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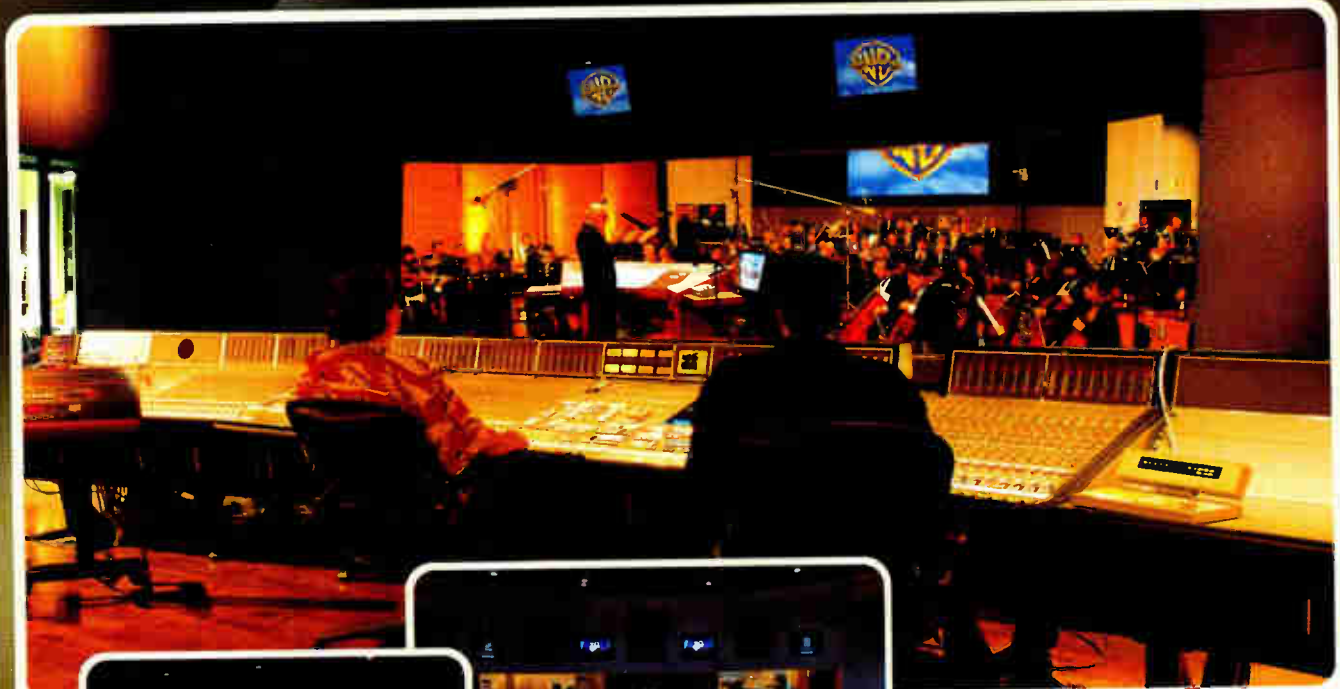
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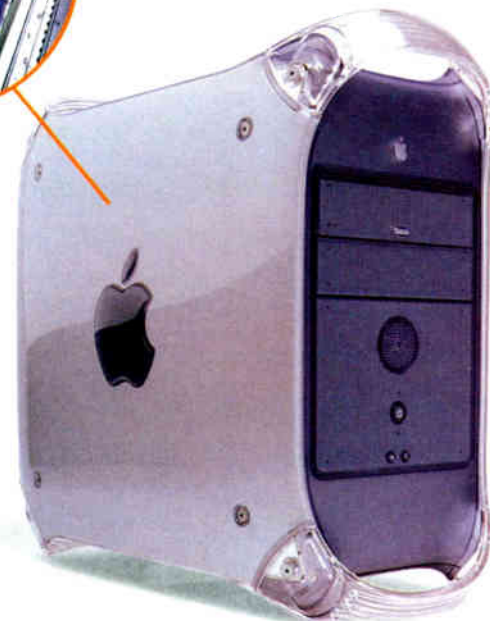
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# MIX

PROFESSIONAL AUDIO AND MUSIC PRODUCTION  
AUGUST 2001, VOLUME 25, NUMBER 8

## FEATURES

### 28 Surround (R)evolution

Blair Jackson surveys an illustrious group of engineers about their latest 5.1 projects: Bob Clearmountain talks about mixing Bruce Springsteen; Tom Jung explains why he chooses SACD for surround; Mickey Hart and Tom Flye discuss their

DVD-A mixes of two classic Grateful Dead albums. Jimmy Douglass puts hip hop in surround with Missy Elliot; and Greg Ladanyi revisits Jackson Browne's *Running on Empty*.



### 54 Apocalypse Now Redux

This month, *Apocalypse Now* will have its first theatrical re-release in more than 15 years—with an additional 49 minutes of material that was deleted from the original. Featuring the first 5.1-channel mix for a general release, director Francis Coppola's masterpiece is arguably the best-sounding film ever made. Film sound editor Larry Blake offers an insider's view of the sleuthing and reconstruction necessary to create the now-definitive version, re-titled *Apocalypse Now Redux*.

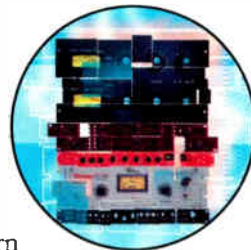
### 90 Putting Together the DVD-Audio Puzzle

The spec is finally in place. But major labels are holding back on putting out titles. Nevertheless, some pioneers have forged ahead with acquisition of DVD-Audio capabilities and have been honing their technique with independent-label projects. Philip De Lancia learns from their experience and reveals what really goes into creating a DVD-Audio title.



### 100 Neo-Retro Analog Signal Processors

Recognizing the demand for vintage signal processors, several manufacturers have reissued the cream of the crop—or have revised those designs with modern improvements. Michael Cooper explores the ways reissues, refurbishments and hybrids combine classic sounds with modern reliability.



**On the Cover:** Sound on Sound Studios' Studio C (New York City) was redesigned last year by the Walters Storyk Design Group. The room is now centered around a Neve Capricorn console and features custom Augsburgers monitors. For more details, see story on page 24. **Photo:** Robert Wolsch. **Inset photo:** Courtesy American Zoetrope Research Library.

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# Apocalypse Now...and Then

**C**ertain events linger in the mind as though they occurred yesterday. I may not recall where I had lunch last Tuesday, but global shocks such as the Kennedy and Lennon assassinations, the Apollo moon landing and the San Francisco quake of 1989 remain imprinted in nonvolatile—and startlingly real—detail. Another such memory of mine is attending a jammed press screening of Francis Coppola's *Apocalypse Now* at San Francisco's Northpoint Theater in 1979.

The street buzz about *Apocalypse Now* was enormous, with its (literally) exhaustive 238-day shooting schedule, typhoons and the overall spectacle of this \$30 million epic. Yet, in spite of the hype, I was totally unprepared for the experience.

Perhaps the first clue came from the program notes. Coppola's vision was that the film would have no title; instead, moviegoers would be provided printed programs with the credits. Unfortunately, these only went out to major cities that received 70mm prints, which faded to black silence after the final scene; 35mm prints had credits superimposed over blazing napalm. The program opens with a statement from Coppola: "The most important thing I wanted to do in the making of *Apocalypse Now* was to create a film experience that would give its audience a sense of the horror, the madness, the sensuousness and the moral dilemma of the Vietnam War."

Here, Coppola's "film experience" phrase is key to unlocking the puzzle. Clearly, *Apocalypse Now* ranks with *The Birth of a Nation*, *Potemkin*, *Metropolis*, *Un Chien Andalou*, *La Grande Illusion*, *Citizen Kane*, *Psycho*, *The Seventh Seal*, *2001*, *Ran* and other masterpieces of 20th century cinema, but none of these other films left me as emotionally drained as *Apocalypse Now*. The film's complex interweaving of dialog and environmental effects with seemingly disparate musical elements by Mickey Hart, Patrick Gleeson, Carmine Coppola, Wagner and The Doors played a major role in creating that powerful experience—in 6-channel surround, no less. After seeing *Apocalypse Now*, can anyone hear "The Ride of the Valkyries" without thinking about the smell of napalm in the morning?

Now, 22 years later, the film returns as *Apocalypse Now Redux*, a new version with an additional 49 minutes of deleted scenes edited and mixed by a team led by the incomparable Walter Murch. In this issue, *Mix* film sound columnist Larry Blake looks at the new production and the enormous challenge—part aesthetic, part detective work—in creating/restoring new audio that matches the majesty of the original 5.1 mix.

Keeping with this month's surround theme, Blair Jackson chats with six top engineer/producers—Bob Clearmountain, Jimmy Douglass, Tom Flye, Mickey Hart, Tom Jung and Greg Ladanyi—who share their insights and experiences of working on recent DVD music projects. This month's cover spotlights New York City's Sound on Sound, where owner Dave Amlen has successfully built a hybrid environment that's equally at home with either stereo or surround production. These days, versatility is the key to success: You gotta be ready for anything.

George Petersen

P.S. Subscribers will find a 2001 TEC Awards ballot with their issue. Check out the Voter's Guide on page 74, listing all the nominees, and take a couple of minutes to cast your vote for the industry's best and brightest. We're counting on you!

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# Letters to Mix

## INFAMOUS OMISSION

I am amazed. I hadn't realized that *Pearl Harbor* was shot as a silent movie and all the sound was added in post. At least that is the impression the reader gets from your article on *Pearl Harbor* in the June issue. I don't mean to detract at all from the wonderful job done by the *PH* post team, but there was, in fact, an excellent mixer on the set and, by all accounts, he did a great job. I've heard that 99% of the dialog was from the production tracks, and many of the airplane and battle effects were those recorded on set.

Don't feel bad, though. This is the third article I've seen on sound for *Pearl Harbor* that made no mention of Peter Devlin, the production mixer. I think your reporter missed out on a good story. As exciting as the post suites are, every now and then something interesting happens on set, too.

*William Sarokin*

*Via e-mail*

## EXTRA CREDIT

Hey, how about a little credit here! I would like to make the suggestion that future issues of *Mix* magazine showcasing newly built studios mention the pro audio dealer who equipped the studio.

I am not asking for credit for the dealer who just sold the gear. I'm talking about the person who met with the studio designer, got the gear there on time, arranged the wiring, and even helped find the right contractor for HVAC, electrical wiring and physical studio construction.

This type of dealer is hard to come by, but they are out there. I know, because I am one of them. I am not looking for credit for just myself, even though I did supply the studio on the cover of your June issue (Metropolitan, Bryn Mawr, Pa.). Mainly, I think *Mix* readers should have a better idea of what is involved in putting together a recording studio.

Perhaps *Mix* magazine could request that information when spotlighting these new studios. The same way everyone wants proper credit on that Grammy-winning album, pro audio dealers look for the same kind of mention and appreciation when they've done their job well, too.

*George Hajioannou*  
*www.angelmtn.com*

## KUDOS FOR THE Q&A

Congratulations on the May 2001 issue's interviews with Armin Steiner and Elliot Mazer. I was fortunate to work with Armin on several occasions at Capitol Studios, but even before that his Sound Labs was a legend in the '70s L.A. studio scene. Elliot and I worked together at the Automatt in San Francisco, although not on the same projects.

I learned quite a bit about recording from both of them, and, while it's good to learn about the latest bells and whistles, these two gentlemen have a lot to share with *Mix* readers. They have managed to survive the ever-changing world of recording by using their knowledge about basics and applying it today. Sometimes "old school" is the best school.

*Leslie Ann Jones*

*Skywalker Sound*

## MAC DEFENDER

A reader submitted feedback on computers vs. "stand-alone" DAWs (September 2000). He expressed concern that this is a "transitional time for the Mac, with OS X threatening to outdate existing software..." He also claimed that "Mac [is] abandoning the PCI slot on many new models." I am a happy Mac engineer and find these arguments for preferring stand-alone DAWs as alarmist and irrelevant.

It's true that Apple's models, such as the iMac and G4 Cube, have no PCI slots and, therefore, would be inappropriate models for digital audio workstations. However, these models were not designed for audio engineering, whereas the G4 is a superb candidate for audio applications, having three PCI slots and the speed to make "host-based" workstations competitive with dedicated board systems. Of course, adding RAM and SCSI drives will add to the sticker price, but once your machine is built, numerous applications can use that hardware: from multitrack DAWs to MPEG encoders and CD recorders. Even a laptop, like the PowerBook (or PC laptop) can connect to a Magma PCI expansion unit. Imagine running Pro Tools MixPlus on a laptop. With the computer appearing in so many of our daily tasks, it might as well earn its keep and track a few sessions. Older Macs still have high-end life in them, too. I had a "Cold Fusion" (8100/100) lying around, so I installed an

Audiomedia II (NuBus) in one of its slots and Digital Performer. Now I have a very inexpensive solution to 24-bit mix archival. Yes, the Audiomedia II's digital-in handles 24-bit digital audio even though its analog-in converts at 16-bit (64x).

As for OS X, it won't "outdate" existing software. All our apps that run on OS 9 will run in emulation mode on OS X. But when audio software comes along that's written for OS X it'll be well worth the upgrade. Right now, no MIDI/audio software takes advantage of the single-processor G4's 128-bit processing ability, not to mention the MP G4's throughput. I've written MOTU, who are still working on their G4-friendly Digital Performer. But, in all honesty, compared with the speed and track allocation I was used to before getting the "Sawtooth," I'm well pleased with the investment. Once software catches up, the Mac will improve in performance. Maybe a stand-alone DAW is attractive for its ease of use. It's definitely more "plug and play" than configuring a Mac. I hated computers until I saw what could be done with music on them.

Of course, a stand-alone DAW is really just another computer, but with limited upgradability. I use four Macs of various vintage at my studio: a Cold Fusion, a Nitro, a Gossamer and the Sawtooth. They're very reliable machines and, except for the G4, were bought second-hand. The DAW in the window drives a hard bargain, indeed. This was written on a "Carl Sagan." For info on PowerMacs, check out [www.apple-history.com](http://www.apple-history.com).

Lastly, I don't run the Internet on my DAWs. This avoids the unlikely, but possible, event of a Mac virus. Also, Internet applications are only data-sensitive, unlike audio applications, which are time-sensitive as well. I've been told that an inherent incompatibility resides in this difference of protocol, and, therefore, one shouldn't mix one's audio with one's browsing. Maybe that's overly cautious, but I shouldn't want to lose someone's project for any reason.

*Andrew Hamilton*  
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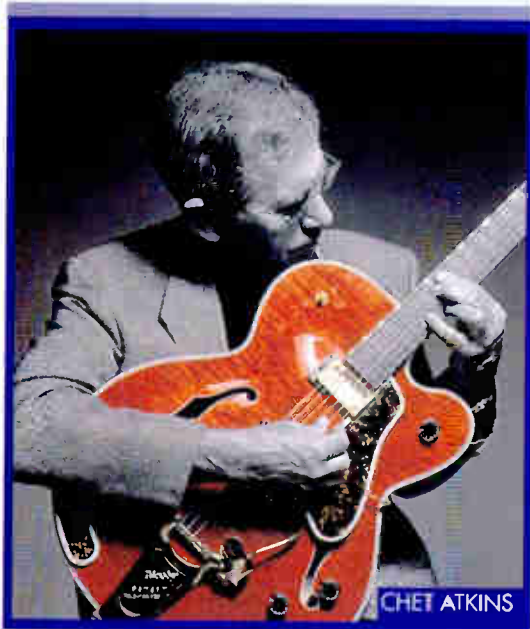
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World Radio History

## CHET ATKINS, 1924-2001



Chet Atkins, who, as an artist and as head of RCA Records in Nashville for almost 20 years, was a major force in defining the "Nashville sound," passed away on June 29, 2001. Born June 20, 1924, on a farm outside Knoxville, Tenn., Atkins' first job was playing violin for a local radio station; he honed his distinctive finger-picking guitar style as a touring guitarist during the 1940s. Atkins released some 75 albums under his own name, selling more than 75 million copies in total, and worked consistently as a session player. He appeared on hundreds of records, including such classics as "Heartbreak Hotel," "Your Cheatin' Heart" and "Wake Up, Little Susie." Atkins' influence reached far beyond country music, and musicians such as George Harrison, Mark Knopfler, George Benson and Larry Carlton readily acknowledge his influence.

As a musician, record company executive and producer, Atkins was creatively involved with hit recordings by Eddy Arnold, Bobby Bare, Suzy Boguss, The Browns, the Carter Sisters, Ray Charles, Skeeter Davis, Jimmy Driftwood, the Everly Brothers, Red Foley, Larry Gatlin, Don Gibson, Merle Haggard, Homer & Jethro, Waylon Jennings, George Jones, Garrison Keillor, Doug Kershaw, the Louvin Brothers, Ronnie Milsap, Mickey Newbury, Mark O'Connor, Dolly Parton, Elvis Presley, Charlie Pride, the Pure Prairie League, Jerry Reed, Jim Reeves, Junior Samples, Hank Snow, Sons of the Pioneers, Red Sovine, Ray Stevens, Ernest Tubb, Steve Wanner, Dottie West, Slim Whitman, Roger Whittaker, Hank Williams and Faron Young.

Atkins also worked with guitar manufacturer Gretsch to develop the Tennessean and Country Gentleman guitars, both of which found favor with country, jazz and rock players. In 1982, Atkins and Gibson introduced the CE (Classical Electric), an innovative, solid-body electric classical model used by Willie Nelson and Earl Klugh.

A legend whose career spanned more than five decades, Chet Atkins was an American icon. His nickname, The Country Gentleman, could not have been more appropriate.

—George Petersen

## WILLIAM NISSELSON, 1945-2001

William Nisselson, regarded by many as the greatest champion of the independent film community, died on June 19, 2001, in his office at Sound One in New York.

After working in a broad spectrum of businesses, including stints at The New York Times, in the garment industry and as a taxi driver, Nisselson joined Sound One in 1980 as a production coordinator and quickly rose to the position of studio manager. In 2000, subsequent to Sound One becoming part of the Liberty Livewire family of companies, Nisselson was named COO of Sound One.

Nisselson's career gave him the perfect opportunity to combine his passion for movies with his commitment to the underdog. In his everyday dealings, Nisselson connected with the entire roster of Sound One's more notable clients, including Woody Allen, Ken and Ric Burns, Joel and Ethan Coen, Jonathan Demme, Brian DePalma, Nora Ephron, Milos Forman, Lasse Hallström, Ang Lee, Spike Lee, Mike Nichols, Martin Scorsese and M. Night Shyamalan. But Nisselson also found the time to support independent and documentary film directors, including Tom DiCillo, Charles Guggenheim,

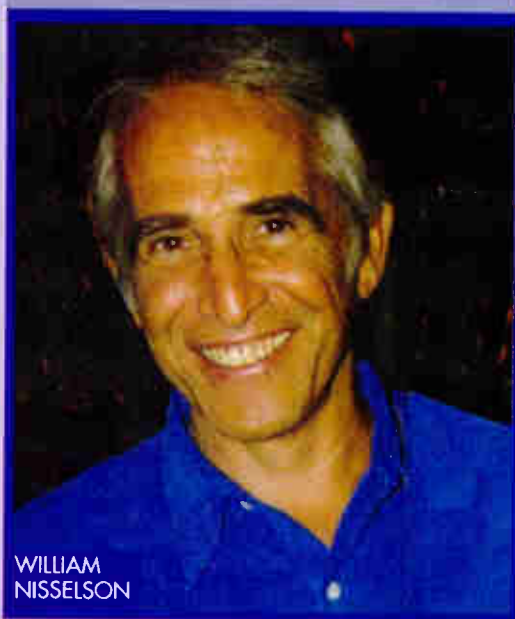
Jim Jarmusch, Michael Moore, Mira Nair, D.A. Pennebaker, Nancy Savoca and John Sayles. Posters for many of the film and television projects mixed at Sound One are exhibited in the facility's hallways, and many of them feature handwritten notes that express both gratitude and appreciation for Nisselson and his outstanding team.

"I didn't have enough money, and he gave me a lot of time and cut rates, which was the first time anyone had gone out of his way for me," said director M. Night Shyamalan. "All he said was, 'When you become famous, bring your films back here.' It was a good moment. It was like your father giving you the keys to the big car." Director Joel Coen also testified to Nisselson's generosity and enthusiasm. "He was someone who bent over backward to make it easy for people who were just starting out," said Coen.

Nisselson's true talent, however, was creating a family atmosphere within a technologically fast and talent-driven environment, as evidenced by the longevity and loyalty of his exemplary staff. Nisselson is survived by his wife, Susan Diederich; mother, Herta Danis; sister, Jane Assi-

makopoulos; and stepdaughter, Alana Vidal.

Information provided by Sound One, with additional reporting by The New York Times.





## INDUSTRY LINES UP TO SPONSOR TEC AWARDS

The Mix Foundation for Excellence in Audio has announced that 29 leading pro audio companies have already signed on as sponsors of the 17th annual Technical Excellence & Creativity Awards, set for September 22 at the Marriott Marquis in New York City.

For complete information about the 2001 TEC Awards sponsors, see the TEC Awards voter's guide on page 74. A limited number of sponsorships and tickets are still available. For more information, call Karen Dunn at 925/939-6149 or e-mail KarenTEC@aol.com. Complete information is also available at [www.tecawards.org](http://www.tecawards.org).

## Industry News

**Side Door Studio** (Newark, DE) welcomes Paul Janocha, chief recording engineer, to its staff...Sound designer/engineer **Daniel Pruitt** joins **Oasis Recording's** (Atlanta) audio post-production and music recording team...**Sennheiser** (Old Lyme, CT) announcements: **Jamie Scott**, dealer representative professional products for Northern California and Nevada; **HP Marketing** (Denver) "2000 Pro Rep of the Year" award; "Most Improved Pro Territory" awarded to **Taub Sales** (Baltimore); **Heartland Marketing** (Brookfield, IL) represents Sennheiser accounts in Minnesota, South and North Dakota, and western Wisconsin; **Dale Electronics** (New York City) named 2000 professional products dealer of the year for broadcast; and **B&H Photo-Video Pro Audio** (New York City) named 2000 film and video dealer of the year...**Lewis Frisch** joins Chicago-based **Gepco International Inc.** in the position of Eastern region account manager...New hires at **Synchro Arts** (Epsom, UK): **John Cavendish**, sales manager, **Tim Rogers**, software developer, and **Janine Wilson**, marketing and administrative coordinator. The company also moved its facility to: **Global House**, Ashley Avenue, Epsom, Surrey, UK KT18 5AD...**TOA Electronics** (South San Francisco) is now represented in Texas, Oklahoma, Arkansas and Louisiana by **Graham/David Partnership** (Houston)...Supporting **JBL** (Northridge, CA) pro products in Canada, Mexico, Central and South Americas, and the Caribbean is **Guillermo Wabi**, market development engineer for the intercontinental region...**Cari Davis** and **Rico Santana** have been promoted to executive VP and sales manager, respectively, at **Devlin Video International** (New York City). The company also welcomed **Mick O'Connor** to the VP of sales position...The new Eastern region sales manager for **DSP Media** (Studio City, CA) is **Gerard Volkersz**...**Nexo USA** (San Rafael, CA) appointed **SECOM** (Atlanta) to represent the company's products in Tennessee, Georgia, Alabama, Mississippi and the Carolinas. Additionally, **Hibino Corporation** (Japan) was named Nexo's outstanding export distributor for 2000...Former Line 6 director of marketing communications **Jack Sonni** joins **Guitar Center** (Agoura Hills, CA) as VP of marketing communications. **Guitar Center** was also named **Neumann's** (Berlin) 2000 Dealer of the Year...**Waves** (Knoxville, TN) adds **Mick Olesh** as international sales manager...**Richard Bowman** is the new sales manager at Las Vegas-based **Transamerica AG**...**Crown Audio** (Elkhart, IN) awards: **Mars Music** (Fort Lauderdale, FL), national dealer of the year; **Sweetwater Sound** (Fort Wayne, IN), local dealer of the year; and **Poll Sound** (Salt Lake City), contractor of the year...**D. Pagan Communications** (Melville, NY) moved to 175 Pinelawn Road, Suite 215, Melville, NY 11747; 631/659-2309; fax 631/659-2310.

