converter

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At 44.1 kHz with 24 bits signal EIAJ A Weighted:
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• POWER CONSUMPTION

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PHASING COWBELLS

I devised two simple tests for Speed—one to check tempo change accuracy and one to check pitch change intonation. Working in Pro Tools, I recorded and quantized four measures of a simple quarter note cowbell. I stretched this 120bpm cowbell up to 130 and also down to 110 bpm. I then slipped all three waveforms so that they started together. After the first two quarter notes, periodicity or the time between the quarter notes was exactly the same and so was the pitch. The waveforms were not the same anymore, making exact alignment impossible, but a lot of the time all three cowbell tracks phased when I played them together.

Checking intonation was easier. In the sequencer, I recorded and quantized a short four-measure piano part in three keys: A, up to C and down to F#. After pitching the parts in C and F# to the key of A (and slipping the three tracks together to compensate for processing delay), it was pretty hard to tell them apart!

My final test was to stretch an entire finished mix. Of course you cannot expect miracles when you stretch a music mix beyond a few half-tones, but I was impressed how well all the instrumental sounds and the balance of the mix held up. Vocals were the toughest, but I found that Speed allowed me to put a backing track and/or backing vocals in a better key for an overdubbed singer. How far you can adjust pitch successfully will depend on the track, the musical instruments and your own tolerance to changes in sonorities, harmonics and partials. I found I could shift the key of a track along with backing vocals up or down about three half-tones. I also found that percussion and certain orchestral instruments do better than guitars and stringed instruments.

Speed is a valuable asset to have in your plug-in folder. Speed can solve big tempo and pitch problems and, priced at \$495, may even pay for itself the first time you use it. (Speed is also available as part of the UltraTools 2.0 bundle, which costs \$895. See the June 2000 issue of *Mix* for a review of UltraTools.)

Wave Mechanics; Box 144, Montclair, NJ 07042; 877/COOL-EFX or 973/756-9417; fax 973/746-0762; www.wavemechanics.com.

Barry Rudolph is a L.A.-based recording engineer. Visit his Web site at www.barryrudolph.com.

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JBL LSR25P

LINEAR SPATIAL REFERENCE BI-AMPLIFIED MONITOR



The number of compact powered monitors on the market continues to swell. JBL's LSR25P Linear Spatial Reference Bi-amplified Monitor joins a crowded field, vying for the ears of engineers working in post-production, surround sound and multimedia facilities. With their futuristic, silver-coated appearance, the LSR25Ps (\$958/pair) proved to be a surprising bantam terror sporting plenty of attitude and punch.

Unveiled in 1998, the LSR Series is a much-lauded development from JBL. In particular, the clarity of imaging and transparency from its TEC Award-winning LSR28P monitors have drawn praise from mixing engineers. While the LSR25P is substantially smaller, its design remains consistent with the series, and it upholds the enviable LSR reputation.

The LSR25P is a front-ported design featuring a 5.25-inch woofer and a 1-inch tweeter, powered by onboard 100-watt and 50-watt amps for a max peak of 110 dB. Covered by a black grille, the woofer incorporates JBL's Symmetrical Field Geometry (SFG) technology, designed to offer excellent distortion performance at high SPLs. The tweeter is a titanium/composite diaphragm encircled by

an indented Elliptical Oblate Spheroidal (EOS) Waveguide, offering 100°x60° dispersion. The Waveguide includes a thin, protective vertical bar over the tweeter. Both components are shielded for use near video monitors. A power switch and volume control are located on either side of the woofer. An LED shines green when powered up and flashes red if either amp clips.

The LSR25P cabinet is tapered front to back, with the amps' heat sink forming the back panel. Dimensions are 6.8x10.6x9.5 inches, and each cabinet weighs in at a substantial 17 pounds. Rear inputs include RCA (-10 dB) and XLR (+4 dB) connectors and an IEC AC socket. All connectors mount vertically; an odd choice given that the XLR jack is a nonlocking type. Rear-mount DIP switches provide tweaking options: an 80Hz high-pass filter, "boundary compensation" for bass and low-mid frequencies and a gentle ± 1.5 dB cut/boost above 2.2 kHz. The DIP switches are recessed about 2 inches into the back of the monitor, so system adjustments require a flashlight and a thin screwdriver or probe. Two rear points are provided for attaching an Omnimount 75-Series wall bracket.

For my listening tests, I took down my Meyer HD-1s and put up the LSR25Ps, spaced about four feet apart, roughly four feet from the listening position, with the drivers at ear level. First, I listened to mixes I liked and knew well—primarily very dynamic *musique concrète* selections with piercing highs and pit-of-the-stomach lows. The sources typically combine heavily processed orchestral instruments with various electronic sounds. The LSR25Ps were impressive, with a clear, balanced image across the frequency range, even at high SPLs.

For acoustic instrumentation, I listened to cuts from Gonzalo Rubalcaba's amazing *Inner Voyage*. The LSR25Ps presented a good balance between piano, upright bass and drums. While I missed some of the hiss of the brush and the loping quality of the bass, the articulation was clear.

I did extensive A/B tests with both Meyer HD-1s and the LSR25Ps' larger cousins, the LSR28Ps—perhaps not an entirely fair comparison, but quite revealing. I was struck by how well mixes I had done on the LSR25Ps translated to the HD-1s. With the exception of a slight dip around the crossover, the LSR25Ps sounded smooth with an impressive depth, considering the monitor's size and bulletproof, cast-aluminum housing. After trying various DIP switch settings (including the boundary compensation, which I didn't like), I felt the speakers sounded best in the default positions.

Readers used to Genelec 1029s might feel that the LSR25Ps share their balanced characteristics and transient response, if not the crispness and high-end detail. But I found the LSR25Ps to be a bit warmer and never experienced fatigue from extended use.

In summary, the LSR25Ps are very impressive. While probably best suited for work not requiring clear, low-end definition, they can be easily augmented with the optional LSR12P subwoofer (\$1,223). The LSR25Ps are well-suited for post-production facilities, and the consistent, pleasing image of a single speaker configuration recommends them for use in small surround mixing environments. The LSR25P's small size and shielding makes it an ideal choice as a multimedia/Internet audio monitor. ■

Alex Artaud is a musician and independent engineer living in Oakland, Calif. He can be contacted at analog@slip.net.

BY ALEX ARTAUD

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Langevin



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TRUE SYSTEMS PRECISION 8

EIGHT-CHANNEL MIC PRE

One of the most important links in the recording chain is the microphone preamplifier, and many engineers recognize that console preamps can often be bettered. And the popularity of 8-track digital recorders has created a market for mic pre's that interface directly with MDMs, bypassing a console entirely. Marketed by Neumann USA, the Precision 8 is an eight-channel microphone preamp manufactured by True Systems, a product line of Tucson, Ariz.-based Sunrise Engineering and Design, Inc.

In order to fit eight mic pre's into a single rackspace, Sunrise Engineering has eliminated some of the bells and whistles common to other 8-channel preamps, such as a summed output, a headphone amp or aux sends. However, the Precision 8 offers a few handy features not found on other units: The first two channels can function as an M/S decoder, and the last two channels double as instrument direct boxes. The metering scheme is well thought-out with peak hold and reset functions, as well as an adjustable peak reference level.

APPEARANCE

The sturdy enclosure has a thick front panel with nine knobs: eight for input gain and one for selecting peak reference. The peak selector knob is a stepped switch, while the gains are continuously variable. Every gain knob is flanked by switches for polarity reverse and 48V phantom power. An additional switch engages the M/S decoder on the direct outputs of channels one and two. The switches feel solid, and the knobs have a satisfying smoothness when turned. White lettering on a burgundy background is easy enough to read, even in dimly lit environments and adds to the handsome appearance of the unit.

Each channel has its own over-



load light and five-segment level meter. On each meter, the first two green segments indicate signal present (anything exceeding -24dBu) and the second lights up at $+4\text{dBu}$. The next two segments are yellow and show when the signal is 6 dB and 3 dB below the level set by the peak reference switch. The red fifth segment illuminates when the selected peak reference is reached. The peak and overload LEDs remain lit once illuminated; the Reset button clears all held peaks.

The back panel has eight XLR inputs (the DI inputs for channels seven and eight are Neutrik Combo XLR/ $\frac{1}{4}$ -inch jacks). Sixteen outputs allow the Precision 8 to function as a splitter, with eight of the outputs appearing on balanced $\frac{1}{4}$ -inch jacks, and the other eight outputs available through one DB25 (multipin) connector wired to the Tascam convention. The rear panel also has a ground lift switch.

CONTENTS

The instrument DIs are discrete FET designs, while the mic preamp is a hybrid design which uses discrete, monolithic, dual bipolar transistors for the input stage, followed

by Burr-Brown IC op amps for the intermediate stage and output driver. No transformers are employed, and there are almost no capacitors (two are used for phantom power blocking). The result is an extremely flat, uncolored signal.

Metering options are numerous. Resetting eight-internal jumpers (one for each channel) switches the yellow -3 and -6 indicators to operate in peak-hold mode.

The signal path of the M/S decoder is simple, using no extra buffering or phase inversion circuitry. Both phases of channel one and channel two signals are already available internally and are combined resistively at the intermediate stages of the two channels. This causes the gain controls of the two channels to interact when decoding M/S. For example, changing the width also changes the output level, but I had no trouble achieving the desired stereo image with proper output.

The stated specifications are impressive: Frequency response at 40dB of gain is 1 to 500k Hz, $+0/-3\text{dB}$, noise is rated at -132 dB EIN (20 to 30k Hz) and maximum output is $+31\text{dBu}$.

IN USE

I tried the Precision 8 on voice,

BY DAVID OGILVY

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acoustic guitar, drum overheads and percussion, and each time met with astonishing results. It's a shame that my DAT and MDMs only record at 48 kHz, because they're missing some of the glorious top end provided by these fine preamps. My AKG 414s sounded better than ever; I heard exactly what they picked up, with no noticeable coloration of the sound. I compared the unit to a few other solid state preamps, and, in terms of clarity, presence and absence of noise, the Precision 8 won every shoot-out.

When I set up an M/S pair for the drums, I chose to record the Mid and Side channels straight—undecoded by the P 8—to two tracks. The P 8 allows one to record a decoded M/S image to two tracks (via the direct outs of channels one and two), but I chose to do the decoding in the mix with three channels of the console. This allows one to change the width of the stereo picture at a later date. But I used the preamp's internal decoder to check the M/S pair for alignment during set up and found it quite the luxury.

The DI channels also came in handy on some live to ADAT sessions. Samplers, drum machines and synthesizers all sounded perfect, driven by the Precision 8 down a long snake.

CLEAN, CLEAN, CLEAN

With its compact size, splitting capability, peak hold metering and transparent sound quality, the Precision 8 is ideal for location recording. It does get fairly hot after being powered up for an hour, but proper ventilation should take care of that.

This is one of the cleanest preamps I have ever heard, only adding discernable noise after 45 dB of gain. Even if you are looking for a tube preamp to warm up your digital recordings, you might want to hear one of the best preamps the solid state realm can offer. Sold separately, eight preamps, two DIs and an M/S decoder might run as high as \$5,000, but True Systems' suggested retail price for the Precision 8 is \$2,695.

Distributed by Neumann USA; 1 Enterprise Drive, Old Lyme. CT 06371; 860/434-5220; www.neumannusa.com.

David Ogilvy is a field recordist, producer and engineer working at studios, concerts and radio stations in California.



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World Radio History

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Milestones

25 YEARS OF INNOVATION AT NEUTRIK

BY GEORGE PETERSEN

In 1975, Bernard Weingartner founded Neutrik with two employees in a barn in Liechtenstein—a small country that's about the land area of Washington, D.C., and bordered by Switzerland and Austria. Still based in Liechtenstein (a half-hour drive from Zurich), Neutrik outgrew its barn headquarters long ago and today is a major supplier of connectors, cables, patch assemblies and test gear for the professional audio industries.

Formerly with AKG, Weingartner developed the successful CMS (Condenser Microphone Modular Series), combining interchangeable capsules with the C-451E pre-amplifier body. He also worked on the classic C-414 mic, the first plastic artificial head mic and AKG's reverb products. Despite his long tenure with AKG, Weingartner decided to try something outside audio and took a job with Liechtenstein-based Hilti, a leading maker of demolition tools and air drills for mining and construction.

Weingartner never lost his love for audio, and eventually he left Hilti to form Neutrik. Around 1973-74, the XLR was gaining popularity as a mic connector in Europe, though no European companies were building them. Weingartner seized the opportunity, and with one 5,000-XLR order for a large broadcast supplier, Neutrik was born. Early on, Weingartner used the concept of a drill chuck (thanks to his engineering days at Hilti) to create his first XLR, where tightening a threaded rear cover bears down on a three-sided strain relief to hold cables securely in place. Another Neutrik innovation was screwless XLRs, which simplified assembly while eliminating the problem of connector failure due to lost screws in the field.

A few years later, Neutrik expanded into test gear. Its 1977 AudioTracer frequency response chart recorder and 1981 AudioGraph were followed by the software-based A1 and A2 analyzers and the more recent pocket-sized Minirator tone generator and Minilyzer analyzer. Earlier this year, Neutrik's electro-acoustic division became the now-inde-



Company headquarters in Schaan, Liechtenstein.

pendent Neutrik Test Instruments company (NTI), with the parent company focusing entirely on connection systems.

In 1987, fueled by European Union mandates regulating systems carrying more than 34 volts (i.e., pro power amp outputs), Neutrik unveiled Speakon, the first connector designed specifically for speaker cables. Now offering 2/4/8-pole versions for mono- or multi-amping, Speakon prevents arcing damage if disconnected under load and—unlike ¼-inch and banana plugs—it is touch-proof and locks into place. Today, Speakon is the accepted standard worldwide—no easy feat in any industry.

Arguably the best RCA plug ever devised, Neutrik's ProFi features a retractable sleeve that makes

ground contact before signal and, when disconnected, breaks signal before ground. Unlike other phono connectors, ProFi's "make first/break last" approach prevents noise and destroyed speaker cones when used under load.

In 1992, Neutrik debuted Combo, which puts a ¼-inch TRS jack in the center of a female XLR receptacle. A perfect example of "why-didn't-I-think-of-that-first," Combo saves valuable real estate on today's I/O-packed gear, simplifies hookups in this pro/semipro world and costs Radio Shack millions each year in lost adapter sales. That's innovation!

In 1998, Neutrik acquired British patchbay specialists Re-An and now offers a wide array of patching systems. This year, Neutrik entered the BNC market with both traditional bayonet-twist and a clever push-pull locking version for connecting in spaces too tight for fingers to grasp.

Now, after 25 years of success, Weingartner has retired, selecting current managing director Werner Bachmann as his successor. But don't expect radical changes—Bachmann joined the company as the second employee in 1975. There's definitely a connection here.

For more info about Neutrik visit www.neutrik.com. ■



Founder Bernard Weingartner (left) and successor Werner Bachmann.



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*> H.D. Wells,
Bromley, England, 1899**



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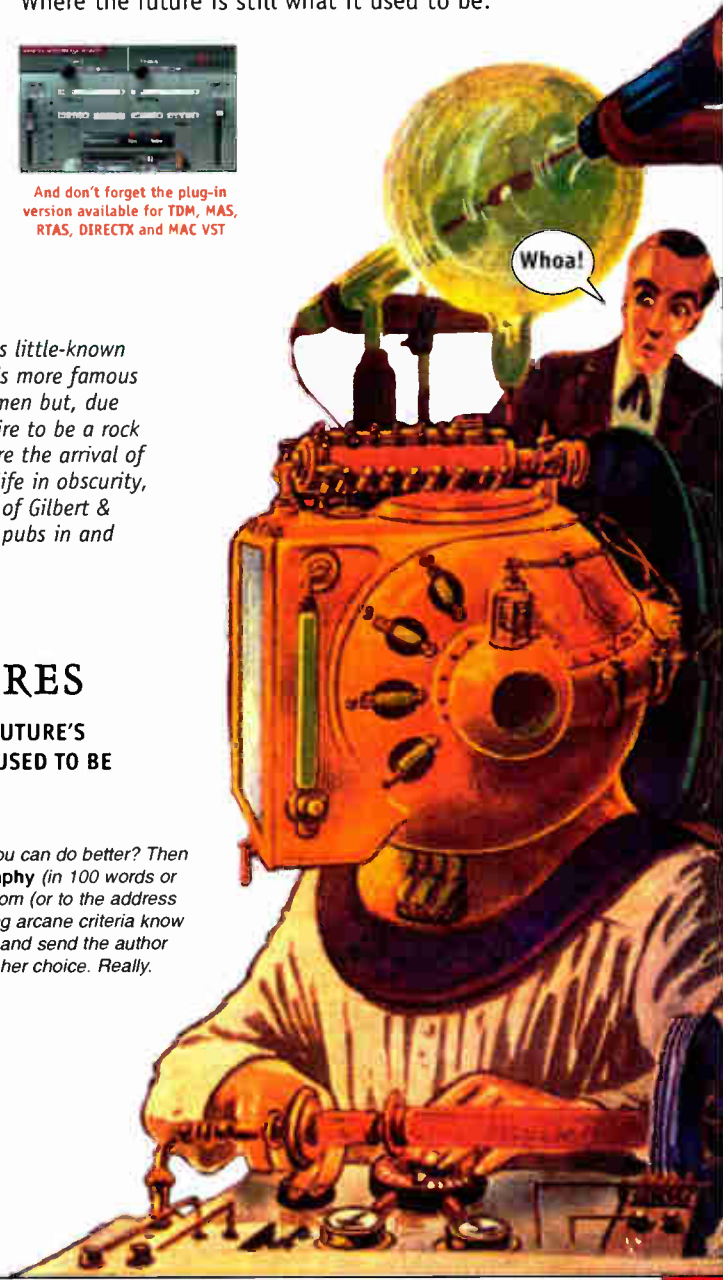
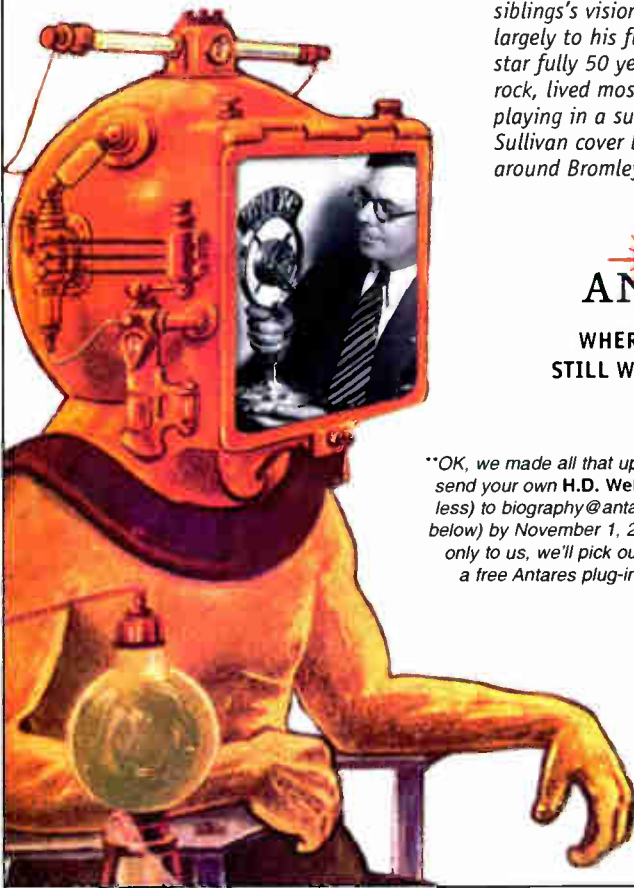
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H.D. Wells, H. G. Wells's little-known older brother, shared his more famous siblings's visionary acumen but, due largely to his futile desire to be a rock star fully 50 years before the arrival of rock, lived most of his life in obscurity, playing in a succession of Gilbert & Sullivan cover bands in pubs in and around Bromley.*

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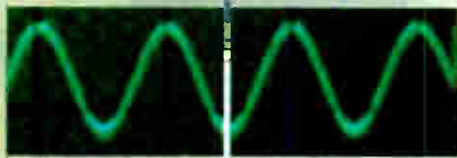
***OK, we made all that up. Think you can do better? Then send your own H.D. Wells Biography (in 100 words or less) to biography@antarestech.com (or to the address below) by November 1, 2000. Using arcane criteria know only to us, we'll pick our favorite and send the author a free Antares plug-in of his or her choice. Really.*



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MMK 2000 RES NEW PRODUCTS GUIDE

The Mix 2000 AES New Products Guide



Welcome to *Mix's* annual AES New Products Guide. In this guide, we focus on products that were introduced (or were shipping for the first time) in the months prior to—and including—new introductions at the 109th Audio Engineering Society convention in Los Angeles. For those who plan to attend, here's some of the new technology that will be on view at the Los Angeles Convention Center September 22-25, 2000. If you can't make it to AES in person, don't worry—we'll provide complete coverage of all the show highlights in future issues. —George Petersen

Please note that the manufacturers supplied all of the information presented here. Specs, prices and availability may change, so contact these companies directly for more information.

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AC Power Products

Equi=Tech ET10R Big Rack System

Two new, large balanced power systems debut at AES this year from Equi=Tech, the pioneer of balanced power. The Models ET7.5R and ET10R are large-capacity rack systems designed for heavier power applications such as mobile recording trucks and large P.A. amp racks. Having a continuous running capacity of 60 amps and 83 amps, respectively, both models also feature a compact design occupying only 4U of rackspace.



Equi=Tech ET12.5W Wall Cabinet System

Equi=Tech, continuing to lead the way with balanced power technology, introduces a new and better version of its award-winning Wall Cabinet System at this year's AES Show. The new wall system is designed to retrofit easily into many pre-existing studio electrical wiring systems. Premiering for the first time at AES, the new system sports increased circuit capacity for large facilities as well as Equi=Tech's newest version of its revolutionary balanced-power isolation transformers.
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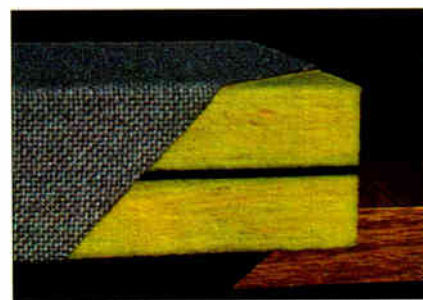
ETA introduces the model PD6201, a high-amperage power distribution system that provides six 20-amp circuits.

ETA Systems Model PD66

ETA introduces the model PD66, a high-amperage power distribution system that provides two 30-amp circuits and four 20-amp circuits.

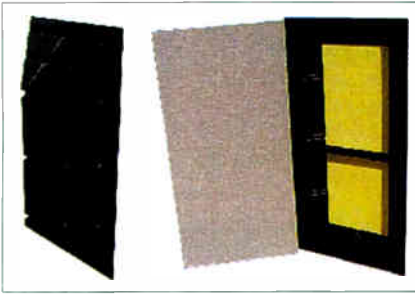
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Gepco 5596 Series

The 5596 series is the most accurate cable available for transmission of all formats of AES3 digital audio, including 24-bit/96kHz. Two versions of single pair are offered, the 5596EZ and 5596M, along with a dual version, the D5596EZ. The 5596M is the premier 110-ohm digital audio cable with an extra-flexible, matte PVC jacket. The 5596EZ and D5596EZ are both designed for permanent installation and are UL listed Type CM.

1770 Birchwood Ave.
Des Plaines, IL 60018
847/795-9555; Fax 847/795-8770
www.gepco.com

Monster Cable Z-Series Speaker Cable

High-resolution speaker cables idea for passive studio monitors. These cables feature our patented Monster Locks. This system allows the user to quickly and easily change the termination of the cable assembly to accommodate any type of speaker or amplifier.

455 Valley Drive
Brisbane, CA 94005
415/840-2000; Fax 415/276-3767
www.monstercable.com

Neutrik Easycon Connectors

An innovative design features IDC or solder contacts—only three pieces—no set screws to lose or drop. Gold-plated contacts are standard. Self-adjusting cam lock cable clamp accepts cable ODs of 5.5 - 7 mm. Various prices for male or female, IDC or solder, plastic or metal shell.

Neutrik Rear Twist BNCs

True 75-ohm design. Rear twist locking/unlocking using easy-to-reach soft touch boot. Screen and jacket crimp technology prevents problem of exposed grounding braid on cable assemblies. Suggested resale price is \$2.11 each at 100-piece quantity.

195 Lehigh Ave.
Lakewood, NJ 08701
732/901-9488; Fax 732/901-9608
www.neutrikusa.com

Radial Engineering Little-Chief

The Radial Little-Chief is an all-in-one snake system that combines the snake head, cable trunk and case as a single unit. The advantage with the Little-Chief is a considerable cost savings over similar systems, which is achieved by

eliminating the multi-pin disconnect. Any choice of configuration is available including standard 40x8 with 200-ft main trunk.

#114-1585 Broadway
Port Coquitlam, BC V3C 2M7
604/942-1001; Fax 604/942-1010
www.radialeng.com

Ramtech FLEX2000 Series Cable

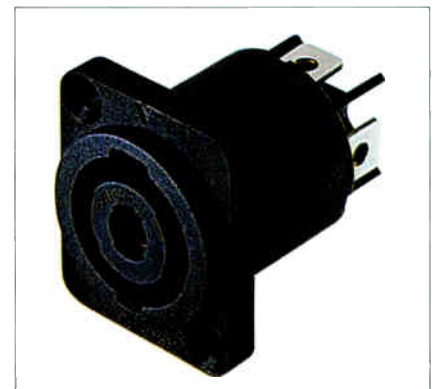
Designed specifically for the rigors of pro-audio applications. A flexalloy™ compound is added to the outer polyvinylchloride jacket, which allows for an extremely flexible cable that also resists abrasions and extreme temperature changes. Most crucial in manufacturing is a high-pressure extrusion technique used to guard against pair migration, a real hazard for cable that is coiled and uncoiled on a daily basis. 99% oxygen-free.

3709 SW 42nd Ave., Suite 13
Gainesville, FL 32608
352/466-0920; Fax 352/466-0906
www.ramtech.net

Rapco FiberOptic & Data Cables

Rapco now manufactures a wide variety of fiberoptic cable assemblies and custom panels with ST, SC and MTRJ connectors. Rapco can also provide Cat5 and Cat5E high-speed copper cables and panels for data distribution.

3581 Larch Lane
Jackson, MO 63755
800/467-2726; Fax 573/243-1384
www.rapco.com



Switchcraft 30A Panel Mount Connector

Switchcraft improves its HPC Series offering by producing a 30A version of the HPC panel mount connector. Featuring silver-plated copper contacts, the new design meets 30A at UL 1977 specifications. The 30A rating holds for all versions of the HPC panel mount, including straight and right angle PC and 0.250 and 0.187 Faston terminal versions. All previous part numbers remain the same.

Switchcraft HPC Loudspeaker Connector

Switchcraft expands its HPC loudspeaker connector line to include a 4-pole straight cord plug. Completely compatible with the Neutrik Speakon Series, the HPC cord plug offers push-to-lock design when used with the Neutrik panel mount series. Simply push the connector in and it locks securely. The HPC cord plug is capable of handling 30A. Terminations are to 0.250 Faston terminals for easy assembly.

5555 N. Elston Ave.
Chicago, IL 60630
773/792-2700; Fax 773/792-2129
www.switchcraft.com

Wireworks InstaLUX Cable

InstaLUX is a color-coded cable for applications that require a small diameter, easy-to-bundle, easy-to-strip and terminate cable. Two stranded, 24-gauge tinned copper

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conductors are covered with color-coded PVC insulation and paired to provide a low-capacitance, low-resistance signal path. Features include a twisted pair for cross-talk reduction and a 24-gauge tinned copper drain wire. Available in spools of 500 feet, InstaLUX cable has a soft, satin finish color-coded PVC outer jacket.

Wireworks MusiLUX Cable

MusiLUX is a full-sized, shielded microphone cable created specifically for professional use. Instead of a braided or spiral shield, MusiLUX features a black conductive thermoplastic tube. A 30-strand drain wire requires no stripping and provides easy ground termination. With no braiding to prepare, preparation time is cut by as much as 60%. MusiLUX is jacketed in a satin finish, extended service PVC. Available in 500-ft. spools and ten colors.

380 Hillside Ave.
Hillside, NJ 07205
908/686-7400; Fax 908/686-0483
www.wireworks.com

**CD/DVD
Duplicating/
Recording Systems**

Adaptec Easy CD Creator 5 Platinum

Easy CD Creator Platinum is Adaptec's flagship Windows-based CD-recording software package. The new version has usability improvements, new audio features, new data features based on DirectCD and a new video editing application that includes an MPEG1 encoder for compatibility with Video CD Creator. Retail: \$79.

Adaptec Jam 2.6

Adaptec Jam is Macintosh CD-Recordable software for mastering professional quality audio CDs. Jam 2.6 offers support for USB and FireWire CD recorders, and also includes MP3 decoding technology that allows users to burn MP3 files to standard audio CD. Other features include BIAS Peak LE 2.10, updated easy-to-use interface and improved level meter interface. Jam 2.6 retails at \$199.

691 South Milpitas Blvd.
Milpitas, CA 95035
408/957-1484; Fax 408/957-6666
www.adaptec.com

INSC RoboCopier-600

RoboCopier-600 is designed to create the most perfect digital audio mix as well as 600 CDs. The RoboCopier-600 can hold up to 30 complete CDs and 30 Complete CD print images. The unit is a true unattended pre-mastering and duplication system. Upgrade to DVD-R or 12X.

22995 Mill Creek Drive
Laguna Hills, CA 92653-1215
800/875-1117; Fax 949/454-2601
www.insc.com

MediaFORM AP1301i-t

MediaFORM's latest CD-R printer is a flexible, network-enabled print station that accommodates both thermal and inkjet printing needs up to 1200 dpi. The AP1301i-t enables high-resolution printing on 300 CDs per run, without the need for user intervention. Fully network ready and automated, this versatile NT-based printing station provides low-cost, yet high-quality CD printing in less than a minute.



MediaFORM CD Recorders

Three new automated systems for economical CD-R duplication feature 12x/8x selectable recording speed, anti-piracy copy protection, electronic watermarking and SmartDRIVE2. The CD-3701 single CD-R replicator is upgradeable to future CD-R/DVD technology. The CD-3703 can simultaneously copy up to three CDs without any intervention and has a 125-CD spindle. The CD-3706 allows continuous, fully automatic duplication of up to six masters at the same time.

400 Eagleview Blvd., Suite 104
Exton, PA 19341
610/458-9200; Fax 610/458-9554
www.mediaform.com

Microboards Technology AudioWrite Pro 8

AudioWrite Pro 8 is a portable, stand-alone CD Recordable System with an optional interface for both Mac and PC. Users can connect the unit directly to any analog audio source, including tape decks, LP players or stereo consoles. Audio CDs are created automatically on-the-fly, with no computer intervention.

1721 Lake Drive West
Chanhassen, MN 55317
612/556-1600; Fax 612/556-1620
www.microboardsproaudio.com

**Microtech Systems MyDisc
Enterprise Publishing Software**

MyDisc is Microtech's new software solution enabling groups of users to make data or audio CDs from their desktop. Now, groups of departments can share a network CD-R publishing system. MyDisc is easy to use: Just specify what files you want to print on the CD, then enter how many CDs you want to make. The combination of MyDisc and Microtech's ImageAutomator family of systems is analogous to using a network printer—instead of printing on paper, folks are creating their own CDs.

Microtech Systems IA150

Microtech's new IA150 CD-R publishing system configured with four Plextor 12X recorders and your choice of either an Inkjet 1200dpi or thermal inline printer. The IA150 can run unattended for up to 400 blank CDs and comes with a network interface for those wanting to make custom on-demand audio CDs. The IA150 is a compact system with an attractive price starting at \$11,300 for a Signature III based unit. Optional DVD-R recorders can be configured with the IA150 system.

2 Davis Drive
Belmont, CA 94002
650/596-1900; Fax 650/596-1915
www.microtech.com

Rimage Producer Product Family

The Producer Product Family provide file transferring, recording and surface printing for automated online production. All units combine DVD-R or CD-R recorders to

give you maximum flexibility. All products offer full-color thermal printing that is faster and more less expensive than inkjet printing.

7725 Washington Ave. S.
Minneapolis, MN 55439
952/944-8144; Fax 952/944-7808
www.rimage.com



Sony CDR-W33 CD Recorder

Priced at \$799, the CDR-W33 is a 2-rackspace unit with 24-bit AD/DA converters. Onboard DSP functions include parametric EQ, limiting and Super Bit mapping, while CD-Text support allows editing and display of disc and track names. The built-in sample rate converters operate at 32 or 48 kHz. The CDR-W33 has S/PDIF (optical and co-ax) digital and unbalanced analog I/Os and supports CD-R-DA and CD-RW-DA media. A remote control is included.

1 Sony Drive
Park Ridge, NJ 07656
201/930-1000; Fax 201/958-4907
www.sony.com/professional

Superdups Dupco CD-R Media

High-quality, grade A blank CD-R media. 12x certified, silver/silver. Lacquer and inkjet printable surface available (white). Excellent for audio and data CD duplication.

500 Main St. #204
Tewksbury, MA 01876
800/617-3877; Fax 978/988-1333
www.superdups.com



Tascam CD-RW2000

Tascam's latest CD recorder is the CD-RW2000, offering many of the design elements of its predecessor, the CD-RW5000, and also featuring balanced XLR analog inputs and outputs, a word clock input and AES/EBU digital I/Os. The user-friendly CD-RW2000 also includes a control I/O for total control of the unit through such functions as fader starts and stops and event start.

7733 Telegraph Road
Montebello, CA 90640
323/726-0303; Fax 213/727-7635
www.tascam.com



TDK veloCD

TDK's new veloCD burner provides the world's fastest writing (12X), rewriting (10X) and audio ripping (24X) speeds and is 100% multitasking compatible with new Burn-Proof, write-assurance technology, which eliminates buffer underrun errors. The new veloCD includes a new CD

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www.glyphtech.com
(800) 335-0345



Lately there is a lot of talk about SANs (storage area networks), and with good reason. A good SAN will transform your production facility. Imagine an environment where editors can easily share files with each other. Data is immediately available for others without stopping the work flow. Glyph has developed SAN solutions specifically for A/V production. Our approach to SANs starts at the individual workstation.

We understand the applications you use like no one else does.



If you are interested in greater creative collaboration, increased productivity, and a chance to protect your investment in your existing SCSI drives, then give us a call. We provide SAN solutions in SCSI, FibreChannel, or even hybrids.

Do yourself a favor, go ahead and check with others, then speak with a SAN specialist at Glyph. Let us show you configurations that will relieve you.

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We build cool, reliable gear so you don't have to.



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World Radio History

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Blender software suite, consisting of TDK Digital Mixmaster music recording software, plus Nero 5.0 CD recording software and InCD drag-and-drop packet-writing software. Price: \$399.
12 Harbor Park Dr.
Port Washington, NY 11050
800/835-8273
www.tdk.com

Computer Hardware & Peripherals

Apple Computer 500MHz G4

The new 500MHz dual-processor Power Mac G4 with Velocity Engine delivers up to twice the firepower of previous G4 models. So you can now rip through complex tasks, pound digital video files into submission, and produce dynamic Web content. Not only has the Power Mac G4 effectively doubled its brainpower, it's got the muscle to match: speeds of up to 500MHz, performance measured in gigaflops, the ATI RAGE 128 Pro graphics card and built-in USB and FireWire.

Apple Two-Port USB

All three of Apple's new displays come with integrated two-port USB hubs, so attaching speakers, keyboard and mouse or other USB devices is child's play. All offer unique benefits and have convenient two-port USB hubs. If you're getting the Power Mac G4 Cube, for example, you can plug in your Apple-designed speakers with 15 watts of floor-thumping audio right into any of these three monitors, without using a power adapter.

1 Infinite Loop
Cupertino, CA 95014
408/974-8801; Fax 408/873-7235
www.apple.com

Event Electronics EZbus

EZbus is a combination computer audio recording interface, software control surface and stand-alone digital mixer. It offers 24-bit/96kHz mic/instrument/line inputs, USB I/O, ADAT optical I/O, S/PDIF I/O, dual MIDI ports and word clock. Each audio channel and the Main Mix bus features 4-band EQ and a compressor/gate/expander. Four sends per channel are provided, and the four returns can be used as additional input channels. Built-in transport controls operate computer-based sequencers and/or MMC-capable devices. Retail: \$849.

Box 4189
Santa Barbara, CA 93140
805/566-7777; Fax 805/566-7771
www.event1.com

Gefen Inc. CAT5-3000

ex*te*d*it CAT5-3000 extends any keyboard, video and mouse combination up to 300 feet using standard CAT-5 cables to provide a quiet and clutter-free environment. The unit can be used to extend computers with noisy fans, printers, hard drives, scanners, cameras, keyboards, mouse, etc. away from the work area. The units have versions to extend USB, 2x VGA, ADB and PS/2 connections.



Gefen Inc. ex*te*d*it DVI-100S/R

The ex*te*d*it DVI-100S/R, designed to extend digital displays up to 300 feet without loss of high-resolution visual quality. Since DVI (Digital Visual Interface) emerged as an industry standard for interfacing with digital displays, most display manufacturers have embraced the technology. The interface delivers high-quality images, improves PC performance and transmits data up to 1.6 GHz.

6265 Variel Ave.
Woodland Hills, CA 91367
818/884-6294; Fax 818/884-3108
www.gefen.com

M-Audio Delta Audiophile 2496

The WaveWorks, the latest card in M-Audio's highly successful Delta family, is an extremely versatile and inexpensive solution for a variety of audio and A/V needs, ranging from multitrack recording to home theater systems. The WaveWorks card offers S/PDIF and MIDI I/O, along with stereo analog I/Os on RCA jacks with 24-bit/96kHz performance. The WaveWorks card includes a powerful digital mixer/router and control over SCMS (Serial Copy Management System). Delta cards support all computer platforms and major software programs.

M-Audio Omni I/O

The Omni I/O by M Audio is a record/playback front-end for the Delta 44 and Delta 66 interface cards, joining together to form a complete system capable of adapting to many studio scenarios and providing multiple solutions within one desktop environment. The Omni I/O emulates a split console mixer design, and contains everything needed to record mics and instruments, monitor playback, add effects and mixdown. Two mic/instrument preamps can be switched to line input.

45 E. St. Joseph St.
Arcadia, CA 91006
626/445-2842; Fax 626/445-7564
www.midiman.net

Magma 1 Slot PCI Expansion System

The 1-Slot CardBus PCI Expansion System promises to provide the various industries a portable solution for non-linear audio/video production. Available for OEM consideration or large volume purchases. Sold in two models, Model CB1F accommodates one full-length PCI card and Model CB1H accommodates one half-length PCI card. The system operates on 12-volt DC power, which provides the ability to run off a wall plug, car lighter adapter or a laptop battery.

9918 Via Pasar
San Diego, CA 92126
858/530-2511; Fax 858/530-2733
www.magma.com

Midiman MidiSport 8x8s

In addition to being a gateway to the high-speed and enormous channel capacity that USB offers, the MidSport 8x8s may also be connected to legacy serial ports. Rock-solid drivers on both Mac and PC, full SMPTE implementation, and the ability to run multiple units simultaneously are just a few of the reasons this interface is the one to

choose. Add to that stand-alone MIDI patchbay operation, a MIDI cable tester and an easy-to-read front panel design.
45 E. St. Joseph St.
Arcadia, CA 91006
626/445-2842 or 800/969-6434; Fax 626/445-7564
www.midiman.net

Radikal SAC-2K

The SAC-2K is an expandable USB/MIDI hardware control surface. It is totally automated with touch-sensitive motorized faders and LED touch encoders. All transport and editing functions are within one switch touch. There are three LCDs for parameter names and amounts. The layout allows access to as many as 160 digital tracks. Full user accessibility to setup and layout. The U.S. list price is \$1,899 for 5 USB ports. It also functions as a complete synthesizer and effects programmer.

1119 North Wilson Ave.
Teaneck, NJ 07666
201/836-5116; Fax 201/836-0661
www.radikaltechnologies.com



SansAmp XDI

The XDL is an instrument interface for computer sound cards, mixing consoles and SansAmp direct recording software (SansAmp PSA-1 Plug-In for Pro Tools manufactured by Bomb Factory Digital). Features include: two balanced XLR and 1/4-inch outputs; two 1/4-inch hi-Z inputs; and Normal and Bright. Low noise and advanced F.E.T. technology offers a unique bridge from guitar to computer. The unit also functions as a standard transparent active DI. Utilizes optional 9V DC power supply, 9V battery or phantom power.

Tech 21, Inc.
333 West 52nd Street
New York, NY 10019
212/315-1116; Fax 212/315-0825
www.tech21nyc.com



SeaSound Solo EX8

Integrated 24-bit/96kHz DAW system for MacOS/Windows/Linux. Beautiful anodized blue 3-rack unit features 2 high-quality mic preamps (48V phantom), real instrument preamps (guitar/bass), inserts for outboard processing, six balanced line inputs, a zero latency monitor mixer (no virtual mixer needed), clip lights and VU meters, two loud headphone amps, MIDI I/O 20, metal knobs (much better than a mouse!) and a hardware control expansion port. MSRP \$1,199.

2955 Kerner Blvd.
San Rafael, CA 94912
415/485-5124; Fax 415/485-5124
www.seasound.com

GAIN WEIGHT THE EASY WAY



THE NEW HHB FAT MAN STEREO TUBE COMPRESSOR

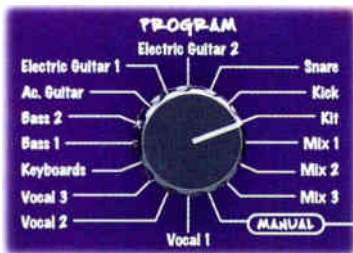
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Step 1: Pay a surprisingly small sum of money for the amazing new HHB Radius 3 'Fat Man' stereo tube compressor.

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World Radio History



Sonus Inc. Opto/64

Opto/64 is a 1-rackspace device that can convert up to 64 streams of digital audio between the ADAT lightpipe format and 1394 FireWire. Via the ADAT interface, other devices such as A/D and D/A converters, and legacy digital audio recorders can be easily connected to the new 1394 bus. The Opto/64 is the first in a line of 1394-based professional audio products from Sonorus.

366 Washington Street
Newburgh, NY 12550
845/562-6000; Fax 845/562-3794
www.sonorus.com

Sound Devices LLC USBPre

A complete, high-performance, portable microphone interface for hard disk recording. USBPre is the direct connection between microphones and computers. Features include 48V phantom power; mic, line, instrument DI, or tape level input per channel; bus powering via USB; portable, all-metal chassis; 20-bit DACs; complete monitoring. USBPre is designed for computers running Windows 98, ME or 2000 as well as Macintosh OS 9 computers—both notebook and desktop.

300 Wengel Drive
Reedsburg, WI 53959
608/524-0625; Fax 608/524-0655
www.sounddevices.com

Voyetra AudioTron

AudioTron transmits and receives digital audio via a standard phone wiring to your PC, providing a new way to store, play, organize and personalize all of your audio media. Features include: D/A Conversion at 32, 44.1 and 48kHz; 16- or 24-bit resolution; signal-to-noise ratio better than 100 dB; outputs include unbalanced RCA, S/PDIF optical and co-ax, USB and Ethernet interface are optional. Price is TBA.

5 Odell Plaza
Yonkers, NY 10701
914/966-0600; Fax 914/966-1102
www.audiotron.net

Yamaha mLAN

Designed for music in which electronic musical instruments and equipment, home audio equipment and multiple computers are connected to exchange data using industry-standard IEEE 1394 (Apple Computers' FireWire & Sony's i.LINK). Transmit approximately 100 channels of audio data and/or up to 256 ports of MIDI data at current rate of 100/100/400 mbps. mLAN8P connects existing MIDI and audio devices to mLAN system and CD8-mLAN installs into the YGDAI slot of an mLAN-compatible Yamaha digital mixer.

6600 Orangethrope Ave.
Buena Park, CA 90620
714/522-9011; Fax 714/522-9522
www.yamaha.com



AlterMedia Studio Suite V5.0

This latest version of the leading software for studio and production management features a new interface and a faster, more intuitive Calendar/Scheduling module, including the ability to book Packages and accommodate related industries like video, TV, film, radio, DVD, mastering, Web production and equipment rentals; exporting of Invoices to quickbooks and other accounting programs, a Petty Cash module, the ability to link audio/video/picture/document files to individual records, and much more!

6300 Powers Ferry Road #600-336
Atlanta, GA 30339
770/303-0970; Fax 770/303-0967
www.studiosuite.com

Beatnik Music System

The Beatnik Music System is a powerful collection of integrated products and technologies designed specifically to author and deliver high-quality interactive music and audio via the Internet and wireless systems. Authoring components include the Beatnik Editor for creating extremely small Rich Music Format (RMF) files, Dreamweaver Action Set, the Music Object and a JavaScript library that exposes the many features of the Beatnik Audio Engine (BAE), the scaleable heart of the system.

2600 S. El Camino Real
San Mateo, CA 94403
650/295-2300; Fax 650/295-2333
www.beatnik.com



BIAS Peak 2.5

The premiere solution for Mac 2-track recording, editing, processing and delivery. Record and playback through any ASIO, DAE, Sound Manager-compatible audio card, or use built-in audio. Supports 32-bit files, 96kHz sample rates, VST, real-time Adobe Premiere, and Audiosuite and TDM plug-ins (TDM Edition only) support. Powerful playlist with CD burning, QuickTime movie window, SMPTE sync, extensive sampler support, multiple looping tools, built-in DSP and a Batch File Processor that integrates any series of Peak processes including plug-ins. Supports multiple file formats (including MP3, Shockwave and RealAudio) and compression codecs. Includes over 25 free VST plug-ins, built-in Waves IDR dithering, Adaptec Toast and SFX Machine Lite.

BIAS Deck 2.7

Full-featured, multitrack digital audio workstation. Now includes support for ASIO hardware, offering a greater choice of hardware options than ever before. Record & playback up to 64 tracks. Also offers high-resolution mixing and automation, QuickTime movie window, SMPTE sync and more.

1370 Industrial Ave. Suite A
Petaluma, CA 94952
800/775-2427; Fax 707/782-1874
www.bias-inc.com

Bitheadz Unity DS-1 Version 2.0

The Unity DS-1 Digital Sampler imports and plays stereo multisamples in a variety of popular formats with stunning realism that only digital sample playback can provide. Unity DS-1 includes over 300MB of samples and supports real-time playback from a MIDI controller and/or MIDI application with up to 24-bit/96kHz resolution. Version 2.0 now supports up to 128 voices and MIDI channels, and includes new features for tempo matching and handling patch names.

Bitheadz Retro AS-1 Version 2.0

The Retro AS-1 Virtual Analog Synthesizer transforms your computer into one the most powerful analog synthe-

sizers ever devised. Retro AS-1 includes over 1,300 patches and supports real-time playback from a MIDI controller and/or MIDI application with up to 24-bit/96kHz resolution. Version 2.0 is optimized for G4 and Pentium III processors and now supports the Digidesign DirectConnect plug-in format.

4400 Capitola Road, Suite 202
Capitola, CA 95010
831/465-9898; Fax 831/465-9899
www.bitheadz.com

Cakewalk Sonar

Cakewalk, the leading provider of music and sound production software for the Windows platform, introduces Sonar, its next generation of professional multitrack digital audio and MIDI recording/editing/mixing software for Windows 9x/NT/2000. Stop by the Cakewalk AES booth, or visit the Cakewalk Web site for more information. Price TBD.

5 Cambridge Center
Cambridge, MA 02142
888/Cakewalk or 617/441-7870; Fax 617/441-7887
www.cakewalk.com

Digital Audio Research FXManager

FXManager is a time-saving sound effects management interface for CDAdvance, DAR's fast-copying (40x) audio CD system offering full varispeed and scrub/reel rock facilities. FXManager enables DAR's SoundStation STORM workstations to access database information across tens of thousands of commercially available sound effects, which can be scrolled through using STORM's scrub wheel. Effects can be auditioned in context against picture and direct from CD, with the commented description of each effect being shown instantly.

2 Silverglade Business Park
Leatherhead Road
Chessington, Surrey, UK KT9 2QL
44/0/1372-742848, 44/0/1372-743532
www.dar.uk.com

Digidesign Pro Tools 5.1 LE

Available for Mac OS and Windows 98, Pro Tools LE 5.1 powers Digidesign's Home Studio products, the Digi 001 and Digi ToolBox XP. This latest version of Pro Tools LE software adds new mixing, editing and MIDI capabilities to both systems. The Digi 001 is a complete audio and MIDI production system, with 8 channels of analog I/O, 8 channels of ADAT Optical I/O and 2 channels of S/PDIF digital I/O and a MIDI interface.

3401-A Hillview Ave.
Palo Alto, CA 94304
650/842-7900; Fax 650/842-7999
www.digidesign.com

Emagic WaveBurner Pro

WaveBurner Pro is a new, more powerful version of Emagic's Eddy award-winning CD mastering software for the Macintosh. WaveBurner Pro features an elegant interface that sets a new standard for CD Mastering. Features include interactive waveform display, drag-and-drop PQ editing, real-time sample rate conversion and non-destructive region editing. Wave Burner Pro also includes support for 24-bit/96kHz editing, VST plug-ins, Direct I/O and ASIO, also includes a powerful collection of Emagic DSP Mastering plug-ins.

13348 Grass Valley Ave., Bldg. C Suite 100
Grass Valley, CA 95945
530/477-1051; Fax 530/477-1052
www.emagic.de



Kind of Loud SmartCode Pro Encoders

SmartCode Pro™ streamlines the surround production process by encoding in 5.1 within Pro Tools. SmartCode Pro is available in two versions to accommodate the two most widely used surround formats: Dolby Digital™ and DTS™. Both versions of SmartCode Pro are AudioSuite software programs that allow Pro Tools users to preview their 5.1 surround mixes in real-time 5.1, then encode and decode the mix to create a 6-channel surround master. SmartCode Pro/Dolby is \$995, SmartCode Pro/DTS is \$1,995.

P.O. Box 3800
Santa Cruz, CA 95063-3800
831/466-3737; Fax 831/466-3775
www.kindofloud.com

Metric SpectraFuo RTAS

The award-winning SpectraFuo visual audio metering system now includes plug-in support for Digidesign Pro Tools LE Real-Time Audio Suite. You can use SpectraFuo in tracking, recording, mixing and mastering sessions, as well as during the setup and mixing of live shows. SpectraFuo helps you get it done faster and better and is absolutely essential for broadcast and critical mixing and mastering. Price: USD \$500-1,000, or free for registered users.

MS 601 Building 8
Castle Point, NY 12511
845/831-8600; Fax 603/250-2451
www.mhllabs.com

Minnetonka MxTrax Native Multitrax

MxTrax Native Multitrax mixing/editing software for Windows soundcards is easy to learn and use, with a track and mixer configuration that has a familiar feel. Minnetonka's build-your-own-mixer architecture lets you create custom mixers. All edits are non-destructive, with unlimited undos and redos. Project files remember all edits and automation—you can literally load a project and undo an edit you did last week. List price: \$499.



Minnetonka Mx51 Native

Mx51 Native for Windows Soundcards, Mx51 makes mixing to 5.1 Surround easy. Minnetonka's Build-Your-Own-

Mixer architecture lets you make custom Surround mixers. All Surround panners can be automated. Minnetonka's unique tactile-feedback interface lets you feel surround as you hear it. Features include: adjustable panning algorithm; Virtual Center Blend control; and automatic creation of 6-track masters. Also includes built-in interface to optional SurCode program, to make it easy to encode for Dolby® Digital or DTS Digital Surround. List price: \$699.

17113 Minnetonka Blvd.
Minnetonka, MN 55345
952/449-6481; Fax 952/449-0318,
www.minnetonkaaudio.com

QDesign MVP 1.2

MVP 1.2 is the industry's first cross platform (for Mac OS and Windows), all-in-one entertainment software application for recording from CD to QDesign Music (24 to 128 kbits/sec), MP3 (from 34 to 320 kbits/sec) and MP2 (from 64 to 384 kbits/sec) files, playback of digital music and videos (including QuickTime and AVI) and playlist management. MVP will be the first application to incorporate QDX, the first scalable secure digital music platform, in the fall of 2000.

QDesign Corporation
1035 Cambie Street
Vancouver, BC, Canada V6B 5L7
604/688-1525; Fax 604/688-1524
www.qdesign.com

Seer Systems SurReal Super Bundle

Seer Systems' Seermusic player is bundled with the 64 voice software synthesizer/sample player SurReal. The Seermusic player can simultaneously stream MIDI synth sounds and digital audio (MP3 or .WAV) over 16 tracks. Websurfers can control the volume, panning, and reverb of each track independently. The bundle includes a translator program that enables SurReal to read and play Akai and Roland Sample Libraries. Ships with over 350 MB of designer techno sounds and Grand pianos. (\$179 list)
108 Portola Road, Ste. 108
Portola Valley, CA 94028
888/232-7337
www.seersystems.com

Sibelius Version 1.3

Sibelius is the music notation program for the 21st Century. It is designed to notate, edit, playback and publish music of every kind. It is the world's fastest and smartest. Fastest: processing happens instantly, most operations take just 1/10th of a second. Smartest: Sibelius understands how you think and work, because it's designed by musicians. Easiest: takes just minutes to learn and a few days to master.

Sibelius Software Ltd.
1407 Oakland Blvd., Suite 300
Walnut Creek, CA 94596
925/280-0600; Fax 925/280-0008
www.sibelius.com

Sonic Foundry SIREN

SIREN Jukebox 2.0, 9/22/2000, Siren Jukebox 2.0 from Sonic Foundry is the complete media manager for anyone who needs to store, play, and organize audio and video on their PC. SIREN Jukebox 2.0 encodes to MP3 and Windows Media, burns audio and MP3 CDs, prints CD jewel box labels, manages and streams Internet Radio, and features a built in browser to allow users to surf the Web while enjoying their music and video.

Sonic Foundry Inc.
754 Williamson St.
Madison, WI 53708
608/256-3133; Fax 608/256-7300
www.sonicfoundry.com

TC Works Spark Version 2

Spark 2.0, TC Works' real-time digital audio processing ap-

plication for MacOS, features a completely redesigned file engine for instant undo and fast destructive edits. Real-time processing capabilities have been improved even further in this new version—the new FXmachine matrix allows configurations of up to 4 parallel audio streams with 10 Plug-ins each. Spark 2.0 includes Spark Modular, the modular virtual analog synthesizer with audio processing capabilities and VST support.

TC Works Spark XL

SPARK XL is a real-time, stereo-based digital audio editor for MacOS offering real-time processing and mastering, and a unique Browser window, with integrated Wave editing, project file management and play list. Spark XL is a new high-end version of SPARK supporting Pro Tools 24Mix and featuring audio restoration facilities. Real-time de-noising and de-clicking are now included, and Pro Tools users now also have access to TDM plug-ins from inside the application. SPARK XL includes 12 VST real-time plug-ins. List \$699.



TC Works Mercury-1

Mercury-1 is a Mac/PC Virtual Analog Software Synthesizer. Mercury-1 is a VST instrument monophonic synth with four engines, each of which has a dual oscillator and an additional sub oscillator. Waveforms include sine wave, saw tooth, triangle, square, PWM and noise generator. It also features Oscillator Sync and Ring Modulation, a 24 dB/octave lowpass filter with resonance, two envelope generators, key follow, gate, modulation matrix, an LFO with sine, saw tooth, square, and sample and hold all with MIDI sync. List: \$199.

742-A Hampshire Road
Westlake Village, CA 91361
805/373-1828; Fax 805/379-2648
www.tcworks.de

Digital Converters

ADC DA 4050 4-Channel SRC

Single module compatible with NV4000 Series rack frames, two 2-channel AES inputs and outputs, 20-bit resolution. Handles an input sample rate from 8-56 kHz. Output sample rate may be locked to onboard crystal oscillator or externally referenced to AES, word clock or video.
125 Crown Point Court
Grass Valley, CA 95945
530/265-1000; Fax 530/265-1021
www.adc.com/broadcast

Aphex Model 1788 A/D Option

Since its introduction two years ago, the Model 1788 remote controlled 8-channel mic preamp has been used by top recording artists in studios and on tour. Diverse installations include TV soaps, the U.S. Congress and the latest Broadway musical, *Seussical*. The 24-bit digital option for the 1788 has been upgraded to offer 96kHz sampling rate. The

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TDIF and Toslink outputs will continue to work up to 48kHz and the higher rate will be only available on the AES3 output. 11068 Randall St. Sun Valley, CA 91352 818/767-2929; Fax 818/767-2641 www.aphex.com



ART DI/O

Applied Research and Technology's DI/O (Model #110) puts analog-to-digital conversion where it should be—outside the computer. With clean, accurate conversion up to 96k, it is stunning! Its built-in 12AX7 vacuum tube enables the unit to warm up already recorded tracks. The unit features high-resolution, 2-channel 24-bit S/PDIF digital I/O, switchable 44.1/48/88.2/96kHz sampling rates, a hand-selected, dual-triode 12AX7 tube with variable tube character control and 1/4-inch stereo analog ins/outs. 215 Tremont St. Rochester, NY 14608 716/436-2720; Fax 716/436-3942 www.artroch.com

ATI DM200 Digital Monitor

The Audio Technologies Inc. DM200 Digital Monitor accepts loop-thru AES/EBU-format digital audio data via a 110-ohm XLR and 75-ohm BNC and RCA connectors. A 24-bit, 96kHz D/A converter feeds stereo headphone drivers, balanced audio line outputs and a stereo LED meter. DM200: \$599.

ATI DMM100/DMM100-BAT Digital Match-Maker

The Audio Technologies Inc. DMM100 accepts serial digital NRZ signals such as AES/EBU digital audio from either of a 110-ohm balanced XLR input, a 75-ohm BNC or RCA input or a TosLink optical fiber. The DMM100 provides re-shaped outputs to simultaneously drive a 110-ohm balanced XLR line, 75-ohm BNC or RCA cables and a TosLink optical fiber. All inputs and outputs are transformer-coupled and floating to provide maximum isolation and ground loop elimination. DMM100: \$259; DMM100-BAT: \$299. 328 W. Maple Ave. Horsham, PA 19044 215/443-0330; Fax 215/443-0394 www.atiguys.com

Benchmark DAC2408

Benchmark's new ultra-high-performance 24-bit, 192kHz DAC redefines the state of the art. Dynamic range exceeds 122 dB, and THD+N is better than -110 dB. A multistage PLL VCXO ensures that jitter-induced artifacts never exceed -138 dB. The unit supports single or dual cable interfaces, at sample rates from 28 to 200 kHz. Features include input routing, 2, 4, 6 and 8-channel modes, bit scope, meters and status display.

Benchmark Media Systems DDA1626

The DDA1626 is a dual six-in, eight-out Power DA for digital audio. Inputs include 2 XLRs, 2 BNCs, 1 Toslink, and 1 internal source. Each DA has 4 XLR and 4 BNC outputs. In addition there is a Toslink output on section A. Features include signal presence LEDs and front panel BNC monitor outputs. Options include AGC, cable equalization and digital audio "black" generation. The 1-RU DDA1626 runs on

international power and lists for \$995. 5925 Court St. Road Syracuse, NY 13206 315/437-6300; Fax 315/437-8119 www.benchmarkmedia.com

Cirrus Logic CS43122 DAC

The CS43122 is a high-performance, stereo D/A converter, which provides 24-bit conversion and supports sample rates up to 192 kHz. This latest Crystal audio DAC from Cirrus Logic achieves the highest dynamic range performance in the industry—122 dB—and delivers excellent sound quality, enabling state-of-the-art audio performance. The CS43122 further strengthens Cirrus Logic's position as the worldwide leading provider of audio chips and is available in a 28-pin SOIC package, priced at \$7.25 in OEM quantities. Cirrus Logic Inc. 4210 South Industrial Drive Austin, TX 78744 512/445-7222; Fax 512/445-7581 www.cirrus.com

dB Technologies M-AD820

dB Technologies introduces the newest plug-in module to the expandable dB44-96 system frame—the M-AD820, a 2-channel analog-to-digital converter. The multichannel unit offers 44.1, 48, 88.2 or 96kHz sampling frequencies, and a choice of 2, 4, 6 or 8 channels. The expandable dB44-96 system frame may be ordered with a variety of plug-in modules, which also includes the m-DA824 (2-channel D-to-A module) and the M-DD1-2-1, a single-double wire AES translator. Price: \$1,495.

dB Technologies M-AD824

dB Technologies will profile the dB44-96 Multi-Channel Conversion System—its latest model of 96kHz/24-bit converter. The expandable frame may be ordered with a variety of plug-in modules; the newest is the M-AD824: a 2-channel analog-to-digital converter. The following configuration is a self-contained, dual-channel single- or double-wire conversion system: the M-DA824 (2-channel D-to-A module), the M-AD824, the M-DD1-2 and M-DD2-1 (the single/double and double/single wire AES translator). 1155 N. La Brea Ave. West Hollywood, CA 90038 323/845-1155; Fax 323/845-1170 www.dbtechno.com

Harrison Digital Converter

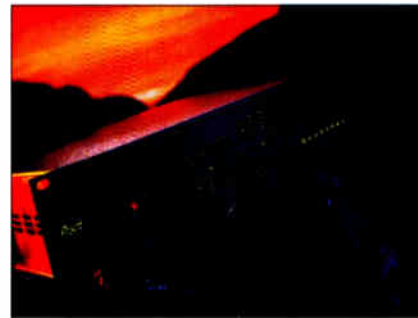
Harrison's Digital Converter provides up to 448 channels of analog/digital signal conversion with MADi interface housed in a 12U enclosure. Each cost-effective unit houses eight dedicated converter cards, which can be mixed within the system for custom configurations. Twenty-eight AES pairs or 56 balanced analog signals per card with built-in SRC on AES receiver card. Audio signal interface is via 25-pin D-type connector. External AES/EBU and TTL reference standard. Call for more information. 1024 Firestone Parkway LaVergne, TN 37086 615/986-7700; Fax 615/986-7707 www.harrisonconsoles.com

Otari Corporation FS-96

Format and Sample Rate Converter. Handles all common digital audio formats and sample rates up to 96 kHz. Bi-directional conversion. List Price: \$6,000. 8236 Remmet Ave. Canoga Park, CA 91304 818/598-1200; Fax 818/594-7208 www.otari.com

Peavey MM-8802

The new MM-8802 is a single-rackspace, 24-bit product featuring a new interface, front panel control features and a CAT5 cable interface with an 80-foot capacity. The MM-8802's analog circuits are now controllable from within the MediaMatrix™ software. The I/O includes eight line inputs and outputs, as well as eight 10-volt control ports and eight TTL logic outputs. The front panel input and output meters, fault and status LEDs are also new features. 711 A St. Meridian, MS 39301 601/483-5376; Fax 601/486-1678 www.peavey.com



Prism Sound ADA-8

A modular multichannel digital processor, initially offered in 8-channel, 24/96 A-D-A configuration with AES I/O. Standard features include premium-quality 8-channel synchronous sampling rate conversion and SNS noise-shaping. Options include a direct Pro Tools interface, additional AES I/O card for 2-wire on all channels; 24-bit TDIF interface; more to be announced at the show. Introductory price: \$8,250. 21 Pine St. Rockaway, NJ 07866 973/983-9577; Fax 973/983-9588 www.prismsound.com

Sonic Sense Sonic AK2K+

The Sonic AK2K+ is a 2-channel, portable (12VDC), compact 8x5x1.75-inch (WxDxH) 24-bit, 96kHz analog-to-digital converter. Multiple 16-, 20- and 24-bit outputs on single or dual wire AES/EBU and S/PDIF. 44.1, 48, 88.2 and 96kHz sampling rates, balanced input and variable input sensitivity calibration. Digital through for word-length reduction and format conversion, 9-segment digital meters, DAT-compatible and all controls on recessed front panel. List price \$1,795. 2755 S. Gilpin St. Denver, CO 80210 303/753-0201; Fax 303/753-0817 www.sonicsense.com



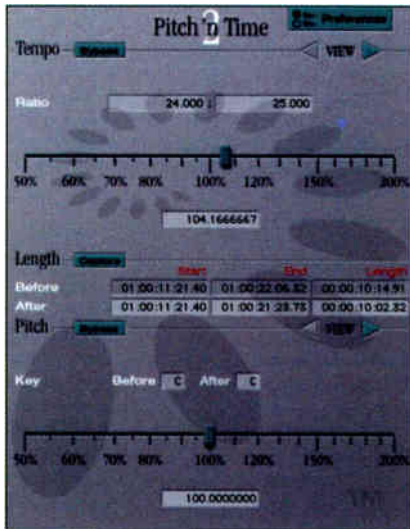
Swissonic AD8

The Swissonic AD8 is an 8-channel, 24-bit/96kHz analog-to-digital converter with mic/line inputs and built-in preamps including phantom power. Clocking can be internal from word clock. Choice of output formats available: ADAT Lightpipe, AES/EBU, mLAN via a switchable output module. Get 'em all! \$1,499; AD8 S/MUX, \$159; AD8 AES/EBU, \$359. 407 Stony Point Road Santa Rosa, CA 95401 707/577-7691; Fax 707/577-7692 www.swissonic.com

All Your Time-Stretching and Pitch-Shifting Dreams Have Just Come True...

A new version, more features, more power. This is not a toy.

Pitch 'n Time, originally released in December 1999 by Serato Audio Research, has already been described as the best pitch and tempo control tool on the market today. It has received rave reviews from a number of pro audio magazines and was recently nominated for the 2000 Mix Technical Excellence & Creativity award.



With the release of version 2.0, we at Imaginary Gadgets have built on that tradition of excellence to deliver a

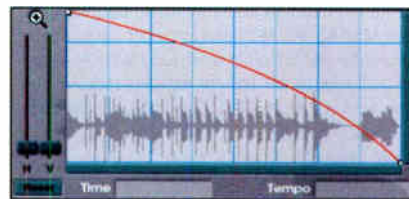
product which incorporates exactly what you have been wishing for.

Introduced in this release is an impressive array of new features including multi-channel mode, waveform overviews, tempo mapping, cue points and pitch mapping which together make Pitch 'n Time 2.0 an essential tool for your collection.

New in Version 2.0

Multi-Channel Mode allows you to process up to 48 tracks together while maintaining their original phase coherency.

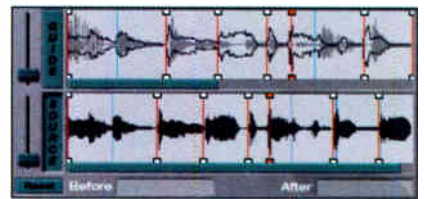
Waveform Overviews mean that each of your graphical editing portals has its own preview. You can actually see the effects of your tempo map as it is applied directly to the Waveform.



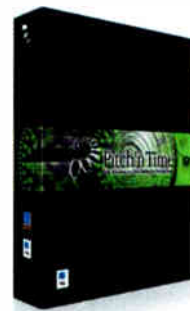
Tempo Mapping gives you the power to create variable tempo ramps and

changes over the length of your sample.

Pitch Mapping allows you to create amazing pitch-bends and record-scratching effects by drawing your pitch change right on top of the waveform.



Time Morphing, this simple yet powerful feature lets you synchronize arbitrary cue points: simply move them where you want them to go in the output, and Pitch 'n Time warps the timebase as required!



Pitch 'n Time is powered by
serato
intelligent sound

Download your **free 15-day trial** of Pitch 'n Time
www.pitchntime.com/demo



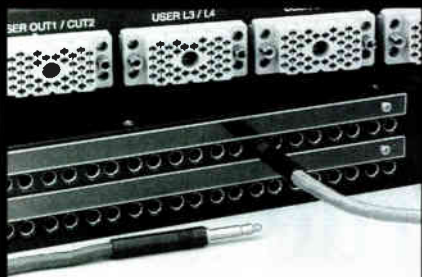
www.pitchntime.com

Pitch 'n Time™
Version 2.0

CIRCLE #121 ON PRODUCT INFO CARD

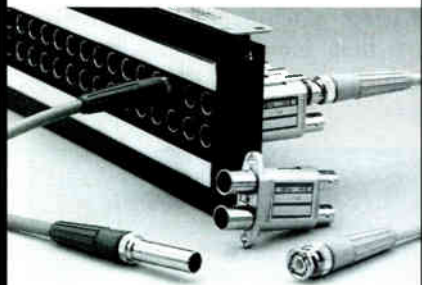
World Radio History

Patching Equipment



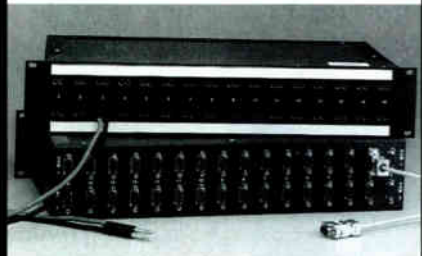
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- Pre-Wired Audio Panels
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- Available in both 1/4 & Mini Sizes



Video Patching

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- Video Panels & Jacks
- Patch Cords
- RGB Panels



RS-422 Patching

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 - 24 Port (12 in, 12 out)
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 - 32 Port (16 in, 16 out)
 - 48 Port (24 in, 24 out)
- Interconnect Cables

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Audio Accessories, Inc.
Mill Street, Marlow, NH 03456
Phone: 603/446-3335
Fax: 603/446-7543

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2000 AES NEW PRODUCTS GUIDE

Disk-Based Recorders/Editors



Akai DPS16

The DPS16 is the world's first 24-bit/96kHz 16-track digital personal studio. Standard features include a large, diagonal flip-up graphic display, 10GB internal IDE drive, 56-bit 4-channel effects processor, 24-bit/96kHz A/D and D/A converters, no data compression and much more. Akai's Q-Link Navigation, which includes real-time control knobs, provides possibly the easiest operating system on any unit of its kind. The DPS16 has introduced the masses to the 24-bit/96kHz recording world.

Akai DR16 Pro

The DR16 Pro is a hard disk recorder with sophisticated editing capabilities and a 16-channel digital mixer in one. Featuring superb 24-bit sound quality and 96kHz sampling rate, the DR16 Pro is the ideal creative tool for broadcast, post-production, professional audio and music applications. Akai's new RE32 multi-track recording and editing remote provides real-time control of transport, editing and record functions for up to 128 tracks of audio and includes Akai's Superview graphic display driver.

710 Mercantile Drive
Fort Worth, TX 76137
817/831-9203; Fax 817/222-1490
www.akaiapro.com

Antex StudioCard 2000Plus

This latest generation of the Antex StudioCard series of post-production sound cards now features the enhanced performance of true 24-bit/96kHz converters and processing. The four balanced XLR analog inputs/outputs, stereo AES/EBU I/O, MIDI port and eight-stereo devices offer professional digital mixing of audio with 32-bit precision. For the video professional, absolute audio/video lip sync is achieved via SMPTE LTC and VITC with enhanced H-sync clock-locking.

1125 W. 190th St.
Gardena, CA 90248
310/532-3092; Fax 310/532-8509
www.antex.com

Bertsch DPR32

The Bertsch DPR32 is a 32-track hard disk recorder with onboard dynamics processing. This 24-bit/96k linear recorder allows for up to 32 simultaneous record tracks. Included are 32 gates, 32 comps, 32 duckers all featuring true RMS look-ahead envelope detection. Price: DPR32 with 16 inputs and 40 Gbyte: \$4,000.

Bertsch HDREQ824

The HDREQ824 is an 8-track hard disk recorder with built-in digital mixer and EQ. This 24bit/44.1k linear recorder can hold IDE drives up to 34GB. It features eight 3-band EQs with fully parametric mids. Three aux sends with digital and analog returns. Optional TDIF, SMPTE chase. Price HDREQ824 10GB \$2,100.

583 Reid St.
Quesnel, B.C. V2J 2M8

250/992-9298; Fax 250/992-6362
www.bertschelectronics.com

Digidesign Pro Tools Version 5.1

Version 5.1 enhancements include fully integrated multichannel editing, mixing and processing, with support for all popular surround formats. New editing and mixing enhancements include support for multichannel and stereo tracks, multiple levels of undo and viewing of multiple plug-in windows in the TDM mixer. MIDI sequencing capabilities add an Event List Editor. PT 5.1 has a release date of late 2000 or early 2001 and more details and features will be available at AES.

Digidesign EditPack

EditPack—a new hardware option for ProControl users—features two touch-sensitive motorized joystick panners, a QWERTY keyboard and trackball, dedicated edit buttons and encoders and high-resolution multichannel metering. EditPack supports all of the new surround features provided in the new Pro Tools Version 5.1.

3401-A Hillview Drive
Palo Alto, CA 94304
650/842-7900; Fax 650/842-7999
www.digidesign.com



Doremi V1-MP2 Digital Video Recorder

The V1-MP2 is a video disk recorder/player using MPEG-2 compression. It is three rack-units high and has full front panel controls, including jog/shuttle wheel, autolocator and audio input level controls. The V1-MP2 offers full-screen NTSC and PAL resolutions. It records frame-accurate, compressed video with up to 8 audio tracks and VITC/LTCtime code. Two RS-422 serial ports are available with Sony 9-pin protocol. A 100BT interface is available.

3631 Cahuenga Blvd. West
Los Angeles, CA 90068
323/874-3411; Fax 323/874-3401
www.doremilabs.com

DSP Media Postation II

Postation II, an all-in digital audio workstation for TV, trailers, commercials, ADR/Foley, film editing and foreign language dubbing. Features: Digital Audio Recording for editing and playback of 24-bit audio, Digital Video for seamless integration of random access video, Digital Mixing via 32x32 modular engine, 24-bit, scaleable to 96 inputs, comprehensive surround sound monitoring, hi-resolution touchscreen interfaces, networkable TEAM™ system allowing multiple users to share projects. Sexy, sleek, fast and efficient, Postation II was ergonomically designed to maximize studio productivity.

11330 Ventura Blvd.
Studio City, CA 91604
818/487-5656; Fax 818/487-5660
www.dspmedia.com

E-mu PARIS 3

PARIS 3 is E-mu's new successor to the Ensoniq PARIS DAW, and features major software and hardware improvements, including new Version 3.0 software. Version 3.0 offers integrated MIDI, a dedicated waveform editor window, OMF import/export, support for 3rd party automated control surfaces and much more. The base PARIS 3 system consists of Mac/PC software, PCI card, 16-channel dedicated control surface and Modular Expansion Chassis.

1600 Green Hill Road
Scotts Valley, CA 95067
831/438-1921; Fax 831/438-8612
www.emu.com



Fairlight Prodigy

Fully integrated digital audio post-production system featuring a 24-track MFX3plus recorder/editor and all-digital automated mixing control surface in one compact, cost-effective package. Features include a 36-channel, 12-bus mixer expandable to 48-channel/24-bus, 16 touch-sensitive moving faders, automated joysticks for surround panning, optional file exchange with most popular workstation formats, optional MediaLink networking, stereo and surround mixing to 5.1, dynamics on all channels, compressor/limiters on all mix buses, integrated machine control, snapshot memories of entire setup and Dolby decoder insertion.

844 N. Seward Street
Hollywood, CA 90038
323/465-0070; Fax 323/465-0080
www.fairlightesp.com

Fostex D-2424

Fostex has added a new top end to its line of stand-alone pro digital multitrack recorders with Model D-2424, a 24-track digital recorder/editor. It features 24-bit/96kHz high performance in caddy-held standard E-IDE hard drives, and 128x oversampling delta-sigma A/D/DAs. It also features 32 virtual tracks and .WAV file import/export. For professional post-production applications, a full-blown SMPTE Sync package is available, complete with generator/reader and RS-422 protocol. An optional DVD-RAM Drive for back-up is also available.



Fostex VF-16

Fostex's new VF-16 is an all-digital, 16-track, hard drive-based multitrack retailing for \$1,399. The product's many amenities include two independent digital multi-effects processors, assignable compressors, eight virtual tracks for multiple takes, a 99-mix scene memory, three-band EQ with parametric mid and high on all 16 channels and master, eight mic inputs (two XLRs with +48V phantom), easy copy/paste editing, full MIDI implementation, SCSI backup and more.

15431 Blackburn Ave.
Norwalk, CA 90650
562/921-1112; Fax 562/802-1964
www.fostex.com



Gadget Labs Wave/496 Interface

The Wave/496 comprises a PCI card with interface patch box, software drivers and support for 24-bit, 96kHz digital audio recording. It includes 4 full-duplex audio channels for analog-to-digital recording and playback and is compatible with all popular multitrack software applications. The Wave/496 interfaces to studio gear with either balanced or unbalanced connections at +4dBu or -10dBV signal levels and includes a MIDI interface. Optional ADAT Lightpipe and S/PDIF connections are available. Retail price: \$349.

333 SW 5th Ave., Ste. 202
Portland, OR 97204
503/827-7371; Fax 503/295-0119
http://gadgetlabs.com

iZ Technology RADAR 24

As the inventors of the TEC-award winning RADAR, iZ Technology is proud to introduce its 3rd generation release of the popular RADAR product line. RADAR 24 has the same hit making sound and format compatibility as RADAR I and RADAR II. Enhanced operation and features include 192kHz capability, integrated graphic user interface and a reliable new BeOs operating system. Drop by booth #963 at AES L.A.

3938 N. Fraser Way
Burnaby, B.C. Canada, V5J 5H6
604/430-5818; Fax 604/430-5828
www.recordingtheworld.com



Mackie Designs HDR24/96

The HDR24/96 combines a high-precision recording system with robust, intuitive editing software—just plug in an SVGA monitor, mouse and keyboard directly into the rear panel ports to start slipping tracks and making crossfades. There's never been a system like the HDR24/96 at anywhere near its remarkably affordable price.

16220 Wood-Red Road
Woodinville, WA 98072
800/258-6883; Fax 425/487-4337
www.mackie.com

Mark of the Unicorn 2408 MkII

Twenty-four-channel audio interface for Macintosh and Windows. Eight channels of balanced, 24-bit I/O on TRS connectors. Twenty-four-channels of ADAT Lightpipe digital I/O. Twenty-four-channels of Tascam TDIF digital I/O. Stereo S/PDIF digital I/O. Word clock I/O. Sample accurate transfers via ADAT sync port on PCI-324 card. Expandable to 72 channels. ASIO 2, .WAV and .MAS drivers included. Core system includes Audiodesks workstation software for Macintosh and PCI-324 audio card. \$995 (core system) \$695 (I/O only).



Finally!

A large diaphragm microphone with the character of the past and the performance of leading edge technology.

Introducing the all new **3541**.

It's performance will surpass your fondest vintage memories.

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- Highest Dynamic Range
- Interchangeable Solid State or Tube Preamp
- Complete soloist recording accessories included.

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www.dpamicrophones.com

DPA 
MICROPHONES

TGI North America Inc.
300 Gage Ave., Suite #1
Kitchener, ON Canada N2M 2C8
Tel: (519) 745-1158 Fax: (519) 745-2364

3541@tgina.com

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Mark of the Unicorn 1296

A 12-in, 12-out 96kHz/24-bit audio interface for Macintosh and Windows. 117dB (A weighted) S/N ratio. AES/EBU stereo digital I/O with built-in sample rate conversion. Two-rackspace steel chassis with extensive front panel metering on all inputs and outputs. XLR connections on all I/O. Expandable to 36 channels. ASIO 2, .WAV and .MAY drivers included. Core system includes Audiodesk workstation software for Macintosh and PCI-324 audio card. \$2,095 for the core system; \$1,795 I/O-only. 1280 Massachusetts Ave. Cambridge, MA 02138 617/576-2760; Fax 617/576-3609 www.motu.com

Merging Technologies Pyramix 3.1

Pyramix Virtual Studio version 3.1 from Merging Technologies is a Windows 2000/NT4 PC-based audio workstation that combines multichannel audio mixing, recording, editing, effects processing and CD-R mastering. The innovative Mykerinos PCI card developed by Merging Technologies employs 32-bit signal processing for absolute sonic integrity. 3340 Dundee Road , Suite 2C-3 Northbrook, IL 60062 847/272-0500; Fax 847/272-0597 www.merging.com



Roland VS-890

The VS-890 24-bit Digital Studio Workstation includes 8 tracks/128 Virtual Tracks, 2-stereo FX including COSM guitar, mic and speaker modeling, full dynamic automation and 999 levels of Undo. It adds 24-bit A/D and D/A converters, a 24-bit recording mode and a faster CD burning mode, eliminating the need to create an image file, and a dedicated CD-RW Mastering button to access the new CD archiving and burning modes and the Mastering Tool Kit. 5100 S. Eastern Ave. Los Angeles, CA 90040 323/890-3700; Fax 323/890-3701 www.rolandus.com

SADIE RADIA

Featuring 4 inputs and outputs and up to 24 replay tracks at 48 kHz, the RADIA is supplied as either a single PCI card for user-configurable systems, or as a complete 19-inch turnkey hardware solution with removable SCSI audio storage. Providing a unique combination of speed, flexibility and reliability in a highly cost-effective professional package, the SADIE RADIA workstation is suitable for all serious editing applications, especially in the radio production and music editing markets. Not just another PC-based hard disk recorder, the SADIE RADIA will service a wide range of editing requirements. 2218 MetroCenter Blvd. Nashville, TN 37228

615/327-1140; Fax 615/327-1699 www.sadie.com

SEK'D Sequoia

Sequoia is a high-end DAW written in totally new code recompiled for maximum performance, designed specifically for DVD-A preparation and classical editing and mastering. This new program provides a special Four Point Cut Mode, which is optimized with regard to efficient and reliable four point cuts. Sequoia provides a highly professional editor for handling real-time crossfades between audio objects of a track. Other features include 2ch 24/192 and 24/96 5.1 recording modes. 407 Stony Point Road Santa Rosa, CA 95401 800/330-7753; Fax 707/578-2025 www.sekd.com

Sonic Solutions SonicStudio HD V.1.4

The latest generation of the most popular CD mastering system ever provides the full range of capabilities needed to deliver 24-bit/96kHz High-Density Audio and DVD-Audio production. Designed to provide the utmost in efficiency, SonicStudio HD also provides the precision to fine-tune audio content to the most exacting specifications. 101 Rowland Way Novato, CA 94945 415/893-8000; Fax 415/893-8008 www.sonic.com

Soundscape R.Ed 24 and R.Ed 16

R.Ed 24 and R.Ed 16 are aggressively priced 24- and 16-track versions of the R.Ed System for Music and Broadcast—priced at \$4,500 list! Both feature a single hard drive mount and a full set of editing and mixing features. The R.Ed 16 has fewer tracks but a full selection of sync options for broadcast. 4435 McGrath Street, #308 Ventura, CA 93003 805/658-7375; Fax 805/658-6395 www.soundscape-digital.com

Spectral Design AudioCube 4

The AudioCube 4 is a 24-bit/96kHz Mastering, Audio Restoration/Archival/Editing Workstation. The NT-based system utilizes 64/32-bit floating-point Native Signal Processing and supports networking with all open standards and supports Umatic/DDP/CDR. The AudioCube performs over 20 real-time audio restoration and mastering functions, including de-buzz, de-noise, de-ess, de-clip, de-scratch, azimuth correction, loudness maximizing, simulation of analog EQ and analog tape machine saturation and phase linear EQ with sound morphing, plus a powerful integrated editor. Dist. by Spectral/Sascom 34 Nelson Street Oakville, ONT, Canada L6L 3H6 905/469-8080; Fax 905/469-1129 www.sascom.com/audiocube.html



Steinberg Nuendo 1.5

Nuendo 1.5 combines a 200-track production facility with a fully integrated 8-channel surround mixing environment, offering host-based DSP with ASIO 2.0 support, intuitive

ease of use, a full array of post-based editing features, dynamic automation of VST plug-ins and more. New for version 1.5: definable Auto Fades & Auto Crossfades; VST Virtual Studio Instruments; ReWire 2.0; Track Sheet printing; TCE Tool; DirectShow & QuickTime support; improved 9-Pin Machine Control; Macintosh OS9/OSX support and much more. The Nuendo base software sells for \$1,299. 21354 Nordhoff St., Ste. 110 Chatsworth, CA 91311 818/678-5100; Fax 818/678-5199 www.steinberg.net; www.nuendo.com

Tascam 788 Digital Portastudio

Offering 24-bit, non-compressed recording to an internal hard drive, the 788 (\$1,149 MSRP) features 6-track simultaneous recording and 8-track playback, with an 8-channel main mixer and 6-channel sub mixer and 8-channel cue mix. Also included are four mono balanced inputs (TRS) and one stereo input with 2-TRS phone jacks, plus stereo output, monitor output, stereo aux output and coaxial digital out. The 788 has 3-band EQ and aux and effect sends on each channel in the main mixer. 7733 Telegraph Road Montebello, CA 90640 323/726-0303; Fax 213/727-7635 www.tascam.com

360 Systems Short/Cut 2000

Short/Cut 2000 is the newest version of 360 Systems' popular 2-track disk-based editor. It now offers split-second editing and faster operation throughout. Features include independent 2-track record, insert record and cut/copy/paste editing, outstanding scrub and a large waveform display. Also included, file interchange via .WAV, .BWF, SDII and .AIFF, crossfade, gain edits, built-in speakers and a mic preamp. 5321 Sterling Center Drive Westlake Village, CA 91361 818/991-0360; 818/991-1360 www.360systems.com

Wave Digital Systems Studio001 PC

Turnkey PC solution for Digidesign's Digi 001 w/Pro Tools LE. Comes preconfigured and optimized for 001, with all software, drivers and OS tweaks set to Digidesign's specifications. Prices start at \$1,599. 1170 Greenwood Lake Turnpike Ringwood, NJ 07456 973/728-2425; Fax 973/728-2931 www.wavedigital.com

WaveFrame Inc. FrameWorks/DX

WaveFrame's new FrameWorks/DX Digital Audio Workstation is designed for recording, digital editing, surround mixing, CD Mastering and DVD prep. FrameWorks/DX features up to 64 channels of 24-bit audio (32 channels at 96kHz), sophisticated real-time cross fades, automated mixing, including 5.1 surround, direct output to CD-R devices or DDP tape, AVI and QuickTime digital video support, AC-3 and DTS encoding options, plus awesome DSP plug-in effects and Direct-X support. FrameWorks/DX— not just another pretty interface.

WaveFrame Inc. WaveFrame/7

WaveFrame/7 is a next-generation post-production sound editing system, featuring the familiar WaveFrame interface running on our powerful new hardware platform. Based on Windows 2000, WaveFrame/7 offers 24-bit audio, sample rates to 96 kHz, automated mixing (with 5.1 surround), DSP plug-ins (including DirectX support), connection to shared storage and high-speed networks, with up to 64 channels of disk playback (32 at 96k Hz). Options include Auto Assembly, Machine Control, GPIO (ADR beeps) and MADI I/O. 1226 Powell Street

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Emeryville, CA 94608
510/594-9455; Fax 510/654-8370
www.waveframe.com

Yamaha AW4416

Sixteen-track digital recording, audio processing, automated mixing and stereo mastering—even sampling and sample triggering, all integrated into a single professional package. The AW4416 combines the power of the infamous 02R with 16-track hard disk recording, as well as stereo mastering capabilities that allow CD production directly from an optional CDRW drive, all in a small, tabletop design. No compromise, 16/24-bit recording, 44 available inputs at mixdown, the ability to export raw or submixed tracks in digital form, and the ability to produce both data backup and audio CDs is included.
6600 Orangethorpe Ave.
Buena Park, CA 90620
714/522-9011; Fax 714/522-9522
www.yamaha.com/proaudio

Loudspeaker Products



Bag End TA6000

The Bag End TA6000 is a Time-Aligned™, compact speech range high-output loudspeaker system that offers both high fidelity and high efficiency for a variety of applications. Because of its light weight (26 lb.) and trapezoidal shape, it can be flown or installed at a wide variety of angles or used as a portable unit with equal ease. The TA6000 contains a pair of low-frequency, 6.5-inch cones with a 1.5-inch voice coil and a high-frequency, bi-radial horn with a 1.8-inch titanium diaphragm. The front is covered with a black-coated 16-gauge perforated steel grille. The installation model is equipped with three rigging points.