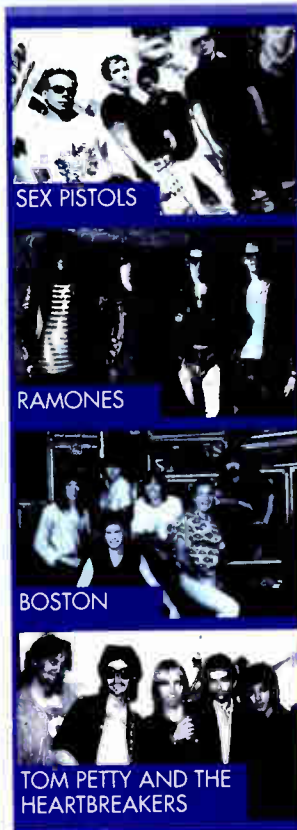
## ALMOST THERE...

### 2002 Eligible Rock and Roll Hall of Famers

Boston, The Ramones, the Sex Pistols, Patti Smith Group, Talking Heads, and Tom Petty and The Heartbreakers head the 2002 class of newly eligible artists for the Rock and Roll Hall of Fame. To be included in this VIP list, an artist has to have a 25-year history of recording.

Other artists eligible for the first time are Will Ackerman, Blondie, Bootsie's Rubber Band, Peabo Bryson, Burning Spear, John Cougar, Dwight Twilley Band, Firefall, Graham Parker and The Rumour, Amy Grant, Greg Kihn Band, Sammy Hagar, Richard Hell, Nick Lowe, Luther, Kate and Anna McGarrigle, Runaways, The Babys, the Brothers Johnson, the Modern Lovers, Deniece Williams and Warren Zevon.

For more, visit [www.rockhall.com](http://www.rockhall.com).



## NOTES FROM THE NET

- **Napster** and **MusicNet** have entered a licensing agreement whereby Napster will become an affiliate of MusicNet alongside RealNetworks and America Online. BMG Entertainment, EMI Recorded Music and Warner Music Group had previously said that they will permit their libraries to be delivered to Napster once the company operates in a "legal, non-infringing manner" and successfully demonstrates that rights holders will be compensated for their works by implementing a technology that accurately tracks the identity of files on Napster's servers.
- **MediaBay** has filed a copyright infringement lawsuit against **Napster** in the U.S. District Court in San Francisco, alleging that Napster has provided a way for users to download copyright-protected recordings of vintage radio shows and other spoken-word audio that are currently available through MediaBay.

• **Bertelsmann AG** has expanded its presence in the online music delivery business with its acquisition of **MyPlay Inc.** for an estimated \$30 million.

• **Launch Media Inc.** has joined with **MusicMatch**, **MTVi Group**, **Listen.com** and **XACT Radio**, along with the **Digital Media Association**, in filing suit against the **Recording Industry Association of America**, seeking a declaration that the parties' Internet radio services are eligible for a statutory license for transmission of sound recordings over the Internet.

• The **RIAA** has filed a copyright infringement suit in Federal District Court in Manhattan, seeking an injunction against **Aimster**, a service that allows users to use AOL's instant messaging service to send music and video files to other users on their "buddy list."



# TIME IS ON MY SIDE

**YES IT IS...I THINK**



ILLUSTRATION: HEATHER SCHOLL

Dear readers, I should warn you now that as this column developed, it became a more encompassing piece than I had originally planned, partially due to my typical side-trips, and partially when I began to realize the scope of the subject itself. This means that it will be a two-parter. I don't know about you, but I don't love two-part columns; I want to know what it's all about the day I start it, but...Bear with me on this one, and maybe I can show you a little art in the dirt and, in part two, a little dirt in your art. (Cliff's Notes translation: This month, viewing art through the lens of time. Next month, making music, and friends, with time.)

## TIME BANDIT

Art is spooky stuff, to be sure. I went to Carnegie and majored in fine arts, painting and sculpture. While there, I was lucky enough to be able to bring in bucks doing graphic design—corporate logos, album covers, those giant encrypted posters that told only those with altered minds who was playing and where. As a kid before that, I airbrushed skulls, flames, and women on custom cars and bikes, and even etched a few custom cars and bikes on women.

So I have been creating art most of my life, as I imagine many of you have.

BY STEPHEN ST.CROIX

And over the decades, I have come to realize that all art is the same—not exactly the same, but really close. But first...

It seems to me that there are two basic kinds of art, in and out of time. I'm not talking about a bad drummer here. I'm talking about two very different concepts of art. Different in what they are, and different in what they do.

## OUT OF TIME

A painting is *out of time*. No matter how long it took for the artist to create it, the length of time that it takes for the viewer to see it, to absorb it, is solely within the control of that viewer. He may glance past it as he walks by one day, but



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World Radio History

## THE FAST LANE

linger for a few minutes another day.

Any story that the painting has to tell, any emotions that it is meant to instill, must be developed within the time allotted by the viewer.

The painter uses every trick from the Old Masters on through the Warhol wannabes to try to draw observers into the canvas, and there are many tricks to do just that. But, in the end, the painting must tell its story at the rate (and depth) chosen by the observer. Six months' work to create, eight seconds to convey: art outside of time.

Perhaps one of the most pure examples of this is one of the most disliked art forms of all times: graffiti. Its purity and power come from two factors: the time it took to create the art, and the time that is usually available to observe it. It is safe to assume that because graffiti is illegal, it is almost always done in a hurry. Additionally, it has become popular in recent years to do it in impossibly difficult locations, both to one-up the competition and to show disrespect for the law as blatantly as possible.

This produces everything from initials hurriedly bombed onto stop signs to full-color elaborate scenes on the un-

dersides of freeway overpasses. In either case, we have an interesting sense of dynamics—a real sense of speed, tension, risk and anger.

The little gang stingers on stop signs convey a real sense of movement. You know that the perp stopped for three to four seconds (if he stopped at all; I have seen them do it from moving convertibles) and then moved on to the next target. They leave behind static art, out of time, but art that successfully conveys their story of speed and urgency.

And then there are these huge murals 60 feet over your head. While the little

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**When you hear  
the first note  
of a song,  
you wait for the second  
so that you can  
determine the  
most important  
thing about the song,  
its tempo.**

gang tags took seconds and tell their story not in one place, but in the number of different places you see the same tag, these murals look like they took days and days, but are often done in one or two *hours*! Some are very high-quality workmanship and leave you pondering just how the hell they were done. There you go. Art that tells a story, a mystery that you might think about for days or weeks. And the more you think about it, the more you learn about tagging, the deeper and more significant the story becomes.

And here's the clincher, the reason why I say this type of property defacing is the ultimate in static art telling a dynamic story out of time. Not only is most of this stuff done in seconds, but by its very nature, most of it is *seen in seconds* as well. We, the unwilling observers, are almost *forced* to view this stuff as we drive, and we generally see each example for only a second or two. So, no matter how much we may hate it, or how much some people like it, we all see it—and for a length of time determined not

—CONTINUED ON PAGE 206

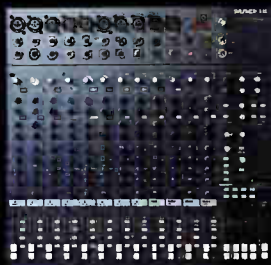
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**8** Control Room/Phones Source Matrix lets you route any combination

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**9** Separate Tape input gain control, Tape to Main Mix switches and RCA tape input/outputs.

**10** EFX to Mon folds effects back into musician's headphones.

**11** RUDE Solo light flashes brightly any time a channel is soloed. A life saver during 3 a.m. mix sessions.

## ↑ 1202-VLZ<sup>®</sup> PRO

12 total channels • 4 XDR<sup>™</sup> premium mic preamps • 4 mono line level chs. • 4 stereo line level chs. • Extra ALT 3-4 stereo bus • 3-band equalization • 75Hz low cut filters on mono chs. • 2 aux sends per ch. • 2 master stereo aux returns with EFX to Monitor • Control Room/Phones source matrix • Rotary gain controls • Built-in power supply • Plays well with others



## ← 1642 VLZ<sup>®</sup> PRO

16 total chs. • 4-bus w/ double-bussed outputs • 10 XDR<sup>™</sup> premium mic preamps • 8 mono line level channels • 2 hybrid mono mic and mono/stereo line level channels • 2 mono/stereo line level chs. • 3-band EQ w/ swept mid on mono channels, 4-band EQ on stereo channels • 75Hz low cut filters on mono chs. • 4 aux sends per ch. • 4 stereo aux returns with EFX to Monitor • Control Room/Phones source matrix • 60mm log-taper faders



## ← 1402-VLZ<sup>®</sup> PRO

14 total channels • 6 XDR<sup>™</sup> premium mic preamps • 5 mono line level chs. • 4 stereo line level chs. • Extra ALT 3-4 stereo bus • 3-band equalization • 75Hz low cut filters on mono chs. • 2 aux sends per ch. • 2 master stereo aux returns with EFX to Monitor • Control Room/Phones source matrix • 60mm log-taper faders • Switchable AFL/PFL and much more cool stuff



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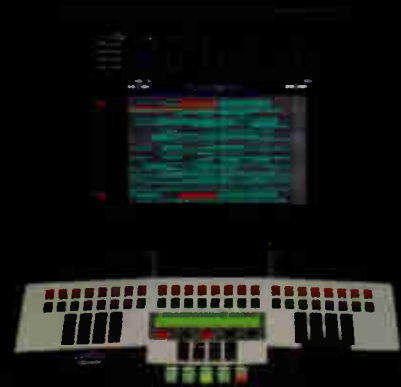
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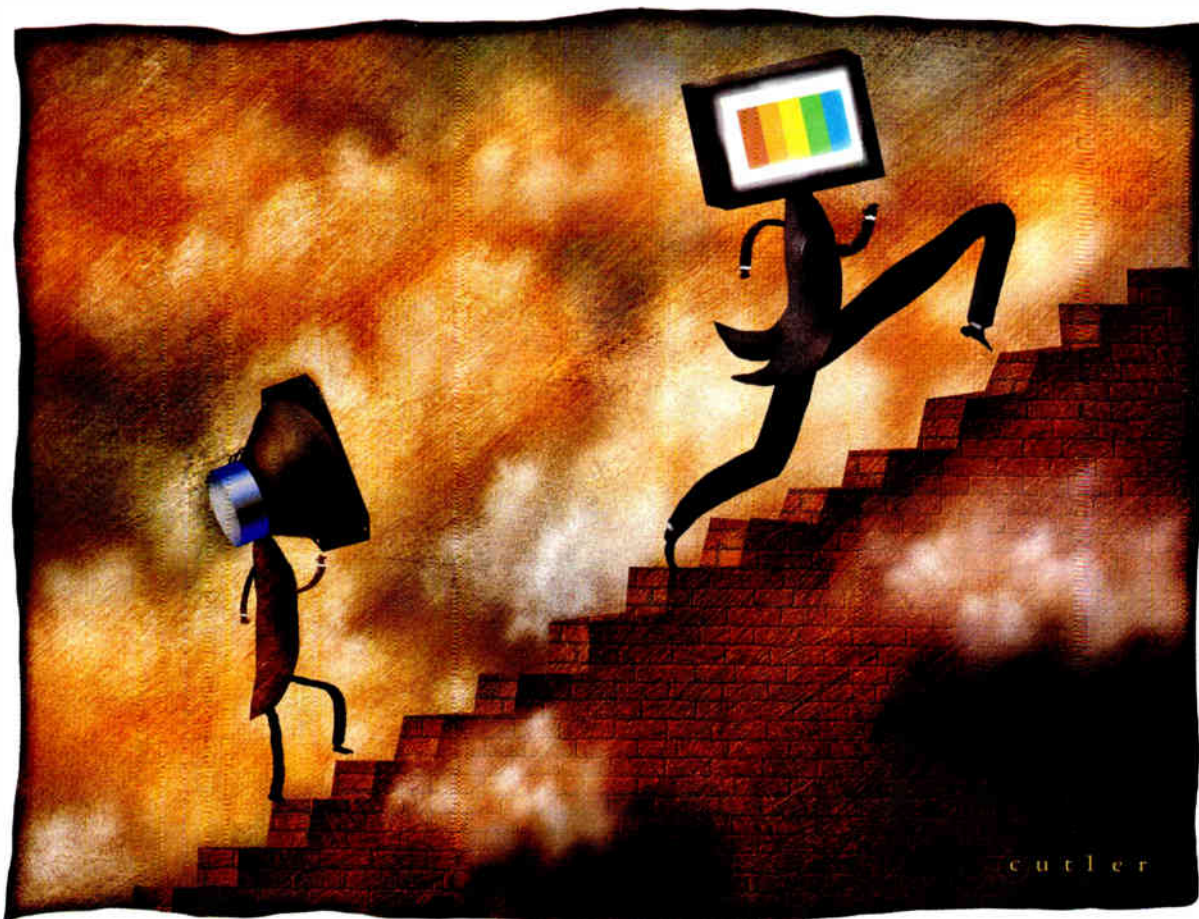


ILLUSTRATION: DAVE CUTLER

**D**rop or Non-Drop? Pull-Up or Pull-Down? Thirty or 29? And what the heck is 23.976? All questions that strike terror into the hearts of post-production audio engineers, sound designers and even composers, all over this great land.

Anyone who works with sound for television has a nightmare story about dealing with this nonsense. I've been collecting them for years. One of my favorites, from the days when analog multitrack ruled the post-production world, involved a studio that striped 29.97 SMPTE on one track and 60Hz Nagra resolve tone on another, and then told the synchronizer to lock to both. The hapless 2-inch machine bucked like a clothes dryer with a bowling ball

inside, until the tape snapped.

Even now, in the age of digital, we still can't escape this insanity. I just went through yet another journey through sync hell with a score for a 15-minute film on Beta SP video that was being posted by an expensive transfer house in New York. I told them, "I can give you the music on audio CD, on CD-R as a Pro Tools session, on CD-R as .AIFF or .WAV, on ADAT or DA-88, or on timecode DAT. Which one would you prefer?" The response: "Ordinary DAT will be fine—just tell us at what frame of the film to start the audio." I thought this was great; among other things, it saved me the cost to rent a timecode

BY PAUL D. LEHRMAN

DAT machine (and can someone explain why they are still three times the price of a digital 8-track?).

When I got the videotape back, the audio indeed started right on the money, but it ended about 40 frames after the picture did. For the next three days, the transfer house and I argued about mismatched frame rates. We used up my monthly allotment of cellphone air time, and then some, arguing about how to make the audio and the video come together. They tried different DAT machines, different video machines and different operators. They tried transferring it from DAT to another videotape, and pulled it up and down, and probably in and out as well. Nothing worked. Finally I asked, "Is the DAT machine locked to

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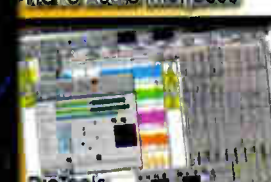
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## INSIDER AUDIO

house sync?" "How do you do that?" came the response. I knew all was lost.

I persuaded them to send back the tapes, and I brought them over to a friend with lots of experience in this sort of thing, as well as access to a Beta deck. Everything locked up on our first try. All of the fretting about frame rates was totally unnecessary, and as long as everything in the house was running from the same master clock, there was no problem.

Our equipment certainly has gotten smarter, and for many of us, sync issues are routinely solved by having our com-

puters do the required complex math on-the-fly, thus taking the worry out of it. But there's always that nasty little factor, "pilot error": The equipment only works right if it's set up and operated correctly. At one point in the process of scoring this particular film, my synchronizer—unknownst to me—decided to change its default clock value to 30 fps instead of 29.97 non-drop, and suddenly all of my hits were in the wrong place and the MIDI tracks weren't agreeing with the audio. That one took a couple of hours to find, and a couple of years off my life. (And when we couldn't get the first transfer to work, I wondered whether or not it was

my fault that they were having problems.)

In Europe, of course, they laugh at us. Their video frame rates are nice whole numbers, and they don't understand how we could be so stupid as to make our video run 0.1% off, or why we spend so much time and energy trying to deal with it. (And, in point of fact, the real frame rate is 29.9700267/sec, but who's counting?)

Frankly, I don't fully understand it either, although it's been explained to me numerous times. I'm not enough of a television engineer (despite my '70s-vintage First Class FCC license, which mostly proves I am good at taking multiple-choice tests, not that I know anything) to really know what it's all about, but I think I get the gist of it. Most people, however, who think they know why the 29.97 frame rate was adopted have it wrong. And it's quite likely that those who do understand it correctly, but believe it was ac-

"The warm, even sound was far superior to any DI box - tube or solid state - that I had tried before."

— PRO AUDIO REVIEW, MAY 2001

"Everything I patched through its all-tube audio path sounded big and fat, while retaining clarity and a smooth tone."

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tually necessary, are also wrong. I was first alerted to this by a friend, who at the time was president of a synchronizer company, who pulled me aside at a demonstration of his wares at an NAB show and whispered, "You know, all of this B.S. really wasn't necessary." When I asked him to elaborate, he only said, enigmatically, "Take a look at the documents."

The version, it seems, that most people know is this: In the early days of television, when everything was shades of gray, the standard frame rate in the United States (and Canada) was 30 frames per second. Because each television frame consists of two "fields" of alternating lines, the field rate was 60 Hz. When the color standard developed by RCA was adopted in 1953 by the NTSC (that stands for the "National Television Standard Committee"—not, as some of our European friends insist, "Never The Same Colour"),

—CONTINUED ON PAGE 218





SREV1 Remote



SREV1



### Time to reflect on reverberation.

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# Sound on Sound

by Paul Verna

Two years after building a surround-ready studio based around a Neve Capricorn digital console, pictured on this month's cover, Sound on Sound owner Dave Amlen is beginning to reap the rewards of his investment.

"On the surround front, there's actually money the labels are spending now to do that, after years of waiting to see how the formats would shake out," says Amlen. "So, we're finally able to take advantage of that, especially in our Capricorn room. We recently did a big surround project for Ginuwine for Sony Music and another for Changing Faces for Atlantic. We also mixed the music for the film *The Deep End*." That project won a cinematography award at the 2001 Sundance Film Festival.

However, the bulk of the studio's business is still in stereo, which is why Amlen made sure the Capricorn room could be easily outfitted for either configuration.

"Most of the time, the room is set up for stereo," he explains. "But whenever we have surround projects, all we have to do is set up five identical speakers, whether they be Genelecs, Yamaha NS-10s, or something an engineer or producer might want to bring in. We have a calibration program that we run in conjunction with a sound pressure meter to ensure that the room will work for any speakers. For subs, we use a pair of Genelec 1092s."

While the Capricorn suite serves a variety of functions—surround mixing, stereo mixing, digital editing, audio post—Sound on Sound's two analog rooms, Studios A and B, provide the facility's bread-and-butter business of tracking and mixing music projects.

Amlen likes to joke that he runs the Noah's Ark of recording studios, because so much of his gear—from his tape machines to his outboard processors, to his monitors to his digital audio workstations—is duplicated in Studios A and B.

Effective this summer, the Noah's Ark concept extends to those rooms' consoles as well, as Amlen replaces an old Neve VR in Studio A with a Solid State Logic 9000 J to match the one in Studio B, which was installed in late 1998. The installation of the 9000 J shifts the room's focus from tracking to mixing, which suits Amlen just fine.

"This was strictly a business decision on our part," he says. "The amount of tracking business going on in New York is good for



Sound on Sound owner Dave Amlen has configured Studio C for 5.1 surround and stereo projects.

one or two days a week," he says. "I'm willing to sacrifice those bookings for a seven-day mix session."

"I've talked to jazz engineers, including the ones who did the last sessions on the VR, and they're disappointed," says Amlen. "The jazz community has this bias that you need to record on a Neve console. But jazz is losing as much momentum as country music. You can't keep a room dedicated to someone who is going to book a six-hour session once a week."

The new 9000 J was purchased from Boston-based equipment broker Dave Lyons of Sonic Circus; Lyons also bought back the VR.

As is often the case with high-end consoles, the J Series desk has a colorful history. It was commissioned by famed London studio Town House Recording, but was recently swapped for an SSL G-Plus. Then the board was used at Aerosmith guitarist Joe Perry's home studio to mix the band's latest Columbia Records release, *Just Push Play*.

Whether analog or digital, multichannel or stereo, many projects these days take place, at least partially, in the Pro Tools domain. In response, Amlen has invested in three full-blown systems, one of which resides in the Capricorn room, another in a Pro Tools-oriented edit/mix room with a 24-fader Pro Control; the remaining one is in ei-

ther of the two analog studios, depending on the clients' needs.

"We're seeing an equal number of sessions on analog 24-track or Pro Tools or both," says Amlen. "We still get the odd session that's on 3348 DASH or DA-88, but those seem less and less everyday."

Still, Amlen insists on offering virtually every major multitrack and mixdown format that his clients might want to use. That means maintaining a fleet of high-end analog and digital decks, including Studer A827s and A820s, Sony 3348s, Tascam DA-88s and Sony PCM 9000s.

As if keeping up a world-class studio isn't enough, Amlen and COO Christopher Bubacz have recently delved into such ancillary areas as producer/engineer management. Operating under the name SOS Management, the new division's clients include Jason Standard, Mark Partis, Matt Hathaway and Ted Cruz.