22272 Pepper Road
Barrington, IL 60010
847/382-4550; Fax 847/382-4551
www.bagend.com

Carvin TCS Touring Concert System

The TCS Touring Concert System provides the ultimate in pro sound for any venue, large or small. The loudspeakers are designed to fly together whether the same model is flown or several of the models are flown together to create the perfect coverage. Because of their power handling, the TCS systems require only half as many enclosures while still providing flawless performance at extreme levels.
12340 World Trade Drive
San Diego, CA 92128
800/854-2235; Fax 858/487-7620
www.carvin.com

Celestion CXi Series

The CXi Series' loudspeakers are compact speaker systems specifically designed for high-power, high-quality installations. CXi Series' loudspeakers utilize the latest low-frequency drive unit technology, including a long-gap ultra-linear motor assembly for reduced distortion and minimal power compression, combined with a regenerative flux magnet design for increased efficiency. Flying hardware options allow CXi Series to be incorporated easily into any installation.
Dist. by Group One Ltd.
200 Sea Lane
Farmingdale, NY 11735
631/249-1399; Fax 631/753-1020
www.celestion.com

Cerwin-Vega LR 36

The LR 36 offers Cerwin-Vega "Earthquake" bass performance from a super-compact, 18-foot folded horn. Recommended for sound reinforcement, music playback, cinema sound and side-fill monitoring and all applications requiring a compact cabinet featuring high-acoustic output, low distortion and cost-effectiveness in a highly portable system. The LR 36 uses a newly designed 18-inch woofer with high output at 35 Hz and a unique bias control system for improved linearity and accurate punch.

Cerwin-Vega SUB 218

The SUB 218 is a direct-radiating, dual 18-inch subwoofer featuring high-power handling and tremendous output down to 32 Hz. Performance of two subwoofers in one convenient package makes the SUB 218 a perfect choice for any installation requiring deep bass and high-power handling.
555 East Easy Street
Simi Valley, CA 93065
805/584-9332; Fax 805/583-0865
www.cerwin-vega.com



Community XLT 500

The XLT 500 is a trapezoidal, full-range loudspeaker designed for optimum bass performance at an affordable price. 120dB SPL/127dB SPL (peak). Contains a 1-inch high-frequency driver and 15-inch low-frequency drivers. 97 dB at 1 Watt/1 Meter. Frequency range is 50 Hz to 16k Hz. New dual Intellisense™ 3-color LEDs on front and rear for worry-free operation. Rugged construction. Permanent or portable use. MSRP is \$779.

Community R.5

The R.5 loudspeakers are compact, general-purpose, full-range outdoor systems and are the latest addition to the popular R Series. The R.5s are two-way systems with a 12-inch LF and one-inch horn HF driver. Applications include outdoor music/page/P.A. systems and fill coverage for stadiums and arenas. Available with 90x40 and 60x60-degree patterns, they excel at projecting clear, intelligible

speech and high-fidelity music. Enclosures are roto-molded, UV-resistant polypropylene with an included yoke bracket. MSRP is \$570.
333 E. 5th St.
Chester, PA 19013-4511
800/523-4934; Fax 610/874-0190
www.loudspeakers.net

dbx 480R DriveRack

The dbx DriveRack complete loudspeaker management system is the first all-inclusive system that allows the user to use only one unit between the mixer and the power amps. DriveRack features include PC interface, four 31-band graphic EQs, 27 crossover types, digital delays, notch filters, parametric EQs and fully configurable signal routing. List price: \$3,499.95.

dbx DriveRack Remote Controllers

The DriveRack loudspeaker management system is the first-ever, all-inclusive device that allows the user the convenience of using only one box. The DriveRack series 480, 481, 482 and 480R remote controllers offer control over all processing effects, including 27 crossovers, digital delays, notch filters, parametric and 31-band graphic equalizers and compressor/limiter functions. MSRPs: 480: \$2,699.95; 481: \$2,099.95; 482: \$2,199.95; 480R: \$3,499.95.
8760 S. Sandy Parkway
Sandy, UT 84020
801/568-7660; Fax 801/568-7662
www.dbxpro.com

Dunlavy Audio Labs Cantata

The Cantata is a three-way acoustic suspension loudspeaker utilizing two 6.5-inch mids and one 1-inch tweeter in an MTM array and one downward firing, omni-directional 10-inch carbon-fiber woofer. Each Cantata is individually tested in an anechoic chamber and custom built to a guaranteed +/- 1dB (35-20, 000 Hz; -3 dB @ 25 Hz) frequency response. 90 dB sensitivity, 4 ohm nominal impedance. 52hx12wx12d, 85 lbs. each. \$4,795/per pair.
P.O. Box 49399
Colorado Springs, CO 80949-9399
719/592-1159; Fax 719/592-0859
www.dunlavyaudio.com

Dynaudio Acoustics BM5.1a

The Dynaudio BM5.1A Complete 5.1 Mixing System is a revolutionary matched set of five-powered near-field speakers and a subwoofer, offering the ultimate mixing environment for multichannel audio. The BM5.1A System consists of five-matched dual 100W-amplified BM6A 2-way near-field speakers and one active 130W BX30 Bass Extension System with a 12-inch woofer, all controlled by three precision lowpass networks calibrated to meet internal standards. Designed to meet Dolby, DTS and THX criteria for theaters. Retail price: \$9,497.
742-A Hampshire Road
Westlake Village, CA 91361
805/373-1828; Fax 805/379-2648
www.dynaudioacoustics.com

EAWSM84

The SM84 Stage Monitor is a uniquely designed new stage monitor consisting of four 8-inch woofers surrounding a 1.4-inch exit neodymium compression driver. The monitor provides a very precise 90° vertical x 40° horizontal coverage pattern. The wide vertical pattern provides a large field of uniform coverage for the performer to operate within, and the narrow horizontal pattern minimizes destructive interference from neighboring monitors.

EAWS The E-Active Series

Eastern Acoustic Works' The E-Active Series is a new line of self-powered loudspeakers comprising the EA1, EA2

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and EA3. The EA1 is a dual 15-inch subwoofer. The EA2 is a 2-way speaker with 15-inch woofer and a 1.4 exit compression driver on a 90 x 90 degree horn. The EA3 is a 3-way full-range loudspeaker with a 15-inch woofer, an 8-inch horn-loaded mid-range and a 1.4" exit compression driver. The EA3 is a 60x45° loudspeaker. All E-Active Series speakers include rugged internal amplifier packages optimized for use with each specific model, featuring automatic voltage selection, signal, clip and power indicator lights, loop through and a variety of other features.

1 Main Street
Whitinsville, MA 01588
508/234-6158; Fax 508/234-8251
www.eaw.com

Genelec 1093A Active Subwoofer

The Genelec 1093A is a compact but highly dynamic subwoofer made for professional 2-channel and multichannel surround playback environments. It features a single 10-inch magnetically shielded driver mounted in a 44-liter cabinet tuned to 19 Hz. Features include: 6.1 Bass Management system with 6 XLR I/Os for L, C, R front and L, C, R rear plus LFE In, 250 watts, phase adjustments with built-in calibration tone, LF response control, driver protection, bypass and loop-thru for chaining multiple 1093A systems together.

7 Tech Circle
Natick, MA 01760
508/652-0900; Fax 508/652-0909
www.genelec.com

Hafler M-5 Passive Reference Monitor

The magnetically shielded Hafler M-5 is a compact (5.3 liter) 4th order Butterworth, vented 2-way passive reference monitor. The M-5's 5/8-inch thick MDF cabinet has an internal volume of 5.3 liters and a front firing slotted port tuning the system to 70 Hz. The 5.25-inch (133mm) M-5 mid-bass driver is both thermally and mechanically capable of handling the 200-watt system power rating. The M-5 crossover uses a symmetrical 4th order (24dB/octave) Linkwitz-Riley passive filter set at 3.2 kHz. MSRP is \$299 each.

2055 E. 5th St.
Tempe, AZ 85281
888/423-5371 or 480/517-3046; Fax 480/894-1528
www.hafler.com

Hot House ASB 215

The ASB 215 Active Sub-Bass System utilizes two new custom-built, 38-pound, 15-inch ultra-long-throw drivers with over two inches of linear excursion in a 35x31x22, 300-pound, heavily braced non-resonant sealed 2-inch-thick MDF enclosure. Driven by our Model Two Thousand amplifier and SBX Crossover/Controller, the ASB 215 is capable of ruler-flat, distortion-free, low-frequency performance to below 15 Hz. Negligible group delay and fail-safe driver protection guarantee highly articulate bottom-octave reproduction at peak SPLs exceeding 130 dB in pairs. MSRP is \$5,999.



Hot House SBX Sub Controller

A new generation of high-performance, high-output super subwoofers for control room applications has been made possible by the development of the single-rackspace analog SBX. Designed for ease of room alignment and absolute driver control and protection, while delivering true audiophile sound (.001 THD, S/N > 105dB and a 180kHz highpass bandwidth), its unique lowpass Q and 360-degree phase alignment controls provide seamless integration of any combination of our subwoofers, wide-range monitors and studio amplifiers. MSRP is \$1,999.
275 Martin Ave.

Highland, NY 12528
845/691-6077; Fax 845/691-6822
www.hothousepro.com



JBL EON15 G2

The second generation of JBL's EON Series, the EON15 G2 two-way active loudspeaker system features a 15-inch neodymium Differential Drive® woofer and a 1.75-titanium-diaphragm compression driver. Features include 300-watt LF and 100-watt HF amplifiers, built-in 3-channel mixer, 2-band EQ, balanced loop thru/mix output and Thermomaster® Total Thermal Management System® (no external cooling fans necessary). MSRP is \$849.

JBL LSR-25P Studio Monitors

The LSR-25P is a compact, bi-amplified monitoring system with a 5.25-SFG woofer and one titanium-composite tweeter. Internal amplifiers provide 100 watts for low-frequency and 50 watts for high-frequency. The aluminum enclosure incorporates an EOS waveguide and Linear Dynamic Apertures. The LSR-25P combines JBL's latest in transducer and system technology and incorporates the LSR design philosophies. The LSR-25P provides an accurate reference for workstations, edit suites and small control rooms. MSRP is \$479.

8500 Balboa Blvd.
Northridge, CA 91342
818/894-8850; Fax 818/830-1220
www.jblpro.com

KRK Systems S8 Series

The S8 is a 100-watt-powered subwoofer that includes an 8-inch coated paper woofer, variable crossover, phase correction control, variable input sensitivity, XLR balanced inputs and line level outputs with a fixed 80Hz 4th order highpass filter. The enclosure features 3/4-inch MDF construction with a 1-inch MDF front baffle. The S8Si has an 8-inch Kevlar woofer, is custom finished, and features a front-panel power indicator light. Suggested retail prices: S8—\$599; S8Si—\$799.

KRK Systems V4 Series

The V4 is a bi-amplified, 2-way monitor with a 4-inch coated woofer and a 1-inch titanium dome tweeter. Internal amps provide 30 watts for LF and 15 watts for HF. The 1/2-inch MDF enclosure features radiused corners and edges and comes with a Zolatone finish. The V4Si has a 4-inch Kevlar woofer, is custom finished and has a front panel power indicator light. Video shielding is standard on both models. Suggested retail prices: V4—\$299.50 each; V4Si—\$399.50 each.

5452 Business Drive
Huntington Beach, CA 92649
714/373-4600; Fax 714/373-0421
www.krksys.com

Mach Systems M82P

The M82P is a unique speaker enclosure combining hi-fi properties with professional ruggedness. It is a 2-way profes-

sional speaker housing two 8-inch mid-woofers, two 1-inch soft-dome horn tweeters and a 330-watt power amplifier.
3015 Greene Street
Hollywood, FL 33020
954/927-3005; Fax 954/929-6405
www.mach.dk

McCauley Sound SM950-2

The McCauley SM950-2 Three-Way Integrated Point-Source Monitor is a 3-way, ultra-low-profile, high-power, high-fidelity floor monitor for touring and soundstage applications.

16607 Meridian Avenue East
Puyallup, WA 98373
253/848-0363; Fax 253/841-3050
www.mccauley.com

Meyer X-10

X-10 is a self-powered, bi-amplified studio monitor capable of 136dB SPL peak output with extremely low distortion and near-ideal impulse response. Revolutionary Pressure Sensing Active Control (PSAC™) technology maintains consistently linear response from the robust 15-inch low-frequency driver and dedicated 1,200W amplifier. The HF section comprises a 4-inch diaphragm HF driver with a low-distortion wave guide and 620W amplifier. Performance is characterized by wide, uniform dispersion and a neutral response free of identifying horn characteristic.

Meyer MTS-4A

The MTS-4A is a self-powered, four-way, quad-amped (2,480W total peak output) loudspeaker system capable of extremely high output levels across the full audio range without use of separate subwoofers. The four drivers (18-inch, 15-inch and 12-inch cone and 4-inch diaphragm compression drivers) are housed in separately tuned acoustic enclosures. Cone drivers are the robust new MS8xx series, and refined processing circuits keep drive signals fully in phase for increased acoustic gain, more powerful bass/drum reproduction and extended driver life.

2832 San Pablo Avenue
Berkeley, CA 94702
510/486-1166; Fax 510/486-8356
www.meyersound.com



Music Electronic 906/903/901

Music Electronic offers the RL906 (near-field speaker), the RL903 (Control Room Monitor) and the RL901 (Main Monitor). All monitors feature active multi-way techniques with internal crossovers and power amplifiers. Special coaxial transducers are the basis of all professional monitors in the RL series.

Distributed by G Prime Ltd.
1790 Broadway, Suite 402
New York, NY 10019
212/765-3415; Fax 212/581-8938
www.gprime.com

NEXO PS8

The PS8 is a high-powered, low-profile single-amped loudspeaker. Loaded with neodymium driver components, an 8-inch cone low/mid and a 1-inch compression driver, the PS8 is especially suited for use with video screens or computer monitors. Freq. response of 63 to 21k Hz. Asymmetrical dispersion of 50°-100° H by 55°

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 vertical. 200W cont., 400W peak.
 2165 East Francisco Blvd. #E2
 San Rafael, CA 94901
 415/482-6600; Fax 415/482-6110
 www.nexo-sa.com

PMC AML-1 Studio Monitor

Designed for post-production applications, the two-way AML-1 Studio Monitor features 6-carbon, fiber-nomex, flat-piston woofers and a silk dome tweeter, oxygen-free copper wiring and 3/4-inch MDF cabinets with interchangeable face plates in a wide array of available colors. The fully active systems are powered by internal Bryston power modules (150 watts at the woofer, 100 watts at the tweeter) and crossover networks (crossover @ 2.2 kHz). Frequency response is 30 Hz-25k Hz. Sensitivity is 91 dB 1W/1m. Maximum SPL is 115 dB.
 Distributed by Bryston
 Unit 72, Haselmere Industrial Estate
 Tewin Road
 Welwyn Garden City
 Hertfordshire, UK AL7 1BD
 705/742-5325; Fax 705/742-0882
 www.bryston.ca

Professional Audio Systems P18

The P18 2-way co-axial loudspeaker system from PAS is rated at 150-watts RMS with a sensitivity of 95 dB (1 watt, 1 meter). Designed for music playback, voice and paging applications, the P18 measures 19 1/4x10 3/4x10 1/4 and weighs 21.6 pounds. The P18 is constructed of Baltic birch plywood and has pre-installed hardware for use with an Omnimount 75 Series or Allen Products Multimount 22. It can also be mounted horizontally using the optional PAS

U-bracket. Available in natural, black or white finishes, the P18 has a list price of \$679.
 2270 Cosmos Ct.
 Carlsbad, CA 92009
 760/431-9924; Fax 760/431-9496
 www.pas-toc.com

Quested SM326 Crossover

Ideally suited for either fixed or mobile installations, the SM326 is a complete stereo 3-way speaker management system in a 1U case. The versatile 2-input, 6-output analog crossover/limiter is designed for optimum sonic performance and uniquely configurable to custom requirements. Major features include phase reversal and full phase adjustment for each band, as well as an optional EQ module providing fully configurable dynamic or band EQ.
 5816 Hwy K
 Waunakee, WI 53597
 608/850-360; Fax 608/850-3602
 www.quested.com

Radian 950 PB

Radian introduces the new 950 PB, a 2-inch exit throat, neodymium high-frequency compression driver. The 950 PB's wide-frequency response range (500 Hz to 20k Hz), ultra-low distortion and 100-watt RMS power handling capacity make it ideal for live sound applications that require transparent high frequencies at extreme SPL levels. The 950 PB utilizes a proprietary Mylar diaphragm suspension with pure aluminum dome, greatly reducing 2nd and 3rd harmonic distortion.



Radian Microwedge RMW-1122

The RMW-1122, the first product of Radian's new MicroWedge line, is a passive two-way stage monitor with a co-axial 12-inch woofer/2-inch compression driver. Rated at 500-watts RMS, the RMW-1122 has a unique, low-profile enclosure that is up to 50% smaller than comparable stage monitors. The co-axial transducer reduces the baffle area by 30-50%, resulting in an enclosure that takes up less floor space while ensuring smooth response and wide dispersion from a single, coherent source.
 600 N. Batavia St.
 Orange, CA 92686
 714/288-8900; Fax 714/288-1133
 www.radianaudio.com

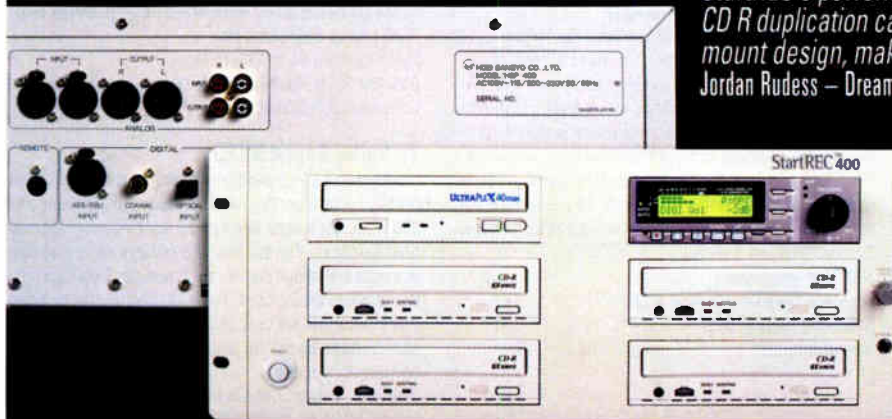
Renkus-Heinz PN81

The PN81 is an active (self-powered), network-enabled, 2-way full-range PowerNet loudspeaker. Features include a 200W R-Control ready Class AB loudspeaker-specific amplifier, an SSL8-4 8-inch driver and an SSD1803-8 1-inch compression driver. Frequency response is 65 Hz to 18k Hz and maximum SPL is 115dB program. The unit measures 19.75x10.75x11.5 and weighs 38 lbs. MSRP is \$2,095.

"Hear The Power"

"StartREC is the final piece of the puzzle"
 Joe Mattis - King Busquit Flower Hour

"StartREC's powerful editing features combined with it's CD R duplication capability, and it's convenient rack mount design, make my work fast and easy."
 Jordan Rudess - Dream Theater



StartREC is the first Digital Audio Editing System combined with multidrive CD-R duplication capability designed specifically for the Audio Professional, from MicroBoards. The StartREC offers Audio Professionals advanced hard disk editing tools, and the ability to create simultaneously up to four custom audio CD's in a convenient rackmountable or desktop configuration.

StartREC™
 CD-R Editor/Duplicator

Headquarters: 800 646-8881 • Fax: 612 556-1620
 East Coast: 888 215-3966 • Fax: 610 495-5437

MICROBOARDSPROAUDIO.COM



CIRCLE #124 ON PRODUCT INFO CARD



Reakus-Heinz PN151

The PN151 is an active (self-powered), network-enabled, 2-way full-range PowerNet loudspeaker. Features include a 300W R-Control ready Class AB loudspeaker-specific amplifier and an SSD3302-8 2-inch compression driver. Frequency response is 55 Hz to 10k Hz; maximum SPL is 121dB program. The unit measures 29.5x19x18.5 and weighs 100 lbs. MSRP is \$3,745. 17191 Armstrong Ave. Irvine, CA 92614-5717 949/250-0166; Fax 949/250-1035 www.rh.com

Roland DS-50A Powered Monitors

The DS-50A is a 50-watt, bi-amplified powered reference monitor with 24-bit/96kHz digital and TRS and XLR analog inputs. Designed to integrate easily in digital studios, the DS-50A eliminates hum and noise problems associated with analog cabling, while delivering the flat frequency response needed for COSM Speaker Modeling. Available in Roland's latest V-Studios and V-Mixers, COSM Speaker Modeling enables users to hear mixes as they would sound on different speakers such as a radio, TV or boombox. 5100 S. Eastern Ave. Los Angeles, CA 90040 323/890-3700; Fax 323/890-3701 www.rolandus.com



Samson Expedition Series

The Samson Expedition is a two-way loudspeaker enclosure offering exceptional audio performance in three different formats: passive (EX-10); powered (EX-20); and powered with built-in mixer and DSP (EX-30). Exceptionally mobile, each enclosure features a telescoping handle and locking wheels. Options for the EX-30 include a rechargeable battery, Samson UHF and VHF wireless modules, a cassette deck and wall and ceiling mounting brackets. Ideal for live sound, DJ use, corporate A/V, fixed installations and more. P.O. Box 9031 Syosett, NY 11791-9031

516/364-2244. Fax 516/364-3888
www.samsontech.com



Stage Accompany E 27

The Stage Accompany Entertainer Series E 27 is a compact full-range speaker for installations without the need for additional bass systems. It features SA's SA 8535 Ribbon Compact Driver and a long stroke SA 1513 woofer (4-inch voice coil), guaranteeing perfect intelligibility and musical reproduction at all SPLs. The E 27 is DDC pre-wired for use with SA's amps. Maximum SPL is 127 dB and frequency response is 55 Hz-30k Hz (+/-3dB). Multiple mounting color options are available. Anodeweg 4 Hoom 1627 LJ Netherlands 31/229/282-930; Fax 31/229/282-920 www.stageaccompany.com



Tannoy i Series i5, i6 and i8

Available in active and passive versions, the Tannoy i5, i6 and i8 offer indoor and outdoor options to fit most installation requirements. Active models incorporate the new ProBASH® amplifier technology, which uses a high-efficiency, fast-response switch-mode power supply to provide the main voltage rails for the linear Class A/B amplifiers. The compact, high-efficiency amplifiers produce large amounts of power, yet little heat. All i Series models use Tannoy's patented point-source drive unit technology. Tannoy/TGI North America 300 Gage Ave., Suite 1 Kitchener, ONT, Canada N2M 2C8 519/745-1158; Fax 519/745-2364 www.tannoy.com



Vergence B-20 Powered Sub

The Vergence B-20 system includes two 10-inch sub-woofer cabinets and a 2U stereo 250-watt RMS/channel amplifier (400 watts peak). Peak Acoustic Output is 110 dB SPL @ 40 Hz. Features include: -6dB cutoff @ 25Hz; switchable low- and highpass filters; switchable Phase Control; continuously variable gain control (0 to -20 dB); switchable subwoofer and HP defeat. Inputs are XLR and TRS. Sub enclosure dimensions are 14x14x16 and weight is 38 lbs each. MSRP is \$2,000. 3195 Park Road, #A Benicia, CA 94510 707/751-0270; Fax 707/751-0271 www.vergenceaudio.com

Westlake Audio Inc. Lc3w10v

Westlake Audio, the leader in high-quality audio products for more than 25 years, will introduce the three-way Lc3w10V Monitor Speaker System at the 109th AES Convention, Booth 1101. The compact Lc3w10V offers extensive electro-mechanical-acoustical dampening, an integrated passive crossover for single or bi-amp operation and tremendous output.

Westlake Audio Inc. Lc 5.75

A 2-way ultra-compact monitor offering precise imaging and impressive low-frequency response from a small enclosure. Applications include project studios, mobile recording studios, broadcast, post-productions and quality control rooms. Features a 5-inch woofer, 3/4-inch dome tweeter. Frequency response is 60 Hz-18k Hz, sensitivity 86 dB, impedance 7 ohm nom, 4 ohm min, power 80W continuous 200W peak. MSRP is \$999.99 per pair. 2696 Lavery Court, Unit 18 Newbury Park, CA 91320-1591 805/499-3686; Fax 805/498-2571 www.westlakeaudio.com

Yorkville Sound NX20

Loaded with 12-inch neodymium speaker and a unique proprietary 1-inch horn, the new NX20 loudspeaker delivers a full 350 Watts, yet weighs less than 26 lbs. Frequency response is 60 Hz-17k Hz. The trapezoid box features a recessed input jack plate and wedge monitor angle and stardmount and flying hardware are included. The NX20 is protected by a two-year transferable warranty and is distributed in North America by Yorkville Sound. Suggested retail is \$429. 550 Granite Court Pickering, Ontario, Canada L1W 3Y8 905/837-8481; Fax 905/839-5776 www.yorkville.com

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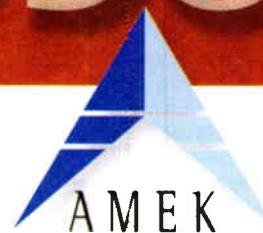
Reid Hyams, Owner/President

When only the best will do. When no compromises are acceptable. When sonic performance rules. These are some of the criteria in selecting a 9098i. Along with its sonic integrity, the feature set is also equally impressive. Recall, dual moving fader automation, built in dynamics and indisputably superior mic preamps and equalizers. The 9098i combines the best characteristics of vintage consoles with features demanded in today's mix environment. We invite you to audition a 9098i and experience the finest mixing console ever created.

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9098i



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Microphone Preamplifiers

Amek Channel in a Box

Channel in a Box (CIB) is the first module in a new range of signal-processing devices by Neve, entitled Pure Path®. CIB combines mic preamp, line amplifier, high- and lowpass filters, 4-band EQ and compressor, all in a single-rackspace unit. List: \$3,250.
1449 Donelson Pike
Nashville, TN 37217
615/360-9488, Fax 615/360-0273
www.amek.com

Apogee Trak2

The discrete, 2-channel preamp has balanced sends and returns, peak/average/phase metering, LCD status/signal flow screen display, remote operation via MIDI or RS-232, plus optional video sync. Trak2 also accepts hi-Z instrument inputs. Onboard A/D converters support rates up to 24 bit/96 kHz with Apogee's UV-22HR, Soft Saturate and Soft Limit proprietary technologies. Two AMBus digital I/O slots interface with Pro Tools, ADAT, TDIF, SDIF-II, etc. and an AES-S/PDIF digital out is standard.
3415 Donald Douglas Loop S.
Santa Monica, CA 90405
805/915-1000; Fax 805/391-6262
www.apogeedigital.com



Earthworks 1024

Based on new circuitry by David Blackmer, the 1024 delivers ruler-flat frequency response from 2 Hz to 100 kHz and clean gain with distortion of under 1 ppm (0.0001%) as well as EIN, which equals the 140dB capability of 24-bit converters and the 10V rms output to use it. It has lower distortion than most wire.
Box 517
Wilton, NH 03086
603/654-6427; Fax 603/654-6107
www.earthwks.com



GT Electronics VIPRE

GT Electronics, a division of Alesis, introduces VIPRE, a full-featured, variable-impedance, all-tube preamplifier. VIPRE boasts a switch-selectable fully floating differential input and a fully floating differential output. Additional features include a switch-selectable rise-time, a switch-selectable variable input impedance (steps from 300, 600, 1000 and 2400 ohms) and precise and repeatable gain settings in 1dB steps from 15 to 75 dB.
1633 26th Street
Santa Monica, CA 90404
310/255-3400; Fax 310/255-3401
www.groovetubes.com



JOEMEER VC1Q

The VC1Q is a mono-tracking channel incorporating a transformer-coupled, hybrid designed mic preamplifier. Other features include a mic/line switch, 48V, 20dB pad, phase reverse, peak input LED, a full function JoeMeek compressor, 3-band MeQ (equalizer) with mid-swept band, enhancer, de-esser, large VU meter, output gain control and an optional 24/96 S/PDIF output card. Retail: \$799.99.
Dist. by PMI Audio
23773 Madison St.
Torrance, CA 90505
310/373-9129; Fax 310/373-4714
www.joemeek.com



Langevin Vocal Combo

The Langevin Dual Vocal Combo is a 2-channel mic preamp with two shelf equalizers plus two channels of electro-optical limiters. The combo is the result of suggestions from our dealers to combine two of the most popular all discrete Langevin products and make the price irresistible. Retail: \$2,000, and it's shipping now!
13880 Magnolia Ave.
Chino, CA 91710
909/627-4256; Fax 909/628-2482
www.manleylabs.com

Millennia STT-1 Origin

The STT-1 Origin Recording Channel is Millennia's innovative, new merging of pure Class-A vacuum tube and pure Class-A discrete solid state circuit topologies. Over 130 product combinations in one chassis. Uncompromised Millennia sonic performance, exceptional versatility and value.
4200 Day Spring Ct.
Placerville, CA 95667
530/647-0750; Fax 530/647-9921
www.mil-media.com

Oram The "Al Schmitt" Box

The Al Schmitt GMS Grand Master Series is pure analog and can switch between three different microphones for comparison. The larger VU meter can be selected to read the input of the source, as well as compressor input or output. The 6-bands of EQ have individual bypass, signal presence LED and switchable Q/slope with 12dB cut or boost. All rotary controls are step-switched for precise setting and accurate recalling.
The Old Forge
Hook Green, Meopham, Kent, UK, DA13 0JE
44/1474/815-300; Fax 44/1474/815-400
www.oram.co.uk



PreSonus DIGIMAX

DIGIMAX is an 8-channel, dual-servo microphone preamp featuring dual-domain limiters and EQ enhancement. The limiter samples audio in both peak and RMS domains achieving an instantaneous, transparent peak stop. Channels one and two offer polarity reverse and high-impedance instrument inputs on the front panel. The DIGIMAX offers eight channels of simultaneous analog output and 24-bit digital audio in three formats: AES/EBU, S/PDIF and ADAT. The user can select sample rates of 32 kHz, 44.1 kHz or 48 kHz. Retail: \$1,499.95.
7257 Florida Blvd.
Baton Rouge, LA 70806

225/216-7887; Fax 225/926-8347
www.presonus.com

Rane NM84 Network Mic Preamp

Rane's NM84 Network Mic preamplifier offers 8-mic or line-level XLR inputs and four line-level XLR outputs employing CobraNet™ technology. Eight-XLR direct outputs, one for each mic input, are also standard. Advantages include: 8-on/4-off configuration; outputs receive any audio channel from any bundle (network channel); full control implementation from front pane; 16 contact closure memories or ActiveX controls via SNMP; and RS-232 and memory transport over the network. Retail: \$3,999.
10802 47th Ave. W.
Mukilteo, WA 98275
425/355-6000; Fax 425/347-7757
www.rane.com

Sound Devices MP-2

The MP-2 from Sound Devices is a studio-quality, 2-channel, portable stereo microphone preamplifier. With its impressive audio performance and comprehensive list of features, including headphone monitoring, metering and M/S Stereo Matrix, the MP-2 is a flexible front-end device for professional studio and field applications. The MP-2 combines rugged mechanical and electronic construction, compact size and high-quality components. The MP-2 allows no-compromise performance for any application. Retail: \$855.

Sound Devices MixPre

The MixPre is a studio-quality, 2-channel, portable stereo microphone preamplifier/mixer. With its pan switches, built-in slate microphone, 1kHz tone oscillator and headphone monitoring, the MixPre is a flexible, portable mixer. The MixPre has impressive audio performance and comprehensive features, making it ideal for the front end of any studio or field production system. Radio, television and film production engineers value the compact size and ability to withstand extremes in the field. Retail: \$855.
300 Wengel Dr.
Reedsburg, WI 53959
608/524-0625; Fax 608/524-0655
www.sounddevices.com

Sound Technology ST193-MIC

ST193-MIC is a universal Mic Preamp/Direct Box that can be used as a stand-alone I/O device or as a USB Based Audio Interface for real-time audio acquisition and analysis. The portable unit incorporates an instrument quality I/O featuring professional dual balanced XLR/TRS combo jack inputs with selectable independent +48V phantom power, -20dB pad, polarity reverse, TRS balanced outputs and much more. Specifically designed for measurement applications for live sound, recording, project studios or any other sound application requiring an integrated, portable, robust solution.
15732 Los Gatos Blvd. #535
Los Gatos, CA 95032
360/779-7080; Fax 360/779-6847
www.soundtechnology.com

True Systems P2 Digital

True Systems introduces the P2 2-channel 24/96 digital mic preamp system. Based on the acclaimed Precision 8, the P2 Digital offers ultimate sonic performance for critical recording and sound reinforcement. Features: M-S decoder, direct inputs, dual-gain range, highpass filters, peak-hold metering, a stereo phase correlation display for optimizing stereo microphone placement (24, 20 or 16-bit digital outputs with sample rates to 96 kHz, AES/EBU and ADAT optical outputs) and multichannel digital output routing.
8175 E. Slate Ridge Drive
Tucson, AZ 85715
520/721-2735; Fax 520/722-4057
www.true-systems.com

Universal Audio 2610 Tube Preamp

Based on Bill Putnam's 610 modular console, the 2610 is a 2-channel, analog tube mic preamp featuring the best in analog design and performance. The 2610 offers mic, line and instrument inputs and ultra smooth low- and high-frequency shelving equalization. Price: TBA.

Box 3818
Santa Cruz, CA 95063-3818
831/454-0630; Fax 831/454-0689
www.uaudio.com

Microphone Products



ADK A-51TL

Large diaphragm, low-noise transformerless F.E.T. condenser microphone with four polar patterns. Identical in dimensions to the A-51TC fixed cardioid tube mic. Frequency curves specifically designed to emulate a vintage '50's-era European condenser mic.

Box 82282
Portland, OR 97282
503/772-3007; 503/772-3097
www.a-dk.com

Advanced Sonic Concepts STM 99

STM 99: Modular Band and orchestral recording microphone. Variable clamping and isolation mounting systems. Interchangeable omni, cardioid and supercardioid capsules. P.O. Box 237, 404 N. Giles Ave.

Chatsworth, NJ 08019
609/726-9202
www.AdvancedSonicConcepts.com

AKG C2000B

The C2000B is a side address, cardioid condenser microphone with a (patent applied for) 1/2-inch active diaphragm that features high sensitivity and low self-noise similar to the best large 1-inch diaphragm mics, but at a much lower cost. Features: switchable 10dB pad, switchable 6dB/octave low-frequency roll-off at 500 Hz. Frequency response: 30 to 20k Hz. Maximum SPL for 0.5% distortion: 150 dB SPL. Equivalent noise level: 20 dB(A). Sensitivity: 20 mV/Pa. List price: \$378.00.

AKG D880 Emotion Series II

A dynamic handheld mic for stage use, the D880 has a supercardioid pattern that's frequency-independent for excellent sensitivity at the front of the mic, while rejecting side and rear sounds. Features include a shock absorbing steel wire-mesh grille, integral wind and pop screen and a gold-plated XLR connector. List: \$142. Frequency response: 60 to 20k Hz, Sensitivity: 2.5 mV/Pa, Equivalent noise level: 18 dB(A). The Series II Emotion Series



includes the models: D880, D880S, D770 and D660S vocal microphones and the new D440 and D550 instru-

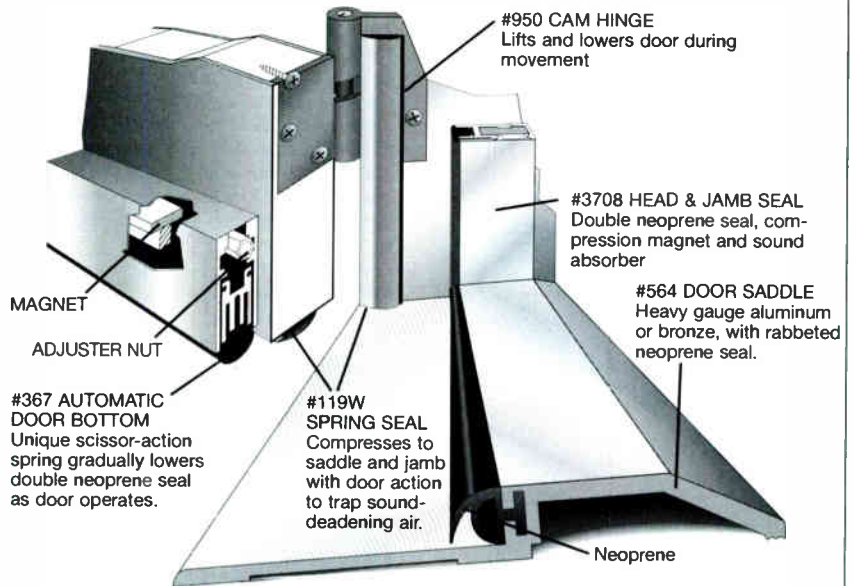
ment microphones.
1449 Donelson Pike
Nashville, TN 37217
615/360-0499; Fax 615/360-0275
www.akg-acoustics.com

Applied Microphone Technology S25B Double Bass Mic

AMT's S25B Bass Microphone is designed for acoustic double-bass. It uses a very tight pattern to get extra gain before feedback, while still maintaining the natural sound of the instrument. Its quick release mechanism makes it easy to attach in seconds—no retrofitting or permanent modification to instrument needed! Positioning this mic is simplified by a flex arm, which also makes it easier to mic the acoustic bass's wide variety of sweet spots (optimum

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Soundproof door openings don't have to come at the expense of clean design lines. ZERO's advanced gasketing technology permits the use of conventionally sized and trimmed-out doors to achieve exceptionally high sound control levels. There's no need for camouflaging the bulk and protrusion of typical soundproof doors. ZERO's SOUND TRAP sealing systems are designed to provide up to a 53 Sound Transmission Class (STC) rating—loud sounds emitted on one side of a door will not be heard, or only faintly, on the other side. By comparison, 12" of concrete provides a 56 STC rating.

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61 Industrial Road
Berkeley Heights, NJ 07922
908/665-2727; Fax 973/994-5139
www.appliedmic.com



Audio Engineering Associates R77 Light

Illumination with the look of the RCA 77 Art Deco Classic. Feature set is the same as our R44 light: internal halogen low-voltage lamp; external power supply with 20-foot cable; on/off switch on the cable.
1029 N. Allen Avenue
Pasadena, CA 91104
626/798-9128; Fax 626/798-2378
www.wesdooley.com



Audix VX-10

Audix's flagship handheld vocal condenser mic is designed for a wide variety of live, studio and broadcast applications. With a smooth frequency response of 40 to 20 k Hz, the VX-10 features a 16mm gold vapor diaphragm, a cardioid polar pattern, steel mesh grille screen and the trademark Audix black satin finish. Operation requires phantom power of 48 to 52 volts. The VX-10 can handle sound pressure levels of 140 dB without distortion and will additionally provide over 20 dB of ambient noise rejection for feedback control on live stages. Retail is \$599, including stand adapter and external foam windscreens.
9400 SW Barber Street
Wilsonville, OR 97070
503/682-6933; Fax 503/682-7114
www.audixusa.com



Beyerdynamic Opus 81

Advanced technology has produced a new breed of microphones using condenser elements for a wider and more linear frequency response. The Opus 81 is appropriate for vocals or instruments onstage or in the studio. The element withstands sound levels of up to 138 dB without a loss of performance. Artists preferring a crisp, "transparent" quality will rave about the Opus 81. Frequency response: 50 to 18k Hz; cardioid polar pattern; 12-48V phantom power. Retail: \$425.

Beyerdynamic Opus 51

The Opus 51 is designed for instrument sound reinforcement and studio recording. Using its boundary effect, this microphone captures direct and reflected sounds from an instrument in perfect balance and at an equal level, taking the guesswork out of microphone placement. Perfect for use with piano, kick drum or inside a double bass. Frequency response: 30 to 20k Hz. Semi-spherical polar pattern and 11-52V phantom power. Retail: \$425.
56 Central Ave.
Farmingdale, NY 11735
631/293-3200; Fax 631/293-3288
www.beyerdynamic.com



BLUE (Baltic Latvian Universal Electronics) Dragonfly

Complete with an integrated elastic shockmount, this Class-A discrete, transformerless microphone offers a rotating capsule grille. The Dragonfly incorporates the BLUE handcrafted 1-inch active diameter capsule with a 6 micron mylar film, which has been sputtered with a special mixture of pure gold and aluminum. The capsule operating principle is a pressure gradient with the pickup pattern being cardioid. The Dragonfly is packaged in an attractive linen box. Retail: \$1,095.
Box 910
Agoura, CA 91376-0910
818/986-2583
www.bluemic.com

CAD M177 Externally Biased Condenser

Resulting from over a decade of intense development, the M177 is one of the first in a new generation of CAD condenser mic. The M177 features a single-pattern version of the original Equitek E-300 externally biased capsule with a gold-sputtered, 1.1-inch diaphragm. The M177 has a high-

speed, low-noise head amp, coupled with a new discrete high-efficiency power circuit. The results are extremely low noise, low distortion and fast transient response. Polar pattern: cardioid. Frequency response: 10-20k Hz. Sensitivity: 15mV/Pascal. Signal to noise ratio: 85 dBA. Self-noise: 10 dBA. Max SPL: 148 dB. List price: \$249.



CAD M179 Externally-Biased Multi Pattern Condenser

The M179 is one of the first in a new generation of CAD condenser microphones featuring 5-point detented pattern control providing nine useable patterns, continuously variable between detents. The M179 features a gold-sputtered 1.1-inch diaphragm. The M179 has a high-speed, low-noise head amp, coupled with a new discrete high-efficiency power circuit. The results are low noise, low distortion and fast transient response. Polar pattern: continuously variable (Omni, Figure-8, Cardioid). Frequency response: 10-20k Hz. Sensitivity: 15mV/Pascal. Signal to noise ratio: 85 dBA. Self-noise: 11 dBA. Max SPL: 148 dB. List price: \$399.
341 Harbor Street
Conneaut, OH 44030
440/593-1111; Fax 440/593-5395
www.eadm.cs.com

Carvin CM87-S

A multi-purpose large diaphragm studio condenser microphone. Gold-sputtered 6-micron element. FET electronics. Max SPL: 145 dB. 48V power supply. 90-ft cable and aluminum flight case included. Frequency response: 30-20k Hz. Dynamic range: 133 dB. Low cut and pad switches. Shockmount included. Dimensions: 7.5x2.75-inches. Output impedance: 200 ohms. Direct price \$299.95.
12340 World Trade Drive
San Diego, CA 92128
858/487-1600; Fax 619/487-8160
www.carvin.com

Coles/AEA 4038 Stereo Template and Bar

Coincident and near-coincident stand mounting for a pair of Coles 4038s. Features include: Blumlein (coincident) head to head mounting; Dooley/Streicher (17-cm spacing) 90° side by side mounting; Other near-coincident spacings and angles possible; Uses AEA standard 4038 SA microphone stand adapters.
1029 N. Allen Avenue
Pasadena, CA 91104
626/798-9128; Fax 626/798-2378
www.wesdooley.com

Crown CM-700MPS

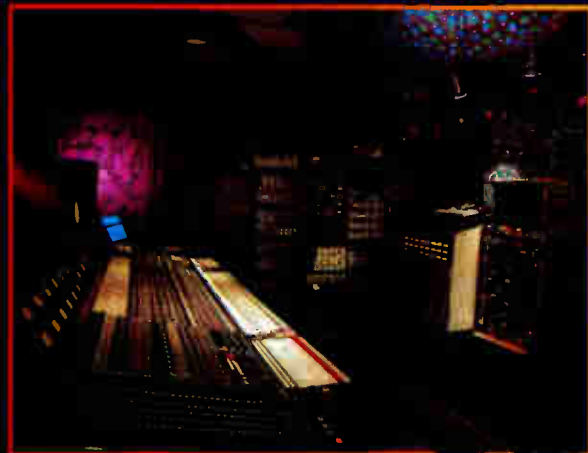
The Crown CM-700MPS is a complete set for stereo miking an orchestra, choir, folk group, drum set, piano or other musical sound source. Includes a matched pair of CM-700 cardioid condenser mics, ASA-4 stand mounts, CM-SM shock mounts, WS-11 windscreens, CM-SB stereo bar, foam-lined carrying case and a template for stereo mic positioning. Mics are matched within 1.5 dB.
1718 W. Mishawaka Road
Elkhart, IN 46517
219/294-8200; Fax 219/294-8329
www.crownaudio.com

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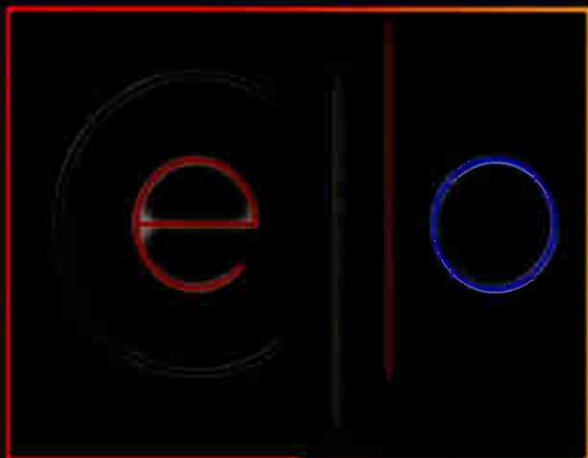
STUDIO 1



STUDIO 2



STUDIO 3



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DPA 3541 Kit

The Type 3541 is a complete microphone kit for all kinds of high-quality soloist recordings and is specially designed for the demanding requirements of everyday studio use. The kit includes interchangeable solid-state and tube pre-amplifiers, allowing the engineer to select between the transparency of the solid-state and the musical nature of the tube, depending on the recording requirements. The 3541 boasts excellent specs, including 144 dB maximum peak SPL before clipping, and a THD of less than 0.5% at 120dB SPL peak.

c/o TGI North America
300 Gage Ave., Suite 1
Kitchener, ONT, Canada N2M 2C8
519/745-1158; Fax 519/745-2364
www.dpamicrophones.com

Earthworks Inc. M30BX

The M30BX is a battery-powered version of our M30 reference mic. It is accurate within +/- 1 dB from 9 Hz to 27 kHz and runs for 1,500 hours on a single AA battery. It will drive a single-ended input just fine. A switch allows 14 dB of gain, enough to drive most sound cards directly for lap-top field use.

P.O. Box 517
Wilton, NH 03086
603/654-6427; Fax 603/654-6107
www.earthwks.com

Lawson L251

Vacuum tube condenser microphone featuring a reproduction of the ELAM 251 capsule. The Lawson L251 captures the character of the ELAM 251—a rare vintage microphone renowned and coveted for its sparkling airy highs and warm solid lows. The L251 features a true toroidal state-of-the-art output transformer exhibiting unparalleled level handling capability, vanishing distortion and extended frequency response, low-frequency contour control, variable -10dB pad and continuously variable patterns. Direct price: \$2,295.

2739 Lamon Avenue
Nashville, TN 37204
615/269-5542; Fax 615/269-5745
www.lawsonmicrophones.com



M. Klemme Articulated Boom

An integral joint (patent-pending) allows a new range of motions to get over the subject, over obstacles and over other booms. Offers four telescoping sections before the

joint and two after, providing a reach of up to 9-1/2 feet (287 cm). Five positive locking positions: 90°, 112.5°, 135°, 157.5° and 180°. Articulated design lets operator hold pole with one hand, with the mushroom base at the bellline, leaving the other hand free. Price \$860. (KA-113CCR Articulated Pole with internal coiled cord and right-angled XLR base.)

1386-A Poinsettia Ave.
Vista, CA 92083
760/727-0593; Fax 760/727-0693
www.mklemme.com



Microtech Gefell M 930mt

Cardioid pattern microphone with side addressed gold mylar capsule and transformerless phantom amplifier.

c/o G Prime Ltd.
1790 Broadway, Suite 402
New York, NY 10019
212/765-3415; Fax 212/581-8938
www.gprime.com

MXL Fox Microphone

Supercardioid dynamic handheld mic for use on stage. Dynamic element provides good intelligibility, and directional characteristics help reduce feedback in live situations. Includes mic stand clip, shockmount and zipper pouch.

c/o Marshall Electronics
5649 Mesmer
Culver City, CA 90230
310/390-6608; Fax 310/391-5408
www.mars-carr.com

Nady Systems SCM-1000

Nady's new top-of-the-line studio microphone. Represents a significant price/performance breakthrough. Features true condenser design with large pressure-gradient, gold-sputtered, ultra thin diaphragms and FET preamplifiers for warm, natural reproduction of subtle to powerful audio sources and the most accurate transient response possible. Selectable low-cut filter, 10 dB attenuation pad, multiple polar patterns (omni/cardioid/figure-8). Price: \$199.95
6701 Shellmound St.
Emeryville, CA 94608
510/652-2411; Fax 510/652-5075
www.nadywireless.com



Neumann M150 Omnidirectional Tube Mic

At AES, Neumann will debut a new version of its classic M50 mic. The new M150 combines a titanium-diaphragm,

omnidirectional capsule combined with the superb transformerless tube electronics used in Neumann's popular M149 mic, for low-noise/low-distortion performance and a low-end that's only -3 dB at 16 Hz. Retail is \$5,300.

1 Enterprise Drive
Old Lyme, CT 06371
860/434-5220; Fax 860/434-3148
www.neumannusa.com

Rolls Corp. RPB623 Phantom Hex

The RPB623 is a 6-channel phantom power supply. The single rackspace unit provides 48V phantom power to up to six condenser microphones. It has XLR inputs and 1/4-inch TRS balanced outputs and is designed to connect to digital multitrack recorders. An LED on the front panel indicates channel operation. If nothing is plugged into the channel, the LED is off. The RPB623 internal power supply is specially shielded to eliminate noise.

5968 South 350 West
Murray, UT 84107
801/263-9053; Fax 801/263-9068
www.rolls.com

Royer Labs SF-1 Ribbon Microphone

Royer Labs introduces the SF-1 ribbon microphone, Royer's latest "modern ribbon," a compact, monaural version of its popular SF-12 stereo ribbon microphone. It uses the same ribbon element, transducer and electronics as the SF-12 and was built to satisfy engineers who like the sonic characteristics of the SF-12, but who want the option of either spreading the ribbon elements out or recording in mono without purchasing the stereo microphone. \$1,075.00.

821 N. Ford St.
Burbank, CA 91505
818/760-8472; Fax 818/760-8864
www.royerlabs.com

Sabra-Sam SSM-1 Universal Shock Mount

Sabra-Sam Commercial debuts the patented SSM-1 Shock Mount for all types/sizes of microphones. The shock-mount can be used with any type/size microphones, and because of its low price, it becomes affordable to use shock mounts in live performances on stage.

289 Rua dos Bandeirantes
Sao Paulo SP, Brazil, 01124-010
55/11/1-228-7970; Fax 55/11/1227-6904
www.sabrasom.com.br

Sanken Microphones CMS-10

Sanken's newest mic, the CMS-10, is the world's first camera-mount stereo shotgun mic. The CMS-10 is ideally suited to today's high-definition cameras because of its extraordinary performance in matching the selected sound with the camera's picture. This is due to the CMS-10's ability to maintain high directionality even in a noisy situation or in an environment with pronounced echo. Price: \$2,195.

1155 N. La Brea Ave.
West Hollywood, CA 90038
323/845-1155; Fax 323/845-1170
www.promediaaudio.com

Schoeps MK 41 V and CCM 41 VG

Side-address versions of the popular MK supercardioid capsule and CCM compact microphone. Frequency response is 50-20k Hz at 2 dB. The MK 41 V is \$1,165; the CCM 41 VG is \$1,960.

c/o Posthorn Recordings
142 W. 26th Street
New York, NY 10001
212/242-3737; Fax 212/924-1243
www.posthorn.com

Sennheiser MKH800

MKH800 condenser microphone for recording studio, broadcast and film. Capable of handling new high-fidelity

audio storage mediums such as Super Audio CD and audio DVD. Frequency response extends to 50 kHz. Dynamic range of 126 dB. Self-noise of only 10 dB(A). Utilizes the wider frequency response and dynamic range of 24-bit/96kHz standards. \$2,950.

One Enterprise Drive
Old Lyme, CT 06371
860/434-9190; Fax 860/434-1759
www.sennheiserusa.com



Shure KSM44

The KSM44 is a multiple-pattern (cardioid, omni, bidirectional), large diaphragm, side-address studio condenser microphone with extremely low self-noise and an externally biased design. It provides an extended frequency response tailored for studio vocal tracking as well as instrument recording applications.

Shure WL50 Series Lavaliers

With a weight of only 0.34 grams and a diameter of 5.8 mm, the new WL50 Subminiature Lavalier Microphone is so small that it virtually disappears when in use. These omnidirectional condenser units have a frequency response of 20 to 20k Hz, and come standard with four equalization caps that can be interchanged as required to assure optimal sound and clarity for various microphone applications. Ideally suited for theater, broadcast and event production.

222 Hartrey Ave.
Evanston, IL 60202
847/866-2200; Fax 847/866-2279
www.shure.com

Soundelux Microphones ELUX 251

Modeled after the famous Telefunken 251, the Soundelux ELUX 251 tube mic will offer the same performance as vintage models, but at a significantly lower cost. The ELUX 251's "no compromise" construction is hand crafted, and all components are hard-wired. This meticulous attention to detail has created an exceptional one-of-a-kind microphone that requires not equalization to record perfect vocals, drums and ensemble settings. Set includes full linear power supply, shock mount and road case.

1147 N. Vine Street
Hollywood, CA 90038
323/464-9601; Fax 323/463-2881
www.soundelux/mic.com

Soundman OKM II

The Soundman OKM II is a German-manufactured binaural stereo microphone headset which utilizes omnidirectional electret condenser microphones. By positioning the microphones in the users' ears, recordings are possible which correspond to the users' subjective perception of sound and during re-play, especially via headphones. This creates a startling impression of three-dimensional space. The Soundman OKM can also be used as a boundary-layer microphone and as a lavalier microphone.

Dist. by Independent Audio
43 Deerfield Road
Portland, ME 04101

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SAC-2K

See it at **A.E.S. [Booth #1850]**

and you will see what the excitement is all about! Touch-sensitive and motorized control with every parameter only one touch away. You will wonder how you ever made music without it!



Radikal Technologies
1119 North Wilson Avenue
Teaneck, New Jersey 07666
Phone: 201-836-5916
Fax: 201-836-0661
email: radikal@tdt.net
Web: www.radikaltechnologies.com

RADIKAL RETURNS MUSICAL CONTROL TO THE MUSICIAN!



Radikal Technologies

CIRCLE #128 ON PRODUCT INFO CARD

SIMPLY THE BEST!



Simon Systems four-channel **RDB-400 Integrated Direct Box** is simply the best direct box you can buy. This AC powered unit boasts a totally active (transformerless) audio path design with no insertion loss. With features like variable line level output, variable attenuation trim, unbelievable headroom, speaker-level input pad, active unbalanced/balanced outputs, front/rear inputs and output connectors, and much more, it's easy to see why so many professionals insist on it in the studio as well as on the road.



The portable single channel version **DB-1A Active Direct Box** also features line-level output with no insertion loss. A three-way independent power scheme facilitates rechargeable battery capability and automatic system power check (optional PS-1 Power Supply is recommended).



For the ultimate in headphone distribution systems there is the **CB-4 Headphone Cue Box**. The CB-4 features four headphone outputs independently controlled by conductive plastic stereo power controls. The XLR input/output connectors allow numerous boxes and headphones to be connected to the same amplifier with headroom, clarity, and flexibility that cannot be achieved with active headphone cue amplifiers. A three-position switch selects left mono, right mono, or stereo mix, allowing for additional cue mixes. Whenever you think signal processing, think like the pros; **Simon Systems - Simply the Best!**



Manufactured by: Simon-Kaloi Engineering, Ltd.
2985 East Hillcrest Drive • Thousand Oaks, CA 91362
Phone: (805) 777-10784 Fax: (805) 777-1186
Website: www.skeng.com Email: sales@skeng.com

CIRCLE #129 ON PRODUCT INFO CARD

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207/773-2424; Fax 207/773-2422
www.independentaudio.com

Stedman Proscreen PS101

All-metal design pop screen with gooseneck. PS101 does not roll off high frequency and eliminates all popping "P" sounds. PS101 comes with lifetime warranty. List: \$59.
4167 Stedman Drive
Richland, MI 49083
616/629-5930; Fax 616/629-4149
www.stedmancorp.com



Studio Projects C Series Mics

The C Series is a joint effort between Studio Projects and 797 Audio, resulting in a new line of superior-sounding large diaphragm condenser mics using the latest in manufacturing and materials, providing high-quality mics at an affordable price. The models are the C1 fixed cardioid (\$299.99 retail). The C3, a 3-pattern with pad and high-pass filter (\$599.99); and the T3 is a dual-triode tube design with variable power supply and case. All mics include shock mounts.

c/o PMI Audio Group
23773 Madison St.
Torrance, CA 90505
310/373-9129; Fax 310/373-4714
www.pmiaudio.com

Mixing Consoles

Alcorn McBride Mr. Mixer

One-rackspace programmable 8x2 mixer. It stores 128 user-defined mixes, mixes any input (balanced or unbalanced) to either or both outputs and is controllable via RS-232, RS-422, parallel contact closures and MIDI. It has trim pots for fine output level adjustments and signal level clipping LEDs for inputs and outputs. Retail is \$995.

3300 S. Hiwassee, Bldg. #105
Orlando, FL 32835
407/296-5800; Fax 407/296-5801
www.alcorn.com

Allen & Heath ML 5000

The ML 5000 from Allen & Heath is a dual function FOH/monitor console or both simultaneously in 32/40/48-channel configurations with the addition of a 24-channel sidecar. The ML 5000 series also offers true L-C-R panning, 12x8 matrix, eight VCA groups with 128 snapshot mute/VCA automation and legendary 4-band British EQ. ML 5000: 32 channels \$23,999; 40 channels \$26,999; and 48 channels \$29,999.

8760 S. Sandy Parkway
Sandy, UT 84070
801/568-7660; Fax 801/568-7662
www.ML5000.com

Amek Media 51

Designed for music recording and post-production environments, the Amek Media 51 effortlessly addresses cur-

rent surround formats 5.1, LCRS, LCRSS and Stereo, providing comprehensive signal path switching and panning specifically for multiformat recording and monitoring. Media 51 includes Mr. Rupert Neve Mic Amp and EQ, Supertrue™ automation, Virtual Dynamics™ and recall of all channel parameters. List: \$49,950.

1449 Donelson Pike
Nashville, TN 37217
615/360-9488; Fax 615/360-0273
www.amek.com

AMS Neve 88R

Remember how it felt when you heard your first Neve...? Feel it again. AMS Neve launches the 88R at AES, the ultimate in music mixing.

AMS Neve Libra Live Series II

The Libra Live Series II is a console designed specifically for versatile operation in a broadcast production environment. The console is suitable for live and multitrack production both in the studio and OB. The Libra Live Series II offers users all the advantages of digital control and a digital signal path with the ease of use of an analog console.

Billington Road
Burnley, Lancs, UK BB11 5UB
44/0/1282-457011; Fax 44/0/1282-417282
www.ams-neve.com

Argosy Enclosures for the Sony DMX-R100

Argosy has introduced its latest 90 Series console enclosure designed to exactly fit the new Sony DMX-R100 mixer. The 90 Series allows for a variety of configurations including one or two R-100s, computer equipment, 19-inch rack gear and producers desk space. The patented expandability feature allows users to extend the chassis to accommodate more equipment in the future. The 90 Series exacting fit and finish transforms the R-100 into the centerpiece of your studio.

5687 Precision Court
Osage Beach, MO 65065
800/315-0878; Fax 573/348-2769
www.argosyconsole.com

Audio Toys Inc. Paragon II

A 64-input FOH mixing console with ATI's new Distributed Intelligence™ control system. Eight mono and four stereo aux sends, eight stereo groups, two mono and two stereo mix masters, eight stereo Matrix masters, ten VCA masters, eight mute groups, onboard dynamics and ATI's famed 4-band EQ. Providing a new and unprecedented level of audio quality and engineer control, the PII House is the reference standard. Prices start at around \$100k.

Audio Toys Inc. Paragon Production Console

The new ATI Paragon Production console is designed for FOH mixing, broadcast production or live theater. Standard unit features 64 mic inputs with full routing, eight stereo line inputs with routing to groups or the mix busses, and four stereo line inputs with routing to the stereo masters or matrix. Outputs include eight mono and four stereo aux busses, eight stereo audio groups with inserts, eight stereo matrix outs with inserts, two main mono mix outs and two main stereo outs. All input channels also have a stereo direct out and insert send, each with level control. New Distributed Intelligence™ allows the console to route and remember Group, VCA and muting without the need for a central computer.

9017-C Mendenhall Court
Columbia, MD 21045
410/381-7879; Fax 410/381-5025
www.audiotoys.com

Cadac R-Type Touring Console

Cadac's new lightweight console—a cost-efficient package designed for fast installation. The R-Type combines tour-

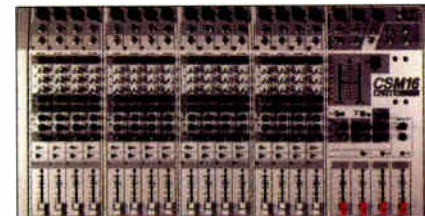
ing ruggedness with the legendary Cadac audio quality and reliability, and is configured in multiples of Cadac's new lightweight 24-slot frame. A typical configuration of the 41-bus R-Type provides 48 mono and four stereo inputs, a full output section plus dedicated LCR outputs with 16 DC Masters. A major benefit for rental companies is the ability to reconfigure the console exactly to match each tour's specification and budget—using Cadac's unique plug-anywhere modules.

One New Street
Luton, Bedfordshire, UK LU1 5DX
44/0/1582-404202; Fax 44/0/1582-412799
www.cadac-sound.com

Calrec Alpha 100 Version 1.4

Calrec's Version 1.4 software for the Alpha 100 digital console builds on the Alpha-based production software launched at the Paris AES show in February, providing 48 multitrack/matrix outputs, 20 auxiliary buses, eight audio groups and four main outputs—each of which can simultaneously be Mono, Stereo or Surround. All desk functions are memorised to snap-shots and full system reset is achieved in less than 60 ms without audio interruption on this fifth-generation Calrec desk to feature an assignable digital control surface.

Calrec Audio Ltd.
Nutclough Mill, Hebden Bridge
West Yorkshire, UK HX7 8EZ
44 /0/1422-842159, 44/0/1422-845244
www.calrec.com



Crate CSM Series Mixers

Crate Pro Audio has introduced a whole new line of stereo console mixers. The series includes 8, 12, 16 and 24-channel models, each built tough with solid metal nutted pots, XLR inputs and a host of other pro features.

1400 Ferguson Ave.
St. Louis, MO 63133
314/727-4512; Fax 314/727-8929
www.crateproaudio.com

Crest Audio X-VCA.52

Crest Audio introduces a larger format of the X-VCA console: the X-VCA.52. Standard configuration includes 48 mono mic/line input channels and four stereo line input channels. VCA control is provided not only on input channels, but on group channels as well. Mono inputs feature 4-band full parametric EQ and high-pass filter system. Group modules include dynamics systems including compressor/limiter and gate/downward expander. L/R/M outputs include parametric EQ and RMS limiters. X-VCA.52 lists at \$30,000.

100 Eisenhower Drive
Paramus, NJ 07652
201/909-8700; Fax 201/909-8744
www.crestaudio.com



Euphonix System 5 V2.0 Software

V2.0 Software offers a number of features developed specifically for the music recording, broadcast and post industries, including a Fail Safe Diagnostics System that provides hot-swappable redundant processing modules that automatically take over in the event of a DSP or control failure. Also included: expanded Integrated PatchNet I/O Router (672x672 sources and destinations at 48 kHz, and 336x336 at 96 kHz); multiformat channels (Stereo, LCR, LCRS, 5.1, 6.1, 7.1 and others); plus Backstop PFL. 220 Portage Avenue
Palo Alto, CA 94306
650/855-0400; Fax 650/855-0410
www.euphonix.com

Geoffrey Daking—Daking Desk 16x8

This all-discrete, Class-A, transformer-coupled topology console using the circuits of the 52270 channel amplifier, featuring Jensen transformer-coupled mic pre, 4-band equalizer with five switched frequencies on each band, stereo bus and eight output buses, four aux sends with pre and post, channel insert with relay bypass, auto-mute group muting, stereo solo, long throw faders, direct channel outputs and genuine Jensen transformers on stereo, group and aux outputs.
2401 Pennsylvania Ave.
Wilmington, DE 19806
302/658-7003
www.daking.com

Harrison by GLW MPC II

Harrison's MPC II incorporates the Digital.Engine™, the High Density I/O Digital Converter system and new control surface components in the most powerful, large-format, digital film/post-production console available. Features include: large format multi-operator digital engine, enhanced multi-operator automation, expanded layering access, expanded film monitoring, multi-operator sweet spot control, new high-resolution digital meters and expanded digital router control.
1024 Firestone Parkway
LaVergne, TN 37086
615/986-7700; Fax 615/986-7707
www.harrisonconsoles.com



Innova-Son Sensory Grand Live

Designed for installed or touring sound, the mixer features 72 inputs, 48 faders and 24 outputs. All inputs offer 5-band parametric EQ, compressor, noise gate and routing. Combining full digital snapshot reset capabilities, the Grand Live maintains an analog feel with motorized faders, knobs and switches, channel-to-channel copying, off-line editing and patch settings. The Grand Live Console provides a remote stage box with a 450-foot co-axial snake. Priced from \$119,000.
c/o Sennheiser
One Enterprise Dr.
Old Lyme, CT 06371
860/434-9190; Fax 860/434-1759
www.innovason.com

Jim Gamble DCX Event 40

Features include: 40 input channels with 80 mic inputs and 80 line inputs, normalised through to the patchbay and 160

female XLR connectors (with ground lifts), and four Ramlatch connectors; eight stereo subgroups and 16 stereo aux sends; eight stereo matrix with stereo EQ; stereo master (with center and mono buses); a pullout LCD server display; 48 output tie lines in the patchbay and 48 male XLRs and two Ramlatch connectors on the back of the console. Includes one DCX workstation with dual 21-inch monitors, a 3Com 10/100 hub, 350 foot CAT5 network wire and a workstation roadcase.
Box 7047
Tahoe City, CA 96145
530/583-0138; Fax 530/583-5603
www.gambleboards.com



Level Control Systems CueConsole

CueConsole™ is a uniquely modular control surface that turns the Matrix3™ mixing/processing engine into a powerful FOH console for theatrical or live concert applications requiring automation. Four types of controllers are available: Faders, Meters, Transporter and Editor. As CueConsole is just a control surface without any audio passing through, the controllers can be separated and placed anywhere they are required. For example, an Editor controller being used to do system EQ could be taken anywhere in the venue including the balcony.

Level Control Systems Matrix3

Matrix3 is LCS' third-generation automated audio control system. Developed to the demanding requirements of live theatrical productions and themed entertainment, Matrix3 offers unparalleled flexibility for solving tough dynamic audio matrixing, processing and automation requirements. Highly modular and greatly expandable: systems can be configured from 8x8 all the way up to 400 inputs by 512 outputs with 256 buses. New features include delays and EQs in the crosspoints of the matrix, compressors as well as delays and EQs on every input/output, Cobranet I/O, digital I/O and selectable gain analog I/O.
130 E. Montecito Ave. #236
Sierra Madre, CA 91024
626/836-0446; Fax 626/836-4883
www.LCSaudio.com



Mackie Compact VLZ PRO Mixers

The three mixers in Mackie's Compact VLZ PRO™ series of mixers feature new Precision-Engineered XDR™ extended dynamic range premium studio-grade mic preamps, with an exceptional 60dB-gain range, ultra-low noise and the highest headroom in their class. Other features include: exceptional RF rejection, special design circuitry to minimize noise and crosstalk, convenient ALT 3/4 bus and active 3-band EQ on the 1202 and 1402 and swept mid on the 1604 (positioned at Mackie's popular musical frequency points).
16220 Wood-Red Road N.E.
Woodinville, WA 98072
425/487-4333; Fax 425/487-4337
www.mackie.com

Oram Pro Audio BEQ Pro 24

The BEQ Pro 24 Professional 5.1 audio console from the "father of British EQ" John Oram. The Oram BEQ Pro24 has been designed for the studio that requires the classic warm sound that Oram Sonics delivers, together with today's sound-around mix functionality. The Pro 24 is also equipped to deliver your finished master from the two mix outputs. We have included \$6,000 worth of mastering equalization and compression in the center section. No other console available in its price range can offer so many features and performance.

The Old Forge
Hook Green
Meopham, Kent, UK DA13 0JE
44/0/1474-815300; Fax 44/0/1474-815400
www.oram.co.uk

Rane ECM 64 Mic/Line Mixing System

The ECM extends Rane's audio conferencing line into smaller rooms and applications. With up to four mic/line inputs, two line-level inputs and four outputs, the ECM 64 offers programmable mic/line mixing through RaneWare RW 232 software. With optional digital hybrid and optional acoustic echo canceller, the ECM 64 easily supports phone add-on and/or audio conferencing feeds from audio or video codes. Retail price of the ECM 64 is \$1,499 and \$3,247.
10802 47th Ave. W.
Mukilteo, WA 98275
425/355-6000; Fax 425/347-7757
www.rane.com

Solid State Logic Avant V4

SSL's Avant V4 enhances the versatility of Avant in both post-production and film applications. New features include grouping options offering new ways to link controls such as pans and EQ, a "virtual paddle" option providing additional monitoring and recorder control from fewer switches and the addition of SSL's unique PenPoint bitpad and pen panning. Also in V4 are further enhancements to automation, including more off-line data trim facilities and to machine control and routing.

Solid State Logic Axiom-MT V2.2

Axiom-MT's V2.2 release brings new features to the world's only digital multitrack console with a traditional control surface. These include EQ setup options, allowing operators a choice of EQ profiles, latency management tools to compensate for delayed signal paths when using external inserts, and surround panning from small and large faders using SSL's unique PanPoint system. MT V2.2 also offers individually selectable stereo channels and sweet-spot control of all channels plus MIDI devices.
Begbroke, Oxford, England OXS 1RU
44/0/1865-842300; Fax 44/0/1865-842118
In USA, call 212/215-1111
www.solid-state-logic.com

Soundcraft Series Four FOH

Compact live sound mixer for FOH applications. Available in four frame sizes providing 24, 32, 40 and 48 mono inputs into eight group buses, 10 aux buses, and stereo and mono main mix buses. Four full-function stereo input channels are also included in each frame in addition to the mono modules. The output section includes eight VCA groups and a 16x8 matrix section.
1449 Donelson Pike
Nashville, TN 37217
800/255-4363; Fax 615/360-0273
www.soundcraft.com

SoundTech ST3242

SoundTech's ST3242 Quantum Mixer has 24 microphone and four stereo line channels. This 4-bus production mixer is perfect for everything from studios to full concert

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events. Many advanced functions are available such as AFL/PFL solo, low noise mic pre's, channel direct outputs, control room outputs, channel inserts, stereo aux returns and smooth 100mm faders. The ST3242 is designed for maximum control in a moderate space. Backed by our five-year parts/labor warranty.
444 East Courtland
Mundelein, IL 60060
800/877-6873; Fax 847/949-8444
www.washburn.com/sthome.htm

Soundtracs DS-M Digital Integrated Workstation

DS-M Digital Integrated Workstation provides 24 or 32 tracks of random access audio, video and automation control combined with the power of Soundtracs DS-3 Digital Production console.
200 Sea Lane
Farmingdale, NY 11735
631/249-1234; Fax 631/249-4854
www.soundtracs.com

Spirit by Soundcraft LX7 (32-Channel)

The LX7 combines the essential Spirit live mixer qualities with basic recording-oriented features. Suitable for gigging bands, small installations, small venues, theaters, houses of worship, live and studio recording. True 7-bus architecture, 4-band EQ with two swept midbands, Ultra-Mic+ preamp with up to 66 dB of gain, channel direct outputs, talkback facility, 100mm faders, 48V phantom power, up to 32 inputs including stereo inputs and returns.
1449 Donelson Pike
Nashville, TN 37217
800/255-4363; Fax 615/360-0273
www.spiritbysoundcraft.com

Stagetec/GMA Cantus Mk II

Stagetec's Cantus is the ultimate Digital Mixing Console for broadcast, theater, post, scoring and OB vans. Cantus features local/central channel control, ten layers, fully assignable touch-sensitive knobs. Multiple Cantus Consoles share I/O through Stagetec's distributed-hardware Nexus Audio Router. Fiber-optic cables interconnect consoles and Nexus. forty-bit floating-point SHARCs give sonic perfection. 5.1 & 7.1 panning with motorized joysticks. Mix Minus System with automatic Talk-Around. Total Dynamic moving fader automation. Twenty-eight-bit mic inputs.
18314 Kinzie
Northridge, CA 91325
818/701-6201; Fax 818/701-9545
www.stagetec.com

Studer D950 M2

Studer debuts the D950 M2 with a completely redesigned control surface, using a new color scheme and circular LED displays for rotary controls. The Studer D950 M2 features new system software and Studer's exclusive 3-D audio positioning system, Virtual Surround Panning (VSP), which now offers reverberation in addition to the distance impression early reflections. All three models of the Studer D950 family (B, S and M2) may be configured to meet a broad range of applications with the D950's software, scaleable DSP power and modular input/output architecture. Sizes from 12 to well over 100 channels.
1525 Alvarado St.
San Leandro, CA 94577
510/297-2711; Fax 510/297-2785
www.studer.ch

Symetrix 460 Presentation Audio Mixer

The 460 Presentation Audio Mixer is a digital mixer for AV presentation systems in boardrooms, classrooms and similar venues. It features two mic/line and four stereo inputs, with two stereo outputs. Routing, level, dynamic control and EQ functions are configurable via front panel

controls. Ports for EIA-232 or 485 serial data control are provided for AMX or Crestron controllers. Contact-closure inputs for preset selection and inputs for remote level control are also provided.
14926 35th Avenue West
Lynnwood, WA 98037
425/787-3222; Fax 425/787-3211
www.symetrixaudio.com

TL Audio VTC Tube Console

The award-winning VTC is quite simply the only large format tube mixing console currently available. Its modular in-line design boasts 4-band EQ with one stereo and six mono aux sends, with options including patchbay, fader/mute automations and comprehensive meter bridge. Available in sizes from 16 to 56 channels, the VTC perfectly complements both analog and digital recorders, and is unique in combining the classic warmth of tubes with the functional demands of modern music production.
c/o HHB USA
1410 Centinela Ave.
Los Angeles, CA 90025
310/319-1111; Fax 310/319-1311
www.hhb.co.uk



Trident MTA

This is the original A Series design, as copyrighted from the original blueprints in 1973 by Malcolm Toft and used by the Beatles, Elton John, Queen and many more! Transformer-stage mic pre, 3 highpass and lowpass filters, discrete Class A amplifiers with inductive-tuned EQ circuits and more. The only real difference from the original is the transparent output gain control which is an essential addition to the A series channel, allowing the output gain to drive any professional equipment. Starting at \$3,499 for two channels.
23773 Madison Street
Torrance, CA 90505
310/373-9129; Fax 310/373-4714
www.joemeek.com

Yamaha M3000-56

The M3000-56 is a FOH/monitor mixing console featuring 56 inputs, four stereo channels, switchable phantom power, sweepable highpass filters, 16 mix buses with group/aux diversity system, 128 scene memories with MIDI-control capability, MIDI mute groups with 8 hard-assign switches assignable channels to 8 VCA groups, 20x8 submix matrix, insert send/return patch points and switchable 4-band EQ.
6600 Orangethorpe Ave.
Buena Park, CA 90620
714/522-9011; Fax 714/522-9522
www.yamaha.com



Beatnik Production Music

Beatnik Production Music is a music and sound licensing site that contains more than 120,000 music and sound files. The site allows for searching, auditioning, licensing and downloading production-quality music and sound clips from prestigious music libraries, including Access Music, Chappell Recorded Music Library, Extreme Music, FirstCom Music, Glacier, Gotham, Headspace, Hollywood Film Library, Keyfax, Killer Edge, Killer Tracks, Network Music, Sonicopia, TunEdge and Zero-G.
Beatnik Inc.

2600 S. El Camino Real
San Mateo, CA 94403
650/295-2300; Fax 650/295-2333
www.beatnik.com

E-mu E4 Platinum

The E4 Platinum is E-mu's new top-of-the-line professional sampler running new EOS Version 4.5 software, and features E-mu's latest filter/mixing chips and the new RFX-32—E-mu's highly anticipated new FX engine (which allows you to route external signals through its synth engine and the RFX-32). The E4 Platinum also comes standard with 128 MB of RAM, 16 analog outs, 16 channels of ADAT out, six analog inputs, eight ADAT inputs, 20 CD-ROMs and large internal IDE HD.



E-mu Virtuoso 2000

The new E-mu Virtuoso 2000 is a 128-voice expandable orchestral sound module that provides the modern composer/musician with a brand new, comprehensive orchestral sound set in a state-of-the-art package. E-mu's sound designers spent months sampling dozens of solo and section instruments, all from the same professional symphony orchestra, to develop an orchestral ROM sound set that is second to none in realism, versatility and consistency throughout all of its instrument sections.
1600 Green Hills Road
Scotts Valley, CA 95067
831/439-0327; Fax 831/438-8612
www.emu.com

Generalmusic GEM PRP6

The GEM PRP6, a 76-key keyboard, features 32-new presets, including ten-exclusive piano sounds and 444-orchestral sounds, which are GM-GMX compatible. Twenty-two-reverbs and 22-effects have been added and are connected to the presets. It offers a six-watt plus six-watt stereo amplification system that reproduces the complex sound diffusion of an acoustic piano, from full tones to subtle tones.

Generalmusic GEM PRP7

The PRP7 offers 48-presets, including ten exclusive piano sounds and 444-orchestral sounds that are GM-GMX compatible. Twenty-two reverbs and effects are also featured. The 88-key keyboard provides an internal library of 96 famous musical pieces written for the piano. It has a practical sequencer with a capacity of 8,000 events, and a joystick allows easy control of the pitch and modulation of each sound.
Generalmusic/Peavey
711 A Street
Meridian, MS 39301
601/483-5365; Fax 601/486-1278
www.generalmusic.com

Kurzweil PC2X

The Kurzweil/Young Chang PC2X 76 semiweighted and 88 weighted-action performance controllers have up to 128 voices of polyphony with a new soundsset: many new stereo multi-strike samples, including three-strike grand piano, new strings, classic keys, new brass, drums, percussion, Take 6 vocals and more. Also included: 24-bit digital out and stunning digital multi-effects, plus four-zone fully programmable master MIDI controller features.
9501 Lakewood Ave. SW, Suite D
Lakewood, WA 98499
253/589-3200; Fax 253/984-0245
www.kurzweilmusicsystems.com

Northstar Ancient Worlds, Symphonique

Ancient Worlds: Irish (Uilleann pipes, penny whistle, cittern, bodhran, mandolin, etc.), baroque, renaissance. Greek: sackbut, kithara, aulos, etc. Symphonique: com-

plete strings, brass, harp, woodwinds, vocals, harpsichord. Solo & section instruments.
13716 SE Ramona
Portland, OR 97236
503/760-7777; Fax 503/760-4342
www.northstarsamples.com

Seer Systems Super SurReal Bundle

A bundle CD that includes SurReal software synthesizer, Technosphere bankset, Warren Trachtman grand piano banksets, CDXtract translator that translates from Roland and AKA! to Sound Font that can be played in SurReal, SeerMusic player for Internet music composition and the Seer Wavmaker that renders MIDI files into .WAV files.

108 Portola Road, PMB 108
Portola Valley, CA 94028
888/232-7337; Fax 210/495-1065
www.seersystems.com

Sonic Foundry ACID Latin & Techno

Following the ACID family tradition of the professional, royalty-free, loop-based production software series, Sonic Foundry introduces two new genres, ACID Latin and ACID Techno. Product specs: unlimited tracks; real-time file/loop audition; automatic loop tempo and pitch matching; G2, WMA and MP3 file support; non-looping audio file support; real-time tempo and pitch changes; and Audio recording. \$59.95 each.
754 Williamson St.
Madison, WI 53703
608/256-3133; Fax 608/256-7300
www.sonicfoundry.com

VideoHelper Music Library Freakshow

Infamous for creating "alternative" production music, VideoHelper storms the midway with its newest disc, "Freakshow." Crammed with 60 discrete themes, "Freakshow" features cuts that dare combine punk rock and Mariachi, plus client-driven requests (the vintage sound of newsreel music in "News Marches On") and tracks composed entirely of glassware and typewriters. Also included is the sickest—and we mean sickest—smattering of Holiday music ever offered by a production music library ("Silent Night, Holy Terror" and "First Noel, Then Rock.")
22 West 21st Street, Suite 1203
New York, NY 10010
212/633-7009; Fax 212/633-9014
www.videohelper.com

Voce 5 Tonewheel Organ Module

V5 organ module is a MIDI controlled, fully polyphonic organ synthesizer utilizing a modeled organ generator architecture. It's a small non-rackmount unit intended for use near a MIDI keyboard as it has onboard drawbars protruding from the front of the unit.

Voce Spin II

Stomp box rotating speaker simulator. Analog simulator has stereo out, adjustment for speeds controls and is AC-mains powered.
7 Palisade Ave.
Emerson, NJ 07630
201/599-0100; Fax 201/599-0404
www.voceinc.com

Power Amplifiers



Apogee Sound CA-1000 Series

CA-1000 Series Amplifiers are designed for touring, permanent installations and commercial sound applications and feature power MOSFET technology for improved reliability and sonic quality and reduced heat output. All models feature rear panel level controls and easy access to the front panel air intake and air filter. Additional features include a clip eliminator, speaker protection and adjustable speed fans. The power supplies use low ESR capacitors and uniform-wound toroidal transformers. Rear panel mounting ears are optional.
2180 S. McDowell Blvd.
Petaluma, CA 94954
707/778-8887; Fax 707/778-6923
www.apogee-sound.com

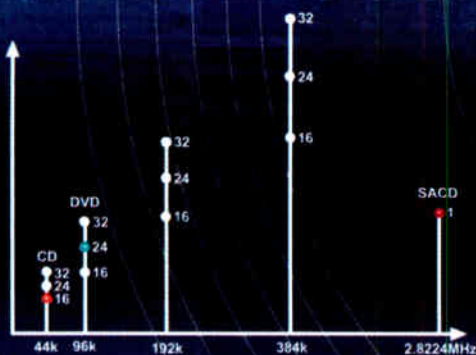
BGW Performance Series 3fL

The Performance Series 3fL Power Amplifier is the first in a series of products to incorporate BGW's innovative fastLink technology. fastLink monitors crucial aspects of amplifier performance via an HD15-F (standard VGA 15-

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PYRAMIX VIRTUAL Studio 3.2



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pin High-Density D-type female connector), allowing the PS 3fL to link with existing industry-standard control systems and signal processing. Based on the BGW Performance Series 3 power amplifier, the compact PS 3fL delivers over 700 watts per channel into a 2-ohm load. 13130 Yukon Ave. Hawthorne, CA 90250 310/973-8090; Fax 310/676-6713 www.bgw.com

Bryston Ltd. 14B ST

Recording studio, film production and mastering suites. Two-channel; power/clipping lights; mono/stereo switch; independent power supplies; Quad-Complementary output section; heat sink; convection cooling; bridgeable; Gold-plated connectors; and 5-way binding posts. Balanced or unbalanced. Individual trim pots per channel. Power per channel: 600 watts @ 8 ohms, 1000 watts @ 4 ohms. Over 2000 watts bridged @ 8 ohms. THD< 0.004%. XLR/1/4-inch/RCA connectors. 19x5.25x22 inches. Weight 90 lbs. Neal Dr. Peterborough, Ontario, Canada K9J 7Y4 705/742-5325; Fax 705/742-0882 www.bryston.ca

Carver Professional CV Series

Three mono amplifiers and three dual-channel amplifiers, from 60 W to 800 W. All are convection cool, with remote level control and power sequencing. Additionally, a series of special application input modules are available for the CV Series: Paging Module, Mixing Module, Microphone Input Module and DSP Module, with and without networking card. 9300 N. Decatur Portland, OR 97203 503/978-3344; Fax 503/978-3302 www.carverpro.com



Crest LT and ST Amps

Crest Audio introduces new light-weight amplifiers with its 33-lb. LT amplifier with linear-toroid power supply and its 24-lb. ST amplifier with resonant-switching power supply. Both versions are available in 250watts, 500W, 750W and 1000W per channel (4-ohm) power points and are housed in a two-rackspace package. Input connectors include 1/4-inch TRS, XLR and Phoenix connectors. Speakon and five-way binding posts are provided for outputs. 100 Eisenhower Dr. Paramus, NJ 07652 201/909-8700; Fax 201/909-8744 www.crestaudio.com



Crown CE-4000

The new CE-4000 features patented and award-winning BCA switching technology. BCA generates more power and less heat than traditional linear amplifiers. Crown's Switch Mode Power Supply allows enormous power and

performance and only weighs 34 lbs. Power Factor Correction for global power compatibility means your CE-4000 will work with any line voltage. Delivers 1800 W @ 2ohms (> or = to 200V line voltage), 1200 W @ 4ohms and 600 W @ 8ohms. 1718 W. Mishawaka Road Elkhart, IN 46517 219/294-8200; Fax 219/294-8329 www.crownaudio.com



Hafler SR-2600

Hafler's new SR-2600 600-watt per channel live sound amplifier delivers real power without thermal problems—continuously—at any impedance. The two-rackspace Class G amp provides for a very simple gain path for incredible sound quality, as well as high efficiency and lower heat. Power is the same regardless of impedance, so the user/installer need not worry about the load. Features include switching power supplies and surface mount and MOSFET technologies. MSRP is \$1,899. 2055 E. 5th St. Tempe, AZ 85281 480/517-3046; Fax 480/894-1528 www.hafler.com

QSC PowerLight 2 Series

New for portable live sound/touring applications, the PowerLight 2 amplifier series combines high-performance power with integrated signal processing. Four models—PL218 (US list price \$1,330), PL224 (\$1,620), PL230 (\$1,920) and PL236 (\$2,160)—deliver up to 1,850 watts per channel @ 2ohms in a 21lb., two-rackspace chassis. Each model comes in three versions: a base model; an A version with internal analog signal processing; and a D version with digital signal processing capability.