Also, Sound on Sound has just branched into mastering in a joint venture with Eric Enjem Studio. The aim of that partnership, according to Amlen, is to capture a mid-level market between the big, commercial mastering houses and the DAW-based, bedroom studios. "These ancillary areas help out," says Amlen. "It's tough out there, but fortunately there's enough work that we're doing fine." ■

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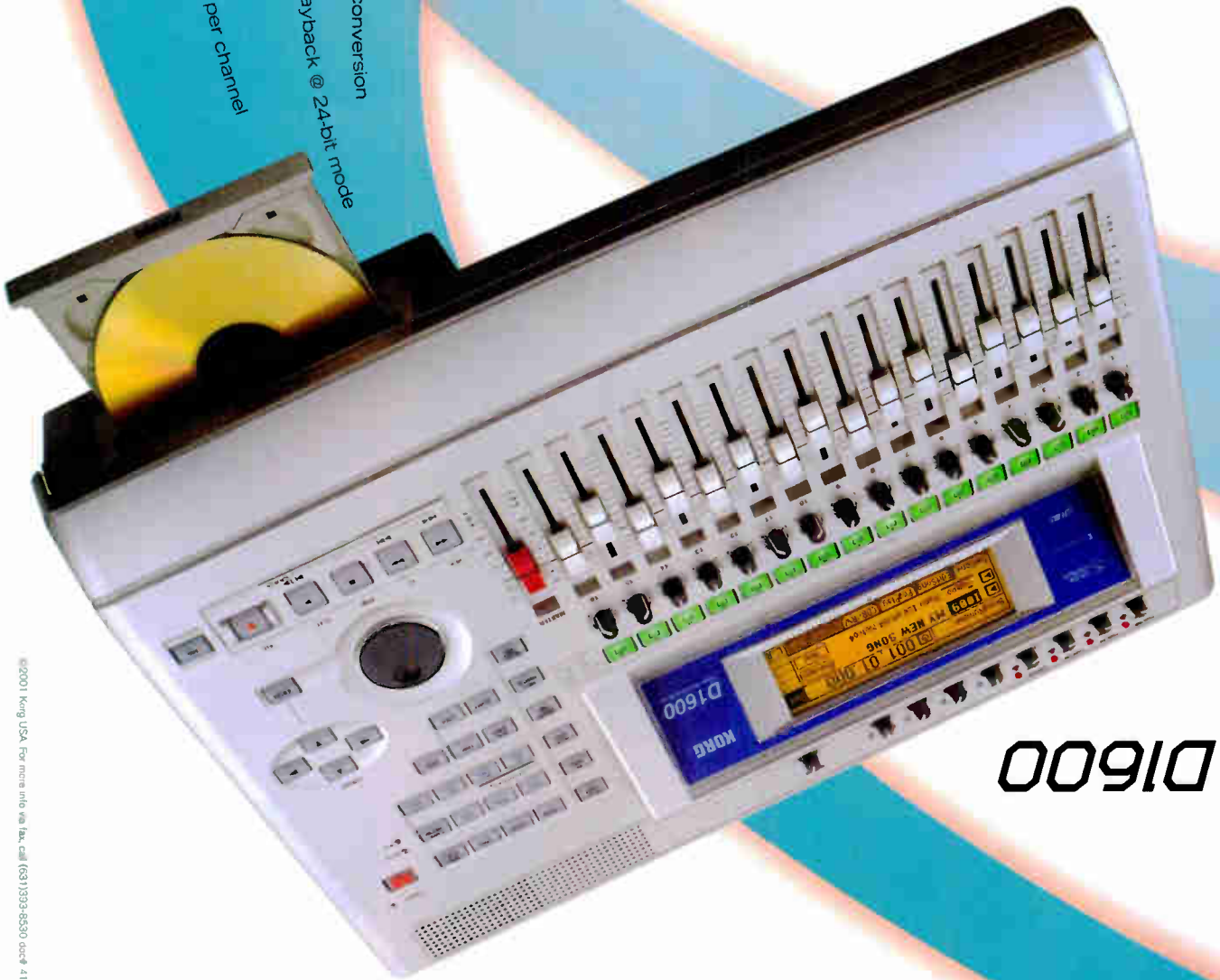
When it comes time to master or backup a project to CD you'll appreciate the D1600's internal CD-RW drive bay. (The Korg model CDRW-2 and many ATAPI-compatible devices can be used.) No cables. No additional power supplies. You can even record audio directly from the internal CD-RW drive. Try doing that with an external unit!

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**D1600**

# SURROUND (R)EVOLUTION

## More Reasons To Take That Multichannel Plunge at Home

By Blair Jackson

Repeat after us: "It isn't just a fad...It isn't just a fad...It isn't just a fad." Surround sound, that is. By now, we know it isn't just hype. This isn't *Quad 2—The Sequel*. This is happening; surround has escaped from the multiplex and is invading homes coast to coast! Could your house or studio be next?

There are still many unanswered questions about the long-term commercial viability of multichannel audio products: As usual, there are format differences to be resolved or, more likely, universal players to be invented. Will the public buy Hendrix's *Electric Ladyland* one more time...after we've already shelled out for the CD, the remastered CD and the special-edition remastered CD? (I will!) Okay, it's great news that the redoubtable Elliot Scheiner is working on a 5.1 mix of Van Morrison's *Moondance*, but how about a surround mix of U2's latest, or of Bonnie Raitt's or Metallica's *next* album. The financial commitment from the record labels still isn't there...but it will be one of these days. The first surround systems are going in luxury cars right now, and it's only a matter of time before the ubiquity of car systems leads to an explosion of surround "product."

Every few months, we like to check in with different engineers and producers to see how the professionals in our business are dealing with the surround phenomenon. This month, we hear about some recent projects from an illustrious group: Bob Clearmountain, Tom Jung, Mickey Hart and Tom Flye, Jimmy Douglass and Greg Ladanyi.



PHOTO: RIEVE JENNINGS



Bob Clearmountain

### BOB CLEARMOUNTAIN: SPRINGSTEEN IN SURROUND

Until I saw HBO's incredible two-hour Bruce Springsteen *Live In New York City*, I thought there was no way the energy and excitement of a Springsteen show could translate to the small screen. Beautifully shot and edited, with the natural pacing of a true Springsteen marathon, it is also one of the best-sounding concert specials ever, thanks to the work of Springsteen's veteran sound team, headed by recording engineer Toby Scott and mixer Bob Clearmountain. So far, three products have come out of the Madison Square Garden concerts: the HBO special, an expanded two-CD set and now, due sometime this month (if all goes according to plan), a DVD with full 5.1 surround mixed by Clearmountain.

"Actually, the first thing we did was mix 'American Skin' [Springsteen's haunting and controversial song about the shooting of a

West African immigrant by New York police] for a single," Clearmountain says from his MixThis! studio in L.A. "We did it stereo, and since I knew the shows had been shot in High Definition video, I ran a 5.1 surround version as well. I've been doing that with just about all the live stuff I've done lately, just in case. After hearing that and seeing some of the footage from the shows, Bruce and his manager, Jon Landau, decided to mix more of the tracks for a possible DVD. In fact, once they decided they wanted to go in that direction, they didn't even ask for a stereo mix, but I did it anyway to keep all bases covered. I always do the stereo and surround mixes simultaneously.

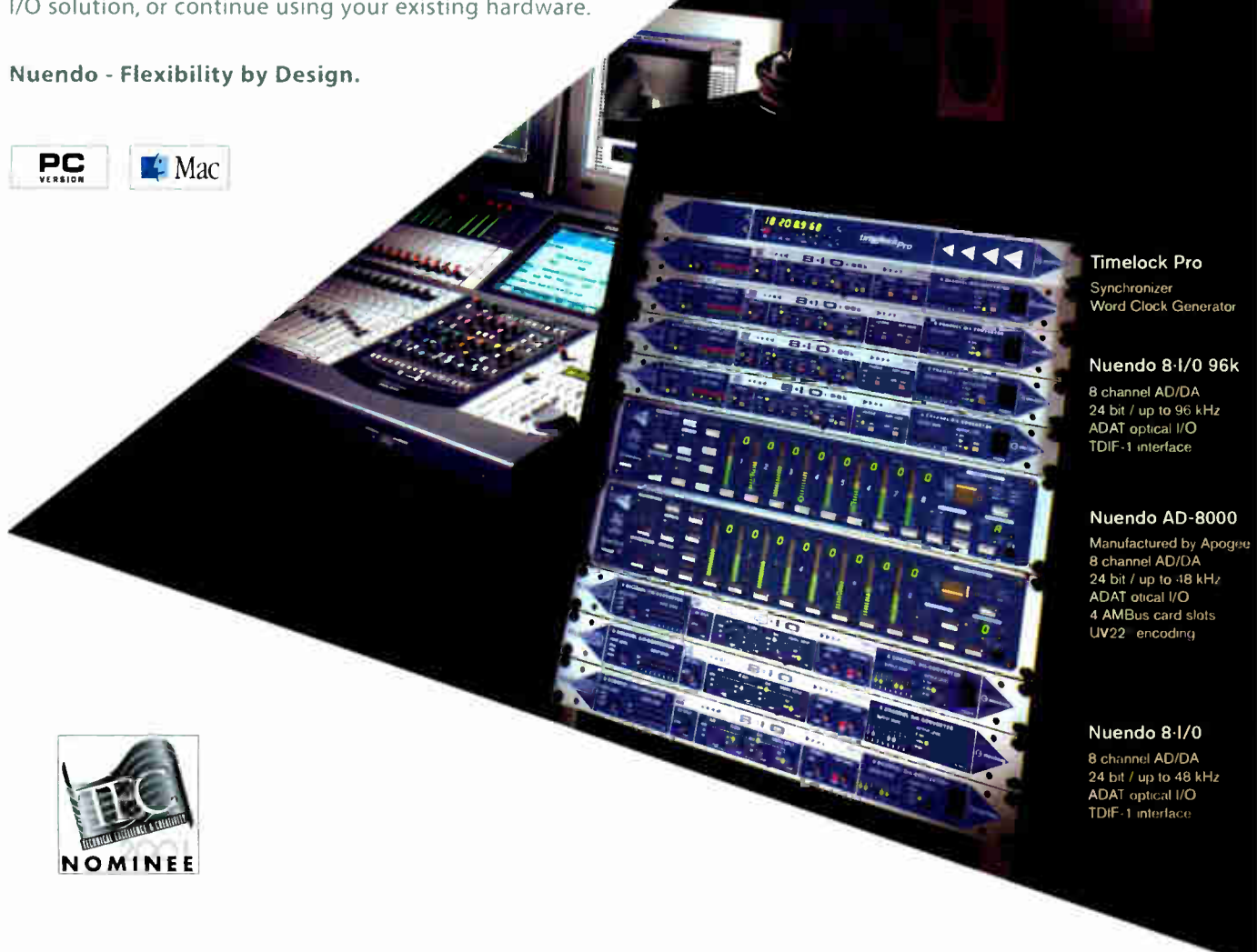
"The way I set up the console [a modified SSL 4072 G+] is to put the small faders post the big faders and put them all at zero (unity) and then send them to the multi-

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channel buses, which route to Pro Tools for my 5-channel mix. Then I use the small faders as trims for the surround mix. I switch the monitors between the surround and the stereo, which comes off the normal stereo bus, and make them compatible using the small faders. The LFE (subwoofer) gets sent off an aux send. That all works really well for me. We've modified six of the SSL's patchable VCAs to work as a 6-channel bus compressor/master fader in conjunction with the SSL stereo compressor, so the surround compression is identical to the stereo.

"Musically, I want the stereo and the 5.1 to be compatible," he continues. "I want it to be the same mix in terms of the balance of the voice and the guitar and all those kind of things. I don't want to go to the surround mix and all of a sudden there's a completely different musical picture, particularly on a live recording. At the same time, you can do a lot more with ambience and audience in the surround mix. Normally, with a live show, you do a lot of audience mic riding, because there are definitely times when it's appropriate to hear more audience, but when the focus is really on the music, you want to bring those mics down so the music doesn't get muddy. Mixing in surround, I find that I want to keep more of the audience and hall ambience up—the mix can take it because there's more coherency as the ambience is spread out in four or five speakers, as opposed to two. A similar effect can be observed by recording a lecture in stereo from the back of a hall—if you listen in mono, you'll find it much harder to make out what is being said than in stereo. I double-patched the audience [tracks] to two sets of faders, so I had one group for the stereo and another for the surround. I would ride them separately and bring the stereo audience down more often and more drastically. In the surround, the audience is up a lot more often, especially the rear channels, because all that's really back there is ambience and audience. I did spread the piano out a bit on the right, and I think the organ is sort of between the front and back on the left."

Clearmountain says he had a bit of trouble with one of the audience tracks because of a defective mic: "I only had four audience tracks to work with, and one of them would crackle a little when there was a lot of bottom end coming in

the mic. I had to filter it quite radically in a few places. My advice for live recordings intended for surround is to spread as many audience mics as possible out over as many channels as possible!" The concerts were recorded by Scott on Sony PCM-3348s.

"Toby is a great engineer," Clearmountain says. "He's very conscientious and he gets really good sounds. The sounds on the tape were just phenomenal! I didn't have to use any samples or anything like that. What was there was just really, really well recorded. He makes my job a lot easier." Clearmountain notes that he occasionally will make suggestions about microphones and compressors he favors, and Scott has always been accommodating.

I remark to Clearmountain that I thought the E Street Band would be particularly challenging to mix because there are up to four guitars playing at once, as well as all that midrange information from the piano and organ—the Springsteen "Wall of Sound." "It is a wall of sound sometimes, and that's the sound they're going for," he agrees. "But the thing about that band is that it's full but not overly cluttered. That band is unique. I've mixed a lot of their records, and what I've found is that they kind of mix themselves. They're an amazing group of musicians the way they work together. They seem to get out of each other's way. Roy [Bittan, pianist/bandleader] is just incredible with the way he fits his piano in. It's huge when it needs to be, and it never really loses that quality, but it also makes space for the other instruments. They're easy to mix; it's obvious, in a way, where everyone belongs. And as for all the guitars, you sort of want to hear it as a blanket of guitars; you don't want any particular one to stick out, unless someone's riffing or soloing."

Over the course of about a month, Clearmountain mixed 46 tracks in both 5.1 and stereo (37 different songs), sending his stereo mixes to Springsteen by ISDN to the rocker's home studio in New Jersey. "My assistant, David Boucher, did all the conform to picture here and at his place on our Pro Tools rigs, so for four months after that I heard it over and over. Before assembling the final HBO show, we did a preview for HBO, then the preview for Columbia Records," Clearmountain says, "and each one was a new playlist we had to conform. David and I would sit there and work on the crossfades and transitions together between other mixing projects. The CD was a completely different thing, so it just went on and on as Bruce kept changing it every few days."

## TOM JUNG DMP and the SACD Difference

One of the most respected pioneers of digital recording, Tom Jung has made his choice when it comes to surround formats: SACD. "This new format squarely addresses the concerns that audiophiles have had with the compact disc since its inception," Jung writes on the home page of his mostly jazz label, DMP (Digital Music Products). "The underlying technology here is DSD (Direct Stream Digital)...a simplified way to convert and store high-quality audio by using a 1-bit word sampled at 2.8224 million times per second...recorded directly to hard disk at the original recording session without the usual impairing decimation process inherent in PCM recording. The result: music that sounds much closer to the original analog input and can be mastered bit for bit to SACD, giving the listener the exact same level of quality the engineers hear at the original session."

Jung has been working in the multichannel environment for a while now, and it will come as no surprise to those who know him and his somewhat iconoclastic ways to learn that he is approaching surround recording a little differently from many of his contemporaries. "What I'm trying to do is six microphones live to six channels," he says. "I'm using kind of a quasi dual Decca Tree kind of arrangement with three microphones in the front and three around the back." In this setup, he places the front and rear center microphones a couple of feet higher than the left and right mics. "I've experimented quite a lot with an overhead height channel, and I really like that way of going because the SACD format supports six full-range channels, and I personally feel that for the kind of music I do, at least, the .1 channel is not particularly useful.

"My goal is to try to get a very holographic effect. There's no panning going on or anything. I really like the idea of having a microphone assigned to a channel and that's the way it's reproduced. It's not about isolation at all. It is about presence."

What mics does this audiophile

—CONTINUED ON PAGE 34



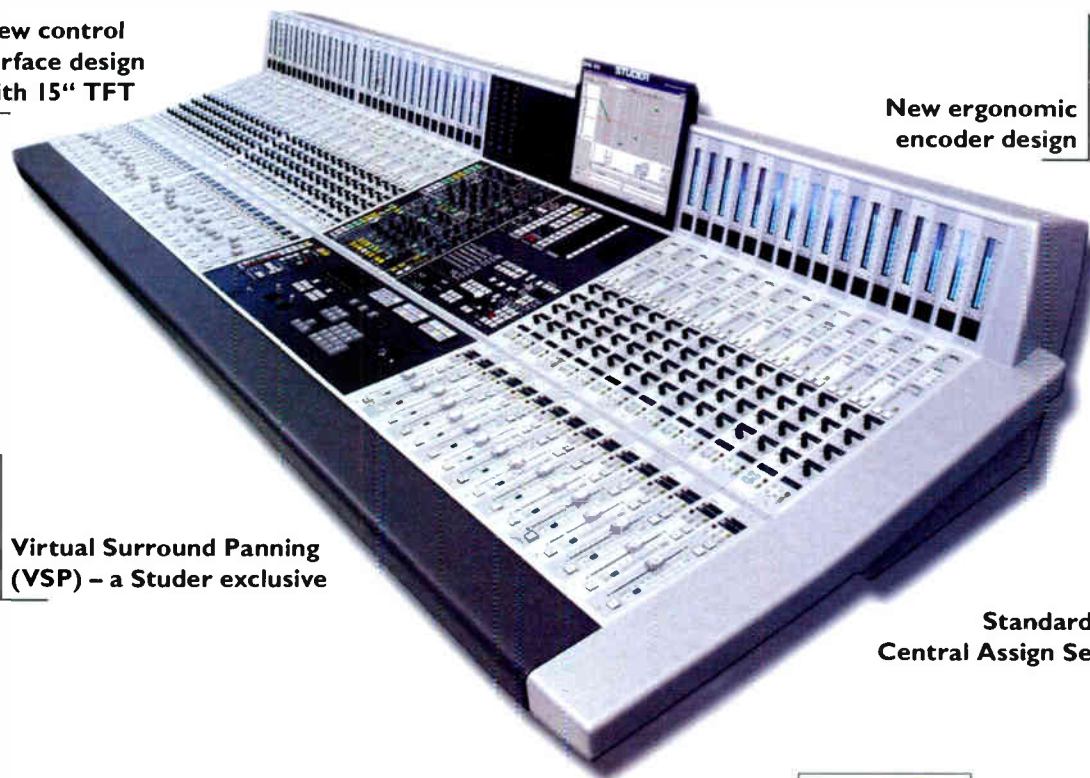
# STUDER

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## Post-Production - Studer D950 M2 Digital Mixing System



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Which is where the DVD project was when Clearmountain and I spoke in late May. "They're constantly re-editing the video, and Bruce is still deciding on the songs and the order. That's just the way Bruce works. It's got to be exactly his vision of the performance and it's got to be totally true to what he's feeling. That's how he's always done it, and that's why he's so great. It's so much fun to listen to and watch. I get hooked in by it every single time. I've got no complaints. I love this stuff!"

In the meantime, Clearmountain is doing other 5.1 work, and there seems to be little doubt that his phone will be ringing often as DVD-A and SACD really start to catch on. Who better, for instance, to do a DVD-A of Roxy Music's classic album *Avalon*, which he mixed originally? And there are new bands, too: He cites Jonatha Brooke's recent project, *Steady Pull* (profiled in April 2001 *Mix*) and he recently did a surround mix for a hot "new metal" band called Darwin's Waiting Room. "Not too many labels have wanted to do 5.1 on new music," he says, "but I've done a few now, and I think the attitude [at the labels] is changing."

## MICKY HART/TOM FLYE: DIMENSIONAL DEAD

Former Grateful Dead drummer Mickey Hart and his longtime engineer Tom Flye have been in the surround world for two-and-a-half years now, practically qualifying them as cagey veterans. Their first two projects were a pair of songs from Hart's percussion-and-voices CD *Superlingua* and a still-unreleased "Best of Mickey Hart" CD; both of those were mixed to 5.1 at Chicago Trax. But now, Hart and Flye are working simultaneously on two surround projects in two different formats. One is an SACD project for Sony Classical, featuring Hart and a number of his percussion world buddies (Airto, Giovanni Hidalgo, et al.) playing with the famed Japanese taiko drum troupe Kodo. That was recorded up at Hart's ranch (see a future issue of *Mix* for more on that) and is due to be mixed in L.A. later this summer for a fall release. The other project, now complete, is 5.1 DVD-A mixes of two classic Grateful Dead albums from 1970, *Workingman's Dead* and *American Beauty*. Those records marked the Dead's turn from overtly psychedelic rock to more concise, folk-influenced song forms,

and they stand as the apex of the songwriting partnership between Jerry Garcia and his lyric partner, Robert Hunter.

For Hart, it's been a long, emotional trip going back to the 16-track masters of these two albums for the first time in more than 30 years; and working on Grateful Dead music in a concentrated way for the first time since Garcia's death six years ago. "Besides the notion of hearing every flaw that we all made, and besides hearing Jerry...there's a lot of emotional baggage that you take with you over the 30 years of the Grateful Dead. But I found it very heartwarming, actually. It felt warm and fuzzy.



Mickey Hart

This was the time we were making acoustic music, and everybody was in fairly good shape. It was a fun time, a light time and these were the great Hunter-Garcia songs. I loved these songs. This was the heart of the Grateful Dead. But it was emotional for me the first couple of days, because I started with 'Attics of My Life.' Might as well jump in with both feet. There were tears in my eyes a few times a day, but they were happy tears."

However, before any mixing could take place at the Dead's studio in Novato, Calif., the control room had to be outfitted for the surround project. Euphonix loaned them an R-1, which the unabashedly pro-analog Flye calls "one of the better digital devices." They installed a 5.1 monitoring system based around Meyer loudspeakers, using a Multimax box. Hart has both the TC Electronic 6000 multichannel reverb unit and the Sony 777 in his own fabulously equipped home studio, and for this project they decided to use the 6000. "They're two totally different devices," Flye comments. "The Sony machine is a true room simulator. They actually went

out and recorded bursts in the room, and it sounds quite good. But it's not as versatile as the TC, which is important to Mickey. That's *total* simulation, so you can change anything you want, and you can do things like have three stereo devices if you want them, or four mono devices." Hart calls the 6000 "our secret weapon."

From the outset, Hart decided that he wanted to treat the two albums with the respect they deserved, but also to view them essentially as new products. After all, he notes, so many people have the CD versions, why simply re-create those mixes in 5.1? "This is a new creation, based on the old," he says. So, he and Flye tackled each song individually, listening closely to the stereo version, then putting up the multitrack and building new mixes based on what they heard there—sometimes beefing up parts that were de-emphasized on the stereo master, and in a few cases, even restoring parts that were left off the original. For example, on the 5.1 version of "Sugar Magnolia," Garcia's pedal steel line has been moved from the background to the lead instrument, and there is a 40-second ending beyond the original fade-out that Hart put back on. "Truckin'" rocks on beyond its fade-out, and on the multitrack of "Candyman," Hart discovered a coda that has Garcia scatting inventively. "It's beautiful," Hart says. "I don't know why it was faded originally, nor do I care. I'm not being judgmental about it. So, I gave it another dB or two, and now you can really hear Jerry pumpin' out there, layin' it out.