QSC DSP-3

The DSP-3 is a compact digital signal processing solution that offers two channels of independent DSP. Each channel handles a wide variety of DSP functions, including high- and lowpass crossover filters, high- and lowpass shelf filters, signal delay, compression, peak limiting, six parametric filters, two-to-one mixer, signal splitter, signal mute, 0.1dB attenuation steps, signal polarity reversal and selectable 1v/3v input sensitivity. Configuration is via an advanced drag-and-drop software graphical user interface. MSRP is \$428. 1675 MacArthur Blvd. Costa Mesa, CA 92626 800/854-4079 or 714/754-6175; Fax 714/754-6174 www.qscaudio.com



SoundTech PL1204

SoundTech is pleased to present the PL1204 Powerlab Quad amplifier. The 4-channel PL1204 provides 280 watts/channel into 4 ohms or 190 watts/channel into 8 ohms. Each pair of channels can be bridged to provide 560 watts/channel. Other features include varispeed fan cooling and two internal heat sinks to keep things running smoothly. Backed by a five-year parts/labor warranty. 444 East Courtland Mundelein, IL 60060 800/877-6873; Fax 847/949-8444 www.washburn.com/sthome.htm

Tsunami Technologies HQS-Series Amps

The HQS family of Switch Mode Power is supply based power amplifiers and desk style powered mixers with models up to 2000W stereo power all updated and improved with better protection circuitry and construction. The HQ-2002S power amplifier, 1000W X 2 weighs only 27 pounds, and the full-featured desk style powered mixers feature the same power amplifier sections and weighs only 34 pounds. 459 Geary Street San Francisco, CA 94102 415/776-9705; Fax 415/776-9214 www.tsunamitechnologies.com

Yorkville Audiopro A4.4

The A4.4 is a power-factor-corrected switching power supply amplifier that delivers 1200 watts/channel at 4 ohms. The A4.4 combines a light aluminum chassis and power-factor-corrected power supply with the high-efficiency power amplifier modules of the AP4040. The 26-pound A4.4 also features front-to-back fan cooling, high-pass filter, advanced protection circuitry, ground lift switch, defeatable limiter, stereo/mono/bridge switch, XLR and 1/4-inch balanced inputs and Speakon and binding post outputs. Suggested U.S. retail price is \$1,799. 550 Granite Court Pickering, Ontario L1W 3Y8 905/837-8481; Fax 905/839-5776 www.yorkville.com

Signal Processing, Hardware

Antares Audio Technologies AMM-1

The AMM-1 Microphone Modeler allows any reasonably full-range microphone to sound like virtually any other microphone; simply tell the AMM-1 which microphone you are actually using and which mic you would like it to sound like. The AMM-1 can be used during mixdown to effectively change the mic on an already recorded track as well as adding a model of classic tube saturation distortion. MSRP: \$995. 464 Monterey Ave., 2nd Floor Los Gatos, CA 95030 408/399-0008; Fax 408/399-0036 www.atarestech.com

Audient ASP510

The ASP510 Surround Sound Mix/Monitor controller is an outboard 5.1 surround controller that can be used with any stereo console to provide comprehensive 5.1 monitoring and mix facilities. The ASP510 supports three 5.1 and three stereo sources, has six speaker outputs, features switchable Encoder/Decoder insertion connections, individual cut/solo function, individual speaker level trims, and offers DCA gain control elements, guide track input and easy system integration. 2140 West Greenview #7 Middletown, WI 53562 608/831-8700; Fax 608/831-7100 www.audient.com

CEDAR Audio DNS1000

The DNS1000 Dynamic Noise Suppressor is the world's first digital noise suppression system designed specifically for film production, dialog, dubbing and remote recording. It is a compact desktop unit whose user interface is quick and intuitive. Its zero-latency signal path ensures no loss of lip sync, and 24-bit digital I/O ensures transparency. The floating-point DSP algorithm offers higher selectiv-

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ity than typical analog processors. Low, mid and high-frequency ranges provide you further processing flexibility.

43 Deerfield Road
Portland, ME 04101
207/828-0024; Fax 207/773-2422
www.cedar-audio.com

Crate Pro Audio Studio Modules

The Studio Module Series packs loads of effects into five versatile units. The SM1-SP provides 32 digital effects, the SM2-SRS simulates 3D sound from stereo speakers, the SM3-PE is a three-band parametric EQ, the SM4-CL provides compression/limiting and finally, the SM5-HP is meant for five headphones.

1400 Ferguson Dr.
St. Louis, MO 63133
314/727-4512; Fax 314/727-8929
www.crateproaudio.com

DACS Vocoder

The DACS Vocoder Filter, manufactured in the UK, is a 16-band vocoder filter with balanced line inputs, microphone input, unbalanced guitar input and internal ramp and noise modulation inputs. Features also include octave shift of modulating inputs up/down with a variation between filter and vocoder mode. This great new product also offers output wet/dry mix control. This ultimate analog effector is built to DACS' standard superior quality.

Dist. by Independent Audio
43 Deerfield Road
Portland, ME 04101
207/773-2424; Fax 207/773-2422
www.independentaudio.com

dbx 376 Tube Channel Strip

The 376 Tube Channel Strip with digital output is a combination tube preamp with EQ and compression, featuring a tube preamp; 3-band equalizer with variable mid; compressor with threshold and ratio controls, overeasy and slow switches; de-esser with frequency and amount adjustment knob; adjustable output level; 48V phantom power; 20dB pad switch; phase reversal switch; low-cut switch; line-level and high-impedance instrument inputs and more. Retail: \$599.00.

8760 South Sandy Parkway
Sandy, UT 84070
801/568-7660; Fax 801/568-7662
www.dbxpro.com

D.W. Fearn LC Equalizer

Utilizing much of the circuit-design elements and construction techniques that made the VT-1/VT-2 Vacuum Tube Mic Preamps so popular, the D.W. Fearn LC Equalizer provides the same sonic quality in a single-channel, Class A triode equalizer. The input is balanced-bridging, and the output is transformer-isolated. Active tube stages surround the passive LC equalization circuitry.

Box 57
Pocopson, PA 19366
610/793-2526; Fax 610/793-1479
www.dwfearn.com



Demeter Amplification Real Reverb

The only analog spring reverb that is ready for the digital age. Featuring two channels (one with short decay, one with long), each with its own classic Hammond/Accutronics 6-spring reverb tank, surrounded with the modern low-noise components and innovative circuit design. Each channel has input, mix, output, low cut, phase controls and balanced inputs and outputs. Both input and outputs can be combined. All in a single rackspace. Retail: \$699. 15730 Stagg St.

Van Nuys, CA 91406
818/994-7658; Fax 818/994-0647
www.demeteramps.com

DigiTech RP100

The RP100 combines a room full of vintage and modern amp models with 25 fully programmable studio-quality effects, and up to 10 effects available at once. Each effect includes up to three adjustable parameters providing complete flexibility. The RP100's Rhythm Trainer plays sampled drum beats in an infinite loop, allowing perfect timing with selectable patterns and tempo. The RP100 includes 40 factory/40 user presets, and measures 6.25x8.25x2.25 inches (WxLxH).
8760 S. Sandy Parkway
Sandy, UT 84070
801/566-8800; Fax 801/566-7005
www.digitech.com

Dolby DM100 Portable Audio Monitor

The Dolby DM100 is a battery- or AC-powered handheld unit for testing and monitoring Dolby Digital, Dolby E and PCM multichannel bitstreams in production and broadcast facilities. It generates appropriate test signals and permits monitoring any two of up to eight decoded channels over headphones, or the sum of any pair over a built-in speaker. Metadata information can be displayed on a 2-line LCD, and a pass-through mode allows modifying the input signal's AES channel-status bits.



Dolby DP570 Multichannel Audio Tool

The Dolby DP570 Multichannel Audio Tool is for monitoring multichannel audio, creating Dolby Digital metadata and hearing the metadata's effects in real-time when preparing soundtracks for eventual delivery as Dolby Digital bitstreams. Used with Dolby E and Dolby Digital codecs, the DP570 gives unprecedented control over what viewers hear at home. The DP570 features speaker selection, a built-in Dolby Surround Pro Logic decoder for checking LVRt downmixes, a signal router and options for remote control.

100 Potrero Ave.
San Francisco, CA 94103
415/558-0200; Fax 415/863-1373
www.dolby.com

DTS CAE-4 Encoder

Now shipping, the CAE-4 Professional Encoder was created specifically for audio professionals to encode soundtracks and music content in the DTS format for DVD and CD. It is designed to be simple and user friendly. The CAE-4 accepts six audio channels (three AES/EBU pairs) and outputs a DTS bitstream on a single AES/EBU pair. Front panel controls include timecode mode, surround gain, LFE on/off and 2-channel/5-channel DVD data rate. A DTS software suite, included with the encoder, provides an easy and efficient method to verify bitstream compliance with DTS quality requirements and with DVD standards.

DTS CAD-4 Decoder

Now shipping, the CAD-4 Decoder is a high-performance decoder designed as a companion to the CAE-4 Encoder in professional environments, enabling instant and accurate monitoring of DTS bitstreams. Features include 24-bit D/A conversion for optimum analog output performance and AES/EBU outputs for use with an external D/A and real-time playback of DTS encoded bitstreams.

DTS Headquarters
5171 Claretton Drive
Agoura Hills, CA 91301
818/706-3525; Fax 818/706-1868
www.dtsonline.com

Empirical Labs Fatso Jr.

This 2-channel audio thickening signal processor offers fatness and warmth control, combined with compression and tape simulation/tube emulation modes. Retail: \$2,199.
c/o Wave Distribution
1170 Greenwood Lake Turnpike
Ringwood, NJ 07456
973/728-2425; Fax 973/728-2931
www.wavedistribution.com

E-mu RFX-32

The RFX-32 is a 32-bit, 16 stereo channel effects processor/mixer that can be fitted in all E4 Ultra samplers (standard on E4 Platinum). The RFX-32 provides professional quality effects, extensive bus routing options (including routing external signals through the synthesis and FX engines) and a large number of simultaneous FX. Also available are new 24-bit Analog and Digital I/O (require the RFX-32 to be installed).
1600 Green Hills Road
Scotts Valley, CA 95067
831/438-1921; Fax 831/438-8612
www.emu.com



Eventide DSP7000

Offering four times the processing power and more features— at half the cost—of the DSP4000, the \$3,695 DSP7000 is a 24-bit/96kHz processor with more than 500 factory presets, with 150-user-preset capability, independent gain control and metering of analog and digital I/Os, and compatibility with DSP4000 presets and library cards.

Eventide EVE/NET

The new EVE/NET remote control unit will control up to four stereo DSP7000 and multichannel Orville effects processors in any combination, from one or two remote locations.
One Alsan Way
Little Ferry, NJ 07643
201/641-1200; Fax 201/641-1640
www.eventide.com

Focusrite MixMaster

The Platinum MixMaster is a stereo dynamics processor that inherits its Class A circuit design from Focusrite's legendary Blue Range of mastering processors. It features independent Expander, Multiband Compressor, Limiter, Multiband EQ and stereo imaging controls, all optimized for the final stages of audio production. The Focusrite MixMaster allows for +4 and -10 operating levels, mixing of direct inputs and optional 24/96 digital output.
Dist. by Digidesign
3401-A Hillview Ave.
Palo Alto, CA 94304
650/842-7900; Fax 650/842-7999
www.digidesign.com

Helicon Vocal Technologies VoicePrism

The Helicon VoicePrism, a vocal pitch and formant processor, is a full solution vocal processor for stage and studio. Unlike simple harmony processors, the VoicePrism has a full range of lead and backing channel vocal processing under preset control. The VoicePrism Expansion Card represents the world's first implementation of HVM (Human Voice Modeling) technology. Helicon is a joint venture company owned by IVL Technologies Ltd. and TC Electronic A/S.
742-A Hampshire Road
Westlake Village, CA 91361
805/373-1828; Fax 805/379-2648
www.tc-helicon.com



HNB Radius 3 Fat Man

The new HNB Radius 3 Fat Man is a stereo tube compressor with 15 high-quality presets, making it easy to add fat, professional sounding tube compression when tracking, mixing or playing live. Nothing matches the unique sonic signature of the vacuum tube, and the HNB Radius 3 Fat Man uses classic 12AX7 dual triode devices for the ultimate tube fatness.

1410 Centinela Ave.
Los Angeles, CA 90025
310/319-1111; Fax 310/319-1311
www.hnb.co.uk

Hosa Technology Hum-Zapper

Hosa's HEM-331 Hum-Zapper is a 2-channel, passive transformer isolation device with ground-lift. Frequency response: 20 Hz to 20kHz (+0.5 dB, -1.5 dB). Distortion: 0.05% at 1kHz. Channel separation: 90 dB at 1 kHz. Max. source impedance: 2k ohm or lower. Max. load impedance: 10k ohm or higher.

6920 Hermosa Circle
Buena Park, CA 90620
714/736-9270; Fax 714/522-4540
www.hosatech.com



Lexicon 960L

The Lexicon 960L redefines world-class reverberation as a true multichannel surround and stereo reverb effects system. Featuring: 24-bit/96kHz processing, Lexicon 3DPM algorithms (3-Dimensional Perceptual Modeling), LARC2 remote, input/output mixing, audio/control/hardware/software expandable, 250 factory programs/1,000 registers, eight motorized faders, joystick for surround panning & parameters. Standard configuration: 3DPM—Stereo, 5.1 surround and combine, eight 24-bit/96kHz balanced XLR analog I/O, four stereo pairs 24-bit/96kHz AES/EBU, MIDI, word clock, 3.5-inch floppy and CD-ROM drive for software upgrades.

3 Oak Park
Bedford, MA 01730
781/280-0300; Fax 781/280-0490
www.lexicon.com

Line 6 Bass POD Pro

Bass POD Pro is a rackmount version of Bass POD, featuring amp modeling, effects and Line 6 A.I.R. speaker/mic/room emulation and unique dual output design. With 1/4-inch and XLR analog outputs, AES/EBU and S/PDIF digital outputs, effects loops and a line level input and output (great for re-amping or processing non-bass sources), Bass POD Pro is perfect for professional recording and live performance.

Line 6 POD Pro

Rackmount version of the POD digital modeling guitar amp system, with 32 amp models, 16 mix and match cab models, 16 customizable studio-quality stereo effects, A.I.R. cabinet/speaker/mic emulation, ToneTransfer Web library compatibility and a chromatic tuner. Professional extras include 24-bit digital outs (AES/EBU and S/PDIF) with sync to external word clock, stereo dual mode direct outs, line in and out, XLR outputs for live/studio mode, stereo effects loop, MIDI and more.

555 St. Charles Drive, Suite 100
Thousand Oaks, CA 91360
805/379-8900; Fax 805/379-3001
www.Line6.com

Lucid Studio Sync Generator

The SSG192 high definition Studio Sync Generator produces master reference clock signals for digital audio equipment in recording, post-production and broadcast studios. By providing a single low-jitter clock source for the entire digital studio, common sync problems, manifested as clicks and pops, can largely be eliminated. When used for film or video post-production, the SSG192 can reference the house video blackburst generator, or it can generate video blackburst and serve as the house generator itself.

14926 35th Ave. West
Lynnwood, WA 98037
425/742-1518; Fax 425/787-3211
www.lucidaudio.com

Millennia MSD-02 The Matrix

MSD-02 The Matrix is a mid-side (MS) decoding matrix with a complete Class-A, all-discrete signal path. Includes L/R decoded outputs, direct (thru) M-S outputs, width control and headphone jack with level control.

4200 Day Spring Court
Placerville, CA 95667
530/647-0750; Fax 530/647-9921
www.mil-media.com



Peavey X-Frame 88

The new 24-bit, single-rackspace X-Frame 88 offers 8x8 analog I/O and is expandable by adding the new MM-8802 breakout box, for additional X-Frame 88s for maximum expansion of 24x24. Support for serial control is included. New front panel features include meters for all eight input and output channels. Additional improvements include more DSP power and a new CAT5 cable interface. New software controls analog stages from the MediaMatrix GUI.

711 A St.
Meridian, MS 39301
601/483-5376; Fax 601/486-1678
www.peavey.com

Purple Audio Eyeball

An analog synth-like processor that will seriously screw up whatever signal you put through it. The eyeball allows the user to mix and filter a Frequency Multiplier, Frequency Divider, Distortion, Ring Modulator and dry signal to achieve truly unique sounds using any type of input device. The filter controls are: start and stop frequencies, resonance, VCA Envelope and sweep rate. The filter can be triggered internally or externally via a 1/4-inch on the rear panel.

Purple Audio SI-32

The SI-32 Synthesizer interface consists of 32 channels of unbalanced to balanced amplifier interfaces in a heavy-duty stainless steel 1U rackmount enclosure utilizing ITT

Cannon DL 96 connectors for the inputs and outputs. The SI Series provides a simple solution to the common problem of connecting large numbers of unbalanced equipment, such as synthesizers, samplers and other MI modules to audio recording and live sound consoles over long cable distances.

38-62 11th Street
Long Island City, NY 11101
718/482-8494; Fax 718/482-8159
www.purpleaudio.com



Requisite Audio L2M

Special attention has been afforded to the L2M's audio performance and its ability to link solidly for 5.1 applications. Recent installations include Capitol Mastering in Hollywood and Georgetown Masters in Nashville. The expansion circuit was inspired by the recent trend of mastering houses receiving program material that suffers from hard, digital over-compression. The L2M is ideally suited for this situation.

2645 E. Glenoaks Blvd.
Glendale, CA 91206
818/247-2047 Fax 818/247-4498
www.requisiteaudio.com

Schoeps DSP-4P KFM 360

Surround sound digital processor for the Bruck KFM 360 sphere surround system. Can be used on-location or in post-production to decode a 4-channel input into a full 360° presentation, including a Gerzon-derived center channel for 5.1 surround playback.

c/o Posthorn Recording
142 W. 26th St.
New York, NY 10001
212/242-3737; Fax 212/924-1243
www.posthorn.com



Sony DRE-S777 Enhancements

New enhancements for the Sony DRE-S777 Digital Sampling Reverb include two sampling reverb CD-ROMs: American Acoustic Spaces and Japanese Acoustic Spaces. Now you can record and mix in Ocean Way Studios, a Tokyo bathhouse or even the Grand Canyon. Also, Sony's new DASK-S704 Sampling Function Software allows sampling and storing your own reverb data on a Memory Stick.

1 Sony Drive
Park Ridge, NJ 07656
201/930-1000; Fax 201/958-4907
www.sony.com/professional



SPL Channel One

The Channel One is a complete channel strip that has all the necessary tools on board which include: mic-/line-tube-preamp, de-esser, compressor/limiter with noise gate, SPL's unrivaled EQ techniques and a headphone monitor combined in this unique channel strip for sound perfectionists. The Channel One is tailored ideally to the needs of HD tracking; however, it also satisfies highest requirements in analog environments. Intelligent automation provides ease of use and guarantees musical results for each recording.

Dist. by Group One Ltd.
200 Sea Lane
Farmingdale, NY 11735
631/249-1399; Fax 631/753-1020
www.g1ltd.com

TC Electronic Triple-C

The Triple-C compressor and envelope is a dedicated 3-band insert compressor targeted towards project studio owners and live sound applications. It represents a significantly faster, intuitive and more powerful style of compressor, and comes in both mono and stereo versions. The Triple-C features 3 independent bands of low, mid and high-frequency compression all accessible via a simple to use WYSIWYG hardware user interface combined with an informative, easy-to-read multispectral LCD.

742-A Hampshire Road
Westlake Village, CA 91361
805/373-1828; Fax 805/379-2648
www.tcelectronic.com



TOA Electronics DP-0206 (DACsys 2000)

The new DP-0206 is a 2-in/6-out device expandable to 2-in/8-out, 2-in/10-out, 4-in/6-out, or 6-in/6-out with optional modules. Its TOA Clear conversion technology offers precise 24-bit A/D conversion and more than 110dB dynamic range. User-friendly control software makes it easy to configure and operate, with a wide range of audio processing tools including crossovers, multiband filters, compressor/limiters, noise gates, delays and more. Full matrixing allows users to independently route any combination of inputs to outputs for multizone or room-combining applications.

601 Gateway Blvd., Suite 300
South San Francisco, CA 94080
650/588-2538; Fax 650/588-3349
www.toaelectronics.com



Universal Audio Teletronix LA-2A Leveling Amplifier

Now shipping, the LA-2A—known for its transparent compression—offers unique electro-optical attenuator system allowed instantaneous gain reduction with no increase harmonic distortion—a breakthrough at the time, still appreciated today. In our reproduction of Teletronix LA-2A, painstaking care has been taken to ensure that it matches the performance and characteristics of the original. Price: \$3,495.

Box 3818
Santa Cruz, CA 95063-3818
831/454-0630; Fax 831/454-0689
www.uaudio.com

XTA DP324

The DP324 is a Digital Dynamic Processor system that provides compression, expansion, delay, gate, limiting and dynamic equalization in an easy-to-use format. The DP324 is a 2-input/2-output unit with two assignable auxiliary out-

puts fitted as standard. It is equally at home as a channel insert device or across the final system outputs. The DP324 can be used in both live sound and studio applications.

c/o Group One Ltd.
200 Sea Lane
Farmingdale, NY 11735
631/249-1399; Fax 631/753-1020
www.xta.co.uk/xta

Yamaha SRV1

The SRV1 is a high-quality reverb featuring FIR sampling technology to reproduce different sound fields, capability to simulate environments with short reverb times such as room ambiances, long reverb times such as tunnels and specialized environments such as a stadium. It has the capability to function as a stereo or surround processor, and the ability to sample your own environments is built in. CD-ROM drive and optional remote control.

6600 Orangethorpe Ave.
Buena Park, CA 90620
714/522-9011; Fax 714/522-9522
www.yamaha.com

Z-Systems z-CL6 Mastering Dynamics

A companion piece to the critically acclaimed z-Q6 mastering equalizer, the z-CL6 is a 6-channel compressor/limiter which is suitable for both stereo and surround sound mastering applications. The z-CL6 operates entirely in the digital domain and offers six channels of processing at resolutions up to 24 bits and sample rates up to 96 kHz. It features precise yet analog-like compression and limiting, an intuitive user interface and MIDI automation.

Z-Systems z-Q6 Mastering EQ

The z-Q6 is a 6-channel parametric equalizer, which is suitable for both stereo and surround sound mastering applications. The z-Q6 offers six channels of processing at resolutions up to 24 bits and sample rates up to 96 kHz. It features precise six channels of Z-Systems' world-famous equalization algorithms, an intuitive user interface and MIDI automation.

Z-Systems Ambience Recovery Processors

The z-K2 and z-K6 K-Stereo and K-Surround Ambience Recovery Processors, based on Bob Katz's patent-pending algorithm. K-Stereo enhances and restores a recording's existing ambience, depth and spatial information; it's a handle on the reverb returns after the mix has been made. K-Surround converts existing 2-channel recordings to surround by extracting and spreading the ambience to the front and surround loudspeakers. Both produce effective, warm, enveloping, natural sound without coloration, comb-filtering, breakup or artifacts.

4641-F NW 6th Street
Gainesville, FL 32609
352/371-0990; Fax 352/371-0093
www.z-sys.com

Signal Processing Software

Antares Audio Technologies Auto-Tune 3

Auto-Tune 3 enhances the worldwide standard in pitch correction with new features, including phase-coherent processing of stereo tracks; extended low-frequency pitch range; 96kHz capability; setting of target notes via MIDI; a new Learn Melody From MIDI function; even better pitch detection; a snazzy new interface; and much more. The TDM version also adds optimized Mix Chip usage for up to 4 instantiations per chip as well as AudioSuite functionality. TDM \$599 MAS, Mac VST, RTAS \$399, DirectX \$299.

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464 Monterey Ave., 2nd Floor
 Los Gatos, CA 95030
 408/399-0008; Fax 408/399-0036
 www.antarestech.com



Arboretum Hyperprism V. 2.5

Hyperprism V. 2.5 is a sound design program offering around 40 effects, with simultaneous mouse control of any parameters for each effect. It includes the latest Granulator, HyperPhaser and Formant Pitch Shift. The program is available as several sets of plug-ins for HyperEngine (Arboretum's native host) for \$299, Premiere (Mac) for \$199, VST (Mac) for \$199, AudioSuite (Mac) for \$199 and DirectX (Windows) for \$199. The Plug-In-Pack includes all Premiere, VST, AudioSuite and DirectX sets for \$399. 75 Aura Vista Drive Pacifica, CA 94044 650/738-4750; Fax 650/738-5699 www.arboretum.com

Bomb Factory BF Essentials

BF Essentials™ for Digidesign and MOTU systems is a full suite of time-saving, trouble-solving tools all priced under \$100. The BF Essential Meter Bridge™ (\$69) provides great analog metering on any channel. Avoid flickering green lines or blinky fake LEDs, and enjoy the ease of use afforded by a needle, a big meter and the decades-old industry standard for meter ballistics. Select RMS or British Peak (PPM) metering and calibrate instantly for useful viewing at any signal level. The BF Essential Tuner™ (\$99) uses the power of TDM and modern host CPUs to track better and tune faster than any of those battery-eating handheld gizmos. Works great on bass, electric guitar, vintage synthesizers...you name it.

Bomb Factory JOEMEEK™ VC5 EQ

Joe Meek prototyped musical circuits in tiny tobacco tins. One of them was a treble and bass circuit used in conjunction with a sweepable mid control. The Meequalizer for Digidesign and MOTU systems recreates the exact circuit used by Joe Meek, offering simple controls and incredibly warm, musical results. Use it on mono or stereo tracks! \$199. 3917 W. Burbank Blvd. Burbank, CA 91505 818/558-7171; Fax 818/558-1611 www.bombfactory.com

Cycling '74 MSP 2.0

Cycling '74 announces Version 2.0 of MSP, its real-time synthesis and signal processing extensions to the Max graphical programming environment for Mac OS. This update includes support for 24-bit audio file formats, 512 I/O channels, support for ReWire and DirectConnect and more than 40 new and enhanced audio processing and sample playback objects. Now shipping; cost TBA. 1186 Folsom St. San Francisco, CA 94103 415/621-5743; Fax 415/621-6563 www.cycling74.com

Digidesign Reverb One

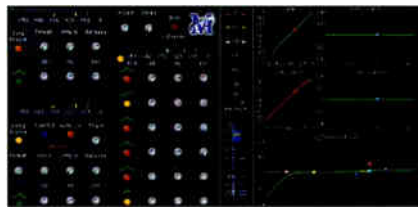
The latest addition to Digidesign's plug-in stable is Reverb One, an exceptional-quality mastering and effects reverb for Pro Tools TDM customers. Making use of controls that were previously only found on hardware reverb units, this new plug-in allows Pro Tools customers to create a wide range of new reverb sounds from an extensive set of presets that are easy to manipulate from an intuitive user interface. 3401-A Hillview Drive Palo Alto, CA 94304 650/842-7900; Fax 650/842-7999 www.digidesign.com

DUY EverPack

EverPack is a native bundle of five plug-ins for RTAS, MAS, VST, Audiosuite and Premiere. The included plug-ins are DaD Valve, DUY Shape, Max DUY, DUY Wide and DUY's brand new reverb, DUY Z-Room, which has three processing modes that optimize processing time. Plaza Lesseps 33 Barcelona, Spain 11/3493/217-4510; Fax 11/3493/217-6313 www.duy.com

Kind of Loud RealVerb 5.1

RealVerb 5.1 is the first reverb designed for surround. RealVerb uses both spatial and spectral techniques to model physical spaces and maps reverberation spatially for surround mixing. Morphing tools customize room shapes and materials, and users can create hybrid rooms, from a simple shoebox to a fan-shaped concert hall, with control over the nature, size and materials. Complex algorithms support morphing and blending in real-time with no zipper effect. Precise and independent controls determine the strength, timing and surround field placement of the direct path, early reflections and late-field reverberation. You can also control the direct source location to change the perceived distance between the sound source and your listener. Price: \$1,495. P.O. Box 3800 Santa Cruz, CA 95063-3800 831/466-3737; Fax 831/466-3775 www.kindofloud.com



Metric Halo Laboratories ChannelStrip

ChannelStrip provides all critical channel processing features one expects on top-line mixing consoles in a single mono or stereo plug-in. ChannelStrip combines stunning sound quality with a convenient interface, allowing control of all critical channel processes interactively and simultaneously, just like a real console! Key features: expander/gate with integrated sidechain filter; compressor with integrated sidechain filter; 6-band fully parametric 64-bit EQ; and high-resolution metering. Price: \$495. MS 601 Building 8 Castle Point, NY 12511 845/831-8600; Fax 603/250-2451 www.mhllabs.com

Peavey MWare 3.1

MWare 3.1 is the latest release of Peavey's MediaMatrix software, featuring new devices and more functionality. Additional support for advanced networking via the CobraNet network and TCP/IP control clients has been expanded. New devices include the DTMF Decoder, which provides external control via standard CO or PBX-based telephone systems, the Gain Sharing AutoMixers, Ramp-

ing Routers and control delay. Support for the new CAB 16 series of CobraNet bridges is also new. 711 A St. Meridian, MS 39301 601/483-5376; Fax 601/486-1678 www.peavey.com



Power Technology DSP-FX Stereo Widener

The DSP-FX Stereo Widener allows you to enhance and manipulate the stereo image of stereo tracks and .WAV files. The Widener accomplishes this by extracting the stereo and mono components of the audio signal and allowing you to manipulate those components in time and space. When used on individual tracks recorded using stereo miking techniques, the Widener is very effective in providing a more natural sound by virtually letting you read just the microphone placements and correct for phase problems.

Power Technology DFX

DFX enhances the listening experience of Winamp, RealPlayer, RealJukebox and Sonique users by correcting the sonic limitations of MP3, RealAudio and Windows Media. These audio formats suffer from two major problems: loss of high-frequency fidelity (causing a muffled sound) and loss of stereo separation and depth. DFX also compensates for the limitations of typical PC playback systems and listening environments. 100 Northhill Dr., #24 Brisbane, CA 94005 415/467-7886; Fax 415/467-7386 www.dspfx.com

Sabine Graphi-Q Remote Control Software V.3.20

Graphi-Q Remote Control software is compatible with Windows NT & 2000. New functions include: Tweak-n-Peek, values for all front panel controls display briefly on the front panel LED after every adjustment; three modes of compressor/limiter linking, Absolute Link (values match), Relative Link (values move together) and True Stereo (compression settings move in stereo); Demo/Edit Offline Mode, create or edit a program offline, store it and load it into a unit in the field; and SIA Smart Pro-compatible. 13301 Highway 441 Alachua, FL 32615 904/418-2000; Fax 904/418-2001 www.sabineusa.com

Steinberg Nuendo Surround Edition

The Nuendo Surround Edition is a collection of six real-time surround plug-ins with up to 8-channel capability, designed for daily use in post-production work. Since the needs in a surround environment differ quite significantly from the classic 2-channel world, Steinberg Spectral Design has developed this plug-in collection specifically as tools for the specialized fields of film, theater, DVD and modern music production. The Nuendo Surround Edition retails for an MSRP of \$1,299. 21354 Nordhoff Street, Ste. 110 Chatsworth, CA 91311 818/678-5100; Fax 818/678-5199 www.steinberg.net; www.nuendo.com

Now the Winner of the Powered Monitor Extravaganza Has Some Stiff Competition.



Introducing the brand new V6 from KRK.

KRK raised the bar in powered monitor performance when they introduced the top-rated V8, a speaker that's taken honors in critical reviews, magazine face offs, and has world-renowned producers and engineers using terms like "completely smooth, neutral, spacious and accurate."

So when the engineers at KRK designed the new V6, a more compact and affordable version of the highly-acclaimed V8, they knew it was a tough act to follow.

Clarity, bass extension and big built-in power—hallmarks of the KRK V-Series—are wrapped in a smaller package that can embarrass bigger, more expensive speakers.

And with a great price to match its awesome performance, the new V6 is the first choice for a complete, affordable 5.1 system. Hear them at your KRK dealer.

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- Precision drivers handle up to 105dB
- Variable gain control and combo inputs offer maximum flexibility
- Compact size lets you fit a KRK V6 5.1 system almost anywhere

*S10...First of the new
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for seamless bass extension
down to 30Hz. 125 Watts
of built-in power deliver
explosive 115dB peaks!*

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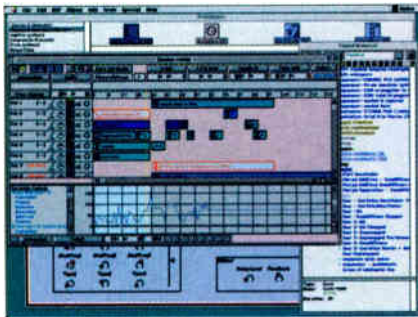
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(714) 373-4600 fax: (714) 373-0421

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Symbolic Sound Kyma.5

Kyma is well-known as the most flexible, real-time sound design software you can buy. Now, with Kyma.5, that power and flexibility has become more accessible and easier to use. A searchable sound library of over 400 factory presets, a timeline and scores of new sound synthesis and effects algorithms make Kyma.5 ideal for remixing, sound design (for film, advertising and computer games) and live music synthesis and signal processing.

P.O. Box 2530
Champaign, IL 61825-2530
217/355-6273; Fax 217/355-6562
www.symbolicsound.com

Waldorf PPG 2.V

PPG 2.V is a VST Instrument plug-in that re-creates the famous PPG Wave synthesizer popular in the early '80s. The original synthesizer had a unique characteristic sound because of its ability to sweep through different waveforms called wavetables. The sound is unique to say the least. The plug-in is so authentic that it actually re-creates the quirky LFO of the original. For Mac and PC: list \$199. Waldorf/Steinberg
21354 Nordhoff Street, Ste. 110
Chatsworth, CA 91311
818/678-5100; Fax 818/678-5199
www.steinberg.net; www.nuendo.com

Waves Renaissance Collection, Version 3

Unbeatable sound and power, for the perfect price. This new Renaissance Collection puts the three most-needed processors into your studio: equalization, dynamics and reverb, all with classic interfaces and profound power "under the hood." It features the new Renaissance Reverb, with classic sound and vintage-style controls for the demands of everyday production; the Renaissance Compressor, an exceptional compressor modeling vintage optical and electrical gear; and the Renaissance Equalizer, our highly praised double-precision resolution equalizer.

Waves Gold Bundles, Version 3

Waves Gold Bundles have everything you need, with essential daily tools, sweetening and mastering processors and sound design mindbenders—from the original Q10 and L1, to the new Renaissance series. It includes every processor we make, including the new Renaissance Reverb, the C4 Multiband, patented MaxxBass, the unsurpassed Renaissance EQ and Compressor. Over 300 setups and processors provide exacting control of the highest-resolution tools, for musicians, mastering, remix, restoration, multimedia, film, Web, games, everything audio.
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Knoxville, TN 37917
865/546-6115; Fax 865/546-8445
www.waves.com

Test Equipment

Audio Precision APWIN 2.1

APWIN 2.1 audio test software adds new downloadable User-Defined Filters for System Two Cascade audio analyzers, as well as a new DSP-based individual harmonic distortion analyzer and support for the new AES17LP hardware filter option.

Audio Precision AES17LP Filter

The S2-AES17LP filter option is available for both System Two and System Two Cascade and facilitates AES17 D/A distortion measurements or other sensitive measurements in the presence of severe out-of-band noise.

P.O. Box 2209
Beaverton, OR 97075
503/627-0832; Fax 503/641-8906
www.audioprecision.com

Logitek TVU-4 Curved Display Meter

The Tru-VU LED meter offers four meters (two stereo pairs) in a curved style. It is different from other curved LED meters in that it represents the true 300ms VU ballistic standard along with a peak display; hence the name Tru-VU. Inputs can be either analog or digital. Analog inputs are bridging, balanced or unbalanced. Digital inputs accommodate professional format (AES) or consumer format (S/PDIF) and automatically adjust to the signal sample rate.

Logitek UV71 7.1 Surround Meter

Logitek's UV71 meter is packaged in a vertical desktop enclosure with 8 bar graphs. Units can be configured for analog or digital inputs. The 7.1 meter uses Logitek's Ultra-VU style display (also available in the 5.1 meter UV51). Each bar graph is composed of 62 LEDs with true 300ms VU ballistics, with simultaneous peak indications and hold. Operating modes include loudness filter and fine resolution.
5622 Edgemore
Houston, TX 77081
713/664-4470; Fax 713/664-4479
www.logitekaudio.com



Neutrik Instrumentation Minilyzer ML-1

Another palm-sized solution from Neutrik, the ML-1 offers advanced analysis functions expected only from larger and more expensive systems. The ML-1 is a sophisticated audio analyzer that measures level (RMS or peak), THD+N and frequency, indicates polarity and signal balance error, and features VU and PPM metering. It can acquire results in

several modes, including meter (numerical results and bar graph), sweep (vs. frequency or time), third-octave spectrum and scope. Several standard input filters are available.
3520 Griffith St.
Sa. Laurent, Quebec H4T 1A7
514/344-5220; Fax 514/344-5221
www.neutrik.com



Prism Sound dScope Series III

The dScope Series III (DS3) is a computer-hosted test and measurement system supporting analog, digital and digital interface testing. The DS3 provides a multifunction real-time analyzer, an FFT analyzer and displays scope, sweep and FFT traces as well as time-domain distortion trace and AES wavetom trace and eye-diagram. With easy user-defined multitone generation, scriptable measurement detectors and VBscript automation, DS3 is a state-of-the-art solution at an affordable price. Price is \$7,995.

21 Pine St.
Rockaway, NJ 07866
973/983-9577; Fax 973/983-9588
www.prismsound.com

Rolls PT102 Phase Tester

The PT102 Phase Tester is comprised of two separate units, a transmitter and a receiver. The PT102t Transmitter emits a pulse via either an internal speaker or 1/4-inch unbalanced phone jack. The PT102r Receiver detects the phase of the pulse through microphones, signal processors, mixers or entire audio systems. A set of LEDs on the receiver blinks with each pulse—a green LED for in-phase signals and a red LED for out-of-phase signals.

5968 South 350 West
Murray, UT 84107
801/263-9053; Fax 801/263-9068
www.rofs.com

TerraSonde Audio Toolbox Plus

The Audio Toolbox Plus builds on the popular Audio Toolbox foundation, which includes Acoustic Analysis functions (SPL, RTA, RT60, Energy-Time Graph), Test Functions (Signal Generator, dB, VU, & PPM Meters, S/N, Scope, Distortion Meter, Impedance Meter), Utilities (Cable Tester, Monitor Amp, PC/Mac interface), and Session Helpers (timecode & MIDI tools). The Plus adds an all-metal case, removable microphone, built-in rechargeable battery system, larger LCD, and includes the Contractor's Software. Booth 452.

1751 Redwood Ave.
Boulder, CO 80304
303/545-5848; Fax 303/545-6066
www.terasonde.com

Wireless Products



Audio-Technica ATW-7373 UHF System

This latest addition to the Audio-Technica 7000 Series features the new ATW-T73 Handheld Condenser Microphone/Transmitter. Engineered with the same element used in the legendary AT4033 studio microphone, the ATW-T73 provides a real step up in wireless audio quality, delivering rich sound, natural top end and superb off-axis rejection. The system also offers 100 PLL-synthesized selectable channels, true diversity reception, UHF operation, ground-lift switch, adjustable squelch control, balanced and unbalanced audio output jacks. List: \$1,149.

1221 Commerce Dr.

Stow, OH 44224

330/686-2600; Fax 330/686-0719

www.audio-technica.com

Azden 411 DRH

This half-rack wireless UHF receiver features True Diversity, 63 user-selectable frequencies, RF/audio displays, on/off switch, external squelch, and rear-mounted detachable antennas.

147 New Hyde Park Road

Franklin Square, NY 11010

516/328-7500; Fax 516/328-7506

www.azdencorp.com

E-V N/DYM UHF Wireless

Electro-Voice's N/DYM UHF wireless microphone series features ClearScan Auto Channel Select. Combining quality, ergonomics, rugged design and affordability, the N/DYM wireless systems feature 10-channel frequency agility, a basic requirement for today's musician who has to perform in highly RF-challenged environments.

Aldrich Avenue South

Minneapolis, MN 55420

612/884-4051; Fax 612/884-0043

www.telex.com



Nady Systems UHF-10

Nady's new single-channel UHF wireless microphone system at new breakthrough low cost. Includes DigiTRU Di-

versity receiver with dual antennae and advanced digital processing circuitry for maximum dropout protection, with either the UH-10 handheld or UB-10 bodypack transmitter. UB-10 can be user switched to operate as a lavalier, headworn mic or instrument transmitter. Full professional features for top performance and operation. 120 dB dynamic range. Full frequency response. Transparent audio. 250-foot typical operating range (up to 500 feet line of sight). List price: \$299.95 (handheld); \$279.95 (bodypack).

6701 Shellmound St.

Emeryville, CA 94608

510/652-2411; Fax 510/652-5075

www.nadywireless.com

Samson Airline Series

AirLine UHF features miniaturized transmitters that eliminate traditional body packs. A tiny AAA battery provides up to 14 hours of battery life. The AH1 Fitness/Performance transmitter is mounted on the headset. The AL1 presentation transmitter has a built-in electret condenser and an input for external lavalier mics. The AX1 handheld transmitter converts any dynamic into a wireless mic in seconds, and the tiny AR1 UHF micro receiver can be wall-mounted for ease of use.

P.O. Box 9031

Syosett, NY 11791-9031

516/364-2244; Fax 516/364-3888

www.samsontech.com

Sennheiser SP 230 Infrared System

This portable, 2-channel infrared system operates on high-subcarrier frequencies (2.3 MHz on channel one and 2.8 MHz on channel two), allowing users to avoid interference

—LISTING CONTINUED ON NEXT PAGE

"For sheer tube magic, a realistic vintage vibe, and superb craftsmanship, the L47MP takes top honors."

EM, Brian Knave, Feb. 98

"... this is the microphone of choice for the project studio owner who wants to buy only one microphone. And at the given asking price, it is the biggest bargain in microphones today."

PAR, Dr. Fred Bashour, Feb. 97

"When you tuck vocals recorded with an L47MP into a mix, something magical happens. . . I cannot praise this microphone enough. Don't wait-- buy it."

Mix, Michael Cooper, May 98

"This mic is my first choice for any vocal, reed instrument, electric guitar, or organ overdub, and for any source that would benefit from the thick low mids, creamy highs, and richness that only a tube mic can deliver."

EM, Myles Boisen, April 99



Relive the Magic.

There's a reason why the classic microphones have endured for over 50 years. It's what happens when you put one on the mic stand and plug it in. And that's all you have to do. The classic microphones have a built-in character that makes things easy, so easy that it feels like magic.

There are two ways you can relive that magic. If you have a small fortune and can find a classic mic that works—that's one way.

The other way is with the Lawson L47MP—a new large diaphragm condenser microphone that we hand-craft in the USA with all the look, feel, and sound of a true classic. Magic included.

Experience the magic for yourself with our ten-day, no risk trial.

- Lawson L47MP Gold Mic features:
- U47/M49 1" capsule reproduction
 - 3-micron gold sputtered diaphragms
 - Vacuum tube
 - Internally shock mounted capsule
 - Continuously variable multi-pattern
 - 30' Mogami cable
 - Jensen transformer
 - Shock-proof carrying case
 - Magic

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World Radio History

—LISTING CONTINUED FROM PREVIOUS PAGE

generated from electronically ballasted fluorescent lights. Intended for use in medium sized installations. Simple to operate. Covers 4,000 sq. ft. in single-channel mode and 2,000 in dual-channel mode. The unit features two line and mic level inputs, 10 lbs. \$2,295.

One Enterprise Drive
Old Lyme, CT 06371
860/434-9190; Fax 860/434-1759
www.sennheiserusa.com



Telex RadioCom BTR-300

Telex Communications Inc. is introducing the RadioCom BTR-300 wireless intercom system. The successor to Telex's industry standard BTR-200/RTS 2105 wireless VHF intercom system, the BTR-300 has been optimized for the realities of today's expanded frequency spectrum. Taking into account the increasing presence of digital television (DTV), the BTR-300 offers twice the available frequency bands of its predecessors.

9600 Aldrich Ave. S.
Minneapolis, MN 55420
612/884-4051; Fax 612/884-0043
www.telex.com

TOA DK-7 Digital Wireless

The TOA state-of-the-art DK-7 digital wireless systems provide users with superior studio quality sound and greater than 110dB dynamic range. Customers choose from handheld, lapel or instrument systems for a wide range of applications from live performances to studio recordings. The DK-7 offers superior immunity from RF interference and as no compander is necessary, users don't experience any unwanted "pumping" or "breathing" effects.

601 Gateway Blvd., Suite 300
South San Francisco, CA 94080
650/588-2538; Fax 650/588-3349
www.toaelectronics.com



ADC Envoy 7256 Digital Audio Router

The Envoy 7256 Digital Audio Router employs innovative Time Division Multiplexing (TDM) technology. TDM architecture provides single-channel (mono) routing from within the AES channel pairs for synchronous and timecode routers. TDM crosspoints enable the router to switch up to 512x512 channels (256x256 AES) in a single 14U rack frame, linearly expandable with additional frames to 2048x2048 (1024x1024 AES) with no distribution amplifiers required.

125 Crown Point Court
Grass Valley, CA 95945
530/265-1000; Fax 530/265-1021
www.adc.com/broadcast

AEA SPL 2020 Stereo Phase/Loudness Display

Audio Engineering Associates' SPL 2020 helps monitor consistent stereo tracking and mixing, with an intuitive single-point visual display and lunchbox portability. Incorporates world-standard Dorrrough metering. Dimensions: 6.2x6.5x7 inches (WxHxD); weight is 3.5 pounds. Price: \$1,545.

1029 N. Allen Ave.

Pasadena, CA 91104
626/798-9128; 626/798-2378
www.wesdooley.com

Alcorn McBride 8Traxx

8Traxx lets you play eight independent stereo tracks from a single economical rackmount unit. It uses the MP3 format and stores files on compact Flash media (included). All tracks are independently controllable via RS-232, MIDI and contact closures. Retail: \$1,995.

3300 S. Hiwassee, Bldg. #105
Orlando, FL 32835
407/296-5800; Fax 407/296-5801
www.alcorn.com



ART HPFX Model #132

Applied Research and Technology's HPFX (Model #132) gives you the power and control to sound any way you want in your headphones when recording. The HPFX has four independent adjustable headphone outputs, two high-quality monitor mic preamps, built-in stereo and dual digital effects, as well as monitor level, mix and effects adjustment controls.

215 Tremont St.
Rochester, NY 14608
716/436-2720; Fax 716/436-3942
www.artroch.com

Audiomate Automation

Audiomate offers its newest range of moving fader console automation with new software for PowerPC.

Southside Business Park
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Bunnell, FL 32110
904/437-6600; Fax 904/437-7763
www.movingfaders.com



Aztec Radiomedia/Groupe Digigram HitPlayer

HitPlayer is a superior solution for both automated and interactive audio applications. Combining a stand-alone MP3 audio player with network services and external device control, HitPlayer is an innovative choice for public address, transportation information and a variety of other purposes. \$1,800.

2101 Wilson Blvd., Ste. 1004
Arlington, VA 22201
703/875-9100; Fax 703/875-9161
www.aztec-radiomedia.com



Calzone Series 50 Case

The new Series 50 transit case offers ATA protection at half the weight of conventional transit cases. Features include 3/8-inch extruded polyethylene covered with ABS plastic,

our patented double-angle construction, aluminum hardware and foam-lined or custom interiors.

225 Black Rock Ave.
Bridgeport, CT 06605
203/367-5766; Fax 203/336-4406
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—FROM PAGE 46, SAM PHILLIPS

overtones of his voice, which are just amazing to this day to me.

On Elvis, in most cases I would use a Shure 56S or, on occasion, I would use a [RCA] 77D, which is an excellent microphone if you use it right. It's just great for voice; it's just great for just about any instrument and was one of the most versatile microphones then.

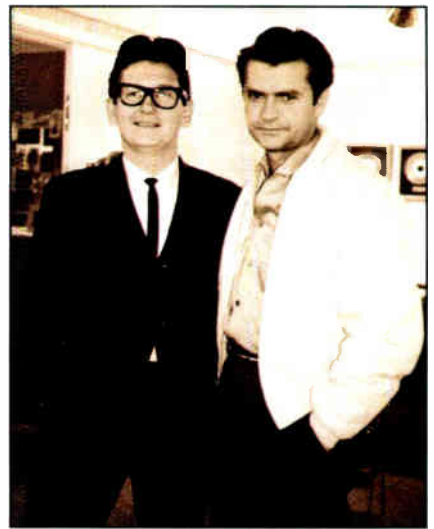
I had three different microphones that I normally used on vocals, and it depended on who it was. One was the Shure, one was the RCA 77D, and the other, if you can believe this, was the old RCA 44D. It was bidirectional, but surprisingly, on a few people, it worked to get a sound that was most complementary. It made your pickups elsewhere more difficult because it's

bidirectional and the vocal wouldn't be as loud as instruments normally, but I was very much intrigued by some of the things I could do with the 44D. I was experimenting all the time.

I just want to say that the "noise" that people make with their voices are the most beautiful things. I've never heard a bad voice. I've heard the worst voices in the world. The Wolf is one of them, okay? But I never heard a bad voice. There's music in voice. If you feel it and it's a part of your spirituality, there is nothing as beautiful as the human voice.

A lot of people you recorded probably had never been in a recording studio before.

That's a fact. You go back 50 years in Memphis, Tennessee, and tell me how many black people had ever even thought about walking inside a record-



Phillips (right) with young Roy Orbison

ing studio to get a record made. It was almost out of the book for them.

How did you set them at ease to get good performances?

I'm a psychologist. I just know how to handle people. I'm certainly no genius, but God gave me a few talents, and dealing with people is one of them. That don't mean we have perfect harmony all the time, but I don't believe anybody ever left my studio because we couldn't get in the groove. I had a type of sound fixed in my mind and tried to convey it to the artist as we went along. If we weren't successful as we went along, I'd tell them why I thought that, and we'd play it back and listen to it, but one thing I never did was get in a hurry. I never made people feel like they were threatened or rushed. That never occurred. I knew what they were going through, and I knew what I was looking for, and together, we were going to get it. If it was there, we were going to get it.

But weren't there times when you just had to say, "It's not happening today, let's come back tomorrow"?

Oh, yeah, but there's a lot of different ways to say that. And did you know, I didn't even have a talkback microphone in the control room until maybe the last year or so? I'd get up from behind the board and open the door and go in there and we'd talk. And I never had a light to say "Watch the light." And so you might say, "Well, were you that poor?" Well, I was poor, but I could have gotten me a light bulb. I just did things different. ■

Mix associate editor Barbara Schultz thanks Sam Phillips for the great chat and the great records, and wishes her own baby a happy first birthday.

SAM PHILLIPS ON THE MASTERING AND REMASTERING OF THE SUN CATALOG

Who did your mastering early on?

I did some of the mastering myself early on, but the one deep-cutting head on the Presto lathe that I had just wasn't adequate to get the level that I needed, so I decided to go ahead and get them done in Chicago. I sent them to Bill Putnam, who was just a great operator, and he and his wife actually did most of the acetate mastering. He had some old Scully lathes, though I don't recall exactly the heads that he used.

Everybody that has anything to do with sound knows that you can lose a lot in the mastering if you're not careful. I wouldn't let them use a hot stylus on mine for a while after the hot stylus became popular, because the presence of certain sounds could just be so easily lost.

Have you been happy with the remastered versions of your recordings?

I would say that [on the remastered vinyl] overall they did a good job, but in some cases they maybe didn't devote enough time to the remastering. But you have to keep in mind that we did lose some things on tape at that time with the type of oxides that we were using. We went from black oxide to red oxide to

you name it. They would stay rolled up a long time, and you would get a little shadow distortion that came about by magnetism from the piece of tape that was closest to the last one you just wound. So, I think they've done a pretty good job overall, because they did have to deal with a lot.

However, I would have been a little harder to please on some things, and I think they didn't know how to handle the bottom end a lot. I didn't have a strong bottom end in the way of a bulky bottom, but I had one that would sting you pretty good. I would also have spent more time to straighten out the presence of the voice. You just have to love it to do it like it should be done.

One thing I do want to do is see how they master CDs. I think we've got a little ways to go, as good as stuff sounds today, because I know that the Sun stuff that was transferred to CD, in many instances, was made a little edgy. It wasn't necessarily that the process was bad, but it was bad for what they had to work with. The frequency response was so much better than you could get on any acetate, so you have to be real careful not to abuse that. ■

—FROM PAGE 227, MUSIC ANNEX

working here for 11 years. It was time for him to move into a better environment, one similar to what Patrick [Fitzgerald] has in Studio 1. The concept is that Studios 1 and 5 are both 5.1, 'no-excuses' rooms—in terms of amenities, technology, the mixer himself and the product."

For various reasons, many of them having to do with strict San Francisco building codes and compliance with the Americans With Disabilities Act, the ground-up build-out turned into a long process. Porter, Grier and chief engineer Roger Wiersema began discussions in early 1997. Soon after, they brought in acoustical consultant Michael Blackmer, and after working out the geometry for 5.1, contractor Dennis Stearns came onboard to build it. Finally, to impart a contemporary look for the entire third floor, they hired Daniel Oakley, an architect and protege of Zaha Hadid.

The resulting Studio 5 features a spacious, multipurpose control room, with two sets of rear monitors to accommodate the relatively long throw. Grier insisted that the 1911 building's original rear brick wall remain, along with skylights over the producers desk. (The entire rear area is raised 7 inches so that clients can see directly into the booth.) Flat-screen monitors, with Internet access, rest on the desk, and if clients need privacy, they can retreat to a booth in the left rear while maintaining perfect sight lines to the mixer and the talent in the main studio.

Grier also insisted on the more traditional center glass, not the left or right that is currently in vogue. "When you're mixing, you're looking forward," Grier says. "You lift your head up, you ought to be able to look into the booth. It's pretty straightforward. If an actor's having problems with a line, body language tells you as much about the performance as what they are actually reading."

From a designer's perspective, center glass can be problematic in a 5.1 room because of the need for a video monitor and a center speaker at the correct height. After initially considering a projection system and a speaker rising out of the floor, Wiersema and Stearns came up with a plan to have the center speaker roll in from the side and disappear from sight into a cavity behind the left speaker. A chassis was constructed above the glass, and Wiersema found what is essentially a garage-door-opener mechanism. When Grier presses the button, the speaker rolls in and locks for

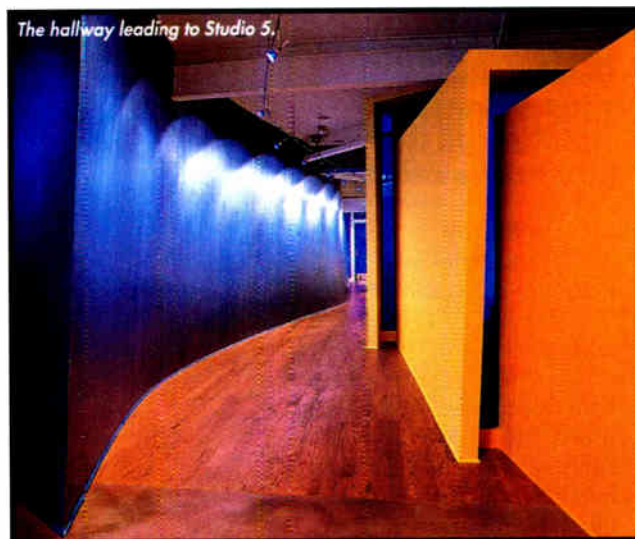
playback; he presses it again and he's ready for tracking. The left and right mains are in dampened soffits, but Grier says that Genelec shot the room, and with a slight EQ adjustment, the LCR speakers match.

The centerpiece of Studio 5 is a 56-input Euphonix CS3000 console, similar to the one in Studio 1. To his right, Grier has his trusty Synclavier/NEI PostPro combo; to his left, Pro Tools. All of the audio guts sit in a third-floor machine room, with video ties to the second floor. The 5.1 monitoring system is all-Genelec, with two subs.

The main studio is equally spacious by modern standards—at well over 200 square feet, it's able to hold four or five actors comfortably. Grier is a big fan of radio drama, and he does a lot of looping, so he wanted room for a director and a large projection screen. As an afterthought, because they didn't need all the volume to make the main booth acoustically correct, the builders added a secondary iso booth within the vocal booth. It's a nice touch and has turned out to be extremely practical.

"Oftentimes, when we're doing group reads, we'll want to process one of the voices after the fact," Grier explains. "It makes editorial a lot harder if that voice has been overlapped into the off-mics. By having the secondary booth, the actor can stand in there, maintain eye contact, read at the same time, and we get the separation.

"The other thing we put in the booth were Foley pits," he continues. "Even though we're primarily a television and radio production room, we have Foley needs like everyone else. For me to run in there and do nine footsteps is a heck of a lot easier than running to a sound effects library, grabbing the CD and playing the steps off the Synclavier. And it's more fun and more creative. I have to give credit to Stewart Sloke at World Wide Wadio, who put some Foley pits in his radio room and took the time to show them to me. Great Foley can be played loud, bad Foley gets hidden. Nothing beats great Foley. We do clothing, body falls, steps, the whole business. But we don't do car and we don't do wet work [laughs].



PHOTOS: EDWARD COVER

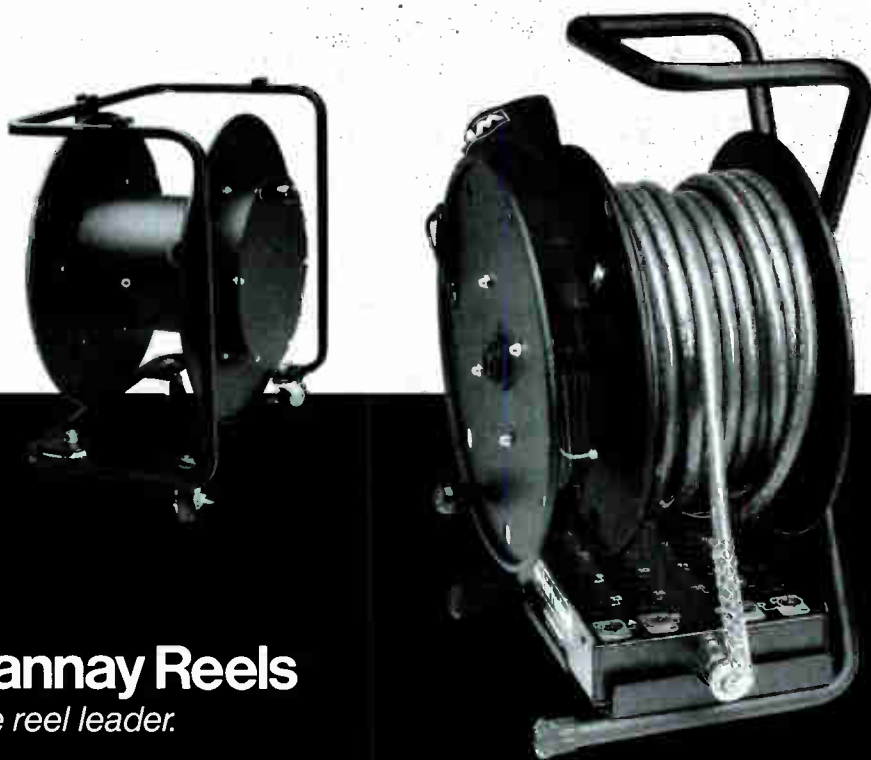
"We also use the room for our film sound editorial department, which does lots of long-form animation in here, and it has Foley from stem to stern. They tieline our room to their edit room and cut the Foley directly into Pro Tools."

Not all of the amenities are of the cosmetic variety, though Studio 5 and the entire third floor is on par with the best that either coast has to offer. An off-line Avid Express room is available to clients who want to make picture changes on-site, or begin work on their next spot. Wiersema was expected to have a Pro Tools network, based on Fibre Channel technology, ready by the time you read this—an Avid Express and seven Pro Tools systems available. And for clients like KRON-TV, Wiersema has developed a system for delivery of KRON's sweeps radio spots via a Music Annex-hosted secure FTP site, which allows radio stations to easily download the spot, trafficking information and everything else formerly handled by ISDN.

After 27 years in the biz, Porter and company are obviously not content to sit still. They built Studio Five so that when 5.1 becomes commonplace for spots, they are ready. In the meantime, their work on documentaries and long-form has been a part of three Sundance Award-winners in the past three years, and long-form work for the Discovery Channel, History Channel and the like has increased to about 15 percent of the business.

"It may not be as much money," Porter says of the long-form work, "but I like a broad base. I've always been reluctant to get too deep into any one area. Every time I've ever allowed one segment to become a huge percentage of the business, it scares me. I like the diversity." ■

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—FROM PAGE 227, SIGNET STUDIOS

David Dubow, who started his career as a musician and recording engineer, cut his management teeth at Richard Perry's legendary Studio 55. When asked to explain his secrets for so successfully combining a diverse clientele, he laughs. "What do you need to do this? Incredible techs and eight billion different equipment formats. We have Sony 3348s and analog 24-tracks with Dolby SR, but we also have DA88s, MMRs, Pro Tools, Genexes and Albrecht mag recorders. We do it all. We don't necessarily have everything in house, but we have the technical experience to deal with all of it well.

"For example, Dennis Sands will often be doing a score album for a project at the same time that he's doing the film mixes," he continues. "That means he may be recording on two analog 24-tracks and a digital 48-track and mixing to Pro Tools and a couple of Genexes. Then there's video, a couple of DATs and a half-inch 2-track—all happening at the same time.

"Our assistants at Signet are excellent—they have to be. They don't just lock machines together with a Lynx; they understand KCU controllers and sophisticated offsets, and they regularly deal with mountains of equipment."

All three main rooms are set up for 5.1, and Studio B can also be configured for 7.1. Studio A, 40 by 40-feet with 22-foot ceilings and three iso booths, is the main tracking and scoring room, also used for ADR, overdubbing and mixing. The THX-certified Studio B, also fitted with a 72-input VRP as well as a custom SSL stem mixer and video and film projection, is one of the favorite dubbing and mix stages in town for both film and television. Last year alone, the music scores for, among others, *American Beauty*, *Erin Brockovich*, *Tarzan*, *Me, Myself & Irene* and *What Lies Beneath* were mixed in B. Studio C, with its VR60 and Sony Super Bright video projection system, is used for music mixing and overdubbing, as well as for film and television dubbing; this season it was home to five shows a week for MTV's *Undressed*.

Also in the complex are Studio G, a 5.1 editorial suite, and, housed in what were originally Motown Studios' basement live echo chambers, six busy edit bays with Pro Tools and Waveframe workstations.

One obvious reason that Signet participates in both album work and film scoring is that many of its clients also do both; cross-pollination is the norm these



David Dubow in his office, where the real work gets done.

PHOTO: MAUREN DROVNEY

days for many musical artists. "We've worked with Bette Midler on many film projects and a couple of different record projects," notes Dubow. "She's done a lot of different things here, most recently some of her latest album with Don Was producing. We worked with Phil Collins on *Tarzan* as well as on other projects. And Eric Clapton was in working on the score for *The Story of Us*, and we're hoping to have him back for an album."

Signet became part of the Soundelux family in 1995, and that fact has proved beneficial for the facility.

"It's a big company and there's a lot of technology and equipment there," comments Dubow. "There's also Bill Johnston, who used to be chief tech here and is now the director of Liberty Livewire Audio Engineering, who stays up on what's going on. Then there's the Vine Street facility, which is state of the art in dubbing technology, one of the first places in town to go with MMRs. It's all been a help in keeping us in the forefront."

There should be plenty more cross-pollination coming up, with the Soundelux, Pacific Ocean Post, DSP, Todd-AO and 4MC companies now all under the Liberty Livewire Audio umbrella. Amid all that film and post-production technology, Signet finds itself the musical center of the amalgam.

"We can do it all," states Dubow. "Final dubs on films, record mixes, commercial mixes, ADR—I do think that with the addition of all these companies that have so many dubbing stages, we may be heading back to our origins. Because, even though there are so many facilities affiliated with us, the only two places among them that really record music are the Todd-AO scoring stage, which pretty much specializes in

large orchestras, and Signet."

To that end, and with an eye, as always, on improvement, recent doings at the complex have included the addition of two iso booths to Studio A, whose main recording space comfortably holds 40 musicians. Console modules in all rooms have been upgraded for lower noise, Genelec 1034B main LCR monitors are now soffited in Studio A, and both Studios A and B are retrofitted to accept the Martech 24-channel extender, making both rooms 96 Flying Faders-capable. In addition, Mad Labs center section post panels are scheduled for installation in all three Neves. "Several of our clients requested the Mad Labs upgrade," Dubow notes. "They feel it will make what our consoles are able to do equivalent to, or even, in some cases, superior to, what SSL 9000s can do."

Other recent projects have been refurbishment of the many lounges and the outside patio, which will soon include a putting green so that all those busy mixers with no time to practice can hit a few balls while on break. Another nod to clients' needs has resulted in omnipresent computer hookups for online access or tie-in to Signet's central server.

"Every engineer has their own computer," says Dubow. "And the producers and the coordinators have theirs also, so we have lots of separate areas for them that can accommodate either IBM or Mac. They can go right through our server, print out cue sheets, edit lists, whatever they want.

"If a client suggests something to me," he adds, "normally I just do it—whatever it takes to make it more comfortable for them.

"First and foremost, I'd say technically, we get the job done. Then, we have a good staff and atmosphere, and we

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accommodate people well. I think people like to work here because we attend to their needs, whatever they are. Our forte is probably mixing; but music is our specialty. For example, Thomas Newman recorded the majority of the scores for *American Beauty*, *Erin Brockovich* and *The Green Mile* in Studio A and mixed them in Studio B. Phil Collins recorded his drums, as well as the hanging on pots and pans he did for *Tarzan*, in A and mixed in B.

"We really are an all-around music studio. We like to say that we're one of the few purpose-built studios in Los Angeles. Most places are taken over and made into recording studios, but this building has been a music studio from the beginning, over 30 years ago. A lot of great records have been made here, from The Jacksons and The Commodores to Herbie Hancock, Wynton Marsalis, Bruce Springsteen, and Christina Aguilera. And a lot of great soundtracks have been done here. Our goal, really, is just to continue serving our clients so that they can continue to turn out great music." ■

Maureen Dronney is Mix's Los Angeles editor.

—FROM PAGE 226, *EXPLODING MYTHS*

in sync. You need to know the frame and scene boundaries in film *footages*. If you want the backgrounds to cut across the scene change right on the money, you need to know where the A/B-side transition is. Sync on a workstation is a complicated tango of many factors: Timecode and film frames are calculated from the start of the session relative to the number of elapsed samples.

They all have to match, but it ain't all that hard. As complicated as it all sounds, it's really quite simple to do right, and I've been able to cut and mix to field-accurate video since the late '80s.

There are three types of videotapes that you will come across: outputs from the nonlinear edit system (aka "digital cuts"), telecine transfers of the edited film workprint and telecine transfers of the answer print (made from the cut film negative). Each has its place and time in post-production, and although an accurate transfer of the latter is clearly the best choice, you can reliably use any of them as long as the picture department has its act in gear.

Digital cuts are important because we can get them as quickly as the pic-

ture assistants can output the reel and get the tape dubbed. Beware, however, that burn-ins created using the Avid Media Reader are rarely correct, and you will probably have a timecode/footage "gap," to paraphrase Dr. Strange-love. One work-around that clever picture assistants have come up with is to have a file of a rendered, A-frame-accurate footage burn-in that can be used to overlay onto digital cuts.

If your picture assistants are on top of things, a digital cut might be all you ever need to cut to. If they conform the film exactly, then a telecine of the workprint will match the digital cut field-for-field, although it will probably be a little better looking. (The only *advantage* of the digital cut is that it still has timecode and footage counters from the dailies telecine, giving you an audit trail to the original production timecode, negative key numbers and Acmade key numbers.)

On top feature films, you can pretty much rely that the assistants will be dead-nuts accurate. Nonetheless, to avoid any possibility of finger-pointing after it's too late, I always insist on mixing to a telecine of the workprint. At that point, the only question is if the

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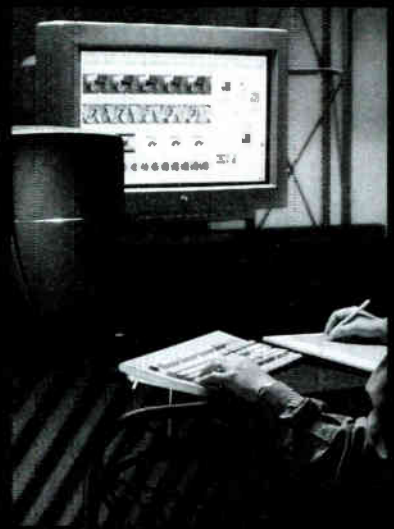
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negative cutters have done their job. They, too, almost never make mistakes, but you have to double-check that the picture assistants run the workprint in a synchronizer with the first answer print, verifying the conform. I've only had problems with negative cutting on two films in my career, and each of them had *two* mistakes. Rest assured that I know the names of those negative cutters, both of whom didn't tell the filmmakers that they had made a few serious boo-boos.

One of the primary needs for a telecine of the answer print is when the filmmakers have chosen to do their fades and dissolves first-generation by AB-roll cutting the negative, instead of creating an optical. These transitions will be different on the final print than those rendered by the nonlinear edit system (as viewed on the digital cut tapes), and your sound will almost certainly be out of sync unless you take this into consideration.

The only time that you *have* to mix to the answer print (I'm assuming that sound answer editing has to start right away from digital cuts in all situations) is when there has been no conformed workprint, and the negative will be cut from a list. The margin for error is much greater in these circumstances, and you have to tell the filmmakers from the get-go that you will not consider starting a final mix unless you have a telecine tape.

The final mix is where you are recording your dialog, music and sound effects stems, which are exactly in sync and balanced against each other. The stems are the products of much shifting and offsetting of cut elements, premixes and sweeteners flown in during finals. The act of going to the next step, printmastering, requires you to shift gears from being a very creative person who keeps an eye out for technical and craft matters to being a transfer person who has the responsibility to create a master that will be used to make thousands of prints. The transition between these two roles takes place in the hour most re-recording rooms need to change over to printmastering.

I think that anything beyond simple level adjustments should have been done during the final mix. Certainly, any sync issues *have* to be dealt with when you can offset individual tracks, and the idea of advancing a line of ADR from a composite dialog stem or a single gunshot from an effects stem is...ridiculous. (Not to mention that

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you would have to offset the stem, and thus couldn't go through a reel without stopping.)

Which bring us to myth 1b, that printmastering to the answer print is somehow reassuring. Sure, you might need to see if ILM got creative and added a few more laser blasts on the late-arriving optical. But one hour before you started printmastering, you had everything up at the final mix...

Myth #2a: Real mixers mix in reverse.

Don't worry folks, this myth can be disposed of much more quickly than the previous ones.

Until the '60s, films were always mixed from the beginning to the end of the reel without stopping. Believe it or not, you could not go backward with all playback dubbers and recorders in sync. Machine room operators would rewind everything, lock up the start mark and then away the re-recording mixers went, hoping to nail the reel. (This after a few rehearsals, of course.)

Then, at varying points through the decade, facilities started to update to "rock 'n' roll" projection, meaning that mixers could hit Stop and Rewind. They

would go forward, match the off-tape signal to the input ("PEC/direct") and then punch-in and carry on.

Funny thing is, many mixers felt that there was a creative advantage to doing a reel in one pass, developing a flow. Clearly, practical issues—not to mention the collective sanity of the industry's re-recording mixers—led to punching in being adopted as standard operating procedure.

The next step, since initially the transports could only rewind at sync speed, was for mixers to use the time in reverse to get a head start on EQ and level. This has evolved into "a way of mixing" for many of my colleagues, who are expert at the dance of going back and forth, matching and punching in and out on small sections, creeping their way forward as they massage a reel. With non-automated consoles (or consoles with just fader automation), it made sense to focus on smaller sections to enable a match of EQ.

While I certainly understand how it came about, I don't understand the continuing fascination with it in light of the ability to quickly go back, say, to the beginning of the scene and have the console automation recall every-

thing. This way you have the best of both worlds: the flow that old-timers revered, along with the gnat-eyelash precision afforded by automation. And the ability to loop critical small sections on a workstation, such as when matching ADR to production dialog, frequently obviates the need to even run picture.

The mixing arena has even morphed a bizarre combination of old and new technology: VCRs running as slaves referenced to the biphasic pulse that usually only handle film transports. (Running to biphasic in this context allows digital dubbers to function as if they were mag recorders.) As a result, you want to fast-wind to the end of the reel? You're going to do it at four times sync speed. I just don't get it.

Myths or reality? Let me know at P.O. Box 24609, New Orleans, LA 70184, or swelltone@aol.com. ■

Larry Blake is a sound editor/re-recording mixer who lives in New Orleans for reasons too numerous to mention, although one of them would have to be that there is an interesting myth at every corner, and none of them pertain to film or video.



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B-52's Go-Go's Psychedelic Furs



PHOTOS BY STEVE JIMINIO
TEXT BY ROBERT HANSON

Fans got a healthy dose of new wave and '80s pop as co-headliners The B-52's and The Go-Go's, with opening act the Psychedelic Furs, brought their Summer Road Trip 2000 tour to the Shoreline Amphitheater in Mountain View, Calif. The crowd came anticipating a party-like atmosphere on an unusually warm Bay Area August night, and no one left disappointed. Both the B-52's and the Psychedelic Furs turned out one classic after another. By contrast, The Go-Go's used the exposure to showcase new material from their first new album in more than a decade, set for release early next year.

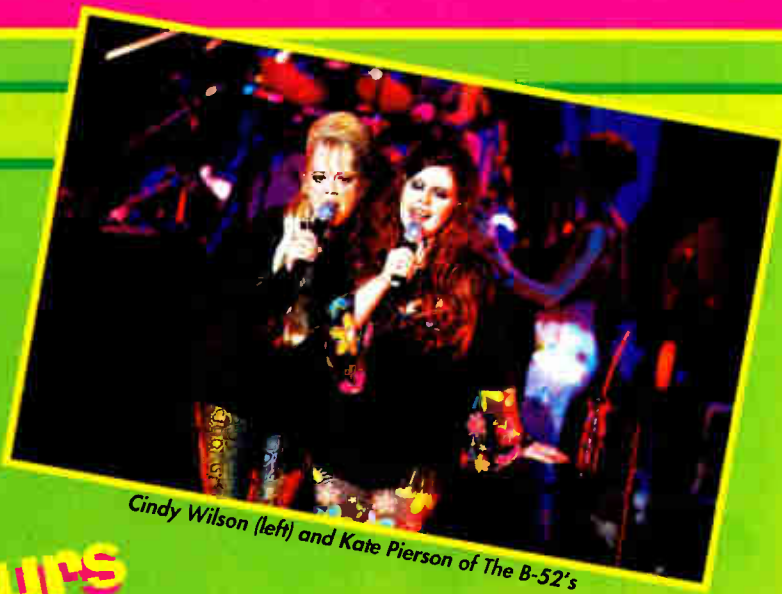


From left, Bunny Warren, John Bracken and Mike Scarfe.

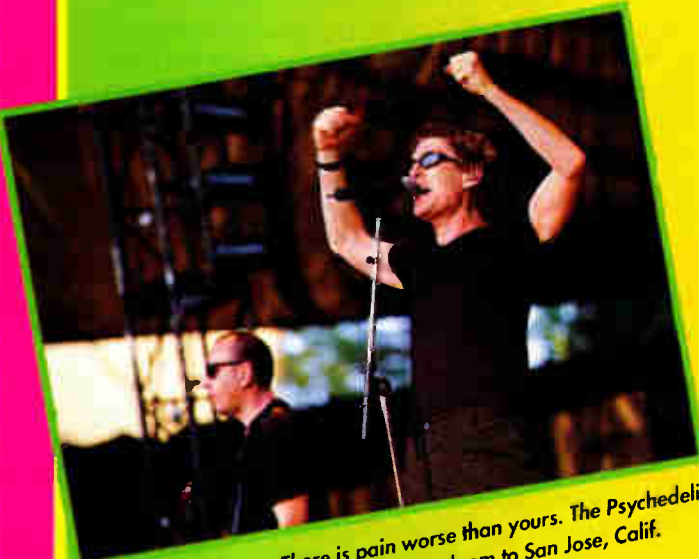
Scarfe handled FOH duties for the B-52's, and Warren was up front for the Go-Go's. All the FOH and monitor desks were Yamaha PM 4000s (two at FOH and two for monitors). The B-52's used one of each of the pairs of PM 4000s, with the Go-Go's and the Psychedelic Furs splitting the remaining two boards.

All three bands also shared effects. Scarfe was running BSS compressors across the three main vocal channels, guitars and bass. His rack included DN 3600 EQ, Eventide H 3000, SPX 900s, Roland SDE 3000 and Drawmer gates. Warren also added a SDE 330 on the three backing vocals for the Go-Go's.

Bracken was working monitors for the two headliners. The B-52s were all on Shure PSM-600 in-ear systems with custom Ultimate Ear molds. The Go-Go's all relied on Martin Audio LE 700 wedges with Chameleon DX-3000 amps, excepting lead vocalist Belinda Carlisle, who also used a single in-ear monitor driven by a PSM-700. Bracken's rack included KT EQ, BSS gates and compressors and "whatever reverb happens to be in the rack," he jokes. Bracken, a huge fan of in-ear systems, also helped out with the Psychedelic Furs. "About the third show in, we approached Richard Butler, the singer of the Furs, about using in-ears, and he was all into it," recalls Bracken. "In Cleveland, without a soundcheck, he just went with it. And he came off the stage and said to me, 'Wow, I can finally hear myself.' It's made a difference in their sound I believe. They seem a little tighter and his vocals are more consistent. Gotta love ear monitors."



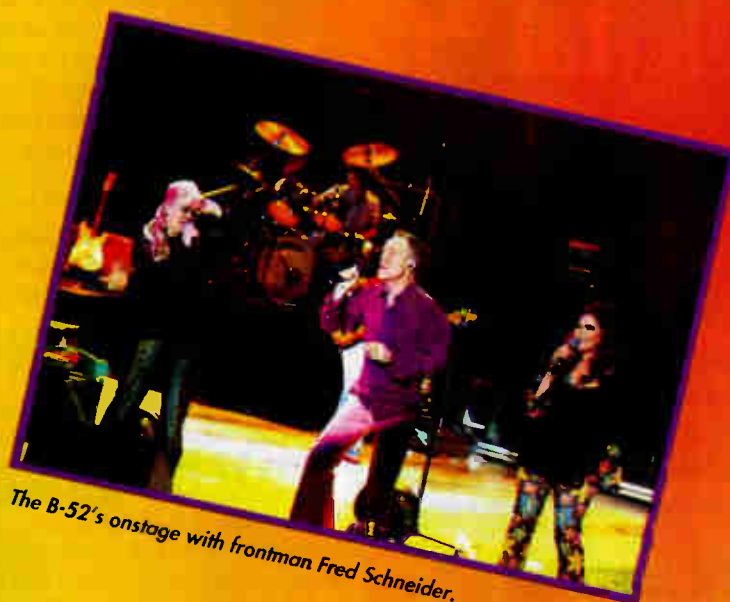
Cindy Wilson (left) and Kate Pierson of The B-52's



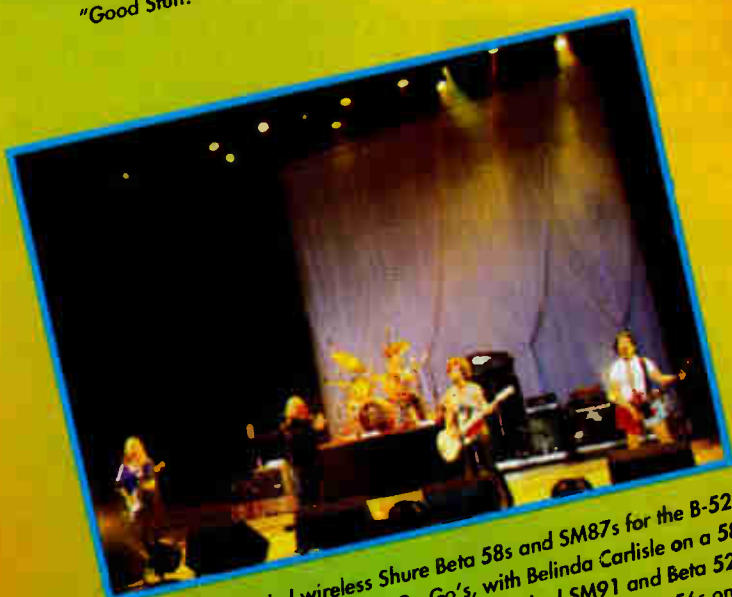
There is pain worse than yours. The Psychedelic Furs brought the gloom to San Jose, Calif.



Guitarist Ricky Wilson played some of that "Good Stuff."



The B-52's onstage with frontman Fred Schneider.



Vocal mics included wireless Shure Beta 58s and SM87s for the B-52's, and hardwired SM58s for the Go-Go's, with Belinda Carlisle on a 58 on kick, Beta 56 on snare top, SM98 on snare bottom, Beta 52 and a VP 88 overhead. Guitars used a Beta 52 on kick, SM57 for snare top and bottom, SM98s with polarizers on both floor and rack toms, and SM81 overheads. The Go-Go's guitars were miked with KSM 32s. "I also use a 57 on each of the cabinets for a couple of numbers, just to give it a little crank," adds Warren.

Scarfe's sound company, MHA Audio, provided the tour's P.A. system, which included proprietary M6 enclosures, 24 flown per side, with under-hung downfill and frontfill cabinets. The MHA boxes each housed six 10-inch low-end drivers, two 10-inch mid drivers, and one 2-inch and two 1-inch compression drivers for the highs.



LIVE SOUND

—FROM PAGE 238, EARS VS. ANALYZERS

the context of other sensory stimuli. Our brain checks what we hear with what we see in order to confirm that what we hear correlates. The brain also has a different set of expectations for sounds heard at different distances and in different types of venues.

The process of training yourself on an analyzer is similar. Analyzer training helps the operator recognize patterns and differences and builds a history file of experience. Context determines whether the data displayed is normal or indicates a problem. So the complete equation for our debate is more like: Ears x Eyes x Brain vs. (Ears x Eyes x Brain) + (Eyes x Analyzer x Brain).

So what's with the adversarial attitude coming from mixers? Is it simply a territorial dispute? Is it a power struggle or ego-control issue? Is it that some mixers have had bad experiences with alignment specialists who were still in the process of learning this challenging skill? How much of it is fear of the unknown?

System engineers using analyzers have no ambition to take over the mixer's job or encroach on their artistic turf. It is so absurd to think that the art of mixing can be objectively analyzed that I won't even go there. It is, however, equally absurd to think that there is no benefit to obtain an objective assessment of the response of the sound system in the room. The laws of physics govern a room's acoustical response; pretending that sound reproduction is pure art, with no scientific component, is folly.

We live in a world of increasing complexity, which results in an increase in the specialization of skills. The modern mixing engineer has so many tasks in the creative arena that he or she has little time to match the sound throughout the listening area. In my experience, it has become increasingly rare to see mix engineers spend an appreciable amount of time assessing the sound away from the mix area. Yet, everyone agrees on the goal of ensuring that the audience hears the same sound as the mixer. This can be quantified objectively by an analyzer, and, based on the information it provides, steps can be taken to achieve maximum uniformity and signal-to-noise ratio. There is nothing artistic about making things sound the same. That is the job of the analyzer and its trained operator.

BUILDING THE TEAM

Assuming we are all in agreement that a mixer and an analyzer operator can work in harmony, how should we proceed? The first step is to evaluate the respective capabilities of ears and analyzers. For the ear side, we will assume an experienced professional with undamaged hearing. For the analyzer, we will assume a high-resolution, dual-channel analyzer capable of analyzing complex frequency response, phase response and data quality, operated by a trained and experienced professional. (Most of the arguments in favor of analyzers are null and void when applied to an RTA, so don't include one in your mental image.) Now, let's take a look at the relative strengths and weaknesses of ears and analyzers.

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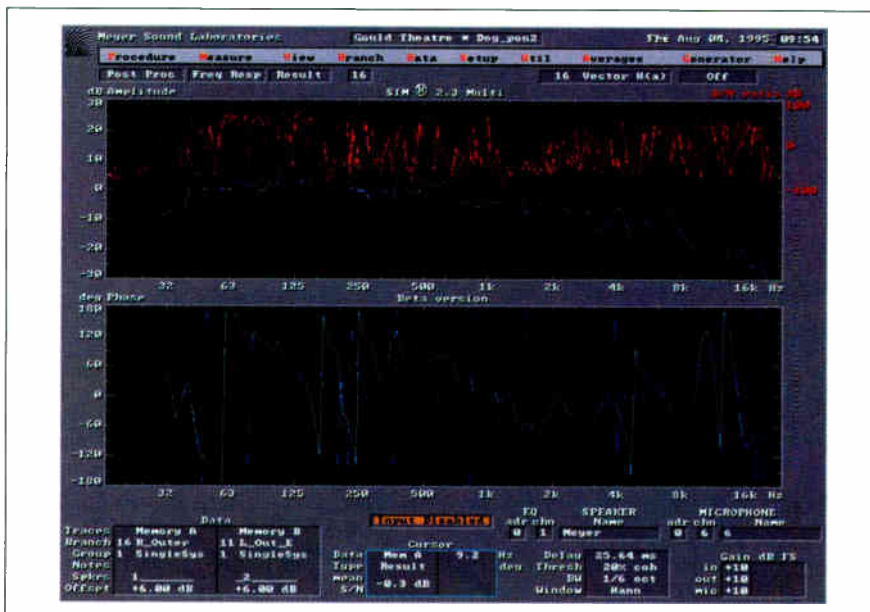
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EARS: STRENGTHS

Parallel processing: The ear is able to simultaneously analyze multiple aspects of the system response. The ear can assess level, frequency response, impulse response, distortion and other aspects at the same time. No mode change is required to switch between hearing these different aspects. This means that the ear is always in a ready state for analysis.

Context sensitive: Because of its link to the brain and its history file, and the ear can analyze a given signal in terms of its intended sound. The ear knows the difference between classical and rock music and adapts its expectations accordingly.

Directionality/Localization: The ear can localize sound instantly and continuously. While special versions of currently available acoustical analysis tools have the ability to localize, there is nothing that comes close to the speed and accuracy of a two-ear/brain system.

Spatial integration: The ear system has the advantage of an integrated transport system: legs. Ears are easily moved from place to place. Therefore, it is possible to quickly map a listening area by walking around.

EARS: WEAKNESSES

Single data output: The ear is connected to only one brain system. It is not possible for me to hear what you hear. Not only does each human ear/brain setup

possess its own distinct frequency response, but each has a different context file. Sound that is "normal" to you may not be the same to me. There is no Vulcan mind meld that will allow me to tap into your brain. This is the cause of the most common issue between sound engineers: My ears tell me that your ears are defective, and vice versa.

Unstable over time: The results are not repeatable. The ear/brain system is prone to the instabilities that are part of human existence. Fatigue, mood swings and nasal congestion are just the start. Hearing mechanism damage, the ingestion of drugs and fear of road managers can all alter the perceived response in dramatic ways.

Single-channel acoustical input only: The ear/brain system can only hear the end product as it arrives at the ear. It can only compare the acoustic response to its historical context. It is not possible for it to compare input vs. output. Ears may flag a system problem easily. But because only the final output response can be heard, locating the problem's source may be difficult.

Non-linear: The ear's frequency response changes over level. This is, of course, a built-in feature of the human hearing mechanism and is unlikely to change. However, it does make the analysis of a sound system response even more subjective.

Requires training: As every sound engineer knows, everyone knows what it should sound like. It takes years and

years of training, however, to know how to get there.

ANALYZERS: STRENGTHS

Objectivity: The analyzer presents just the facts of the system response and is uninfluenced by opinion, historical context or the desired response. The analyzer does not have an ego.

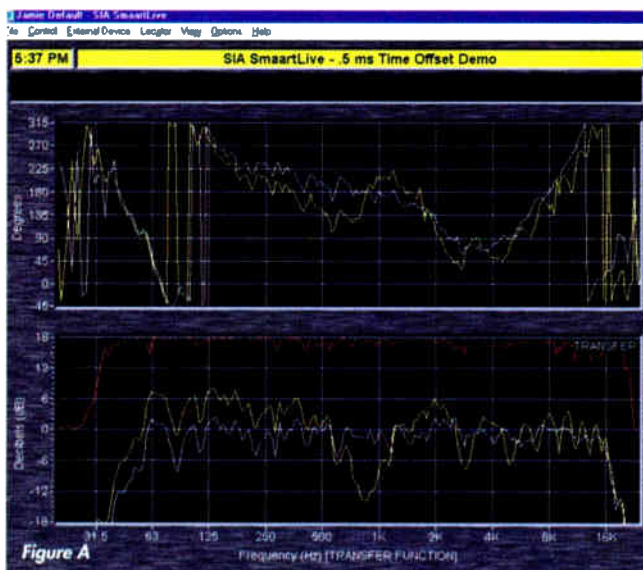
Multiple-data output: The analyzer data can be viewed by anyone. Response information can be shared between team members.