"On 'Dire Wolf,' we found a set of vocals that weren't on the album version and sounded great. Bob [Weir, Grateful Dead rhythm guitarist] walked by the studio when we were listening to it, and he said, 'Oh yeah, that's the way it was supposed to be...' but it wasn't mixed in."

Generally speaking, Hart opted to put the listener in the drummer's chair (Bill Kreutzmann plays traps; Hart more percussion) for the surround mixes. "I even have the bass drum a little forward in the perspective, as if you're sitting at the kit," he says. "The snare is sort of in your lap. I wanted to put you in the band; I wanted you to be in the Grateful Dead as best as you could be...without having to pay the dues," he adds with a smile. Guitars are mostly broken out to the sides, front and some rear, and Phil Lesh's always-dominant bass is front-and-center as it should be. On the beautiful ballad "Attics of My Life," Flye and Hart took the six

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tracks of vocals, made a gorgeous mono a cappella mix, put it in a church setting in the 6000, then went in and layered the vocals almost equally around the four main speakers to create an aural canopy of sorts that plays inside and *above* the listener's head. "I wanted to make a choir out of it," Hart says, "and then I took the band and put it in the church as well."

Hart and Flye have also been working on new stereo versions of the two albums, a job that requires readjusting their thinking about the new mixes. "When you mix a record, especially in stereo," Flye says, "you have different instruments fighting

With 5.1, you have more real estate, and we've found that we are able to leave sounds fuller because they're separated and not right on top of each other all the time.

—Tom Flye

for space, so you have to do things like thin out guitars so the bass still comes through. Well, with 5.1, you have more real estate, and we've found that we are able to leave sounds fuller because they're separated and not right on top of each other all the time. One of the things we have to do is when we go back to stereo we have to trim up some real estate here and there in the low-mids and other places, so you can still hear everything."

Hart and Flye expect that working on these two albums will lead to more archival Grateful Dead 5.1 work for them. For Hart, it's a way to reinterpret the past without actually changing history.

"I try not to overindulge," he says. "You can't take too many liberties and be a total revisionist and take it into some bizarre space because you have this itch. There's a certain respect you have to have

for the original recording. I think I'm doing this for the right reasons, and I'm trying to let the music tell me what to do. I don't have a real agenda other than making it sound great and making it a real treat for the fans, and, of course, making it a treat for me."

### JIMMY DOUGLASS GETS HIS FREAK ON IN 5.1

It's not surprising to learn that one of New York's top R&B engineers, Jimmy Douglass, is also at the forefront of 5.1 mixing in that genre. Recently, he did DVD-A surround mixes for Missy "Misdemeanor" Elliott's most recent album, *Miss E... So Adictive*, which he also tracked (it was produced by Timbaland and Elliot), and for Ginuwine's latest, which he did not record. Douglass likes to do his surround work at Manhattan Center Studios, which is equipped with a Neve console that gets heavy use in film post-production.

"Missy's album is one where Timbaland and Missy and I did the stereo together," Douglass says. "Then they went about their business, and I came in and approached the 5.1 myself; I did it on the back end rather than at the same time we were doing the stereo. They trusted me with it because they were both off doing other things.

"So, the first thing I did was recall every mix that I had first as a stereo, and then I proceeded to rethink and reassign different elements. In this case, I didn't want to do anything too crazy. Mostly what I'm doing there is trying to use all four main speakers as a big, basic stereo mix. I try to make it so that from the middle you get most of the mix in the center without a lot of 'Whoa, there's a snare over there! There's a guitar over there!' The perspective is about 20 yards behind center. If you sit dead front and you call that the middle—the 50-yard line—then, if you move forward to about the 40, you're basically going to hear a true stereo mix; the rears will almost disappear. But if you move back to 10 or 20 yards behind the 50, you actually feel like you can hear everything equidistant. And I think part of that is physical, because your ears have coverings on the back—your earlobes—so they don't hear in quite the same way in front of you and behind you."

Just because he was shooting for an overall "big stereo" sound doesn't mean that Douglass didn't use the surround medium to the fullest. "It let me focus on things in different ways," he notes. "A perfect example would be on Missy's vocals. She can really make her voice do a lot of interesting and sometimes crazy things;

—FROM PAGE 30, TOM JUNG

producer/engineer like for his surround work? "I'm crazy about the new Shures—the KSM 32s and the KSM 44s. I also really like the QTC-1 omni from Earthworks. Usually, I like a combination of those three mics, though nothing is carved in stone. I like the idea of using matched mics in the front and the rear, preserving as much of that Decca Tree purity as I can."

For his recent surround recordings, which include projects by the duo of Joe Beck & Ali Ryerson, the Pilhofer Jazz Quartet, and a trio featuring Warren Bernhardt, Jay Anderson and Peter Erskine, Jung has been using a very simple live recording chain—the six mics into an assortment of preamps (Earthworks, Millennia, the pre's in the Manley 16x2 mixer), and then directly into the new Sony Sonoma 8-in, 6-out 1-bit recorder/editor/mixer, for which he was an original beta tester. "I've been doing projects completely in the Sonoma and getting great results," Jung enthuses. "Last week, we took it up to Bob Ludwig's [Gateway Mastering in Maine] and even mastered within the Sonoma. It's been really dependable. The mixer is extremely transparent.

"I'm a firm believer in the idea that less is more and any additional processing seems to take a bite out of the detail and the space and the holographic image and the depth perspective," notes Jung. Nevertheless, he will employ a pair of the new Sony 777 sampling reverbs in a dry studio environment to give his recordings a little more depth. Jung was in on the development of this piece of gear, too, contributing many of the natural spaces found in the 777. Still, his preference is to record in naturally reverberant places that require little or no processing at all.

With an ever-expanding catalog that includes everything from percussion ensembles to a cappella choral singers, Jung and DMP are poised to do for SACD what they did for the conventional CD many years ago: Show that quality is an obsession worth pursuing. "I'm so happy not to be working in PCM anymore," he says. "All that has to happen for this [SACD] to be successful is for people to hear how good it sounds."

—Blair Jackson



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## SURROUND (R)EVOLUTION

she's *very* animated. And she'll quadruple a vocal part just for size. So, in this case, it made it easy to bust those out in four different places, or have different parts in different places to give the overall sound a different dimension. That made a lot of

tween real center and the phantom center. But I found that when I put vocals across all three of the front speakers, you get some phasing because they're so close together and instead of the vocal getting louder, it gets a little strange."

As for the subwoofer, "I was mixing a lot without even turning the subwoofer on," Douglass says. "Stuff that goes down there is going to go there, and it's pretty much not negotiable—kicks and basses.



Jimmy Douglass

the things come to life. There's this one song she does called 'Dog in Heat' where she has all this heavy breathing, and in the stereo mix I had flanged and moved it left and right, but in 5.1 I moved it completely around the speakers. It's crazy! It's like it's attacking you!" he says with a laugh. "I also did a lot of effects in the rears and sequenced parts. Still, I mostly kept the vocals in the center and the lead vocal mostly in the front field, not to obscure the focus of the song, so if you're sitting at the 50-yard line, you're getting most of the basic record in front of you."

Douglass says he often likes to build his surround mixes in different triangles, "such as left front and right front and phantom center in the back. And then the opposite would be left back, right back and then phantom center in the front. I want things to be somewhat cohesive and to have a shape to them so they make sense. I didn't want there to be a lot of things stuck out on the sides by themselves because that feels strange to me.

"To me, the center [channel] is pretty useless," he continues. "Still, if I have two sets of strings, for instance, I might make a triangle using one set in the real center, as opposed to phantom center. If I have two basses, I might distinguish them be-



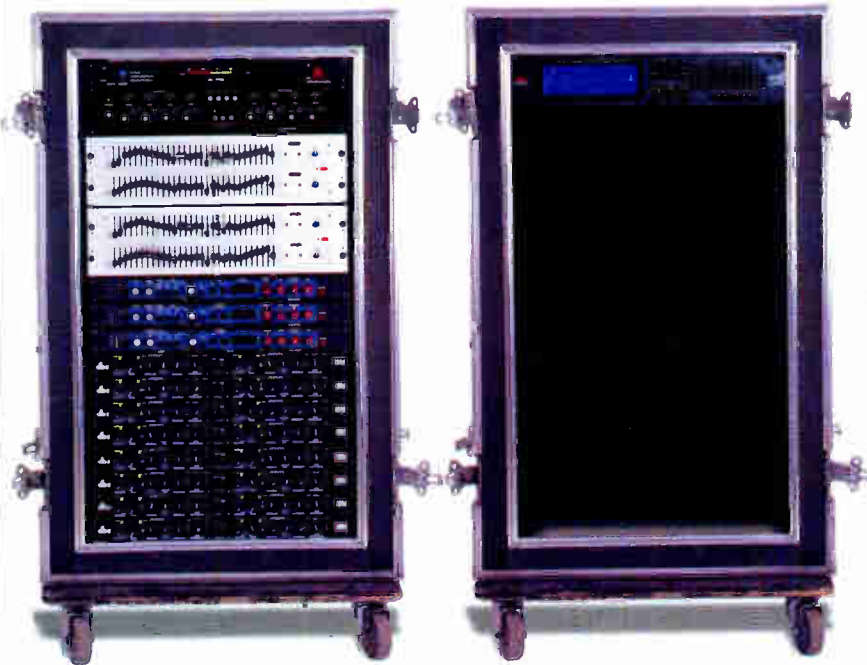
What I did, which some people might find unusual, is I didn't really put them in the equation when I was mixing. I wanted to keep the imaging real clear, because what I found was that when I was using the subwoofer, the kick and the boom were so dominant that for me it was more like I was working on a club record instead of a pop record or whatever. The bottom became so awesome that I started changing how the top was looking because I wanted to match the bottom. What happened a couple of times, as well, is when I did put the sub in and I started changing the stuff on top, when I compared the stereo mix to it, it was clear I was going to a whole 'nother place. So I stopped, took the sub off and then reworked it to better represent the stereo mix." Even so, Douglass acknowledges that DVD-A "is made to order for

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clubs. You're gonna see more and more people doing club mixes in surround."

Douglass notes that his experience doing surround mixes for Ginuwine was less satisfying, mostly because he was not involved in the recording, and the quality of the tracks varied from cut to cut. "It's definitely easier to expand things [into surround] when you know the album inside out and you know how you did things and where everything is. Working this way, it sometimes almost feels like you're working on a karaoke record first. You find out what the other engineers did, and then you try to make it sound like their record, except in 5.1. Timbaland and I use a lot of very subtle stereo imaging, and that helps when it comes to the 5.1 because I'm able to keep it as big stereo, but also shifting the emphasis so every speaker got a little. But on this other stuff, people have these mono drum tracks and all this weird stuff and effects here and there, so you end up putting the kick here, the snare over there to make it interesting. If I could, I'd rather make 5.1s of the records that I engineer."

### **GREG LADANYI: RUNNING ON 5.1**

Twenty-two years ago, a young engineer named Greg Ladanyi got a huge break when Jackson Browne, riding high on the success of his album *The Pretender*, enlisted Ladanyi (who did some engineering for that album) to record a tour for a live album. This would not be a standard "greatest hits live" album, however. Browne had a different concept: He wanted to record an album about life on the road, and it would contain all previously unreleased songs. On top of that, to better reflect the reality of road life, some songs would be recorded in hotel rooms along the tour route, and one song even ended up being cut on the tour bus itself, the roaring engine clearly audible in the background. The result was *Running on Empty*, released in December 1977. It became a Top 5 album and a cornerstone of Browne's long and fruitful career. Now, Ladanyi has gone back to the original 24-track masters and broken out a DVD-A mix, which is due to be released October by WEA. (In addition, Browne is finishing up his latest CD of new songs, so his fans should be *very* happy this fall.)

Not surprisingly, working on this project has been quite a trip back in time for Ladanyi. When I ask him about the origi-

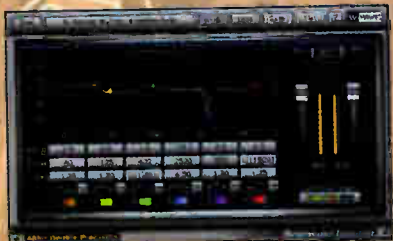


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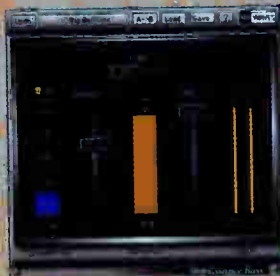
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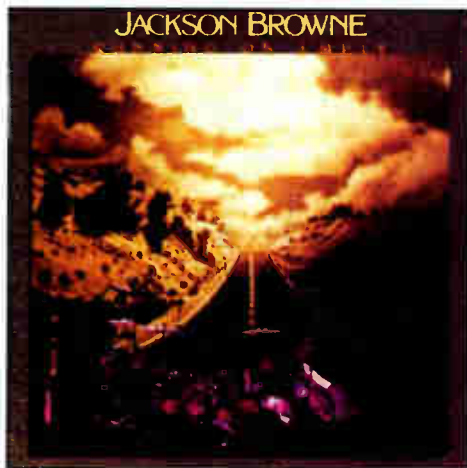


## SURROUND (R)EVOLUTION

nal recordings, he laughs and says, "They were tough! On all the live stuff, I couldn't hear anything. We thought of bringing a remote truck, but it was so expensive. So, we were dragging around a big 24-track machine to about 25 shows, and the cost would've been over the top to try to set it all up [through a console]. I did it all by eyesight. Drums, which I would normally record on 12 or 16 tracks, had to be recorded to just four tracks. So, the way I would get the drum sounds is I know where the bass and snare and hi-hat are supposed to be on the meter, so I just put everything in the general ballpark. All things considered, the tapes sounded pretty good. For the hotel stuff, we planned along the tour places where we would be for two or three days, and then we had a truck to come to those places. 'Shaky Town' and 'Cocaine' were 24-track, 30 ips, and I was in the room next door. 'Nothing But Time' [the song recorded on the bus] was done to a Revox 2-track and a little console we had. There

wasn't room for anything else."

This project marks Ladanyi's first excursion into the world of 5.1, and like most engineers who have worked in the medium, he is very impressed. "Living in the 5.1 world, there are moments on this



record you never heard on the stereo—conversations in the background, atmospheric things, tones," he says, "because I can move things away from each other and give them more space. In the live stuff, I use the first quarter of the front

speakers as the front stage. So I can move things within that realm away from each other. And the ability to hear more tones is unbelievable. You can hear the overtones, you don't have to compress things to make them loud because you have all this space you can work with."

Like Clearmountain and Douglass, Ladanyi does not want to mess too much with the imaging of the live material: "You don't want to suddenly hear the drums or guitars coming from behind you." So in the 5.1 mix, he's mostly put the audience tracks in the rears. "I only had two audience tracks—two mics onstage pointing at the audience. So, I'm using a little finesse in the 5.1 to open it up, using delays. The audience is kind of in the middle of the speaker field, and there's a short delay—35 or 50 milliseconds—and then another that's about 125 or 150 to the rears, and what that does is double up the amount of people and make it sound bigger all the way around."

On the hotel room songs, however, he's made some radical changes. Looking back with 20/20 hindsight, Ladanyi comments, "I should have been more intuitive about the differences between the stage and the hotel room part. For the hotel room stuff,

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in particular, we've gone back and made it more like the reality of what it would be like if you were actually in there with the guys. You wouldn't hear that reverb stuff I used on Jackson's vocals on the album." On the original, the reverb on the hotel vocals closely matches the ones on the live tracks; they were going for continuity. Now, the move is toward naturalism: "I really want people to have the sense of going into an audience and then going into a hotel room. For me, the contrast between the live stuff and the hotel room stuff really needs to be extreme. So, you go into the hotel room, and stuff starts coming out of those rear speakers, and it's like, 'Whoa!'"

Ladanyi's principal tools on this project have been the TC Electronic M6000 and Steinberg's Nuendo software. He calls the former "a marvelous piece of equipment for surround sound. You can do hall sounds, living rooms sounds, get the really, really short early reflection stuff. They have a setup in there where they have an 8-channel panner. Like 7-left, for example, would be the left rear room, so you can have a vocal enter the room from the rear and then disperse the way it naturally would in a room. It's quite amazing. For the hotel room stuff, I'm using all the speakers—like Jackson's in the front,

and [guitarist/fiddler] David Lindley's in one speaker and [keyboardist] Craig Doerge is in another. Same with Kootch [guitarist Danny Kortchmar]. So, you have a sense of sitting in the middle of the song.

The digital world has finally crossed the line. This is it. It is analog, if you know what I mean—the warmth and the clarity and the high end.

—Greg Ladanyi

I've never heard anything quite like it.

"And Nuendo is incredible," he continues. "I think this software and what they've done with the project windows for editing is just great. You can open multiple windows at one time; it's really easy to

drag one file to another and, of course, it's 24/96. Man, I've got to tell you, if I never go back to 48k or analog, I'll be fine. The digital world has finally crossed the line. This is it. It is analog, if you know what I mean—the warmth and the clarity and the high end; it's incredible how you can hear tone and the real sensitive moments of picking a guitar and breathing. You hear *everything*. I've set my whole studio up with Nuendo for 24/96, because it's going to be the future." Assisting Ladanyi on the Nuendo work has been Rob Hill, one of Steinberg's technical promoters.

On the morning we spoke, Jackson Browne was scheduled to come in and listen to Ladanyi's latest mixes. "He's been working on it pretty closely," the engineer comments. "I think for both of us, it's been really interesting to go back and hear this music in such detail. It was a different time in our lives, and this album really captured a certain flavor that's unique. And the band, of course, is so good." Ladanyi also promises a special treat for those who buy the DVD-A: "There's a song we didn't use the first time 'round that we hope to put on there. I can't say anything about it now though; it's a surprise."

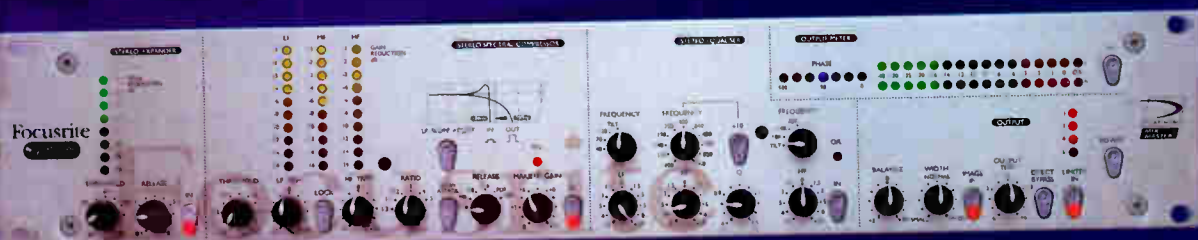
Blair Jackson is the senior editor of Mix.

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# JOHN LECKIE: MUSIC HEAD

CATCHING UP WITH ONE OF BRITAIN'S PIONEERING PRODUCERS

It's been 10 years since *Mix* interviewed John Leckie for a "Producer's Desk" feature. Back then, he was known for his early engineering work at Abbey Road with everyone from George Harrison and John Lennon to Pink Floyd and Mott the Hoople, and for producing punk/new wave-era faves such as BeBop Deluxe, Public Image, Simple Minds and Bill Nelson. Since that interview, however, Leckie's already considerable success has mushroomed. Today, he is one of the most in-demand producers in the UK, after a decade of pioneering hit albums with bands such as the Stone Roses and Radiohead. British writer Mike Collins caught up with Leckie during a break in Leckie's hectic schedule to bring us up to date...

—Blair Jackson

*The last time Mix spoke with you was 10 years ago. Could you talk about your work since then?*

The last 10 years! It's been that long since I talked to *Mix*? The Stone Roses was the first big success I had, around Christmas 1989. Their album



went up high in the charts, and the single, "Fool's Gold," went to Number 2 in the charts [in the UK]. The album, *The Stone Roses*, has gone on to be voted a Top 10 record of the millennium in many polls, and this band became a way of life for many people in the UK.

In 1991, I went to America and



recorded The House of Freaks, two guys from Richmond, Va., signed to Rhino Records—Johnny Hott and Brian Harvey. They combined Americana songs and atmospheres. They were big fans of The Clash and wanted to sound British, as well as sounding American. Then I did *Let's Active* for IRS. This album was Mitch Easter's band. He had produced the first couple of REM albums. I had bought these records, liked his work and then suddenly he was on the phone asking me to work with him! We recorded at Rockfield in Wales and overdubbed at Mitch's Drive-In studio in North Carolina before mixing at Abbey Road back in London.

Then I did The Posies in Seattle, just before Nirvana was signed. The Posies were shocked that such a crap band [as Nirvana] could get a deal! It was The Posies' first album, but it sounded like their fourth; they were very mature.

Then I went to Vancouver and recorded a great Canadian band called The Grapes of Wrath at Mushroom Studios in Vancouver and mixed at Abbey Road. We got a Platinum record in Canada, but the band split up shortly afterward.

*Didn't you work with the Stone Roses again?*

We did go in to record the follow-up album, but the band only had one song called "One Love." We spent a lot of time on this, then I went off and did The Posies while they mixed "One Love." When I had finished The Posies album, they were *still* mixing this track. They had spent six weeks on this, and I came back and mixed the track in six hours! It was only ever released as a single. They never completed the album; instead, they changed record companies in 1992-93. It took them two years to get back into the studio.

We then spent maybe 10 weeks with the Rolling Stones Mobile Studio, which had the first Helios desk. I'd used this truck in France with BeBop Deluxe back in 1977. We recorded in a house near Manchester and recorded just three songs in that time.

*I remember you telling me how you had to call on all your reserves of patience at this time!*

You're not kidding! Anyway, at my suggestion, the band went off and rehearsed for three months. Then we came back and went in the studio for another six weeks. Then I left. I was in charge of the budget, according to the lawyers. I didn't think I was in control of the situation, so I resigned. They then spent another 14 months at Rockfield Studios completing the

BY MIKE COLLINS

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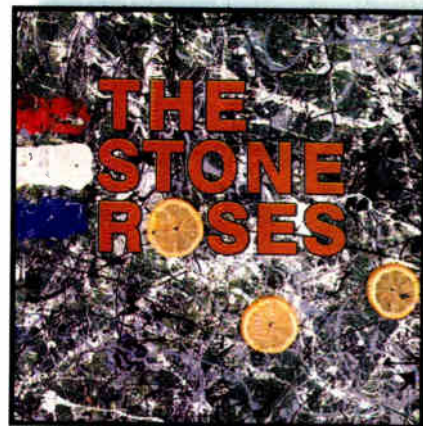
**PRODUCER'S DESK**

album, called *Second Coming*. Because I had resigned, they gave me little money and no credit, nothing.