Stable over time: The results are repeatable. The analyzer does not get tired, take drugs or have a stuffy nose. It doesn't care if it just got off an airplane. If damaged, it can be repaired.

Linear: The response is read as it exists. It shows changes in the system response, if and only if, they actually occur.

Dual-channel capability: Analyzers can measure the difference between any two points in the system. This allows us to analyze the acoustical or electrical response of any part of the system, rather than simply hearing only the acoustical end result. This transfer function capability allows the analyzer to measure the differential amplitude and phase response over frequency and the signal-to-noise ratio over frequency.

Multiple-input locations: Multiple microphones and line inputs can be inputted into the analyzer. A change can be implemented to the system response and the results checked at all locations affected by the change. The analyzer



In this example, the main system is focused to deliver sound to the back of the hall. The downfill system covers from the middle of the hall toward the front. The transition point naturally falls at the worst possible place: the mix position. The off-axis downlobe from the main system arrives 0.5 ms behind the signal from the lower speaker, as shown in the delay locator trace (Figure A) above. The combined frequency response of the two speakers (the yellow trace in Figure B) is much worse than the lower speaker alone (the white trace in Figure B). Notice the complex series of peaks and dips in the combined response. The time offset is so short that it would not be heard as an echo but only as a modified frequency response. The mix engineer could not possibly fix this problem with a graphic equalizer and would most likely struggle vainly to find a satisfying mix. The alignment engineer would be able to find the problem in seconds and solve it with the precise adjustment of a delay line.



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can make it from the floor to the third balcony and back again in seconds and not even break a sweat. Any seat in the house can be checked without the operator leaving the mix position.

Objective memory: The analyzer can recall historical data so that the effects of changes can be measured. This critical factor gives us the data we need to find out whether or not changes are creating a solution, rather than just moving the problem to a different position or frequency.

Improves your ear training: The most powerful of all advantages is the fact

that all of the information gained can be added to the data you have been receiving with your ears. You can take all of the information on the screen and listen and add it all together, creating an advanced form of ear/eye/brain training. Once you have added this skill to your repertoire, there is no going back.

ANALYZERS: WEAKNESSES

Not context sensitive: The analyzer does not care whether it is measuring Beethoven or Megadeth. It compares input to output. Creating the appropriate tone and level for the music is the mix engineer's job, not the analyzer.

Linear: The analyzer response does not change over level. Therefore, it gives us the actual frequency response rather than the perceived response. (Remember Fletcher-Munson?) Dynamically controlling tonal quality to suit the perceived response has always been the domain of musicians and mixers, not analyzers.

Requires training: Just like the ear, the analyzer requires training and experience. Lots of it. Engineers tend to forget that they have been training their ears all their lives and expect to be able to master this additional skill in short order. Like all good things, it takes time.

EARS + ANALYZERS: WORKING TOGETHER

Now, let's look at how we can add these capabilities together. The alignment engineer can tune the system for maximum uniformity using both the analyzer and his/her ears. The strengths of the analyzer listed above are ideally suited to the objective tasks of reproduction and uniformity. The mix engineer can mix using his/her ears. The strengths of the ear are ideally suited for this artistic pursuit. Speed, parallel processing and context sensitivity make the ear/brain tool the right one. The ear's weaknesses—subjectivity, instability over time and singular data output—are considered a normal part of the equation here. The response at the mix position is analyzed by both the mixer's ears and the analyzer, and the response is tailored to suit the mixer's taste. Provided the system has been aligned for maximum uniformity, these changes are then heard both at the mix position and in the audience. When the mixer has achieved the desired response, we now have a system that has met the artistic goals of the mixer and is distributing even sound to the majority of the audience as well.

It is unlikely that there will be major evolutionary changes to the human hearing mechanism in my lifetime or yours, but technological advances in acoustic measurement are certain to continue. The ability of acoustical analyzers to represent complex data in simple form will continue to increase in speed and scope. If you know how to read the analyzer data, you will find that it closely correlates with what is heard. An analyzer can be a mixer's friend, even if the mixer never lays a hand on one. ■

Bob McCarthy lives in St. Louis and specializes in sound system design and alignment. He can be reached at bobmcc@primary.net.

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World Radio History

BOB WEIR AND RATDOG

ADVENTURES IN THE DOGHOUSE

by Blair Jackson

This time it was going to be different. Bob Weir, the former Grateful Dead guitarist/singer, was going to work quickly in the studio, not fuss too much over minutiae, not give in to the “legendary studiophobia,” as he once called it, that seemed to grip the Grateful Dead every time they tried to make a record. When I went up to Weir’s lovely, sylvan Mill Valley, Calif., home studio in March 1999, the new album by Weir’s current band, Ratdog, was half finished by his estimation, and he was looking to have the record done by May ‘99, in time for a planned summer-fall tour. At that point, the group *had* been cutting at a furious clip,

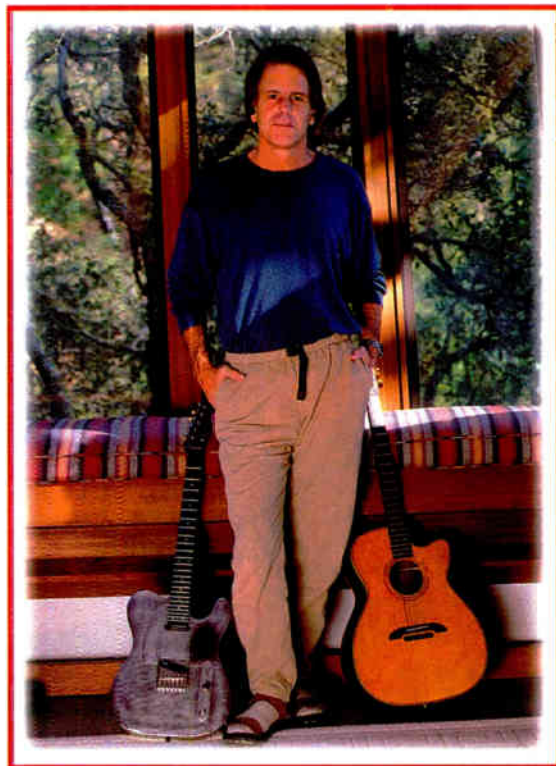


PHOTO: SUSANA WILLMAN

he couldn’t believe that he could make a record so painlessly. His confidence was downright infectious.

But let’s not get carried away. Fast forward to June 2000. The CD is *almost* finished—no, really, this time it’s true! Weir’s engineer Mike McGinn and veteran engineer/mixer Tom Flye are doing some final tweaking on mixes at the Grateful Dead’s studio in Novato, Calif.

A flat note is pitched successfully, and Flye experiments with a couple of light reverbs to bring a little more depth to the vocal. With several of the ten songs on the disc hovering at around ten minutes or more, there might have to be a little editing before all is said and done, but McGinn is confident that can be achieved without sacrificing the integrity of any of the performances. They *will* make the deadline—the CD, *Evening Moods*, was released September 28.

During the intervening year-plus, the project succumbed to numerous delays for various personal and professional reasons. In the spring of ‘99, Weir married his longtime love (and mother of his impossibly cute daughter, Shala Monet Weir), Natascha, and then that summer he decided that he wanted to do more recording, but *after* Ratdog’s fall tour—in keeping with the Grateful Dead’s tradition, he felt that the new songs would benefit from being tested on the road before committing to final versions on tape. And, indeed, a number of the songs did

—CONTINUED ON PAGE 261



PHOTO: SUSANA WILLMAN

Engineer Mike McGinn in Bob Weir’s studio

recording basics for more than a dozen songs and still working on writing and arrangements for another ten. “We’ve actually got some momentum going here,” Weir said with a laugh, as if even

McGinn has a Pro Tools setup on one side of the control room while Flye sits at the Neve VR console, and they do a little cosmetic work on Weir’s lead vocal on a fine tune called “Lucky Enough.”

UNDERWORLD LIVE

**RICK SMITH TAKES IT
WITH HIM**

by Robert Hanson

Few bands in recent memory have managed to stay as close to the bleeding edge of trend and technology as London's Underworld. The band has undergone several complete transformations over its almost 20 years of existence, moving from new wave to neo-industrial, to its current blending of all-things-dance or electronic. Following the release of *Dubnobasswithmyheadman* in 1993, '96's *Second Toughest in the Infants* and *Beaucoup Fish* last year, Underworld has emerged as one of the driving forces in electronic music. Much of

the acclaim stems from both the band's captivating live shows and the fact that their sound generally remains well outside dance music's ever-shifting and emerging genres.

Following the departure this year of renowned DJ/producer Darren Emmerson, Underworld's current lineup consists of Karl Hyde and Rick Smith. In an effort to forever document the band's accomplishments over the last eight years, Underworld has opted to do the most unlikely of things for a dance act—they're releasing a DVD and a live CD, both of which are called *Everything, Everything*.

Smith was kind enough to take a break from putting the final touches on the new DVD/CD release and work on a new studio album to chat with *Mix* about the challenges of touring an electronic band, the promises and



Karl Hyde (left) and Rick Smith

limitations of 5.1 in a live setting and the future of Underworld.

A live album isn't the first thing one would expect from you guys. What brought it about?

It was a strange series of events really. Two years ago,

Rob Buckely of Strongroom Studios in London gave me some free time to experiment mixing in surround sound. He was a very smart man; I think he knew how excited I would get—you know, the possibilities of throwing sound all around

—CONTINUED ON PAGE 266

DIXON VAN WINKLE

**POP TO CLASSICAL
TO POETRY**

by Gary Eskow

Engineer/producer Dixon Van Winkle has traveled many miles in a career that spans three decades, but his story begins in

the sleepy upstate town of Ogdensburg, New York. A fine place, but if your goal is to work in the music business with the likes of Paul McCartney, Frank Sinatra, Paul Simon and Dizzy Gillespie, chances are you'll one day set off on the road heading out of town.

"Both my parents were musicians," he says. "My mom was a vocal teacher, and my dad ran the high school band. He was a very creative guy. When I was in the fifth grade, he started teaching me different brass instruments and eventually the acoustic bass. From then on until I graduated high school, he had me sitting in with different ensembles and eventually going out on the road with him in dance bands. We went all over the

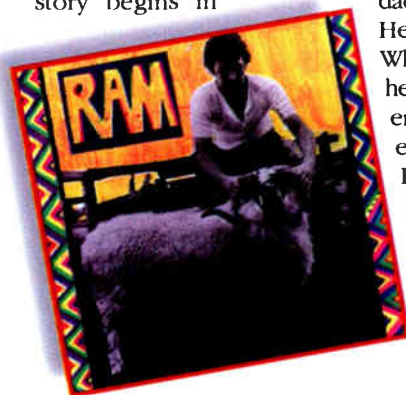


north country together, carrying the official Glenn Miller books. My dad had it in his mind that I'd be playing tuba and bass like the guy in the back of Guy Lombardo's band. It was a great experience."

But if you stay in a small town long enough, you're likely to wind up in trou-

ble—even if you play the baritone horn instead of quarterback. "I was taking my father's car and getting into some trouble, and I had pretty much outgrown the level of musical training in Ogdensburg, so my parents sent me to the Interlochen Arts Academy for

—CONTINUED ON PAGE 269



THE BEE GEES' "STAYIN' ALIVE"

by Dan Daley

When the movie *Saturday Night Fever* was released in 1977, it was one of those not-so-rare moments in American culture when Hollywood redefined and repackaged an entire musical movement, creating a celluloid version without the grittiness and with gobs of gloss. Like *Urban Cowboy*, released three years later, *Saturday Night Fever* was based on a magazine article, "The Tribal Rites of Saturday Night," and the film, like the article, attempted to compress an entire sociological phenomenon into less than two hours or 10,000 words, something American corporate culture has become amazingly adept at. Both films starred John Travolta.



The disco of *Saturday Night Fever* is not the disco of the culture that preceded it, embodied by Betty Wright and T.K. Records and drummers like Jimmy Yung and Yogi Horton, who created that between-the-beats, hi-hat figure that became both the signature and the parody of disco music—a subtle pair of cool-ribbed nylon socks slipped into slick alligator loafers and the dazzlingly white suit with open-to-the-navel black shirt all rolled into one. Disco music is black music; the white kids in Brooklyn that the magazine article focused on re-created it in their own image—Bensonhurst chic—and it was that second-generation iteration that Hollywood latched onto and refined into something they could figure out in Peoria. So it was perhaps appropriate that it was the Bee Gees, three very white brothers from England,



The brothers Gibb hit the high notes

who in 1955 became Commonwealth expats in Australia (although it could be argued that their native Manchester is the British equivalent of Bensonhurst), that created the soundtrack to this very accessible culture. Not that they came to this critical juncture in their musical careers without some soulful credentials; several of the group's preceding records were produced by Atlantic Records' R&B giants Arif Mardin, Jerry Wexler and Tom Dowd, the same production team that made Sam & Dave and Aretha Franklin records, and it was inevitable that some of that deep-fried flavor would become ingrained in the Bee Gees' music.

The Bee Gees' involvement in *Saturday Night Fever* was as much a collateral effect of corporate machinations as anything else. RSO Records owner Robert Stigwood, who along with film producer Alan Carr, had snapped up the rights to the magazine article and signed the group to his label, which was distributed via Atlantic Records, saw the economic synergy between owning multimedia content well before it became the no-brainer that it is today. However, it's significant that a year earlier, Stigwood's label broke away from Atlantic, thus rendering Mardin et al. unavailable to the Bee Gees. So Karl Richardson and Alby Galuten, who had worked in the capacities of engineer and arranger, respectively, on some previous Bee Gees records, took over as co-producers, and the group continued to record with Miami rhythm sections for hits like "You Should Be Dancing" (a Number One hit in 1976) and a ballad, "Love So Right" (Number Three, 1976), which recalled such black

vocal groups as The Spinners and The Stylistics, rather than the British pop band heritage of the Bee Gees.

The Bee Gees arrived at Le Chateau Studios, an hour north of Paris, several days earlier when their manager, Dick Ashby, called to tell them that the album they had just begun work on was now to be a soundtrack record for the film. Barry Gibb, the eldest Gibb brother and the group's acknowledged leader, had spent the previous few months at Stigwood's luxurious resort home in Bermuda, where he penned several new songs, one of which was titled "Stayin' Alive."

"Barry played it for me the first time at that studio on an acoustic guitar," Richardson recalls. "It was around March or April of 1977, and I had gotten to the studio ahead of them and found it to be a disaster. The owner had gone nuts or something and burned down the stables where the studio had been. This was the same studio that Elton John had just done *Honky Chateau* in, and it was that record which had attracted Disk and the Bee Gees to the studio in the first place. [Along with an economic impetus, like other successful UK groups, for tax purposes the Bee Gees had to spend a certain amount of working time outside Great Britain and, thanks to all the work they had been doing at Criteria in Miami the previous three years with Mardin and Dowd, outside the U.S. as well.] They had quickly set up a studio on the second floor of the 13th-century castle on the property, but it was in pretty bad shape, too. I came in there and actually had to ground the place's electrical system on

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my own before we could get to work."

Actually, the song "Night Fever" was initially considered the front-runner for the film's and album's first single, and that was the first track worked on there: it was quickly Fed Exed out to Hollywood. But though it would go on to become a hit single in its own right, the song didn't create the excitement everyone was hoping for. "Stayin' Alive" was the next contender, but its realization had a few hurdles to clear first. Drummer Dennis Bryon's father passed away in England just days into the sessions, and he flew across the Channel to be with his family. Hollywood was clamoring to hear "Stayin' Alive" as the film's produc-

tion progressed. "And on top of the deadlines, this was the middle of France in the winter, not the best time and place to go looking for a great replacement drummer," says Richardson. The solution came to him as the now-drummerless group and technical crew, including Albhy Galuten, played around with the rhythm machine in a Hammond organ at the studio. "It sounded terrible," says Richardson. "This was before the days of a Linn Drum or Roland machines. But we could at least get a 4/4 beat out of it. It gave us something to work with."

But then Richardson and Galuten had an idea: Why not take the drum sounds from the previously recorded "Night

Cool Spins

The Mix Staff Members Pick Their
Current Favorites



Nina Gordon: *Tonight and the Rest of My Life* (Warner Bros.)

Predicting what might become a hit is always a dangerous proposition, because there are always so many variables in play. But it's safe to say that *Tonight and the Rest of My Life*, the solo debut by ex-Veruca Salt member Nina Gordon, has all the ingredients we normally associate with commercial music. Gordon is an attractive woman, with a pleasing voice that ranges easily from wispy balladry to assertive rock tunes. Her CD is loaded with a zillion pop hooks, bright electric and acoustic guitars that soar in all the right places and songs that are introspective but universal enough that they're easy to relate to. The CD was recorded over the course of seven months in Maui, but the exotic and laid-back locale didn't seem to affect the music—this is a slick affair from beginning to end, with layer upon layer of Gordon harmonizing with herself, string-like melotron lines and every note in place. Ap-

propriate credit must be given to producer Bob Rock, for this is a producer's album as much as it's Gordon's, for better and worse. There are a fair number of George Martin-by-way-of-Jeff Lynne-style arrangements here, but Gordon's voice fits the style well. And few producers do *crunch* better than Bob Rock, so there's lots of textural variety. Does radio still play this kind of music? I have no idea, but they would've loved this record in 1969.

Producer: Bob Rock. Engineer: Brian Joseph Dobbs. Mixed by Bob Rock. Studio: Plantation Recording (Haiku, HI). Mastering: George Marino/Sterling Sound (NYC).
—Blair Jackson

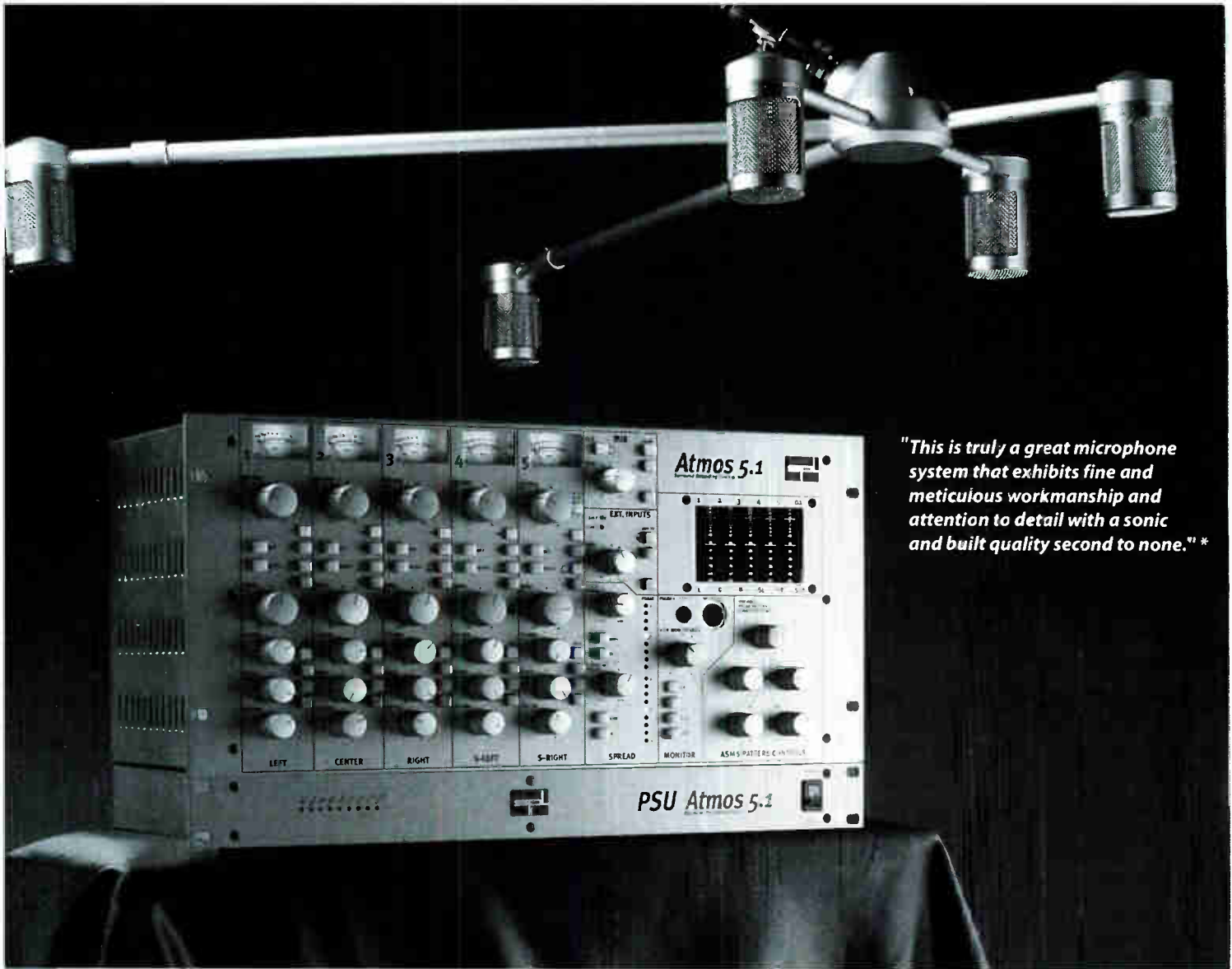
Dion: *Deja Nu* (Collectables Records)

One of the greatest live shows I've ever seen was a rock 'n' roll review that Dave Edmunds put together that included Ed-



munds, Graham Parker, Kim Wilson of the Fabulous Thunderbirds and Dion. When the elder of these rocking elder statesmen took the stage and sang "Ruby Baby," it was worth the price of admission alone. Curiously, with the exception of a couple of authentic doo-wop numbers, this latest

—CONTINUED ON PAGE 271



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Fever” and use them to create the drum track for “Stayin’ Alive”? This was 1977, and drum loops were still more conceptual than real. Richardson’s first instinct was to take two bars of the drums already on tape and then re-record them 100 or so times and splice them together until there was enough to make a new track. That was the plan as he and the band spent hours listening—over Auratone speakers, no less—to “Night Fever”’s drum track, looking for the perfect two bars to make a foundation for “Stayin’ Alive”. By the time they’d decided, Richardson’s technical plan had evolved further: “I copied the two bars onto a piece of half-inch tape on an MCI 4-track deck we had there—kick, snare and left-right tracks. Then it got interesting: The tape was about 22 feet long—we were running at 30 ips—and I took a bunch of empty tape box hubs and gaffer-taped them to the top of microphone stands and set up a tape path that long between the 4-track deck and the [MCI] 24-track deck, using the tape guides from a 2-track deck to add some tension. And we were using the Hammond organ rhythm machine and the varispeed on the MCI to establish the tempo. This was kluge-city; it was total Rube Goldberg. And the

drum tracks that were getting to the 24-track machine were third generation by now, and the tape heads were pretty badly worn to start with—the studio had had no maintenance. So I was tweaking the tracks, which already had Dolby A encoding, with even more high-end EQ from the old API 550-type console to get some brightness out of them. But we got about seven minutes’ worth of pretty good sounding drum tracks that were the right tempo and groove for the song.”

“The other interesting thing about that drum loop was that it went on to have quite a career,” recalls co-producer Albhy Galuten, who had been part of the two-bar search with Richardson and Barry Gibb. “We wound up using that same loop on ‘More Than a Woman’ for the Bee Gees and ‘I’m a Woman In Love’ for Barbra Streisand. So in addition to it being a very seminal point in music, since it was the first hit record made with a looped drum part, it was also a loop that would have more lives to it. That’s what happens when you get a piece of playing that has a great feel.”

After that experience, the rest of the recording process for “Stayin’ Alive” was almost anticlimactic. Barry Gibb record-

ed the basic track with an acoustic guitar and a pilot vocal. Maurice Gibb played the bass guitar direct into the console, using a pick, as was his style. The lack of studio maintenance hampered Richardson all the way. “Someone had taken different-colored nail polish and repainted all the EQ knobs on the console—that should have tipped me off right there,” he recalls. “The faders were so bad that I had to mark the spots on each one where they would drop out as I moved the fader and try to get past those spots quickly so I wouldn’t lose signal.”

More amazingly, during all of this deadline-induced pressure to get the track done, Stigwood also asked Richardson to mix the tracks from a recent Bee Gees *King Biscuit Flower Hour* appearance, recorded at the Los Angeles Forum by the Wally Heider Record Plant mobile unit, so RSO could get a live double album out the door before the *Saturday Night Fever* soundtrack hit the record store racks. Using the same questionable console, Richardson got it and the soundtrack recordings done in the same short window that Ashby had booked for just the new studio recording. And all on Auratone speakers.



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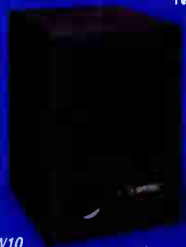


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Subsequent tracks were added individually, with Bee Gees band members Blue Weaver playing electric piano, then an ARP string synthesizer, and Alan Kendall playing electric guitar. Upon his return, Dennis Bryon overdubbed tom fills, cymbal crashes and hi-hat parts.

Richardson recorded the Bee Gees' vocals the way he had for previous recordings: setting up a Neumann U67 and having the three brothers sing harmony parts together first, before the lead vocal was laid down. "Though one thing we did differently this time was to have them sing the chorus harmony parts in unison, one part at a time, then stacking them," he explains. Barry and Maurice Gibb sang the lead vocal in unison, as well. Vocals were run through a UREI 1176 compressor set at 4:1, with medium attack and a fast release.

With most of the recording done, the crew returned to Miami, where percussionist Joe Lala added timbales and the Miami String Section augmented the ARP parts. More strings were then added at Capitol Studios in Los Angeles. The tape finally traveled back to Criteria Studios in Miami for mixing, but not before two more musical interludes. It seems the film's director wanted a bridge to the song to support a moment in the movie when Travolta's character falls in love on the dance floor in mid-song. The Gibbs recorded a completely new piece of music, a ballad, based on the song's theme, and Richardson—who says he never met a razor blade he was afraid of—proceeded to splice the 2-inch multitrack, putting the new bridge in the middle of the song. "Me and Albhy were convinced that we had just ruined a Number One hit song," he says, "but after we sent it off, we never heard from them again about it, so I spliced the piece back out of the track, and we went on from there."

Just before the mix, in Criteria's Studio B, Barry Gibb felt that the song's tag needed some spice. So he came up with the tag vocal parts in the vamp. Everyone liked them, but still felt they needed some sparkle, which Richardson supplied by taking out the Dolby decoder, allowing the new vocals to play back undecoded and then boosting the high frequencies even more. "It sounded pretty psychedelic, but it worked," he says.

The mix was one of the first automated ones at Criteria, using VCA grouping automation on the custom-made MCI console. Mastering was done at Capitol Studios. The record hit the

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Number One slot in February 1978 and continued the Bee Gees' remarkable career resurgence. It garnered a Record of the Year Grammy nomination, and the soundtrack album, now regarded as the definitive document of the disco era, and which also included the Bee Gees' hits "Night Fever" and "How Deep Is Your Love," eventually sold over 30 million copies worldwide.

Providing his own coda to the experience, Richardson says simply, "After everything we went through to make that track, we were just happy we got it done." ■

sociated blues and rock covers and a number of tunes originally sung by Jerry Garcia in the Dead—Ratdog is definitely more than just a Bob Weir vanity project. The group has been together more than five years—dating back to before Jerry Garcia's death in 1995—and the core of Weir, bassist extraordinaire Rob Wasserman and drummer Jay Lane are a remarkably diverse and flexible unit with a distinctive personality. Keyboardist Jeff Chimenti is a solid writer and arranger and a superb colorist, and a more recent addition, guitarist Mark Karan, brings a deft melodic touch to a band already filled with great rhythm

players. There was deep collaboration on this CD; a necessity since Weir is such a notoriously slow writer.

"It's more of a band record than a Bob Weir record," comments Mike McGinn. "The band has been involved in a lot of the writing, and they'll come in and spark things. Like the song 'Two Djinn,' Jeff Chimenti came up with the spark for that. And to give credit where it's due, a lot of the spark also came from Jay Lane. He's quite a good writer and he has a lot of spontaneous energy and he really understands pop form, so for the first couple of weeks, he was coming in and going over to the keyboard and gen-

—FROM PAGE 252, BOB WEIR

change a bit as the band played them over the course of a tour. So the day after Ratdog's tour ended, the group went in for a week of sessions at Coast Recorders in San Francisco, and that yielded about half the basics used on the record; the other half came from the original sessions at Weir's studio, which he affectionately calls "The Doghouse" these days.

Of the Coast sessions, Weir comments, "I felt like we needed to get out of any kind of comfortable environment and go somewhere where we had to be concise and to the point—show up and play, rather than discuss things or try a million different things without regard to how much time it's taking. It gets you to work a little differently. The comfort level at my place, and even at Bel Marin [the Dead's studio] is maybe a little too high, at least for basics. For basics, you want to get momentum. And comfort and momentum are sort of at odds with each other."

Overdubs were cut at Weir's and at the Dead's studio. Then, around New Year's, Ratdog sax man Dave Ellis left the group, which changed the final equation somewhat, too. Ellis, who was instrumental in the initial writing and arrangement sessions, still appears on several tracks, but as a guest. Also guesting on the album are current Ratdog sax player Kenny Brooks, former Ratdog member Matthew Kelly and ex-Grateful Dead drummer Mickey Hart, who still occasionally tours with Weir in the Deadish group, The Other Ones.

Though Weir is the unquestioned leader of Ratdog—he's the lead singer, and the bulk of the group's repertoire is made up of songs he wrote for the Grateful Dead and his various earlier solo albums, as well as a few Dead-as-

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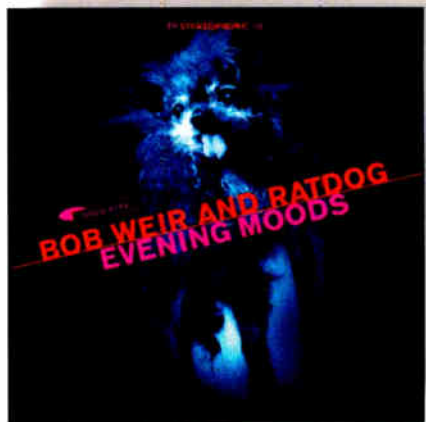
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console in the main studio room, so Weir is used to working that way. One space-saving innovation that was new to me is a small, ceiling-mounted lighting grid that is used to hold microphones, instead of having them cluttering more floor space in the smallish room.

McGinn says that the drum room sounds surprisingly good. "I'm not a huge fan of close-miking on drums," he notes. "I use pretty standard stuff—a 57 on the snare and toms, a D112 on the kick or maybe a 451—but I like to get as much as I can from overheads. I've been using these Lomo Russian tube mics that Steve Albini turned me on to. They're sort of like a tube 414; they sound really good." Later in the project, he used Neumann KM54s with B.L.U.E. capsules as overheads. Keyboards and guitars are mostly recorded direct (though Weir might also have a mic on his speaker) to Studer 820 24-track with Dolby SR. McGinn and Weir both speak very highly of the Sony console's John Hardy preamp modules. A wide range of processing is available, from Lexicon and Quantec reverbs to the popular H3000 Harmonizer and, his current favorite "toy," the Distressor: "I wish I had four of them," McGinn says. "You can't get a bad sound out of them. We have an LA-2A, but I'll use the Distressor because it sounds good and gives me flexibility without having to repatch."

McGinn says he was initially reluctant to use Pro Tools much on the project "because I was afraid it would defer the decision-making process too long. I wanted them to commit to stuff up front. You can always re-track and change the structures. I was fighting for maintaining a spontaneous, immediate feeling, because these songs felt like they needed to be captured earlier rather than later. With Pro Tools, there's almost no end to the amount of fussing you can do on a track, and I wasn't sure that was a way we wanted to go." In the end, though, they did employ a 24-

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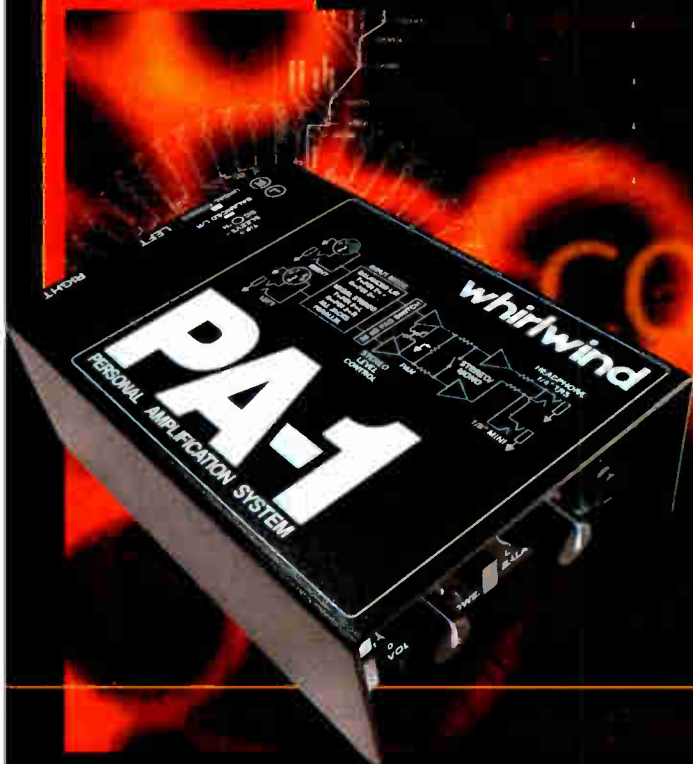
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perfect for coming close to capturing the experience of being at a gig. And really it was the medium of DVD, rather than stereo CD or VHS tape, that cemented it for me. And within about eight days, we had a nine-camera TV crew and mobile recording truck, which Karl and I paid for ourselves.

On a more sort of spiritual level, I had a feeling at the time that we weren't going to be performing in that way much longer. It was sort of a look in Karl's eyes that I recognized; we've been together for nearly 20 years now. And I just thought, "We're not going to keep this up like this." The way we were performing the material where the energy level had risen to a certain point and the pace of things was really fast. And I thought, "This has got a limited life span," in terms of live performance. As it turns out, with Darren leaving the band earlier this year, I was kind of right in a different way.

If you do choose to go on the road again, are you going to look to incorporate 5.1 in any way?

We did some experiments, funny enough, back in 1993 at Glastonbury with surround sound. It was a thing we did with some guys, Function 1, called

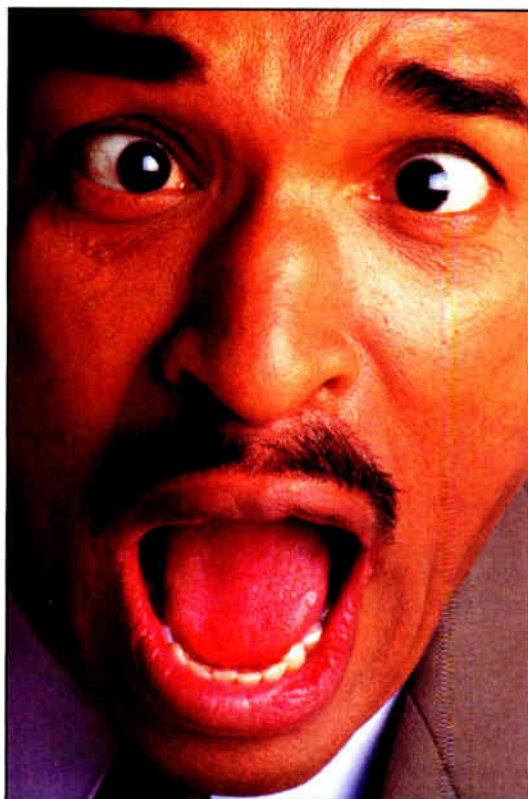


PHOTO: STEVE JENNINGS

Underworld performing at the Warfield in San Francisco during their '99 tour

the Experimental Soundfield, and it was an enormous success. So this is not something that is new to us in a live sense. But there are real serious difficulties with surround sound live. It can be extremely expensive just because of the laws of nature. If you put a live speaker 25 meters from another one, there is a serious time delay, and it really doesn't help dance music. So there are issues

then about the placement of loudspeakers and the sizes of audiences and the expense that goes with that that are really difficult to overcome. But we've been planning on doing something like that for a good couple of years now, but we just really haven't licked the problem. And it's a financial one, to be honest. It's just so expensive that we keep having to rethink our plan.



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In a general sense then, how do you approach a live situation? It has to be a very different undertaking from say a "regular" rock band.

Well, technically, you're preparing, essentially, what is an instrument, and the way all this equipment works together and how I get to play it and preparing it so that it *is* playable and it does translate. Preparing it so that it kind of f—s up fairly often but not too drastically, because the mistakes produce a great response. They can shift directions for you and put you more in touch with something in your subconscious.

There is a simple idea to the system, which I've been developing now for ten years, and the principle is still the same. Funny enough, in the past two or three months, myself and Malcolm Colbert, who looks after our equipment and the studio for us, made a bit of a breakthrough, really. The concept was simple really, and that was to be able to jam, to be able to re-interpret electronic music and rhythm, synchronized rhythm and to be free with it. Electronic equipment doesn't really inately want to do that; it wants to take time to load up, and it wants to go in a particular direction once it's going there. How can I describe it? I want it to be like a DJ with two record decks with the ability to mix seamlessly between pieces and also be able to move from one thing to another instantaneously. And really, that's a thread that's gone through the equipment all this time—in pursuit of that.

There is a master clock [on the system] that says, "Okay, this is going to be this tempo," and when you press it, everything starts. But the system can be broken down into so many parts that if any one bit screws up, there is another part you just take over and move it in another direction. It also allows you to deconstruct things by turning certain sections on and off. At the end of the day, the most difficult thing for me is there are 56 channels of audio coming off a mixer, and it's just trying to deal with that physically so that it doesn't turn into this horrendous noise.

Do you think that more electronic bands are going to start trying to tour in a more traditional sense vs. just doing the DJ thing?

Yeah, I think they will, because record companies want to drive people that way. I think they often have difficulty dealing with the concept of a DJ. But for myself, I think there is no point for a lot of people. I think a great DJ does everything that needs to be done with

vinyl; and why bother? It's a very personal thing; it all comes down to what you want to express.

It seems a lot of the major labels, at least here in the States, keep trying to sell electronic music to the masses like they would anything else.

Yeah, it's kind of sad, and it's not just in the States; it's kind of global. It's really not the point. Back in 1990, that was really the thing that made me want to find a DJ to work with. My wife's brother was coming back from these acid-house warehouse parties where 5,000 people would get together in some old factory and some DJs with a couple decks and a P.A., and they were having the time of their lives. And there were Karl and I touring the world with a seven-piece band and all the problems associated with it. It felt like this great lumbering beast that you had to drag all over the place, and we thought, "No, screw this, this is not happening."

In a sense, those principles are things that we've applied to Underworld. We might have this pile of equipment, but Malcolm Corbert, who designs the cases and things the equipment goes in live, and I took great pride in it, kind of being like guerrilla warfare. We can get onstage and within 12 minutes, be ready to play. And that's important to us. ■

—FROM PAGE 253, DIXON VAN WINKLE

my senior high school year, and the summer before I'd attended a music festival in Burlington, Va. That's where I first met Bobby Ludwig."

Interlochen led to the Eastman School of Music, followed by a couple of years kicking around upstate teaching band and playing in clubs. In 1969, Dixon met Phil Ramone. "Phil was already enormously successful by that point," Van Winkle says. "He was teaching a course on engineering with a couple of other guys, and it was there that I first got my hands on a multitrack—Phil brought out an 8-track recording of the Broadway musical *Promises, Promises* and let us go at it. Phil thought I showed promise and told me he'd make me a star if I came to New York, so down I went."

Young people looking to become studio engineers started out in the '60s, just as they do today: "I was a setup man at Phil's studio, A&R Recording. There was a lot of young talent in that place: Don Hahn, Elliot Scheiner, Tony May, Bob Ludwig to name a few. One

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beats, punk stylings and "the system is failed and flawed"-type chants. Amid the anger and distortion, though, she does manage to bring in a certain degree of irony and quirkiness. Actually, the cute, girly-girl charm when juxtaposed with the jackhammer-like arrangements creates an overall effect that's that much more disturbing and surreal. Some of the stand-out tracks, if for no other reason than the titles, are "Hot Lips-Wet Pants," "(I Wanna) Meat Injection" and "I Luv Speed." This is sick, sick fun and not intended for the faint of heart.

Producer/Engineer: Emie. Mixing: Alec Empire. Recorded at Storm's project studio. Mastering: Steve Rooke/Abbey Road (London).

—Robert Hanson

isn't a great departure from her label mates at DHR (Atari Teenage Riot, Hanin Elias, Christoph Debalon); imagine distorted, double-time break

The Flying Burrito Brothers: *Hot Burritos! Anthology 1969-1972* (A&M)

Though their record sales were never exceptional, The Flying Burrito Brothers were at one time among the most influential groups in rock music. This 2-CD package, containing the 'country rock' pioneers' first three albums,




plus selections from various post-breakup compilations, helps explain the admiration and respect that the Burritos have long enjoyed among musicians and critics. Founded by Chris Hillman and Gram Parsons, whose shared enthusiasm for country music fueled The Byrds' unexpected detour on 1968's *Sweetheart of the Rodeo*, the Burritos provided the perfect setting for Parsons' emotive voice and unusually developed songwriting talent. Pitching their complementary voices over the adventurous steel guitar of "Sreeky" Pete Kleinow and Chris Ethridge's me.odic bass playing, the two singer/songwriters crafted an immediately recognizable sound and the Burritos' 1969 debut, *The Gilded Palace of Sin*, is an undeniable classic. Unfortunately, the 1970 follow-up, *Burrito Deluxe*, lacked both sonic consistency and first-rate songs, and the increasingly drug-addled Parsons was effectively replaced by the David Crosby-like Rick Roberts for the band's well-produced but widely ignored third album. Gram Parsons' posthumous fame has tended to focus attention on his contributions to the Burritos' canon, but it's hard to overstate the importance of Hillman as singer, co-writer and *de facto* bandleader. This long-anticipated collection sets the record straight, replacing the only other domestic Burritos compilation on CD, the Parsons-centric *Farther Along*. And it makes a handy companion to the *GP/Grievous Angel* Gram Parsons twofer on Reprise.

Compilation produced by Mike Ragogna. Mastered by Jim Phillips at Universal Mastering Studios, North Hollywood. Original sessions produced by The Flying Burrito Brothers, Larry Marks and Henry Lewy; Jim Dickson and Henry Lewy; Jim Dickson and Bob Hughes; Gram Parsons; Jim Dickson; Johnny Guitar Watson and Larry Williamson. Engineers: Henry Lewy, Bob Hughes, Lillian Douma. Studios: uncredited and Record Plant.

—Chris Michie ■


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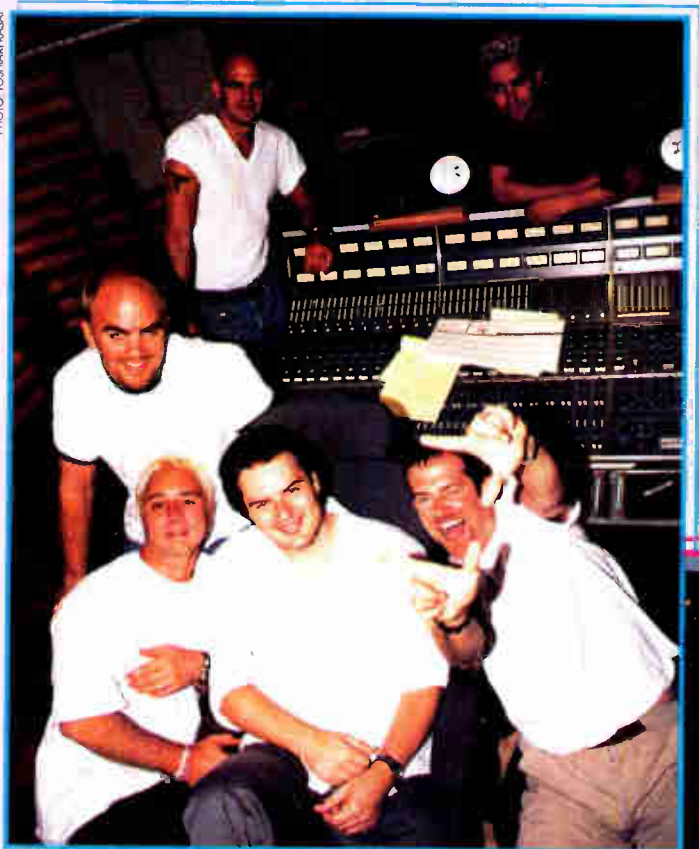
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COAST TO

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L.A. GRAPEVINE

by Maureen Droncy

At The Hook in North Hollywood, I found RCA artists Sugar Bomb hard at work, overdubbing with hot young producer Mark Endert. Endert, just off his first Billboard Hot 100 Number One production (Vertical Horizon's "Everything You Want"), has been steadily accumulating credits over the past few years: production and engineering for Semisonic, Splender, Tracy Bonham and Tonic, and recording and mixing on Fiona Apple's *Tidal* and various Madonna projects, including *Ray of Light*. He and the Fort Worth, Texas-based Sugar Bomb hooked up after an introduc-

Producer Mark Endert (seated) and the members of Sugar Bomb at The Hook.

tion by RCA A&R honcho David Bendeth.

"When I was in New York, I dropped by his office and he played me their tape," explains Endert, "Out of the box, I was totally moved by several of the songs."

Sugar Bomb is a five-piece who have been together just over two years. The core of the band began with brothers Michael and Daniel Harville, a drummer and guitarist originally from Memphis. Daniel and vocalist Les Farrington, who hails from Austin, Texas, share lead vocal duties.

—CONTINUED ON PAGE 278

NY METRO REPORT

by Gary Eskow

The last time we checked in with Bob Sadin, he was putting the final touches on *Gershwin's World*, the Herbie Hancock record that would pull down several Grammys in 1999, including Best Jazz Record of the Year. As producer, Sadin found himself in

the same, his recent purchase of a Pro Tools|24 MIXPlus system has radically changed the way he tracks and edits. "*Gershwin's World* was the apotheosis of the old way of using technology; that's how it strikes me," states Sadin. "We recorded to a Sony 3348, which is a great machine, but tape slowed us down. Understand, when you're working with artists on the level of Herbie and Wayne, they don't have to punch in very often to fix a



Some "Scary Monsters" took over Sear Sound. Seated: David Bowie and producer Mark Platti. Standing from left: guitarist Karl Slick, engineer Peter Kepler, Sear Sound assistant Todd Parker and studio owner Walter Sear.

the enviable position of sifting through offers. For his next project he chose to work with Wayne Shorter on the fabled horn player's current album.

Although much of the fundamental work that falls to Sadin as producer remains

mistake. They use the overdub process to hunt down their best ideas. Sometimes they'll play something that's so good right away that you say, "That's it, we're done." Other times, they'll be happy to play for an hour and de-

—CONTINUED ON PAGE 282

COAST



Artist Meredith Edwards (seated) with (standing L to R) Emerald Studio VP Scott Phillips, producer Richard Marx, engineer David Cole and Emerald staff engineer Jason Piske.

At Extasy Recording Studios, engineer Dave Reitzas and co-producers Lisa Loeb and Dweezil Zappa worked on material for Loeb's forthcoming album.

NASHVILLE SKYLINE

by Dan Daley

Nashville's upper tier of studios is stabilizing after a long round of consolidation, but the city's baseline of facilities is growing again. Engineers and producers have shown an entrepreneurial streak and are carving out niches in response to the demand for different types of studios. Luke Wooten had a mostly personal-use studio called The Station in the Cummins station office complex in downtown Nashville for several years, when an unfortunate lightning strike chased off another would-be studio owner from a facility in progress in the Berry Hill section of Nashville. Wooten was able to pick up the studio, Soundscape, designed by Mike Cronin, and for the past two years has been completing it, developing it as both a commercial for-hire facility and as a base for his own production and engineering work, which recently has included engineering records for Richard

Marx and Bob Seger.

Station West, as it's now called, has a sizable main studio fitted with a Trident 80B and Pro Tools. Wooten outfitted the B studio with one of the three beta models of the now-discontinued Otari Advanta digital console and a RADAR II system.

Rate-wise, at \$800 for the main rooms and half that for the B studio, Wooten is realistic that he's not going to make the bulk of his living from the studio. "That's why I think this facility can work by being both commercial

—CONTINUED ON PAGE 284



PHOTO: DAVID SOCCEN

SESSIONS & STUDIO NEWS

SOUTHERN CALIFORNIA

At Extasy Recording Studios North (Hollywood) Lisa Loeb was working on an upcoming Interscope release with engineer Dave Reitzas. Loeb

is co-producing the effort with Dweezil Zappa. At Extasy South, engineer Joe Barresi and producers Sylvia Massey and George Drakoulis worked on a mixing session for American Records artist Loudermilk. . . Recent sessions at The Village (West Los Angeles): Musician Nancy Wilson (formerly of Heart) and her husband, writer/director

Cameron Crowe, were working on the score

—CONTINUED ON PAGE 285



Guitar goddess and one half of the '80s mega group Heart, Nancy Wilson (left) along with engineer Daniel Mends, Pro Tools operator Carl Kaller and assistant engineer Matt Marrin strolled into The Village to work on the music for a new film by director Cameron Crowe.



FACILITY SPOTLIGHT

M WORKS RULES BOSTON

by Blair Jackson

Over the past eight years, Jonathan Wyner's Cambridge, Mass., M Works mastering studio has established itself as the one of the top facilities of its kind in the Northeast, drawing a diverse clientele covering many different aspects of the entertainment industry. "We're versatile in both our approach and our equipment," says Wyner, who has been a mastering engineer for 15 years, including a stint at Northeastern Digital Recording before he started M Works. "We're equally comfortable with symphonic programs, rock, rap, country, metal, jazz, world music... We're all trained musicians and speak the language fluently. And Boston is an ideal place to be for this kind of work because there's so much going on all the time. There's a strong college music scene. There's a wonderful early classical music scene. Then there's the regular classical music scene, which is driven by the conservatories. There's Berklee [College of Music] and the jazz scene. Ethnic music scene; hip-hop." Wyner holds a music degree from Vassar College and has taught at both Berklee and the Recording Workshop in Ohio. His other staff mastering engineers are Colin Decker, David Merullo and Matthew Azevedo.

To accommodate the company's



steady growth, M Works recently built a new 2,700-square-foot space comprising three audio suites designed by George Augspurger of Perception Inc.—two traditional mastering rooms and a 5.1 room for DVD and other surround applications. "The expansion is something I envisioned over the last seven or eight years," Wyner says. "We had really outgrown our old facility. We needed greater capacity, and I also felt that in order to reach beyond our immediate community that we needed to have a facility that would attract people from far and wide. But I also built it to please myself. I wanted to build a room that had this kind of resolution so I could feel challenged in my work and really hear everything that's there."

Wyner says the stereo mastering suites are "fairly similar in terms of their design. They have a slightly dead front end and a more live back end. The largest room is about 6,600 cubic feet, the other one is 5,200. Both offer a mixture of digital and analog technology." Equipment in the new Studio A includes a Sonic Solutions system (5.4),

Dunleavy SC-5 monitors driven by Bryston 7B-ST power amps, Enlightened Audio Design DAC/Preamp, Avalon and Weiss EQs and more. Studio B is also Sonic-equipped but features ADS 1590 and Tannoy DMT-12 speakers powered by Bryston and Hafler power amps. The 5.1 suite has a Sonic Creator, Genelec monitors, a Dolby decoder, a Baldwin master pot controller, an Audio Cube and various high-end DSP boxes.

Wyner is excited by the advances in technology he's witnessed since his early days at NDR, and he makes every effort to stay on top of things for his clients. Asked if the rise in

project studios and what appears on the surface to be more technologically savvy musicians has made his job as a mastering engineer any easier, he replies, "Frankly, I think in some ways it's gotten worse, partly because of the rise of multi-effects units, which some people view as a mastering engineer in a box. I think that people are not being as mindful of mastering. People are overcompressing and overlimiting; and then, of course, I have to deal with that. I think, overall, people have a better

We're equally comfortable with symphonic programs, rock, rap, country, metal, jazz, world music...We're all trained musicians and speak the language fluently.

—Jonathan Wyner

idea of what mastering is, but I wouldn't say they're better prepared for it than they used to be."

From a business standpoint, this might be good news for Wyner: It seems there will always be some mystery associated with the art of mastering, and Wyner is heartened by this fact: "There seems to be an endless supply of fresh bands out there making their first records. They need to be educated," he says with a laugh. ■

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and chief engineer Harold Kilianski. The new version is a larger, upgraded version of the popular custom API that has been housed in Studio A since its opening in 1993; it features 88 550 A&B equalizers, four stereo cues, 10 effects sends and a 5.1 monitor matrix. It's no exaggeration to observe that the finished product is an example of the kind of custom engineering that's almost nonexistent in today's mass-produced world.

The goal of the upgrade was a traditional, user-friendly, high-quality console that would add inputs and features while continuing to appeal to O'Henry's client base, a mix of both pop music engineers and top scoring mixers.

"I didn't really know how many orchestral sessions we'd done since 1993," Sanicola says. "I counted them up, and it came to over 2,000. It's not uncommon for us to do two or even three sessions in a day. We need things set up so that we can change over quickly. This console is so easy to use; you can just look at it and figure it out. No training sessions are necessary; it's completely straight-ahead."

"The whole mission of this project was to keep the original sound and to improve what we could," adds Kilianski. "The old console was 8-bus and 64-input; it's a testament, and it's a success that a lot of scoring mixers liked to work on it, even though it only had eight buses! They liked the way it sounded. We wanted more buses, we wanted to balance everything to minimize connection issues, we needed more inputs and a 5.1 center section. But in obtaining those things, our emphasis was on a short signal path; we wanted to go through as few electronics as possible in order to maintain the sonic character."

Sixty-four of the original modules were reconditioned. Andrew Isett newly built 24 more, an endeavor requiring painstaking detail: making metal plates, painting and silkscreening. All of the modules are now housed in a frame specially constructed by Dale Manquen.

"The original API frame wouldn't carry the weight and size of this," explains Kilianski. "It was only one-inch tubular steel, and that just wasn't massive enough. Each one of these modules weighs a couple of pounds; they're all discrete, and there is nothing miniaturized about them."

The modules house traditional API-style 2520 amps. The center section,



Inside the renovated studio A at O'Henry Sound Studios: chief engineer Harold Kilianski (left) and studio owner Hank Sanicola.

also all discrete, was designed by Kilianski with board design by Steve Firlotte of Inward Connections, using SPA690 amp blocks designed by John Hall. The Flying Faders automation system, reconditioned by Manquen, now supplies 95 automated faders.

To complete the project, Studio A was shut down for two months. In addition to the console rebuild, the control room was stripped down to cement and redone, complete with new floor and wall treatments. Wiring was replaced, with accommodation made for the increased amount of digital technology now in use. The large recording area, often used for 30- to 45-piece orchestras, was also improved.

"Everybody liked the top end of this room," observes Sanicola, "but what used to happen, sometimes, because of the tile floor and flat ceiling, was that during loud pieces, strings and brass could get a little out of control. So, with the help of [mixer] Armin Steiner and [design firm studio bau:ton's] Peter Grueneisen, we decided to put cylindrical diffusers on the ceiling with trapping behind them. We also replaced the floor with 3/4-inch oak. Now it's much more even."

One of the first sessions in the new Studio A seemed to confirm that the goal had been achieved; top scoring mixer Shawn Murphy mixed a CD release of *Star Wars' The Phantom Menace* soundtrack, and according to Kilianski, Murphy said, "I'm very familiar with this recording, and I've never heard it sound so good."

"We were starting from something

good," concludes Kilianski. "We knew that people liked what we had, and as long as we didn't mess it up, we were going to be okay. But when we really got into it, it took on a life of its own, and to do it right, it became a monstrous, expensive project. I really have to credit Hank's vision. We quadrupled our original budget to hand-build all these things and to do it right. But we feel it's been worth it."

Over at **Electric Mayhem** (the Studios Formerly Known as A&M), I found singer/songwriter Shawn Mullins overdubbing on Studio A's new 80-in SSL 9000 with co-producer Julian Raymond and engineer Greg Goldman. Mullins, an Atlanta native, was putting the finishing touches on his latest project, his tenth album and his second for Columbia, a follow-up to 1998's *Soul's Core*, which spawned the hits "Lullaby" and "Shimmer."

The new album, tentatively titled *Beneath the Velvet Sun*, was recorded both at Studio A and at Crossover Rehearsal Studios in Atlanta and combines formats as well as musical styles. The Atlanta tracks were recorded direct to Pro Tools, while Studio A's were cut to analog 24 on BASF 900 tape, then bounced to Sony 3348 for vocals and overdubs.

The L.A. tracks, co-produced by Raymond (Fastball, Suicide Machines, Chris Perez Band), were laid down by "The Wrecking Crew 2000," drummer Vinnie Colaiuta, bassist John Pierce and electric guitarist Michael Ward, along with Mullins on acoustic guitar.

"Shawn's guitar is a very important

part of the recording," notes Goldman. "He's a really good guitar player with a distinct style, and a big part of recording with him is capturing that."

Goldman used mainly a Neumann KM140 on Mullins' Gibson J200 guitar. "It's very similar to the old KM84 and the newer 184," he says, "but you can change capsules, and it has a pad on it."

For vocals, Goldman stuck to classics: a Neumann tube U47, a Neve 1073 mic pre/EQ and a Fairchild 670 compressor. "With Shawn, you're really just going for performance," Goldman continues. "It's not like there's only one take where it's really right. It's always good and you get to choose among different performances. His voice has a lot of great low end that I wanted to be sure to get, and the 47 captured the full range of his voice."

Goldman (Melissa Etheridge, Bodeans, Michael Penn) started his career as a staff assistant at A&M in its Iovine/Yakus heyday, and he is generally a fan of old gear. He was especially fond of Studio A's previous classic Neve console and was surprised to find himself reaching for fewer vintage knobs this time around. "I ended up using the console an awful lot more than I usually would," he says, "because the 9000 sounds so good. I like the mic pre's and the EQ a lot."

Goldman and Raymond (who, in addition to his indie production work, is a Hollywood Records staff producer) work together frequently; they've just completed the new Fastball effort titled *Harsh Light of Day*. The two hooked up with Mullins when they cut a new version of an old song for him on his *The First Ten Years* CD, a Sony Music compilation culled from his five earlier independent releases.

"We really enjoyed working together," recalls Goldman, "and when it came time to do the new album, he invited us to work with him again. His last album before the compilation was made independently, then got picked up by Sony and had a hit. I guess that makes Shawn, after something like ten years in the trenches, one of those overnight successes! So this time around, he's getting a chance to flesh out his songs a bit more and to try some different flavors. I can't say we did anything really unusual in terms of recording on this record, but we certainly had a lot of fun making it because the songs are so good." ■

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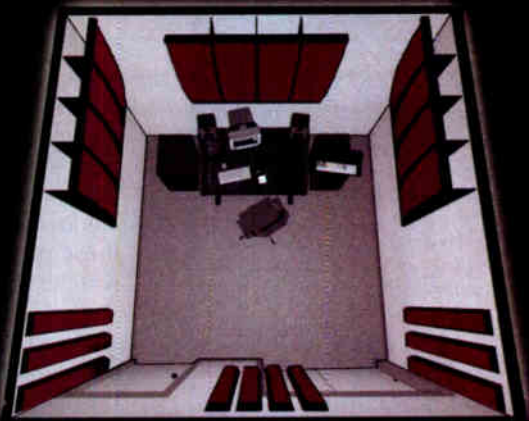
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-FROM PAGE 274, NY METRO
velop the material."

Tracking to even a 48-track recorder imposed a significant limitation on the Hancock project, because half of those tracks were usually taken up with the rhythm section, and Sadin insisted on recording Hancock's piano with four mics pointing to discrete tracks. Six takes down the road, you're done. "We had engineers scurrying around to create slave reels, rolling extra tape machines into the control room," Sadin says. "Now that I'm tracking directly to Pro Tools, we can easily allow Wayne the freedom to play continually, until he's satisfied with the result."

Swappable drives are the rage these days, but Sadin is taking a more cautious approach. "The hot swaps are great," he says, "but I prefer greater quality control, so I generally take my G4 with me to the studio. We're tracking at Avatar here in New York, and at Cello Studios when we're in L.A. Clark Germain is the principal engineer for the project. (Germain did the great tracking of Joni Mitchell and Stevie Wonder with Herbie on *Gershwin's World*.)

"Clark lives in L.A. and has his own Pro Tools rig, so when we work out there he brings his system. In New York, I work a lot with Dave Darlington and Jim Janik, both outstanding Pro Tools-based engineers. They have done additional engineering on the album, and we use their systems as well."

Having worked in the best rooms with the best talent (Bruce Swedien mixed the Hancock record at Sony Music Studios) and equipment, Sadin is perfectly positioned to critique the sound quality of Pro Tools. "Very good," he states, "that's my take, with room for improvement in two areas. Plug-ins offer a lot of functionality, but they still don't quite stack up to stand-alone hardware.

"There's a far more critical area, though, and that involves the limitation of all the hard disk recording systems, including Sonic Solutions, regarding dynamics. That's the Achilles heel of all of these programs, in my opinion. The computation required to change a fader level is very complex; you're just not going to end up with the same waveform you had. When friends tell me they have a problem with a record mixed on Pro Tools sounding small, that's what they're hearing. One day this problem will be solved by all of the manufacturers, but that day hasn't arrived yet."

Sadin's solution is to track all his material into Pro Tools, come back to his Brooklyn home and edit all parameters, including dynamic changes, and come up with mixes that he and his team deem satisfactory. "By the way," he adds, "I find the Apogee AD 8000 critically important. They help the sound enormously." Rough mixes go out of Pro Tools into Sadin's Panasonic 3700 DAT machine.

When it comes time to execute final mixes, Sadin takes his G4 directly into a mix room that sports either a Neve or Sony Oxford console. Setting all Pro Tools tracks to unity gain, he will then consult the notes he's made regarding level changes and have all of the dynamics adjustments made on the console.

So digital editing is cool, regardless of the artist. What about working it with Wayne Shorter? "Wayne Shorter is an artist who is always searching," Sadin observes. "The repertoire of the new album will range from original material to a 12th-century carol, to a Welsh folk song. Wayne reminds me of the composers in the European classical tradition in that there is a great outpouring of music in the early years, and as time goes on there is a distillation and a sense of event to each new work."

Walking down 19th Street, I found myself in front of the building that's been home to Smythe & Company since 1989, so I stopped in for a brief visit.

Formed in 1987 by current company president and owner Janis Smythe and her late husband Tony, Smythe & Co. was initially a commercial music production company, with a ton of national spots ("What would you do for a Klondike bar?") and a fair amount of TV theme and record projects in the can by the time the business started changing in the early '90s. Here in New York, many jingle companies that had been self-sustaining had to restructure their marketing plans to include outside session work. On the day we stopped by, staff engineer/producer Stefane Guyot was setting up for a Jose Feliciano tracking session that was to take place that evening.

"By the time Tony died in 1995, the business was in the midst of a great change," says Janis Smythe. "The band concept that had driven jingle work was gone in favor of synth scores, and singing had become fairly obsolete. Around that time, licensed music became more popular as well.

"Fortunately, we'd always done work outside of the jingle industry, in-

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Recently, my old pal John Van Eps wrote the score, and Smythe & Co. handled music supervision tasks for an independent film called *Under Hellgate Bridge*, which will be released this fall. Van Eps also produced Chicago veteran Robert Lamm's latest album, *In My Head*, out of his space at the company, and veteran Freddie Cole recorded a wonderful collection of jazz standards there.

Studio A features an Otari Status 18R console, with Otari's Eagle Mix Automation. Compatibility with the outside world is paramount, and so standard gear includes 32 tracks of ADAT, a single Tascam DA-88, plus analog multitrack. Digital capabilities are rounded out with the Pro Tools |24 MIXPlus system that resides in Studio B. For more information on Smythe & Co., and a complete equipment list, check out their Web site: www.smythemusic.com/dindex.html. ■

E-mail New York news to Gary Eskow at scribeny@aol.com.

—FROM PAGE 275, NASHVILLE SKYLINE
and my own base of operations," says the Belmont University music program graduate. "You don't want to go up against the few studios in Nashville that can get \$2,500 a day. You can't compete with them. So you pick cost-effective but good-sounding technology that works for you and that the market seems to like, and you try to achieve a balance between your own work and renting it to clients. I think you can have it both ways, as long as you're realistic about what it is you want to do, and as long as you have something that can keep generating income, like your own career."

Recently, I received e-mail from Chip Woody, who owns Industrial Fire & Safety in downtown Nashville, a fire extinguisher business (on Ash Street, no less) above which he built Pro Bono Studios. Equipped with a pair of Yamaha 02R digital mixers, Tascam DA-88s and Digidesign Pro Tools |24 MIXPlus, the studio has a 24x26 tracking room and a

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Woody, who has been pursuing a songwriting career on the side for many years, is candid about the fact that, while music is a passionate vocation of his, he's in the studio business incidentally, not intentionally. "I lucked out in terms of getting a great-sounding room, no doubt," he says. "But this was really something I did for myself and used in off-hours. It just turns out that a few people have stopped by and heard it and wound up renting it because they liked the equipment and the sound and vibe." What had been a sideline and personal pursuit is slowly but almost inevitably turning into a business. Woody is discussing hiring an engineer to operate the studio during the day while he tends to his other business.

Woody readily agrees that it not so much the affordability of the digital technology that he uses as much as its accessibility that has made him into a studio owner. "It's not intimidating equipment," he says. "It would have been another story if it was a huge console. But this stuff is very accessible to me and to a lot of clients."

Woody even engineers his own sessions and sessions for others, having learned the craft by necessity. And that, too, is a by-product of the generation of equipment that has radically altered the studio business. Everyone can have a studio, and everyone, it seems, does.

During country music's boom years between '92 and '95, Nashville was relatively untouched (perhaps I should say "unscathed") by the project studio phenomenon. For the most part, the business here preferred the traditional way of making records: You rented studios when you needed them, and you hired engineers to record artists, who recorded songs written by songwriters. Everyone had a place and a purpose, and the machine chugged along like clockwork.

What's going on along Nashville's studio baseline at the moment illustrates the larger phenomenon of increased and widespread accessibility to the tools of making music. There is no good or bad to this landscape; it's the inevitable progression of what technology does to any art or craft.

However, there's still a bit of the Old South left in the studio business in Nashville. Come on down and see it while it lasts. ■

Send comments or information to Dan Daley at danuriter@aol.com

—FROM PAGE 275, SESSIONS & STUDIO NEWS

for Crowe's new film, which is titled *Almost Famous*. Wilson also wrote several songs to be featured on the soundtrack. Sam Phillips was working on her new album with husband/producer T-Bone Burnett. L.A. Lakers' guard Kobe Bryant took over Studio A for work on a forthcoming release on his label, Kobe Family Entertainment, and Jason Wormer of The Village engineered the vocal overdubs and tracking...At Image Recording Inc. (Hollywood) Hollywood Records recording artists Fastball were busy mixing their new album with producer Julian Raymond, engineer Chris

Lord-Alge and Steve Kaplan assisting. Shawn Mullins also teamed up with Lord-Alge for his new album on Columbia Records, Matt Silva assisted. Artist Chante' Moore and producer/songwriter Jamey Jaz were putting the finishing touches on a new MCA Records release with engineer John Van Nest. Van Nest and Silva also worked on bass overdubs for the Brian Setzer Orchestra with producer Glen Ballard...Queen Latifah, and producers Bu'Da and Kendu, strolled into Skip Saylor Recording (Los Angeles) to begin tracking and mixing a forthcoming album release on Flava Unit Records;

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Producer Sean "Saf" Francis, L.A. Lakers guard Kobe Bryant and manager Jerrad Washington stopped in at The Village to work on Bryant's new album, which is slated for release on the Kobe Family Entertainment imprint.

Daniel Romero and Chris Puram were tapped to engineer the project with Paul Smith and Regula Merz assisting. Also at Skip Saylor: DJ Quick turned out some remixes for his new album *Balance and Options* on Arista Records. Priority Records artist Rass Kass and producer Stu B-Doo mixed an upcoming album release. Ninety Nine finished mixing a European album release for V-2 Records, Romero mixed and Ian Blanch assisted...Swing House Recording and Rehearsal (Los Angeles) hosted Green Day, who were preparing to go out on the Vans Warped Tour 2000. Other rehearsal sessions of note include Iggy Pop and Rage Against the Machine (who were busy getting ready for an upcoming live album)...Megadeth were in mixing a new album at Scream Studios (Studio City). The mixing was done by producer/engineer Bill Kennedy and Megadeth frontman Dave Mustaine, who also co-produced the project. Also at Scream, Universal recording artist Fenix Tx finished mixing their new single "Flight 610" with producer/engineer

Matt Wallace; producer/engineer John Travis pushed the faders for the new Buckcherry album, which is set for release on Dreamworks Records...

NORTHEAST

The Thin White Duke himself, David Bowie, booked Sear Sound's (New York City) Studio C to begin work on his next album for Virgin Records. Mark Platti was in producing, and the sessions are being engineered by Todd Parker. Ben Gross was also in Studio C with Sony Music group Fuel producing and engineering an upcoming release...Earlier this year, Masterdisk (NYC) mastering engineer Leon Zervos mastered the Tito Puente & Eddie Palmieri *Masterpiece* album. The session was on the May 16 and, unfortunately, Puente passed away less than two weeks later; *Masterpiece* was released last July...Massachusetts-based band Chillbone recently completed their debut effort *What Cha' Want* at Pilot Recording Studios (NYC). The album was produced, recorded and mixed by



Farewell to a legend, (L to R) associate producer Eddie Rodriguez, the late Tito Puente, mastering engineer Leon Zervos, and recording and mix engineer Eddie Palmieri at Masterdisk.

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Engineer/producer Eric Rashel (seated) working
with Catch 22 at Big Blue Meenie Studios.

Will Schillinger and executive producer Kevin Dougherty. The album features guest appearances by Marshall Crenshaw, Steely Dan guitarist John Herrington, Amy Fairchild, Adam Widoff and studio regular Steve Holley. Also working at Pilot: Joey Ramone, Ian Hunter and Ryan Adams, engineered by Merle Chornuk. In addition, Schillinger is producing John Lennon's 60th birthday celebration recording of "Imagine" at Abbey Road Studios (London), which will be mixed at Pilot...Indre Studios (Philadelphia) played host to a number of lucky radio winners when 94 WYSP brought the Foo Fighters in to perform a rare acoustic set. The session was engineered by Micheal Comstock. Singer/songwriter Diane Devlin was also in laying down tracks with Indre engineer Bogdan Hernik...Ska/punk band Catch 22 made some noise at Big Blue Meenie's (Jersey City, NJ) Studio A. The band was working on a new album entitled *Alone in a Crowd*, which is slated for release on Victory Records. The producer and engineer for the session was Eric Rachel...

NORTHWEST

BMG recording artists Copyright were at Mushroom Studios (Vancouver, BC) with producer/engineer Dave "Rave" Ogilvie and Jamie Koch. Bill Leeb (Front Line Assembly) and Greg Reely were also there to record vocals for French artist Aude...At Jackpot! (Portland, OR) Joe Davis (leader of the Pinehurst Kids) continued work on a solo album with Larry Crane engineering, co-producing and playing some bass. Mel Brown (drummer for Diana Ross, Temptations and George Harrison) completed a solo record with help from producer Luther Russell and engineer John Fishbach...Egg Studios (Seattle) hosted the Model Rockets, who have begun work

on a new album with producer Kurt Bloch. Tracking for a new album was also started by the Giraffes with Conrad Uno producing...Gravelvoice (Seattle) was visited by Firebrat with engineer Scott Colburn. Colburn also finished albums with Ota Prota and Black Cat Orchestra...Vogville Recording (Vancouver, BC) had Jet 3 mixing their new album with engineer/producer Jonathan Fluevog...At Rainstorm Studio (Bellevue, WA) artist Anthony Ciarochi finished tracking his debut album with Paul Speer and Steve Carter engineering and producing. Singer/songwriter Jim Farrand was in mixing his second release. Carter is also continuing his work with hardcore rockers In Memorium and Contingent, both of whom have new releases planned. Artist Paul Sims completed his new EP with Speer and Carter engineering...Vagrant Records Studio (Seattle, WA) was visited by Dirge Palace, the continuing presence of the Boss Martians, and the Long Faces engineered by producer Erik 4-A, with tracking help from David Miller...

SOUTHWEST

At the Congress House Studio (Austin, TX) Dexter Freebish finished recording final overdubs for their first Capitol Records release with Mark Hallman engineering. Junior Brown cut a new track for his forthcoming release; Richard Mullen and Hallman engineered...Viewpoint Records artist the Joe Richardson Express mixed their debut release at Coves Studio (Austin, TX)...

NORTH CENTRAL

Rykodisc artist Andrew Bird and his band Bowl of Fire camped out at Engine Music Studios' (Chicago) Studio B to record the follow-up to *Ob! The Grandeur*. Mike Napolitano, who has worked with Blind Melon and Squirrel

—FROM PAGE 152, AMS NEVE 88R

amps with much lower power consumption, lower noise and better slew rates than those devices used in the V Series." Small details were not overlooked. "We spent a lot of time improving heat management," Porter adds. "The 88R runs cooler than the V Series, and a 'chimney' effect draws air up through the console, redirecting the heat away from the channel modules."

The 88R was built with surround mixing in mind. Five stereo mix buses and a dedicated LCR bus can be run from the large or small faders. The LCR panning provides two divergence settings—wide or narrow. The 5.1 monitor control uses a passive 24-position stepped attenuator, and three sets of speakers can be selected: The large speakers are six-wide; the small and mini are three-wide. The console powers up in stereo but can be selected to work in 5.1, 7.1, 4-track, stereo or mono. In stereo mode, pressing the mono button sums the left/right buses and plays them equally on two speakers; however, in 5.1 mode, when mono is selected, all buses are summed and sent to the center speaker. Further, a speaker solo function can mute all speakers except the one selected, for checking placement levels, track problems, etc.

The console has four stem inputs that are eight-wide, yet the monitoring is only 6-track; an 8-track-wide VST film-scoring panel from the film console can be added to the 88R as an option. Also adapted from the DFC is a full machine control panel that can run up to six stereo machines directly, or up to 33 machines over ES-Bus or Lynx interfacing, with all track arming taking place from the console.

Dolby switching is provided, for ease of listening to 5.1 mixdowns to 4-track Dolby—and/or hearing a 5.1 or 4-track as Lt-Rt. "This is something that people wanted," Porter explains. "There's a fair amount of 5.1 or 7.1 cinema projects, but there's still a lot of 4-track and stereo work. Users need to make sure that mixes sound okay over many formats."

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Andy Griggs camped out at Storstruck Studios, Nashville, finishing tracks on the follow-up to his Golden debut, *You Won't Ever Be Lonely*. From left: engineer Derek Bason, producer David Malloy, drummer Kenny Aronoff, Andy Griggs, bassist Michael Rhodes and guitarist Kenny Vaughan.

Nut Zippers, engineered the sessions. Rick Sims (formerly of The Didjits) has also been in at Engine with his new band the Gaza Strippers. The group was working on material for a fall release on Lookout! Records. Jason Ward and Chris Brickley were there to engineer...

SOUTHEAST

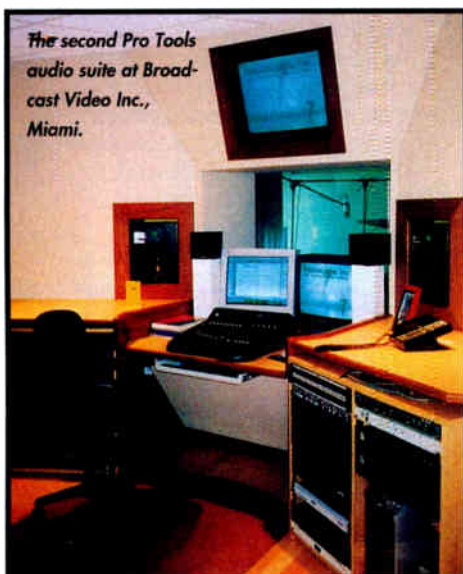
Things have been busy at Doppler Studios (Atlanta, GA): E-40 tracked music and vocals for an upcoming Jive Records release; Outkast and Jazzy Pha produced the tracks with Kevin Parker engineering. Savoy Records gospel artist Lou Rawls stopped in to track vocals with engineer Kendall Stubbs. The Christian rock band According to John tracked drums, guitars and vocals for a new album. Alex Lowe engineered the sessions with Ralph Cacciurri and Steve Fisher assisting. Take 5, a new boy band on Elektra Records, worked on

vocals for their song "Shake It Off." The group worked with producer Brian Kinkaid, and Jason Rome engineered... New artist Meredith Edwards was in at Emerald Recording (Nashville) to work on her forthcoming Mercury Records debut. Richard Marx, Keith Stegall and Robin Wiley are all sharing in the production of the project; David Cole, whose credits include work with N'Sync, is engineering...

STUDIO NEWS

Broadcast Video Inc. (Miami) has added a second 24-bit Pro Tools audio suite to its facility. The room also features sound effect and music libraries, ISDN, MP3 and .AIFF conversion, a Kurzweil E-5000 sampler and Korg Triton Keyboard sampler... Frankie's Hideaway Recording Studio (North Hollywood, CA) celebrated its grand opening last August. The new room was christened by Dave Weckl's band, who recorded and mixed their third studio album, *Transition*, which will be released on the Stretch/Concord imprint... Also celebrating a grand opening, "Brill Street" Canton Studios (Paradise Valley, AZ) officially opened its doors last August. The new Pro Tools-equipped studio is owned by the former manager of Chanton Recording (which was retired last year), Otto D'Agnolo, who purchased the equipment and licensed the name; D'Agnolo's production credits include work with Kenny Rogers, Billy Preston and Sepultura. ■

Please send your Session and Studio News or other propaganda to robert_hanson@intertec.com, or fax 510/653-5142.



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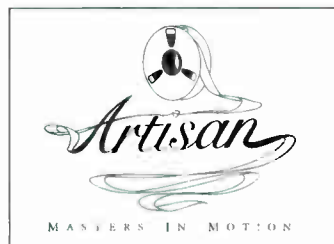
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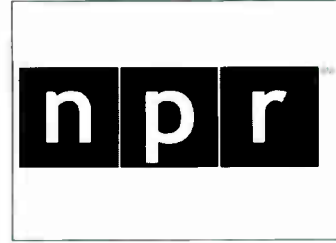
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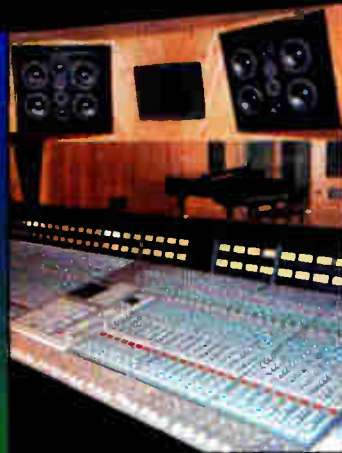
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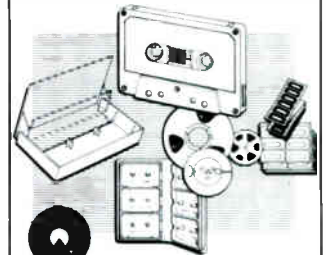
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Why is the Mackie® HUI™ the ultimate mixing work surface for Digital Performer? It's like placing your hands on Digital Performer itself. Sculpt your mix with HUI's silky-smooth, touch-sensitive motorized faders. Tweak effects parameters with firm, yet responsive V-Pot rotary encoders. You can even call up plug-ins on-screen directly from HUI. Keypad and transport controls let you locate Digital Performer's main counter instantly, just like the familiar keypad on your computer keyboard. HUI is a complete hardware workstation console, with the user-friendly ergonomics that Mackie mixers are known for. If you work day in and day out with Digital Performer, HUI will significantly boost your productivity through direct hands-on control.



Apogee

ELECTRONICS

Why is Apogee's new Trak2™ two-input microphone pre-amplifier and A/D the perfect addition to your MOTU recording system? Because it's from Apogee. And because it has:

- Superb two-channel microphone preamplifier with ± 90 dB gain, phantom power, front-panel universal input socket, high-impedance direct instrument input, analog out — and an incredible sound!
- Two channels of Apogee's true 24-bit, 96 kHz A/D conversion with 117 dB dynamic range, plus full 8-channel digital architecture and routing.
- Digital transfer into your MOTU audio interface.
- Optional 2- and 8-channel D/A cards; two AMBus interface card slots support multiple formats.
- Apogee Soft Limit™ — which helps you record at a higher level without overs; Soft Saturate™ gives you the sound of analog tape compression!
- Apogee's enhanced UV22HR™ translates 24-bit signals to 20 or 16 bits while maintaining high-resolution detail.

Trak2

DUAL MIC PRE-AMP & A/D

HUI

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AUTOMATED
MIXING

MACROMEDIA FLASH

OPTIMIZING YOUR AUDIO

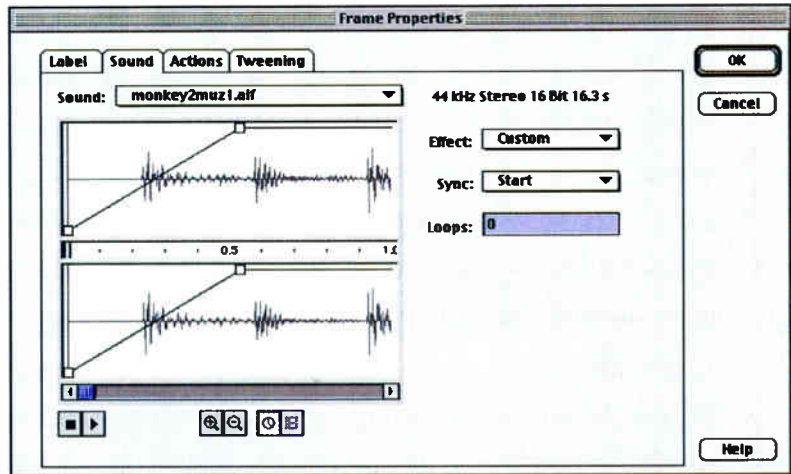
Flash animations in the form of Shockwave Flash movies (.swf) are fast becoming the most prevalent form of interactive life on the Web. Flash movies look great, the files are small, they play-back on Mac and Windows computers and with over 300 million Flash and Shockwave players downloaded, there is an audience.

WHAT IS FLASH?

Flash is a vector-based animation program that makes it possible to combine quality animation and sound files into small, yet high-quality movies. With the addition of the MP3 codec into the release of Flash 4, "near CD-quality" sound was finally a reality for Flash movies. Flash's audio features include the ability to import multiple .AIFF and .WAV files into a Flash work file and compress them into MP3 files, seamless looping of audio files and the ability to sync sound files to an event or action in a Flash movie. When using multiple audio files in a Flash movie, you can compress each file at a different bit rate, saving disk space. The audio in a Flash movie can be set to download or stream.

PREMASTERING AUDIO FOR FLASH (SIZE DOES MATTER)

Most of my clients request that I deliver the audio files for their Flash movies as 16-bit/22kHz mono .AIFF (or .WAV files), and this seems to have become the de facto standard among Flash developers. Initially, this made sense to me as a sound file with this particular set of audio attributes is ¼ the size of the stereo files I would normally deliver. Then I made an interesting discovery. A one-minute 16-bit, 44kHz mono sound file and a one-minute, 16-bit, 22kHz mono sound file end up exactly at the same file size when compressed as an MP3 file. Initially, this didn't make sense to me: Logically, a 22kHz file should be half the



A Flash audio file can be synced to a specific event in the Flash movie, and a custom volume envelope can be created without altering the original source (audio) file.

size of the 44kHz file of the same bit rate and length. Not so in this case, as MP3 compression software apparently looks at the bit rate and length of the file, but ignores the sample rate in regards to file size. This means that a one-minute, 16-bit mono audio file compressed into 56kbps MP3 file is going to have a footprint of about 256 K, regardless of the sample rate. In short, keep the sample rate of your pre-conversion (Flash) audio files at 44.1 kHz. This will make sure that your work will retain more of its original sparkle after it is compressed and exported into a Flash movie.

PRE-EQ

Another little trick I used to make my compressed audio files sound better post-conversion involves applying EQ to the file, pre-conversion. For example, when the target audio file is going to be compressed and exported using audio attributes of (16-bit) 56kbps mono, you'll be throwing away 90% of the audio material from the original file. Even with the magic of MP3, you will notice frequency loss in certain areas. The workaround for this problem is to boost the EQ of

the target audio file before conversion to compensate.

As a test, I take a copy of the original file and compress the target file using a commercial MP3 encoder (software) and the same audio attributes that will be used in the Flash movie. During playback of the test MP3 file, I simply apply the necessary EQ (usually in my MP3 player) to get the target audio file sounding close to its original quality as possible. This gives me an EQ curve that I then apply to the original audio file before I compress it.

THE FIRST ONE'S FREE

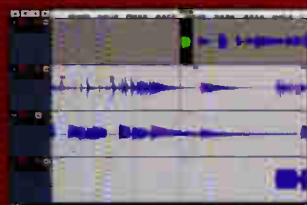
Are you interested in test-driving Flash? If so, point your browser toward www.macromedia.com/flash and follow the links. Macromedia is so sure you'll love Flash that they're willing to let you download a full version of the application and use it free for 30 days.

I have created a Flash showcase/information page on my Web site (www.bozangeles.com) that will help get you started. As we were going to press, Flash 5 was about to be released. ■

Ron Simpson is a freelance writer and Web audio technologist based in Phoenix, Ariz.

BY RON SIMPSON

HDR24/96. MACKIE'S NEW 24 TRACK RECORDER. WORKS WITH ANY MIXER. NO EXTRA COMPUTER OR SOFTWARE NEEDED.



- 24 tracks...24-bits
- Built-in full-feature digital workstation editing
- Affordable pull-out media
- Built-in SVGA, mouse & keyboard ports
- Built-in 100BaseT Ethernet

New hard disk recorders are popping up all over the place.

Our new HDR24/96 is the only recorder with built-in nondestructive graphic waveform editing. Just plug in a mouse, keyboard and SVGA monitor to view all recorder parameters on screen in real time. Enjoy complete editing control with unlimited levels of undo, drag-and-drop cross-fades with 9 preset combinations plus fade/crossfade editor. And look forward to DSP time compression/expansion, pitch shift and lots more!

The HDR24/96 was the only recorder that uses pull out Ultra-DMA hard drives, so affordable that you can keep one for each project—over 90 minutes of 24-track recording time costs less than a reel of 2-inch tape!

Call or visit our website for preliminary info on the new HDR24/96. Shipping soon from Mackie Digital Systems.

HDR24/96 editing features include: 8 takes per track with nondestructive comping, nondestructive cut/copy/paste of tracks, regions or super-regions, drag-and-drop fades & crossfades, 1x/2x/4x/8x/24x waveform views, bidirectional cursor scrub and unlimited locators and loops... with unlimited undos — but without requiring an external computer! Coming soon: DSP time compression/expansion, true waveform editing with pencil tool, invert, pitch shift, normalize and much, much more.



- Built-in 20-gig Ultra-DMA hard disk plus front panel bay for additional easily available pullout drives
- Intuitive analog tape deck interface and monitoring
- Syncs to SMPTE, MIDI, Black Burst, PAL & NTSC without extra cards
- Unlimited HDR24/96 linking! Sync 48, 72, 96, 128 or more tracks sample accurately
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