I was just glad to get out of it. Around this time, I got a call from Robyn Hitchcock & The Egyptians, who asked me to produce the album called *Respect* for A&M records. I have always been a fan of Robyn Hitchcock, so I was delighted with this. The record was recorded using the BBC SSL mobile, parked outside Robyn's terraced house on the Isle of Wight, just off the south coast of England, near Southampton.

*So that was a good call to get, and, ironically, for an album called Respect—exactly what you weren't getting from Stone Roses.*

Yeah, that's right! Anyway, for this record, we laid down an accurate keyboard part using a DX7, Cubase and an Atari, and then we hired a Yamaha Disklavier so we could get the sound of a real piano when we continued working on the recording at Livingston Studios in North London. I was amazed at this facility—the way that you could have the tremendous sound of a grand piano on your record from what was originally a synthesizer part recorded into a sequence.



**Let's talk about The Verve.**

Round about 1993, I turned up early to a gig and caught the support band, simply called Verve at that time, and was so blown away with them that I followed them around. I paid to get into every gig and was convinced they were going to be great. Within a few weeks, they were signed to Virgin, and I was banging on the door asking to be allowed to produce them—the first time I have ever done that. Virgin said, "Yes," and the record was called *A Storm in Heaven*.

**What was remarkable about them?**

The singer, Richard Ashcroft, and his energy and the band's commitment to their music. They were the first band I had heard who could play deafeningly loud and sensitively quiet. And they produced guitar sounds I had never heard before. The guitarist, Nick McCabe, used a Flying V with a Marshall amp, but the way he picked the guitar was unique. It was the confidence and the "f\*\*\* you" element: "I'm great, listen to this." Other bands at the time didn't have the same up-frontness that they had.

**What microphones did you use on his guitar?**

I used an SM58 out in front of the speaker cab with a Neumann U67 touching the cloth of the speaker cab.

**How did things progress for you with The Verve?**

Well, I went on to work with Richard Ashcroft in 1996, and later recorded tracks, which were to become the multi-Platinum album *Urban Hymns* by the band now called The Verve. [Rather than Verve, because the famous jazz label Verve had objected.]

**What followed this?**

The next project was Radiohead in 1994—*The Bends*. This is the record that everyone relates me to. It was just a record that I did. I mean, it wasn't without its problems, and it was just a record that everyone picked up on. Then and now, they're like, "the greatest band in the universe," but it was six years ago. So

**SCOTT HULL  
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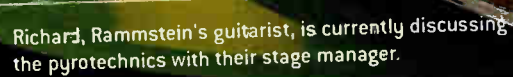


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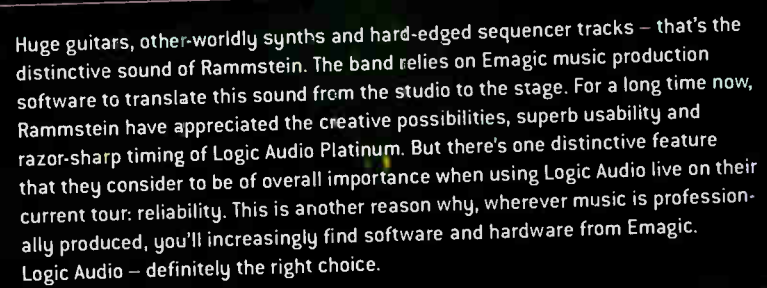


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The Emagic logo, featuring the word "emagic" in a lowercase, sans-serif font with a blue swoosh above the 'i'.The text "logic audio" in a lowercase, sans-serif font, positioned below the Emagic logo.The text "Music Production Software" in a smaller, lowercase, sans-serif font, enclosed in a blue rectangular box.A white rectangular text box with a thin black border, containing text about a guitarist and pyrotechnics.

Richard, Rammstein's guitarist, is currently discussing the pyrotechnics with their stage manager.

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I don't really know what to say about that, except that it was recorded in a traditional manner with two guitars, bass and drums. The difference was that the band was good, played their instruments well and made a good sound—so my work was easy.

*Many of the tracks were loud, but others were gentle acoustic guitar things—more like folk-rock. I didn't like the heavy tracks too much, but I liked the more sensitive tracks. I was impressed with the guitar playing, particularly the acoustic guitars.*

On one song, "Nice Dream," there are five people playing five different acoustic guitars. People ask me all kinds of things about that album, like, "How do you get that vocal sound?" It's easy. Just get a good singer with a good voice, put the singer in front of a microphone and it sounds good. Now, if you have a bad singer, even if you've worked like mad to make him sound good, no one takes any notice. But if you have a good singer, you just record the vocal flat, and you don't even compress it or limit it. You just put the fader up, and he sings the song first go. Everyone says, "Ah, the producer's great! Incredible production, man!" And it's just

because the guy's a good singer!

The same with guitar sounds. I mean, one of the things when we started the record and they wanted to find a new sound was we got every type of guitar in—Gibsons, Fenders, Danelectros—and all sorts of weird amps, like Soldano

**Kula Shaker used Indian instruments—tabla and tamboura—with electric guitars, drums and Hammond organ. They combined Hare Krishna mantras with modern rock.**

amps. And, after three weeks fiddling around, we came right back to where we started, which was just a Fender Twin and a Telecaster.

*One of the best combinations in the world!*

And Marshall Bluesbreaker effects pedals, and that was it.

*How did you get involved with Kula Shaker?*

Early in 1996, I saw Kula Shaker at gigs, and when they got signed, they called me to produce.

*Where did you record?*

We went to Eden, Chipping Norton and Livingston. We recorded an album called *K*, which sold millions, mainly in Europe. The band used Indian instruments—tabla and tamboura—with electric guitars, drums and a Hammond organ. They combined Hare Krishna mantras with modern rock. This album was recorded on a relatively low budget, yet sold a million. The follow-up had the benefit of a much larger budget and a well-known American producer, yet sold fewer than 10,000 copies.

*Moving on from Kula Shaker, where did life take you next?*

In 1997, I worked on an album for Cowboy Junkies, one of Canada's top bands. This suffered from the merger between Geffen and MCA that was taking place around that time, so it didn't do as well as we had all hoped. Unfortunately, they got Tom Lord-Alge to mix this, and it didn't turn out right for me. The record company wanted radio hits, and the band was

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all about late-night, moody listening, so it was never gonna work, really. This band had never spent much time on a record, and they knew it was going to be their last [for Geffen], so it was the first time they had double-tracked vocals or done any amount of overdubbing. They tried to satisfy the record company's wishes but didn't really succeed.

*What is your general feeling about other people mixing your recordings?*

I hate it. I take it as an insult. You don't finish the job. You don't get the chance to present your work as it is meant to be heard—according to your intentions. If you get personally involved like I do, then it is difficult.

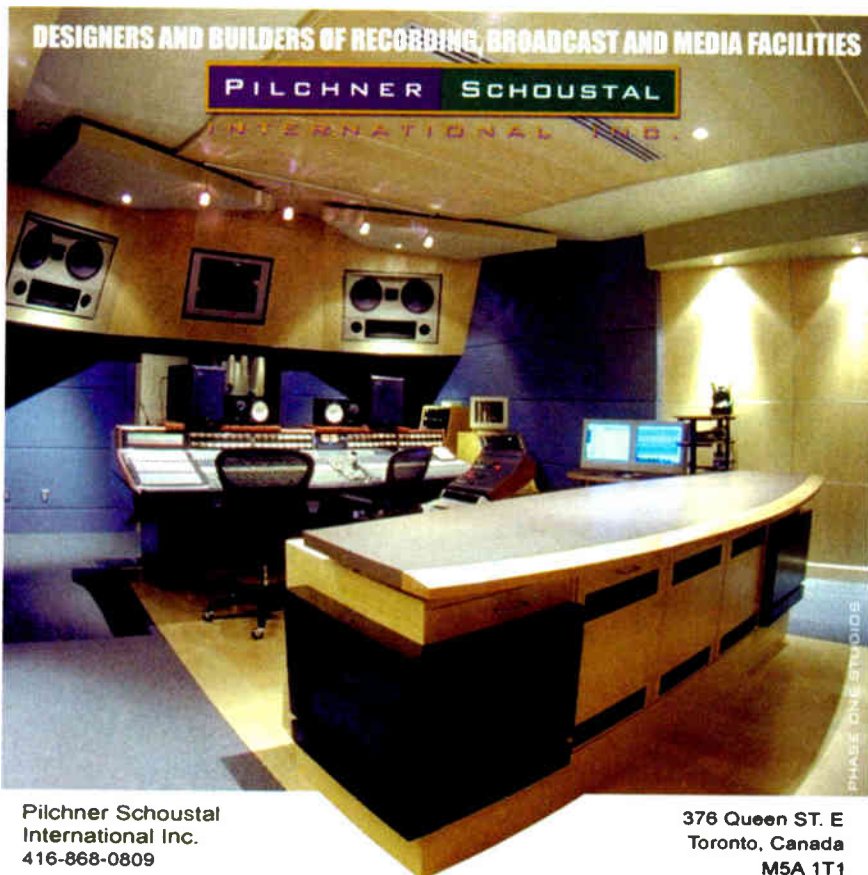
**Working in Africa was very different.**

**There were locusts flying in through the open windows and sitting on the desk. We just had to get used to it.**

Now, if someone asked me to remix someone else's work, regrettably I would almost certainly say yes. Who wouldn't? What I hate is not being told about it in the first place and not being given the budget to finish the record.

*I know that you worked with Dr. John more recently.*

Another honor and privilege. That came about after a phone call from EMI. They wanted to get Dr. John playing his own songs with British bands. They got Paul Weller, who had covered [Dr. John's] "Walk on Gilded Splinters" on his last album, and Spiritualized, a group I had mixed some tracks for earlier. Then there was Supergrass and The Beta Band, who came and did some percussion and pots and pans. Basically, we got two days each to do a minimum of one song and a maximum of three. Then, at the last minute, Supergrass said they didn't want to do it. The drummer hadn't heard of Dr. John. And the whole time, Primal Scream was supposed to be turning up with their gear, but they never turned up at all 'til at the very end to party. We did two weeks of that in Abbey Road Studio 2. We were going to



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## PRODUCER'S DESK

go in and do some more, and then the word was that, for the rest of the tracks, Mac [Dr. John] wanted to record with his own band who he had been touring with for the previous five years. So, I went over to New York and recorded nine tracks with the band.

But it was funny seeing Dr. John sitting there with these Brit pop kids all around him. Mac was great, and whenever he played piano, it was pure magic.

*I know that you went to Senegal to record Baaba Maal toward the end of 2000. How was Africa?*

Working in Africa was very different. There were many situations where I realized that this could not be happening in Europe or America. There were locusts flying in through the open windows and sitting on the desk. We just had to get used to it.

*Do you know why you were chosen for it?*

It probably goes back to two things. One is that A&R man Jumbo Van Rennen at Palm Pictures worked at Virgin when I did XTC back in the '70s. Jumbo was running the Frontline reggae label. In Britain, he is the man for African music. He set up Mango for Island, and Palm Pictures is [Island founder] Chris Blackwell's label. So, maybe it came from that.

Also, I had done a Papa Wemba record for Real World, which was recorded in Paris, and Papa Wemba is from Zaire. Also, Jumbo knew that I had been out to Nigeria in 1982. I worked at the equivalent of Abbey Road in Lagos. This was an EMI-owned studio, and I went out there to show them how to use the 24-track machine and MCI desk. They had just gone from 8-track to 24-track. I was there for about 10 weeks, all by myself. It was wild, and I said I would never go back. But Lagos is very different from Dakar [Senegal], which is much cooler in temperament. Lagos is full of military and police and lots of angry people, whereas Dakar is full of much friendlier, lighter people. It might be the French influence.

So, I said I was interested in the project, and I knew of Baaba Maal. I had three of his albums and I had seen him perform twice, so I knew it was going

to be fantastic to work with him.

I went out to meet him for a week in Senegal and looked at some studios in Dakar. The best studio is used by Yousou N'Dour, but there's a bit of competition between these two artists, so Baaba Maal would not use that studio. We also looked at Deux Mille Studio, which was just like any other studio in the world. They didn't really want to record there either—it was too much of a city vibe. So, we went out to Baaba Maal's walled compound in a place called Toubab Dialo, about 100 miles south of Dakar right on the coast.



*Leckie recorded Baaba Maal at the artist's walled compound, Toubab Dialo. The UK-based FX Rentals provided Tascam DA-88s, a Mackie board (for monitoring), plus all the mics and outboard gear.*



This had some concrete buildings and some mud huts with grass roofs in a walled farmyard area. No electricity, dirt floors everywhere, a few banana trees and mango trees, and it was pretty quiet, not much noise; just a little traffic. So, I decided to record there. It was totally atmospheric. We had a small room, about 15 square meters, leading out into the sandy yard where he had his band set up. When I got back to England, they said I had passed the audition and to work out a list of what to take. Everything was hired from FX Rentals in the UK.

*What did you end up taking?*

I took DA-88s, because I had carried them around in cardboard boxes when I did some Dr. John "live" recordings and had lashed them on the back of the P.A. desks

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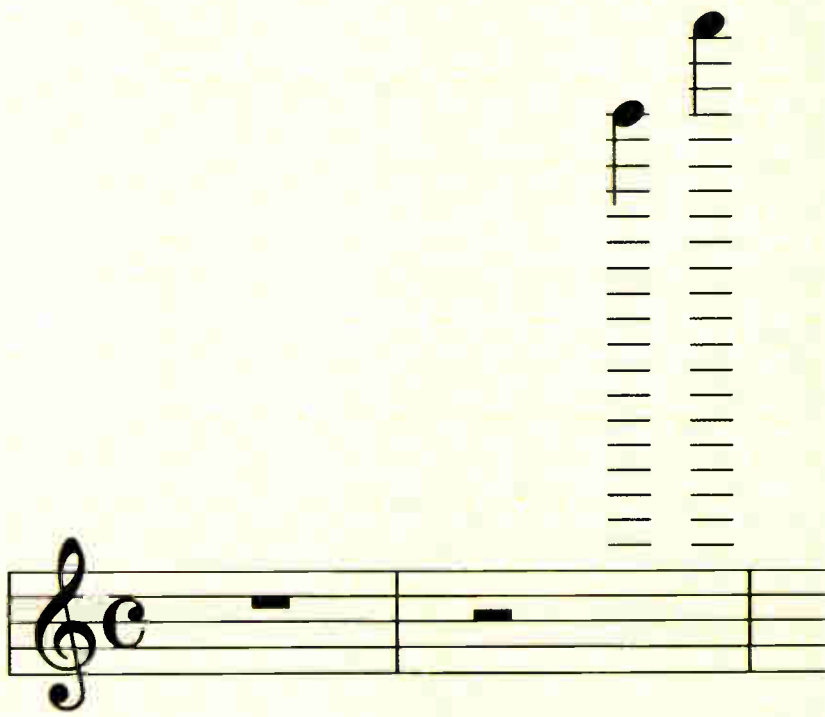
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at the gigs, and they had proven to be very robust, unlike ADATs. I could have taken an MTR90 or a Pro Tools rig, but I thought that if I was 100 miles from a city for four weeks in West Africa in conditions of high humidity and lots of heat, dust and insects getting into everything, it would be difficult. If a multitrack went down, I would be stuck—I wouldn't be able to record, play or anything.

The other thing was that one of the bands had a DA-88, and there were some other little studios around that had DA-88s, so I knew that I could get a replacement if

I needed one. FX Rentals supplied three, and we ended up recording 24-track. They all worked fine. I wish I had taken the newer 24-bit models, the DA-98s. But then they may not have been as reliable; you just don't know. I took Focusrite mic pre-amps, the ISA 115 models, API 3124 mic pre's, which have four preamps on a strip, and the API 550 "cubes and lunchbox." I just knew that they would do the job and not break down. The Focusrite mic pre's both had a separate power supply, so this made for quite a bulky rack of gear. I took a UREI 1178 stereo compressor, and eight Neumann U87 mics and a couple of Shure SM58s, and I knew there were some SM57s

and SM58s lying around and a couple of KM84s. I also knew that the Neumann mics were a lot more robust than most.

Most of the album was recorded on 87s through the Focusrites, then through the UREI 1178 with a lead patched across. We monitored on a little Mackie 24-input desk. And we did some rough mixes on this that really sounded great.

**What about the electricity?**

We ended up with a Honda 150i 1kW generator. This is a really small unit, which uses half a gallon of petrol every six hours, so it just used a gallon a day. It ran all the equipment and two 60-watt light bulbs.

One of the problems we had was insects. All the recording sessions were being video'd, and at night, when the video lights came on, the entire insect population of the area would descend on us. We were in the middle of nowhere with no lights anywhere in sight, so the insects were coming from 100 miles away through the open windows. The insects were going down your t-shirt, up your sleeves, down your neck, then if your tried to button up, you would get much too hot. And there are little blister beetles called wonks. They spray you with acid and this causes blisters immediately, which then burst. So we kept finding these blisters under our t-shirts, on our necks, everywhere. We had to take malaria tablets, injections, everything, just in case.

**What is this album called?**

*Mi Yeeunii*. It means "missing you." Baa-ba Maal has been making records for 15 years and has a whole team around him, world tours, the record company manages him, every country in the world wants him back, and his show is fantastic with the costumes and everything.

**What are you working on next?**

A new album by Muse for Maverick Records. We are recording in the Big Room at Peter Gabriel's Real World studios. Everyone in the same room—drums, bass, Marshall amps. Cut it live and then play with it. Then, we are going to Astoria, which is Dave Gilmour's studio, on a boat at Hampton Court. Great stuff! Then we will mix at Abbey Road. Oh, and we're recording the big organ in Exeter cathedral. And I've got a 24-piece string section standing by. And we are looking at the budget to see if we can afford an adult choir with at least 50 singers. Would you happen to know how much a 200-piece choir costs?


**What kind of projects would you like to take on in the future?**

What kind of projects you got? ■

*Mike Collins is a freelance writer based in England.*


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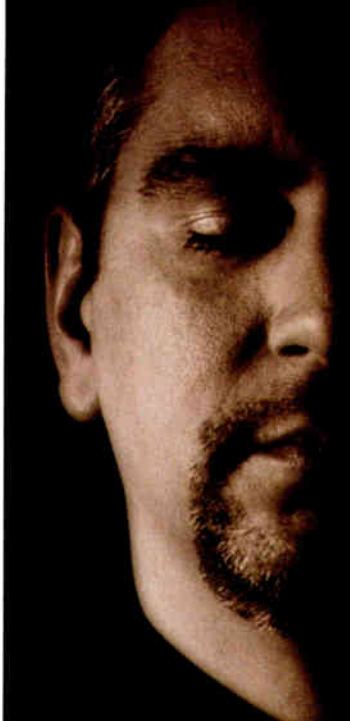


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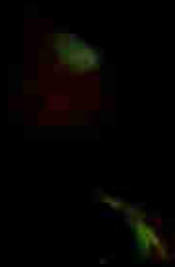


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# Apocalypse Now

R E D U X

## NEW SCENES, NEW SOUNDS FOR FRANCIS COPPOLA'S 1979 MASTERPIECE

By Larry Blake

Every film, from a Mini-DV short to a \$150 million-budgeted Jerry Bruckheimer blockbuster, is hard to make. And while the gap between conception and execution is wide for everyone, some filmmakers not only set near-impossible goals, but succeed spectacularly in the process.

Stanley Kubrick labored for four years making *2001: A Space Odyssey*, virtually inventing modern special effects. The budget and schedule for *Jaws* more than doubled while Steven Spielberg kept his eye on what would make the film tick. George Lucas redefined visual effects nine years after *2001* with *Star Wars*, putting the film on the screen for less than \$10 million.

But in terms of sheer drama, no film's production and post-production holds a candle to Francis Coppola's *Apocalypse Now*. From the changing of the lead actor one month into shooting, to sets being destroyed by a typhoon two months after that, to the heart attack of his next lead actor... principal photography dragged on in the Philippines for 236 days over 14 months. It wasn't finished by any stretch

with post-production lasting a still-record 26 months. Oh, yes, did we mention that Coppola was personally responsible for more than half of the \$30 million budget? When all was said and done, the film that was released on August 15, 1979, was well-received by the filmgoing public and film cognoscenti alike.

The reception by the film sound community was unanimous in its praise, and to this day the sound job is regarded as the *no plus ultra* in terms of creative use of the medium. The track was crafted in San Francisco by a large crew headed by Walter March, whose "Sound Design" credit was accorded "billing block" status on posters. (It read "Sound Montage and Design" on film prints.) The picture and sound departments were staffed by more than a dozen future luminaries in film sound, among them Richard Beggs, Mark Berger, George Berndt, Jay Boekelheide, Doug Hemphill, Pat Jackson, Michael Kirchberger, John Nutt, David Parker, Jerry Ross, Tom Scott, Leslie Shatz, Dale Strumpell and Randy Thom.

This month, *Apocalypse Now* will have its first theatrical re-release in more than 15 years. While most of the original film remains intact, 49 minutes of deleted scenes have been put back in, resulting in a definitive version, now titled *Apocalypse Now Redux*.

### THE ORIGINAL MIX

As the release date of *Apocalypse Now* was set and moved back many times during the extended post-production period, some ended up working on the film for over two years. Led by supervising sound editor Richard Cirincione, *Apocalypse's* sound crew comprised top editors from San Francisco, New York and London.



# Apocalypse Now

REDUX

During this time, a partial music score was composed and then discarded, while the sound team recorded more than 200 rolls of sound effects. Because the Department of Defense in no way assisted Coppola in the production of the film, the intrepid editors would say that they were working for their own companies in order to gain access to Army training exercises.

The eight-month (yes, this is also probably a record) re-recording schedule resulted in what can certainly be called the first 5.1-channel mix, in that it makes full use of stereo surrounds and low-frequency enhancement. (Although the Dolby 70mm 6-track "split surround" format was developed for *Superman* in 1978, that film played in less than a handful of such engagements worldwide.)

*Apocalypse Now* was mixed by Murch, Berger and Beggs in circumstances quite in contrast to the then-standard practice in Hollywood. In Southern California, most of the consoles were by Quad-Eight, most of the rooms were huge, automation was used infrequently, and, perhaps most importantly, the lines were drawn quite dramatically between picture editing and sound editorial and re-recording.

Up in San Francisco's North Beach district, Murch's initial work on the film was as



PHOTO: DOUG HEMPHILL

*The Apocalypse Now final mix in 1979: In front, Walter Murch, Mark Berger and Richard Beggs. Rear: Randy Thom, Andy Moore, Cliff Latimer, Doug Hemphill, Dale Strumpell, Abigail Abbuehl, Jay Boekelheide, Joe Zappala, Paul Bruceck, David Parker.*

picture editor (along with Richard Marks, Gerald Greenberg and Lisa Fruchtman). Beggs was not only the music re-recording mixer, he also recorded the narration and was one of the six synthesists who "realized" the score by Coppola and his father, Carmine. Almost everyone was involved at some point with recording sound effects, much of which recently became available in a Hollywood Edge CD set.

The Pacific Avenue mix room at Coppola's American Zoetrope was designed by Jeff Cooper in the only space available,

a long, thin area with a relatively low ceiling. The mix room was 20x40 feet long, and the MCI JH-500 Series console was only about 15 feet from the screen. Because the board had only 28 automated, full-featured inputs, extensive premixing was required to whittle down the 175-plus tracks cut for the busier reels. Furthermore, because the machine room only had seven mag film dubbers, edited 35mm stripe and 2-track stereo cut elements were "regrouped" seven units at a time onto dbx-encoded 24-track, 2-inch

*Copied*

Copied from the original notes. Slowly open up the music of the jungle as the camera reveals the scene in various positions around the room. Emerging out of this, in an irregular sound that then moves around the room as it follows the boat to change character to moving more noticeably into the sound of the jungle that to place and still on in. Put in the soft birds in this one sound. Flaring around the room. Decaying into a more noise cut back in the middle of the scene. The picture goes into a scene - this is the end of scene, is. And finally of construction in the form of one of the dream like pictures.

The second peak of the scene of the jungle, flying jungle that turns into helicopter.

The being elevated in the dark that becomes the gun.

①

12	VERTURE IN BLACK
192	FADE IN JUNGLE
215	IN HELICOPTER BY
500	GUN ON PILLOW
541	MOVE IN TO VEGETIAN BUND
580	SEE HELL LAND IN STREET
598	NARRATION BEGINS
640	END

WALTER

REEL 1 PRE

12 { HELI GUN GUN

TRAIL

192 ATOM + BEEBEE + BUBBLES

TO BECOME A VERY INTERESTING MOMENTUM THE "HELICOPTER" AT THE END APPROXIMATE THE "HELICOPTER" SOUND EFFECTS ARE RECORDED IN A 1/2" B. BY SOUND EFFECTS I & THE EFFECTS OF THE MUSIC IS MIXED IN A "REARWARD" STRANGE WAY.

HOWEVER, THE HELI GUN MUST BE RECORDED TO THE MUSIC. WHICH REQUIRES 2 PITCH COMPENSATE TO BE DONE AND RECORDED UNDER 1/2" TO 1/2" C.

→ EFFECT PER R1. MUST BE RECORDED

584 BOUND LEFT AND

585 BOUND + SHARPLE

598 STAFF + S.P

Three stages of the sound of reel 1: Walter Murch's notes on his vision of the opening of the film; his "quad" diagrams (music timeline on the left, sound effects on the right), with the widest width representing full 5-channel sound, medium 3-channel (front only), with the thinnest being mono. This helped him "design the sound to have an orchestrated relationship between its three widths and the dramatic needs of the film, so that the audience's 'ear' did not become fatigued." The third panel is Mark Berger's reel 1 effects premix notes to Murch as to how the transition to the fan was finally accomplished.

tape to allow the console to be filled up during premixes, which also utilized dbx noise reduction.

To interlock the multi-track machines with the Multi-Track Magnetics film chain, Zoetrope chose the Minimag system manufactured by API, which used a proprietary timecode different from today's SMPTE EBU standard. The Minimag system controlled the capstan of the Ampex MM-1100 machines, with locations fed by a reel of 35mm mag containing the timecode.

The sound effects pre-mixes, of which there were up to six per reel, were not spread out in clearly defined groups as is customary today, with backgrounds, Foley and hard effects of various flavors each commanding one or more 6- or 8-track pre-mixes. Some films today have up to 20 of these pre-mixes playing at the final mix.

Because their effects pre-mixes were a quilt of many different colors, with speaker assignments changing constantly, the *Apocalypse* mix crew had to keep detailed notes as to what elements were occupying a track at any given moment. For example, on reel 6 (the second part of the helicopter attack), effects pre-mix 1 contains Foley, fire, surf, PBR (Patrol Boats, River: the type of boat the crew is on) and verts. ("Verts" was Murch's term for "vertical effects," which are essentially one-off events, as opposed to "horizontal" effects that occur throughout the film, such as backgrounds, PBR and helicopters. To bring a flow and consistency of style, sound editors were assigned specific elements instead of doing everything for a given reel, the then-standard practice in Hollywood.)

Higher math shows that neither the board nor the machine room would allow for all pre-mixes—dialog, music and effects—to be hung at the final mix. The solution lay in dubbing the five effects pre-mixes into one or two 6-track effects "combines," while the near-final music, dialog and narration were playing on the small faders through the monitor only, having themselves been regrouped to 2-inch to free up the dubbers. A similar technique was used during music pre-mixing, with dialog and effects combines or pre-mixes playing in the monitor while music was folded down from multitrack to 6-track mag.

The engineering staff at Zoetrope,



**Top: The mix crew of *Apocalypse Now Redux*, L-R: Jeremy Molod, Everett Moore, Michael Kirchenberger, Kim Aubry, Erich Stratzmann, Pete Horner, David Bell and Brian Sarvis. Right, L-R: Sean Cullen, Walter Murch Jr. and Walter Murch.**



which was at that time headed by Wayne Wagner, performed extensive modifications on the console to adapt it for film mixing, among them retrofitting the MCI automation with four "quad" joysticks. All four could be used if only four quadrants (left/center/right/mono surround, or left/right/left-surround/right-surround) were needed. If 5-channel panning was desired, then two joysticks were used in series. The first panned through left, center and right, with the fourth quadrant feeding the second joystick, two of whose outputs were assigned to left- and right-surrounds. Automation data for *Apocalypse* was recorded on a separate piece of 3-track mag, bounce-

would have been nerve-racking at best without automation.

During the last week of the mix in August 1979, the crew created two identical 6-track printmasters. One was sent to MGM Studios in Los Angeles as the "sounding master" for the initial 70mm prints, while the other was kept in San Francisco as the vault master. It was also used to create the initial 35mm stereo optical mix.

Although the 6-track mix was noted for its creative use of surrounds, the 1979 Lt-Rt of *Apocalypse* contained no (intentional) surround information, so great was Murch's fear of the downside of badly aligned surrounds.



ing between tracks. (An early investigation to record the data on hard drives came up with a \$10,000 estimate!)

While automation had been in use previously in Hollywood and New York (mostly in the form of the Quad-Eight CompuMix system), it can safely be stated that *Apocalypse* was the first time that a complex stereo film mix used, and ultimately depended on, automation to such a degree. The level of fine-tuning that the crew was making throughout the eight-month mix period—having to step back and update complex pre-mixes and, especially, effects combines with additional elements, for example—

# Apocalypse Now

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## VIDEO MIXES

The first special video version of *Apocalypse Now* was the one prepared (read: sanitized) for broadcast on ABC in 1982. The standards and practices department had Lt. Colonel Kilgore (Robert Duvall) refer to himself as a "goofy guy," because they were afraid that someone might mis-hear his original "goofy foot." (One wonders if anyone at ABC was aware of Jim Morrison's repeated "fucks" during the performance of "The End" in the reel 1 montage.)

The *real* movie was first revisited in 1991, when picture and sound were remastered for release on laserdisc. This mix was made 2-track only, creating a new Lt-Rt on a DASH ¼-inch deck, incorporating the stereo surround channels into the matrix format. At this time, the staff at Coppola's American Zoetrope realized that the two first-generation 6-track printmasters had disappeared; they have never been found despite a worldwide search. The unthinkable possibility—no extant version of the 6-track mix of *Apocalypse* save for what could be transferred from worn 70mm mag stripe prints—was avoided by a bizarre, fortuitous circumstance.

In the early '80s, Les Hodgson, one of the *Apocalypse* sound team from England, was walking through Pinewood Studios in London when he recognized the label on boxes of mag that were in a dumpster. On closer inspection, the label proved familiar, because it was from Zoetrope and corresponded to the elaborate color codes used during the *Apocalypse* mix. Indeed, this was a Dolby A-Type X-copy of the 6-track master that had been made as a guide to assist mixers in England when making the foreign-language versions in 1979. Hodgson rescued these elements and sent them back to Murch in San Francisco; they remain the only record of the original English-language mix.

The moves on all of the elements at the final mix (dialog and music pre-mixes, effects combine and narration single-stripe) were recorded only to the composite 6-track English printmasters. No separate 6-track stems of the main food groups were ever made for archival purposes, in some small part because the

crew assumed that they could put up the final mix elements and replay the automation. Murch remembers that "it seemed as if the automated board solved all these issues. We never figured we would need stems." (It would be glib to say that, among the film's many other "records," the *Apocalypse* crew was the first to be bitten by too much reliance on automation, except for the fact that virtually all films in 1979 were mixed to a composite printmaster only. By these standards, they were ahead of the game with their effects combines. Stem recording became a worldwide standard practice for stereo films a few years later.)



Murch's next opportunity to polish the mix came in 1997, when he was preparing the film for 6-track AC-3 laserdisc release. The original printmasters were not in today's standard left/center/right/Lfe/left-surround/right-surround format. In order to get stereo surrounds from the six tracks on 70mm prints while ensuring compatibility with standard mono surround playback, Dolby Labs came up with a method of "bandpass encoding" high-frequency stereo surround information on tracks 2 and 4, "above" the space that was devoted to "baby boom" low-frequency enhancement. The standard mono surround track 6 contained low-frequency information for all mono and stereo surround playback, plus a combine of HF from tracks 2 and 4.

Because this now-obsolete bandpass encoding would have to be deconstruct-

ed every time the master would be handled, Murch decided to create a new element optimized for modern 5.1 playback. This new Dolby SR-encoded printmaster was made at the Saul Zaentz Film Center in Berkeley, Calif.

For those keeping score, this was the seventh generation for dialog in *Apocalypse*: original ¼-inch Nagra recording, 35mm cut element, 2-inch dbx-encoded regroup, 35mm 6-track dbx pre-mix, 35mm Dolby A-Type printmaster, 35mm A-Type "dumpster X-copy," 35mm SR-encoded 5.1 channel "Saul Zaentz" master. Effects went one more, with the 35mm 6-track dbx combine. Music went three generations—original multitrack recording, dbx-encoded 24-track "wide" pre-mix into quad groupings, and 35mm 6-track dbx pre-mix—prior to the final three printmasters.

## GOING BACK

In the era of DVDs (and, formerly, laserdiscs), extended "director's cuts" of many top films from the '70s and '80s are commonplace. *Apocalypse Now* was as good a candidate as any, not only because of its classic status, but also because many film buffs have long had bootleg copies of an early five-hour rough cut.

Zoetrope has library deals, dating back to 1998, with Paramount Pictures (which has distributed the video versions of *Apocalypse*) and Canal Plus of France, that if Coppola wished to create a director's cut, they would each kick in a certain percentage of the costs up to a certain amount. However, as Kim Aubry, Zoetrope VP of engineering and technology and producer of *ANR*, notes, theatrical release was not initially considered. "We always just thought that it would be under \$500,000 to do the editing and sound, and we thought we'd just use the television elements. But the further we got into it, the more we became convinced that once you open the door to this project, you really are back in film mode. It became obvious that we would need to deliver a reproducible film element [negative] and a new video master would need to be made."

Murch always had doubts about going back to the film whose world he had lived in for more than two years: "I was afraid of getting off the boat and going back into that jungle, in addition to having mixed feelings philosophically and practically. Plays and symphonies have different performances, but what is a film that you then keep changing it?"

In 1998, Murch worked on the restora-

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tion of Orson Welles' *Touch of Evil*, incorporating sound and picture concepts that Welles had written of, but not been able to execute personally. "This broke down my reserve and I was more open to the idea," Murch says. His assistant picture editor on *Touch of Evil*, Sean Cullen, did preliminary investigation into *Apocalypse* elements in fall 1999, and picture editing began in April 2000. Murch gives special praise to Cullen and to Catherine Craig, Zoetrope's archivist, for keeping track of all of the material. Aubry hired Michael Kirchberger, who had worked on the film as a picture assistant back during shooting, to be supervising sound editor of the restoration (which was then informally called, of course, AN2K).

There was some previously edited 35mm workprint and worktrack of the scenes being considered for the new film, and what was still around was "various shades of pink and white," according to Aubry. Cullen and Murch's son, Walter, re-constituted these scenes into their original daily rolls, and then this material was screened in Zoetrope's basement theater, as "dailies." There was also a U-Matic video copy of the film's first assembly in May 1977. Murch avoided looking at this, as he "deliberately didn't want to tamper with [his] brain circuitry, one way or the other." However, when he finished editing a scene, he did look at its 1977 version as "a double-check, a security lock, to make sure that we hadn't missed anything essential."

## 16+6=4?

The film negative of the trims and outtakes had been safely stored in the National Underground Storage facility built into the side of a mountain in Pennsylvania. The required material was shipped to San Francisco and transferred silent to Betacam SP tape at Zoetrope's telecine facility for digitizing into the Avid. To allow for seamless intercutting of old and new, the letterbox matte matched that of the 1998 telecine that was made for the DVD release. The aspect ratio of this matte, as chosen by the film's cinematographer, Vittorio Storaro, is 2:1, cropping some of the side of the original 2.40:1 anamorphic image. This controversial decision was intended to be a compromise between proper wide-screen framing and the relatively limited resolution of NTSC video.

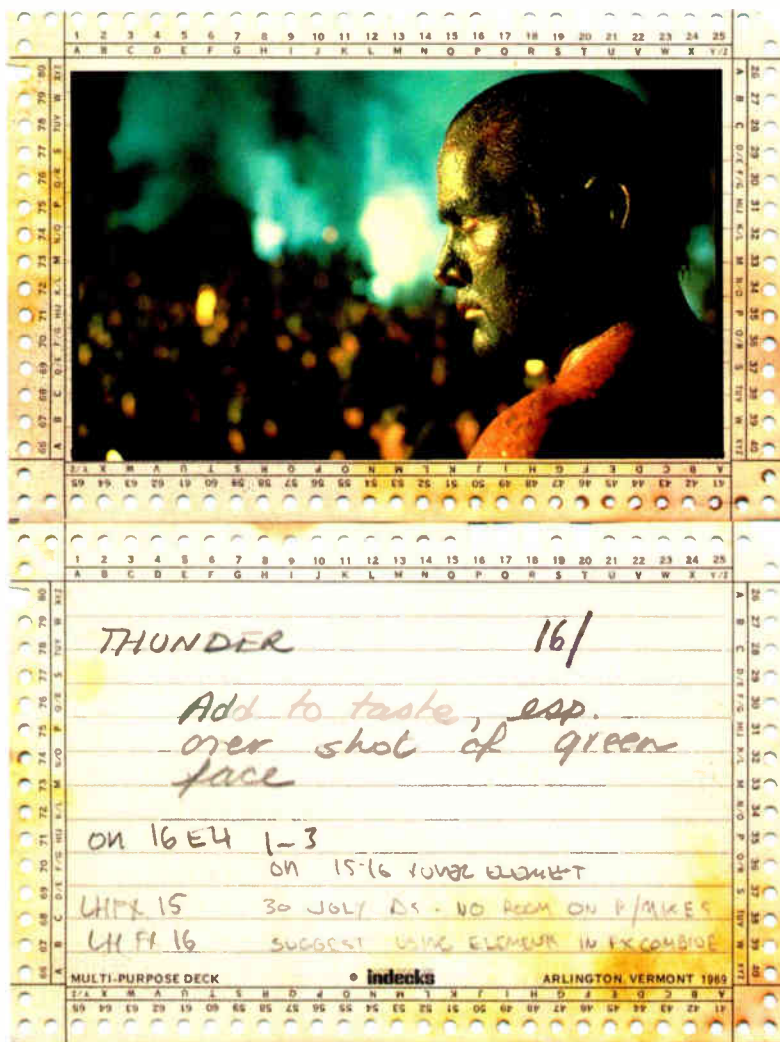
(The cropping did come back to haunt them in one scene where a character outside of the visible frame was speaking unbeknownst to the crew during the sound edit and mix. One cheated line and print-master fix later, all was well.)

Aubry notes that "at a very early point in this process, we conceived that the old eight [projection] reels of *Apocalypse* were not meaningful to us as eight reels. Instead, what was important was that we had three video acts, soon to become four." So, where the sound elements for the original film were divided into 16 reels, with another six reels of new scenes to come, the picture and sound editorial teams decided to work exclusively in the video act format.

Because the re-editing of original camera negative is a serious—and permanent—decision, it was initially decided to edit together interpositives of both the

new AN2K material and the 1979 film, leaving the latter untouched in its original form. However, on the urging of Storaro, it was decided to make prints in the recently revived Technicolor dye transfer process, which requires going direct from original negative to three separation matrices that cannot be edited.

Each of the four acts, as edited by Murch in the Avid, would comprise multiple theatrical reels of negative, with many of the new reel breaks different from the original locations due to the addition of new material. Murch took the opportunity to tighten up the first and last shots of reels that had originally been left a little bit loose to allow for the vagaries of changeover projection. However, with virtually all theaters today splicing reels together on platters, not to mention that the primary goal of the restoration was for home video, he cut what he felt was the best timings, period.



To keep track of mix fixes, Murch used notecards that were filled in as a task was completed. Here we see that the thunder in reel 16 was mixed to effects premix 4, tracks 1 through 3. Dale Strumpell (DS) tried to fit in the premixes the sweetener units that Les Hodgson (LH) cut, but had no room and suggested they be added directly to the FX combine.

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# Apocalypse Now REDUX

The sound for the shots that had been telecined was transferred from the original 7.5 ips ¼-inch Scotch 208 Nagra tapes to 16-bit DTRS at the 44.1kHz sample rate, the standard for all work on *ANR*. (The production sound team on *Apocalypse* was Nat Boxer and Jack Jacobsen. Boxer is one of a handful of lead production sound people who function primarily as boom operator and not as the mixer.)

When the picture department loaded the DTRS tapes into the Avid for synching, they discovered first-hand a well-worn piece of *Apocalypse Now* lore: A significant portion of the film was shot out of sync. To be more precise, the crystals on the Nagra recorder and on the Technovision-modified Mitchell and Arriflex cameras didn't agree. The cameras were running fast (or the Nagra slow), and therefore sound had to be removed from the mag during dailies synching, approximately a frame every 100 feet.

This initially was discovered in the

Philippines during dailies synching by associate editor George Berndt, who came back in 2000 to cut ADR on *ANR*. Everything in the shooting and transfer chain was checked and re-checked, although the exact source of the problem was never found.

The modern tools at the picture department's disposal allowed them to calculate the drift of the offending takes and export the material to Pro Tools, where a 99.94% time-compressed track was bounced and then re-imported into the Avid for eventual OMF export. The production sound rolls were threaded up occasionally to find fill or alternate readings, and Kirchberger recalls how the voice slates were a microcosm of the mood of the endless shooting schedule: "The first were a crisp, 'This is *Apocalypse Now*, scene x, take x' [thwack of clap stick], while the last ones were 'This...is...day...200... what's the scene we're shooting...?'"

#### SOUND EDITORIAL

The first order of business for sound effects editing was to load the dbx-encoded premixes and effects combines, plus the 1997 SR-encoded 5.1 master, into master Pro Tools sessions. Assistant sound editor Erich Stratmann found to his surprise that there were some digital overs, in spite of

the fact that the 0VU reference level on the mags matched -20 dBfs on the Pro Tools. Although small overs are often unnoticeable, Stratmann says that there would often be many of them in succession, rendering the added distortion quite audible.

The offending sections were re-transferred at a lower level—sometimes as much as 6 dB below the -20 standard—and using the "Find Peaks" function in Pro Tools (which only worked for peaks longer than 10 samples; the others he found by hand), Stratmann would do precise volume automation to bring only the offending peak down, raising the rest of the material back to the reference level. He would then do a bounce of the section in Pro Tools incorporating the fix.

Stratmann created a master session comprising all extant material from the 1979 mix, with the 1997 5.1 printmaster and the original 6-track M&E, the only elements that were available for the whole film. Effects combines and premixes were available for most reels, although they could find nothing from reel 8 (the Hau Phat scene with the Playboy Bunnies). As "blind luck" would have it, according to Kirchberger, they were always able to find a way to make the joins work.

The crew used a "donut and holes"

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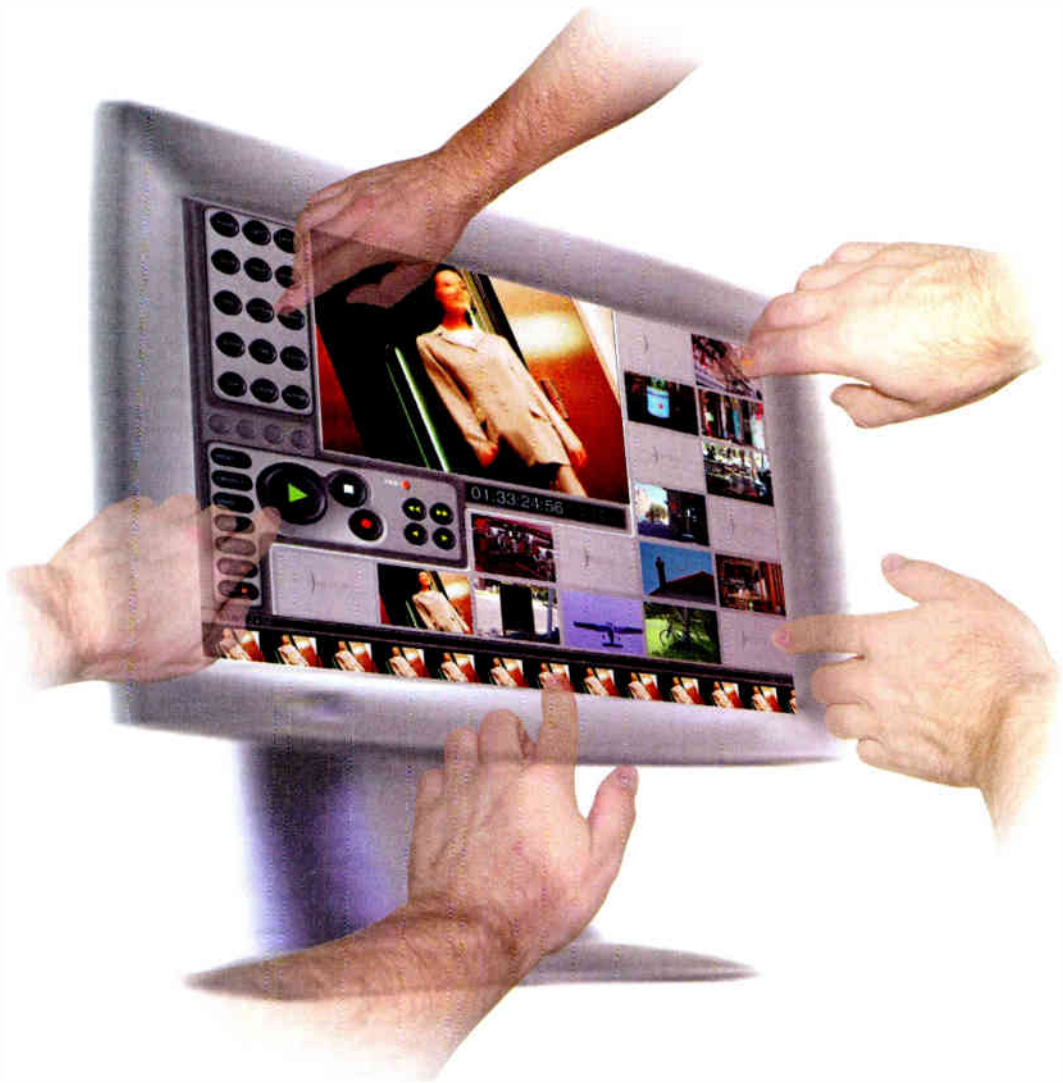
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# Apocalypse Now

REDUX

metaphor to guide themselves in communicating what they were doing. The area outside the donut was the original printmaster alone, while the donut rings were the transition points where effects pre-mixes and combines and new material would be added to the printmaster in order to get to the "hole," which was the completely new material. The intention was to make the donuts seamless, which usually translated to as short as possible, as in a hard scene change. But fighting against this goal, to some extent, was the brilliant way in which effects and music in *Apocalypse* effortlessly weave in and out of each other across scenes. Kirchberger remembers that one of the cooler transitions was during the Kilgore landing scene when the decay of the mortar covers the transition point. "Masking was our favorite friend," Stratmann notes. "In many cases, the pre-dubs were used as source material for the new scenes, but also to help us feather back into the printmaster when the combines didn't provide enough separation."

There were three other Pro Tools sessions in addition to Stratmann's master: Foley, which was cut by Jeremy Molod, dialog, which Kirchberger cut himself, and sound effects, which were cut by Kyrsten Mate Comoglio and Pete Horner, including both old and new material.

Kirchberger says that "this show couldn't have been done without Kyrsten; she's an unbelievably talented effects editor. She did a cut of the 'Conex' scene [when Kurtz reads to Willard in the storage container], where she presented Walter with two scenarios, and he heard the first one and didn't even listen to the second."

Comoglio says that the second version contained "highly EQ'd sounds made to disorient the viewer, plus air movement sweeps and odd jungle calls that I volume-graphed in Pro Tools to then evolve into a more typical, grounded jungle BG after Brando opens the doors and we know where we are.

"In general, I tried to volume-graph pre-mix all my sessions to cut down on tracks and on mix time up in Napa," she

continues. "This worked especially well for the Monsoon Medevac scene, where Walter wanted a different rain sound for each of the different materials—oil drum, mud, helmet, tent, helicopter, PBR, etc.—all coming and going as Willard walks through the camp. It was lots of fun."

The effects for the French plantation were cut by Horner, whom Aubry says worked "in the original Zoetrope spirit on many different capacities on *ANR*. In addition

to ten (as it was for the ADR editors in the original film) to find out "what the hell were they saying? Walter and I would listen to all of the takes to piece together the dialog in a scene." The actors were helpful in narrowing things down.

Berndt found out from Leslie Shatz, who had supervised the 1979 ADR, that the Schoeps CMC with an MK 41 capsule had been chosen for the original sessions, so the decision was made to use it again.

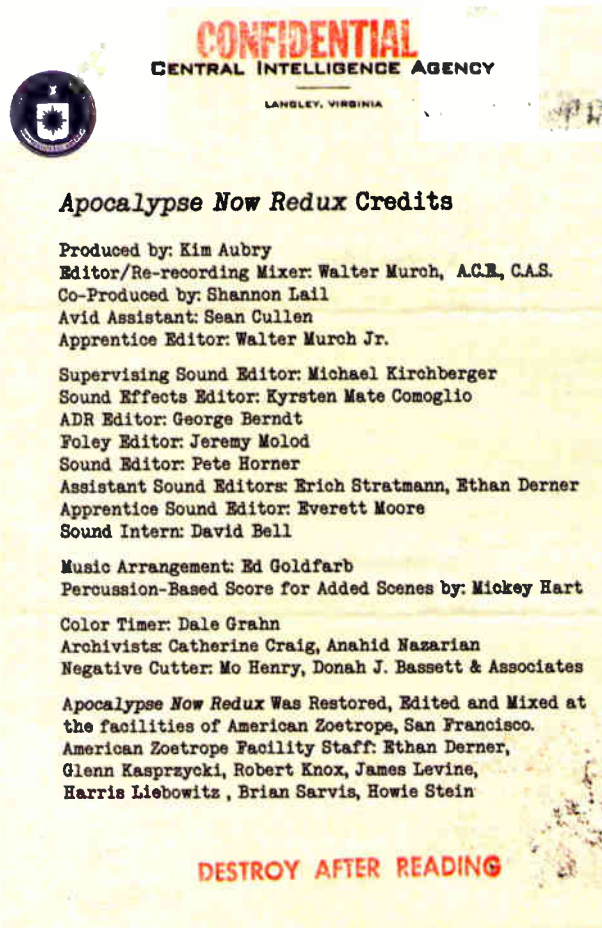
Because of an extraordinary (even by *Apocalypse* standards) stroke of luck, no new narration by Martin Sheen needed to be recorded. Murch told Cullen that he was considering putting in some new shots of Willard reading Col. Kurtz's dossier, and requested that he look for any additional material from the original sessions.

At Coppola's storage facility in Napa, Cullen came across 35mm trim boxes that were labeled "Willard VO—Trims and Outtakes," and contained a dozen small rolls of mag stripe. Meanwhile, Murch had found old workprint of dossier material scenes, and, of course, they happened to be of the same material. It wasn't perfect, though, as Sheen's voice doesn't have the gravelly quality of the original narration.

Sheen did have to be brought in for standard ADR for *ANR*, as did most of the crew of the *Erebus* PBR: Duvall (Lt. Colonel Kilgore), Sam Bottoms (Lance), Albert Hall (Chief) and Frederic Forrest (Chef). (Everyone is probably

relieved that Laurence Fishburne, née Lany Fishburne in the credits, was not needed to loop any lines for Clean, so much has his voice changed since he shot *Apocalypse* in his teens.) Both Berndt and Murch were greatly impressed by how well the actors slipped back into their roles. "The first line that Bobby [Duvall] did required shouting, and he got right back to the hoarse Kilgore," Berndt says. Murch found that he had to pitch-shift ADR both up and down to help bring the actors 23 years back to shooting (and the original ADR sessions).

Further ADR was done by Aurore Clément (Roxanne) for the French plantation scene; it must have been strange for her to work again on a film that she was cut out of two decades ago. Coppola's son Roman supervised her session in Paris. James



## Apocalypse Now Redux Credits

Produced by: Kim Aubry  
Editor/Re-recording Mixer: Walter Murch, A.C.E., C.A.S.  
Co-Produced by: Shannon Lail  
Avid Assistant: Sean Cullen  
Apprentice Editor: Walter Murch Jr.

Supervising Sound Editor: Michael Kirchberger  
Sound Effects Editor: Kyrsten Mate Comoglio  
ADR Editor: George Berndt  
Foley Editor: Jeremy Molod  
Sound Editor: Pete Horner  
Assistant Sound Editors: Erich Stratmann, Ethan Derner  
Apprentice Sound Editor: Everett Moore  
Sound Intern: David Bell

Music Arrangement: Ed Goldfarb  
Percussion-Based Score for Added Scenes by: Mickey Hart

Color Timer: Dale Grahn  
Archivists: Catherine Craig, Anahid Nazarian  
Negative Cutter: Mo Henry, Donah J. Bassett & Associates

*Apocalypse Now Redux* Was Restored, Edited and Mixed at the facilities of American Zoetrope, San Francisco.  
American Zoetrope Facility Staff: Ethan Derner, Glenn Kasprzycki, Robert Knox, James Levine, Harris Liebowitz, Brian Sarvis, Howie Stein

DESTROY AFTER READING

tion to cutting effects and recording ADR, he worked side-by-side with Walter at the mix as the second engineer."

### ADR

Approximately 85% of the production dialog in the original film was replaced due to what Berndt terms "impossible" conditions on many of the locations. The battling average in the new scenes in *ANR* was much better, notably in the French plantation sequence. (Good planning on Coppola and Nat Boxer's part was also a factor in preparing the M&E for that scene, which features a man playing the accordion in the midst of dialog. Kirchberger found a wild track of the performance in the production sound rolls.)

Berndt's first order of business was of-

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# Apocalypse Now

REDUX

Keane, who plays Kilgore's gunner, was the last principal ADR talent recorded. Keane was also called on to re-voice the late rock impresario Bill Graham, who plays the agent of the Playboy bunnies in the original film.

The final ADR sessions were recorded in Zoetrope's basement facility in North Beach. The necessary lines for the Vietnamese woman and several soldiers at Kilgore Beach, and for the remaining G.I.s at Medevac, were performed by volunteers recruited from among the Zoetrope extended family and recorded by Pete Homer.

## THE MIX

Re-recording for *Apocalypse Now Redux* took place in August 2000, on Coppola's Napa, Calif., estate. The mixing facilities of American Zoetrope moved there from the Pacific Avenue location in 1983, with the console changing to an Otari Series 54 in 1990 for the mix of *The Godfather Part*

III. The VCA-automated console has 50 full-featured inputs and 50 automated small faders with limited EQ and bussing capabilities. In spite of having primarily used moving faders for the past 10 years, Murch said the VCA automation was "like getting back on a bicycle."

Murch spent approximately two weeks premixing the dialog and effects for the new sequences. Five 8-track premixes were created, two for effects, one for backgrounds, one for Foley and one for dialog. These were recorded as Akai native projects, then converted to Pro Tools 4.3 sessions and Track Transferred into Pro Tools 5.0.1. Premixes were played back by a 32-output Pro Tools system on the mix stage, plus an Akai DDS playback dubber.

All premixes and their subsequent stems were "empty" when the film was in a section that was untouched, with modulation on the new material beginning and ending at the in and out points. In preparation for the final mix and eventual printmaster, Stratmann made a file convert of the 6-track printmaster of each act to the Akai format. Not only did this avoid any further AD/DA generations or a needless pass of the signal through the console, but it also gave Murch a definitive

way to verify, during premixes and finals, that the tie-ins would indeed match exactly. It was as if they were starting the mix with most of the printmaster already recorded, and that was what would be punched into during printmastering.

The issue of generation loss was a factor in Murch's taking the napalm strike from the original premixes; the subsequent four generations had removed impact far from what they had heard the mix stage back in 1979.

This first printmastering stage was, course, in the 5.1 format and was used to make three subsequent printmasters: the non-noise reduced Lt-Rt for home video use (recorded in full acts) and the new theatrical AC-3 Dolby Digital 5.1 and SR Lt-Rt, which were printed to the Dolby MO drive as 10 new film "AB" reels. The by-act printmaster was carved into reels in the Akai, utilizing the editing functions in the DDS.

An interesting anomaly was discovered when making the matrix-encoded Lt-P printmasters. The first ghost helicopter classic sound effect that opens the film (ated by Richard Beggs on a Moog synthesizer) went from the surrounds to the center as on the discrete 5.1 version, but the second one seemed to disappear in the surround

## BONUS MATERIALS: A NEW SOUNDTRACK

As opposed to the sound effects, from which the sound editorial team was able to reconstruct sections of the film, there were virtually no final music elements to draw on. None of the 35mm 6-track premixes were located, and of course there was no final music stem. The closest-to-final generation of music was the 2-inch dbx-encoded 16- and 24-track original recordings. However, with no mix notes and no playable automation, an impossibly huge amount of work would have been necessary to match into existing cues.

Thankfully, this was not necessary, in large part due to the fact that Murch was working as both picture and music editor, and was making his decisions fully aware of the needs and repercussions.

The new music for *Apocalypse Now Redux* came from two primary sources. Mickey Hart (of the Grateful Dead) and the Rhythm Devils worked much on the original film, and his cues were featured in Clean's death and the prelude to the arrow attack, as well as threading in and out of the background of many other scenes. Hart's 1979 recordings saw even more use in ANR—in the "napalm wind" surfing scene on the beach, in the bedroom scene between Willard and Roxanne, as bookends on both sides of the

French plantation scene, leading you out of the Medevac scene, and in the Conex scene.

The other new music was originally composed by Carmine Coppola for Clean's burial at the French plantation, but was never orchestrated or recorded until 2000. It was re-created by Ed Goldfarb at the mix stage. The bugle at the end of the cue was from production and was believed to have been played by Francis Coppola.

The soundtrack album that will be released by None-such Records this summer will be the same as the Elektra 1980 European edition produced by Richard Beggs (with the addition of the two new Carmine Coppola cues), not the one released in the U.S. that featured dialog and sound effects interspersed through two LPs. Beggs mixed down the film's multitrack music masters back in 1980 to dbx-encoded 1/4-inch, and, as you might have guessed, in 2001 the masters were nowhere to be found. Beggs saved the day with his protection copies.

As of press time, there was discussion under way regarding the creation of a 5.1 DVD-A soundtrack album. If this project is undertaken, Beggs will have to step back to whatever multitrack masters can be located in Zoetrope's vaults.

—Larry Blake

# Practice.



## PM1D General Specifications

<b>Number of Input Channels</b>	48 mono + 4 stereo (DSP1D) 96 mono + 8 stereo (DSP1D-EX)
<b>Number of Output Channels</b>	48 Mix, Stereo A, Stereo B, 24 Matrix
<b>Number of Scene Memories</b>	990
<b>Sampling Frequency</b>	Internal: 48kHz/44.1kHz External: 44.1kHz -10% ~ 48kHz +6%
<b>Fader</b>	67 x 100mm motorized
<b>Total Harmonic Distortion</b>	Less than 0.02% 20Hz ~ 20kHz @ +24dB into 600Ω Loss than 0.007% 1kHz @+24dB into 600Ω CH IN to STEREO OUT
<b>AD Converter</b>	28bit 128 times over sampling (Signal Delay 1.5msec @ Fs = 48kHz)
<b>DA Converter</b>	27bit 128 times over sampling (Signal Delay 1.2msec @ Fs = 48kHz)
<b>Frequency Response</b>	+1, -2dB 20Hz ~ 20kHz @ +10dB into 600Ω
<b>Dynamic Range</b>	120dB typ. AD+DA (*LMY-* AD card to DA card)
<b>Hum &amp; Noise</b>	-128dB typ. Equivalent Input Noise. (20Hz ~ 20KHz)

### Input Section CH1-96, ST IN1-8

<b>De-emphasis/DC cut</b>	Normal/Reverse
<b>Phase</b>	Input, Direct Out
<b>Patch</b>	(pre-eq/pre-fader/post-fader/post-on), Insert In/Out (pre-eq/post-eq/ pre-comp/pre-delay/pre-fader)
<b>Attenuation</b>	-96 ~ 0dB (1dB step)
<b>High Pass Filter</b>	20Hz - 600Hz (60 point) slope -6dB / -12dB / -18dB/oct 4 band PEQ
<b>Equalizer</b>	(Low/shelving, Low-mid, High-mid, High/shelving/LPF) F: 20Hz-20kHz (1.2U point), Gain: + - 18dB (0.5 dB step), Q: 0.1-10 (41 point)
<b>Gate</b>	Gate/Ducking selectable 4 key-in bus
<b>Comp</b>	Comp/Expander/Compander selectable 4 key-in bus
<b>Delay</b>	Delay time (0 ~ 250 ms, 0.02 msec step)
<b>Fader</b>	100mm motorized, -90 ~ +10dB (128 step/100mm), Interpolation 24bit (16,777,216 steps)
<b>On/Off</b>	On/Off (PFL/AFL)
<b>Cue/Solo</b>	On/Off (PFL/AFL)
<b>Pan</b>	127 positions (L=1 - 63, center, R=1 - 63)
<b>Stereo/Group Assign</b>	STEREO/ MIX 1-48 (FIX/ VARI selectable)
<b>Metering</b>	pre-att peak, comp/gate gain reduction, pre-att/pre-gate/pre-fader/post-fader/ post-on selectable with Peak-Hold

### Output Section STEREO A, B, MIX 1-48, MATRIX 1-24

<b>Patch</b>	Output, Insert In/Out
<b>Equalizer</b>	6 band PEQ (Sub Low/HPF/Shelving, Low, Low-mid, Mid, High-mid High/ LPF/Shelving) (Bypass switch for each band) (Parameters are same as input EQ)
<b>Comp</b>	Comp/Expander/Compander selectable, 4 key-in bus
<b>Delay</b>	Delay time (0 ~ 1000 ms, 0.02 msec step)

<b>On/Off</b>	On/Off (PFL/AFL)
<b>Cue/Solo</b>	On/Off (PFL/AFL)
<b>Balance</b>	Stereo A, B, Paired Mix & Matrix
<b>Mono</b>	Stereo B
<b>To Stereo Assign</b>	from Mix output
<b>To Matrix Assign</b>	from Mix 1-48/stereo A, B
<b>Metering</b>	comp gain reduction, pre-eq/pre-fader/ post-fader/post-on selectable with Peak-Hold
<b>Dither</b>	On/Off, Word length 16 ~ 24bit (DIO8 only)

### Other Mixer Section

<b>Effects</b>	Fight internal patchable multi-effects units
<b>Graphic equalizer</b>	Twenty-four internal patchable 31-band graphic equalizers, each with 4 notch filters
<b>Oscillator</b>	sine/pink/burst noise
<b>Talk back</b>	From console 1 & 2
<b>Communication In</b>	Includes ducking control
<b>12 DCA</b>	with DCA mute, DCA cue/solo, 9-12 are selectable for output
<b>Monitor A</b>	2Tr In 1, 2, ST A, B, user define selectable with delay (max 750msec)
<b>Monitor B</b>	2Tr In, 2, ST A, B, Monitor A, user define selectable
<b>2Tr In 1-6</b>	1 & 2: Analog/Coaxial/AES/EBU selectable, 3-6: AES/EBU (with Sampling Rate Converter for digital inputs)

### Libraries

PATCH Libraries	Number of user libraries:	99
NAME Libraries	Number of user libraries:	99
INPUT UNIT Libraries	Number of user libraries:	99
OUTPUT UNIT Libraries	Number of user libraries:	99
INPUT EQ Libraries	Number of factory presets:	37
	Number of user libraries:	02
OUTPUT EQ Libraries	Number of factory presets:	3
	Number of user libraries:	96
INPUT GATE Libraries	Number of factory presets:	4
	Number of user libraries:	95
INPUT COMP Libraries	Number of factory presets:	34
	Number of user libraries:	65
OUTPUT COMP Libraries	Number of factory presets:	9
	Number of user libraries:	90
INPUT CH Libraries	Number of user libraries:	99
OUTPUT CH Libraries	Number of user libraries:	99
EFFECT Libraries	Number of factory presets:	70
	Number of user libraries:	129
GEQ Libraries	Number of user libraries:	99

### DIO8: Digital I/O Box

Slot	8 mini-YGDAI slots
Digital connector	68-pin digital signal connector 4 (in A, B, out A, B) Port B selector for slots 5-8

### Optional Cards: Mini-YGDAI Cards

MY8-TD	TASCAM Format
MY8-AT	ADAT Format
MY8-AE	AES/EBU Format
MY8-AD	ANALOG 8in Format
MY4-AD	ANALOG 4in Format
MY4-DA	ANALOG 4out Format

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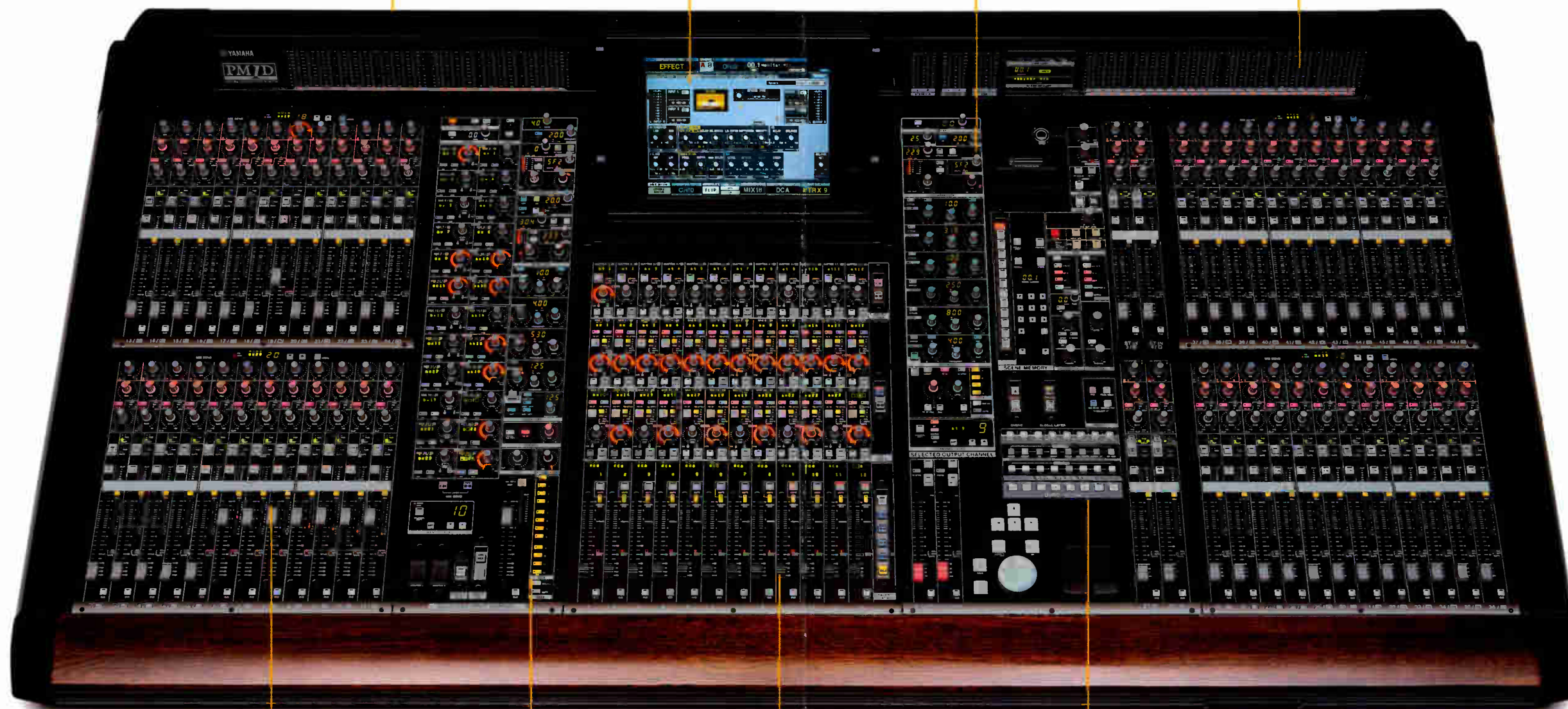
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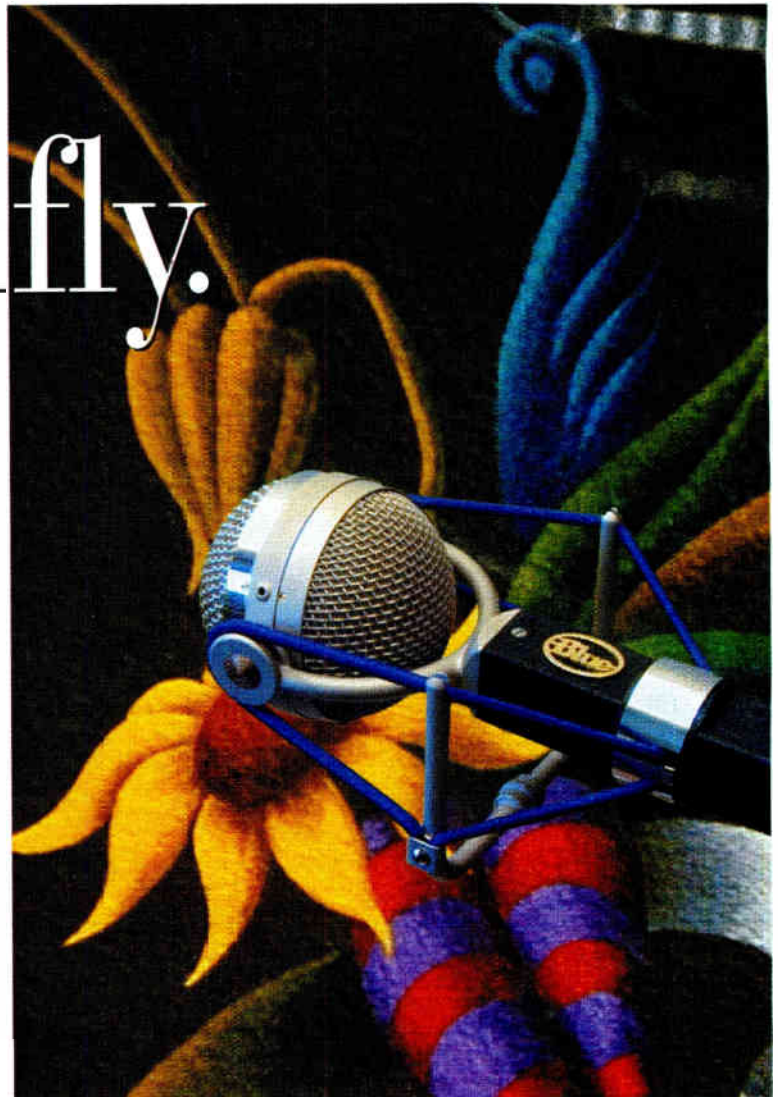
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# Apocalypse Now

## REDUX

rounds. It appeared that Robby Krieger's opening guitar notes on "The End" caused the 2:4 matrix decoding to steer the helicopter to the front. After much head-scratching and investigation, the crew realized that there wasn't much to be done about this; it was yet another example of why the film sound community has welcomed the discrete 5.1 digital formats.

Because part of the financing came from France, one of the delivery items was a 6-track M&E. Stratmann prepared the M&E in the same manner as he did the printmaster, punching in and out at the same points. New foreign-language versions will be made for the major FIGS (France, Italy, Germany, Spain) territories.



It's a tribute to the crew that they upheld the high *Apocalypse Now* standard in relatively little time—they cut and mixed 49 minutes in three months, a mere blink in the 26-month schedule for the original 147-minute film. There's no question that



new technology was a big help, as Murch observes: "You *could* do a restoration like this without the technical shift that's taken place over the last 20 years—Avids and Pro Tools—but I wouldn't like to contemplate that. Once I started putting the material back, I wasn't second-guessing anymore because of length. 'Let my people go! Let the film be what it wants to be. What happened is that *Apocalypse Now Redux* has become much more like the script, and has all the major beats the script had. As a result, there is a greater unity to it; the arc is more consistent."


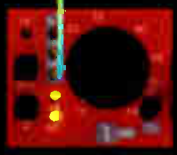
Kirchberger says that "it was a real thrill, which is an overused phrase, going back to something you worked on 20 years ago. Walter would come into the cutting room with the lined script and it would say, 'For more information, see Michael K.' Do I remember what I was supposed to know? Not a chance!"

Walter Murch: "I am anxious going into every film to find the marriage point between myself and the material. In a mysterious way, where do I connect with this film at a deep level? I found it on *ANR* in the transition coming out of the French plantation back onto the boat. A long dissolve from Roxanne on the other side of the mosquito netting so that her image, which is already veiled, becomes more and more ethereal as the netting dissolves into the fog. The last images of her are the smile of the cheshire cat as she says her last line. Then you are in the fog, although you don't know that yet, and you see Willard beginning to emerge, sitting there on the boat. That told me, as much as anything, that everything was going to be okay." ■

*Larry Blake wishes to give a hearty thanks to Dale Strumpell for his invaluable help in the graphics for this article.*

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# ROLL TAPE

## NOW BACK IT UP

While things churn in some circles, in others, it's the tried and true that comforts us huddled masses. I recently attended a series of strategic meetings with a client in Scotland and was struck by the fact that wherever I went, I heard American music playing. Good stuff, recognized the world over.

Some performances truly are timeless, and our digital assets, once born, should be cuddled. Which brings us to the topic this month: backing up. "Argh, backups," you say, "I've got your backup right here!" But have you ever tried to perform a restore of your backup? Who cares if it's backed up if you can't restore the doggone thing?

With the slow acceptance of advanced distribution formats like DVD-A and SACD, file sizes are no longer mere 650MB trifles. An hour of 96/24 surround will consume 5.433 GB of space. A completed stereo plus surround SACD project requiring a typical amount of editing can easily weigh in at 150 GB. Now, this isn't a scary amount of data from a management point of view, but it does require a bit of forethought, and that, now that I've entered humble mode, is my bread and butter.

Okay, backups. That usually means tape—data, not audio tape. You can use spare hard disk volumes, either direct or network-attached. With the cost of 30GB ATA drives down to \$99, that's an option for some. Actually, Gigabit Ethernet-attached NAS makes a great temporary storage buffer for studios needing to move files quickly off working vol-

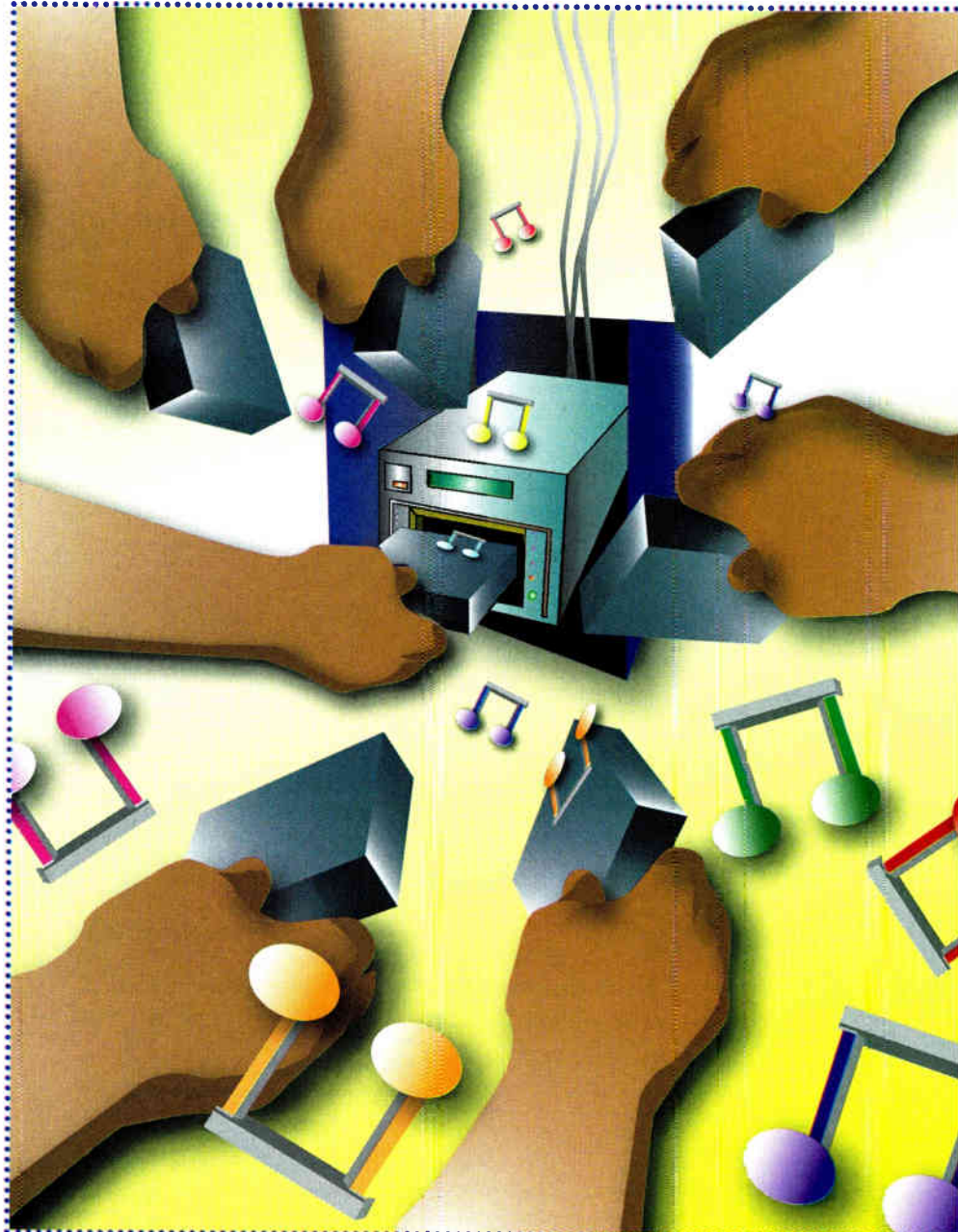


ILLUSTRATION: MA

umes so they can be backed up later. But, for most of us, backups take the form of stationary- or rotary-head tape formats as either a stand-alone mechanism or as part of a "library," another name for robotic autoloaders.

BY OLIVER MASCIAROTTE

Libraries come in many sizes, from small, single-drive boxes holding seven cartridges to fridge-sized monsters with 20 drives and over 1 terabyte/hour sustained rates. Yup, one terabyte per hour. Granted, you may not need such powerful juju, but the ability to fill a cartridge a day for a week's worth of



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unattended network backups is a real butt-saver from a disaster recovery point of view.

Let's look at two midrange, single-source tape formats, ignoring the macho ones like LTO, DTF-2, Mammoth-2 and SDLT, which cost a premium for their superior qualifications, and the wimpy flavors, such as the original Exabyte, Travan and DDS-2 formats, which have served their purpose and should be put out to pasture. Indeed, the end of the road has come for the DDS family, with no plans to continue past the fourth generation. Looks like what the R-DAT audio format hath spawned will ride quietly into the sunset. What has trotted into town to take up residence are three budget formats whose low-end price belies their capabilities.

Billed as bigger, faster and more reliable than a DLT4000, OnStream's ADR tape format has some interesting features at a price well within any professional's budget. With a native capacity of 25 GB at 2 MB/second, its LVD SCSI product can be had for around \$700. The drive's several design improvements are intended to reduce tape damage and subsequent loss of data. Trouble is, they're in trouble. OnStream's business has been rescued by their investors, and only those on high at Philips know what the future holds for the format.

For a few hundred more, the spiffy new features (and then some) of ADR are available in my current favorite, Ecix's VXA format. It boasts a native capacity and transfer rate of 33 GB and 6 MB/sec, respectively. A key aspect of the format is the packetization of data written to tape, which allows for data recovery regardless of the order that the data comes in. The VXA spatially shuffles the packets to prevent tape damage or dropouts from resulting in data loss. Moreover, the heads overscan data tracks during read to reduce the need for costly precision head alignment.

Another important feature is VXA's variable-speed transport. This lets the drive slow down when the host can't provide sufficient data throughput to satisfy the transport, so less rewinding. Also, because this isn't a rotary-head transport, there's no need to wrap the tape around a drum. The tape stays in the cartridge, nice and safe.

With extremely robust storage and retrieval specs, you can get SCSI or 1394-attach stand-alone versions for under \$1,000. In addition, VXA drives are being

## REMEMBER KAI WINN

If you've been trolling the DVD titles lately in search of vintage fun, you may remember Doug Trumbull's 1983 sci-fi hit, *Brainstorm*. A vehicle for the ever gaunt Christopher Walken, Louise Fletcher, the evil Kai of *Deep Space Nine* fame, and the always regal Natalie Wood, the plot hinges on a VR system with direct neural interface. Anyway, the VR box used an optical tape drive to store the mental machinations of the hapless participants. What was once fiction is now reality.

MicroContinuum is the last man standing after a joint venture between Polaroid, Avid, EMC, Lucent, and LOTS Technology gave up on an optical tape-based HD DTV storage product. Polaroid and the National Institute of Standards & Technology have stuck with it, working with MicroContinuum to create a family of write-once and rewritable enabling technologies that promise ultra-capacity, long archival life and a transfer rate of 100 MB/second. That transfer rate translates into 360 TB/hour, *for one transport!* Just when this stuff will appear in commercial products is unknown, but the development team says a 1-terabyte-per-cartridge product is 12 to 18 months away.

By the way, they're not the first to attempt this. Both Sony and a group effort by Creo and Euro-giant ICI worked on optical tape products in the early '90s with not much to show for it. At the time, the huge capacity didn't justify the cost. Nowadays, Creo makes computer-based printing equipment and Sony is probably waiting to unleash an optical tape product on the unsuspecting IT world.

## PEDANT IN A BOX

### TERABYTE

A terabyte (TB) is 1,000 gigabytes (GB) or 1 million megabytes (MB). In comparison, a double-sided, double-layer DVD only holds 18 GB. It's not uncommon for many Fortune 1000 IT departments to have 50 to 500 TB of storage online. By the way, a byte is 8 bits, with bits being the smallest quanta of binary data.

### DISASTER RECOVERY

This umbrella phrase covers a range of methodologies, business practices, technologies and IT strategies aimed at bringing back full functionality after a disaster. Think about where you'd be if a fire, flood or lightning strike took out your *entire* information infrastructure...sobering, ain't it?

### NATIVE CAPACITY

This phrase refers to the fundamental, uncompressed capacity of a device. All tape-based formats have an embedded, hardware-mediated, lossless data compression capability that provides about a 2x increase in capacity coupled with a resultant increase in throughput.

built into various vendor's libraries for automatic backup bliss.

I mentioned three midrange formats earlier, the third being DLT1, a low-cost version of DLTtape (DLT). Space constraints prevent me from discussing it this month, but we may look at it in the future.

Given such a groovy welterweight format as VXA, you might think that would be all you'd need. Alas, for DVD-A and SACD production, a good ol' DLT

or AIT-1 drive is still needed to get the image to the replicator. But, for general network backup tasks, these affordable critters can't be beat. ■

*OMas, while luxuriating in the blue glow of his new DVD-A player, has been wondering what you folks want to read about in the "Bitstream"...Check <http://seneschal.net/> for e-mail info, related links and informal test results on some ADR and VXA drives.*

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The Technical Excellence & Creativity Awards is your chance to vote for the best products and projects of the past year.

Beginning on page 78 are 5 pages of nominee descriptions. Please take the time to read this information before voting, then vote in the categories in which you are most qualified.

Your ballot must be returned no later than Friday, September 7, 2001.

For information about TEC Awards tickets and Sponsorships, contact Karen Dunn, TEC Awards Executive Director, at (925) 939-6149 or check our web page at [www.tecawards.org](http://www.tecawards.org)

A benefit for hearing conservation.

You are also invited to join fellow members of the pro audio community at the TEC Awards ceremony at the Marriott Marquis in New York City on September 22, 2001, on the second night of the AES Convention.

**Proceeds from the 17th Annual TEC Awards will be distributed to the following organizations:**

Sound Partners, co-founded by *Mix* magazine and the House Ear Institute of Los Angeles

Hearing Education and Awareness for Rockers (H.E.A.R.), San Francisco

Audio Engineering Society Educational Foundation

Society of Professional Audio Recording Services financial aid program

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Gibson, founded in 1894, continues to be one of the most highly respected names in the musical instrument world. Gibson Musical Instruments currently encompasses a large family of companies that make and sell the world's finest guitars, basses, banjos, mandolins, drums, keyboards, amplifiers, MIDI hardware and software, strings and accessories. Gibson is the official sponsor of the Les Paul Award, presented annually to individuals or institutions that have set the highest standards of excellence in the creative application of recording technology.



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## GOLD



AKG Acoustics is a leading manufacturer of microphones, headphones, wireless systems and OEM acoustic devices. Company operations are located in the music cities of Vienna, Austria, Nashville, Tennessee and Munich, Germany. AKG is the holder of over 1,400 patents, 300 of which have been basic developments having influence over the entire audio industry. Recent developments relate to physiological loudness measurement on headphones (for hearing protection), binaural processing to create a natural 3-D listening experience, miniaturization of wireless and hardwire microphones for optimum mobility and aesthetics in entertainment.



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Audio-Technica has been dedicated to advancing the art and technology of electro-acoustic design and manufacturing since 1962. From a beginning in state-of-the-art phono cartridges, Audio-Technica has expanded over the years into high-performance microphones, wireless microphone systems, headphones and other audio equipment. Best known for the 40 Series line of precision capacitor microphones, Audio-Technica strives to create innovative, problem-solving products in each new area it enters. Audio-Technica is proud to be a Gold Sponsor of this year's TEC Awards.



Ex'pression Center for New Media is a total-immersion new media arts college located in San Francisco's East Bay. Ex'pression graduates can earn a Bachelor of Applied Science degree in Sound Arts, Digital Visual Media and Web Design in less than a year-and-a-half, or an Associate of Applied Science degree in less than a year. During an intensive 14 months of study, students are taught by, and work with, some of the best practitioners and equipment that the industry can offer. Located in an imagination-inspiring 65,000-square-foot building, Ex'pression features classrooms, professional studios and labs designed by pre-eminent studio designer John Storyk.



Kurzweil Music Systems is the leader in quality audio systems for professional and studio use. Kurzweil's line of products includes the popular Mark Series Digital Pianos, the versatile PC2 Performance Controllers, and the award-winning K2600 Series instruments. New products include the V Series digital pianos and the KSP8 Effects Processor.

CONTINUED

# 2001 SPONSORS

## GOLD continued

### **MACKIE.**

Mackie Designs, Inc. develops and manufactures high-quality, reasonably priced professional audio products for use in both recording and sound reinforcement environments. A worldwide organization, Mackie Designs is marketed by 60 distributors to over 100 countries. Mackie recently acquired RCF, a renowned audio company in Italy, and Eastern Acoustic Works, a high-end loudspeaker manufacturer in Massachusetts.



Meyer Sound, a Berkeley-based manufacturer of professional audio reinforcement systems and sound measurement tools, is known worldwide for consistent excellence in quality and engineering. Founded in 1979 by John and Helen Meyer, the company has become a leading worldwide supplier of systems for theaters, arenas, stadiums, theme parks, convention centers and touring concert sound rental operations. The company's client base includes such diverse talents as Luciano Pavarotti and the Dave Matthews Band and encompasses prestigious permanent installations such as New York's Carnegie Hall.

### **SENNHEISER**

For more than 50 years, the name for innovation in sound has been Sennheiser, a world leader in microphone manufacturing, RF-wireless and infrared sound transmission, headphone transducer technology, and more recently, in the development of active noise-compensation. The growth of the company has been directly attributable to ongoing research, precision engineering skills and meticulous manufacturing standards, as well as an innovating and pioneering spirit. Spanning more than 70 countries, Sennheiser's worldwide distribution network supports this tremendous growth through close contact with its customers.

### **Solid State Logic**

Solid State Logic (SSL) has grown over 30 years to become one of professional audio's most successful high-technology enterprises. A constant innovator, the company has introduced four new consoles to its product range in the last six months. Each incorporates SSL's latest generation of processing and is tailored to different applications in music, broadcast, film and post-production. SSL supports its leading edge technology with an international network of offices, establishing an industry benchmark for customer service.

### **SONY**

Sony Professional Audio is both an inventor and manufacturer of professional audio hardware technologies, with diverse offerings that include digital multitrack recorders, DAT recorders, MD recorders, CD players, signal processors, audio and broadcast mixers, digital consoles, wired microphones, wireless microphone systems, headphones, power amps and speakers.

### **t.c. electronic** ULTIMATE SOUND MACHINES

TC Electronic is a world-leading inventor, manufacturer and distributor of high-end professional digital and analog audio signal processing hardware, software applications and plug-ins, near- and mid-field monitors, vocal processors and multi-channel metering equipment for use in recording, post-production, surround, multimedia, broadcast and live-sound environments. Renown for its innovative world-class products, TC Electronic is the exclusive U.S. distributor for several high-quality brands including TC Works, Dynaudio Acoustics, Tube Tech and DK Audio.



Yamaha, a leading manufacturer of innovative analog and digital products utilizing its own DSP technology, offers a diverse scope of professional audio recording and post-production products ranging from signal processors, powered and reference monitors, multitrack recorders, Mini Disc systems, and digital mixers to the TEC-nominated AW4416 digital audio workstation. The company's commercial audio sound reinforcement products range from powered amplifiers, speakers, digital mixing engines, high-end reverbs, and analog consoles to most notably, the TEC-nominated PMID live digital console.

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## 17th Annual TEC Nominees

Beginning this year, the Creative and Institutional Awards categories have been combined under the heading Outstanding Creative Achievement, creating six new creative categories. In each category, all engineers, mixers, producers and production facilities will receive TEC Awards recognition. Please take the time to read through each category before voting on the ballot. Please only cast one vote in each category.

### OUTSTANDING CREATIVE ACHIEVEMENT

#### A. Record Production/Single

Awards go to all members of the production team, including the Recording Engineer, Mixing Engineer, Producer, Recording Studio, Mastering Engineer and Mastering Studio.

**"Music":** Music. Madonna.

Maverick Warner Bros. **Recording Engineer/Mixing Engineer:** Mark "Spike" Stent. **Producers:** Madonna, Mirwais Ahmadzai. **Recording Studio:** Sarm Studios, London; Mix Suite at Olympic Studios, London. **Mastering Engineer:** Tim Young. **Mastering Facility:** Metropolis Studios, London.

**"The Real Slim Shady":** *The Marshall Mathers LP*. Eminem.

Interscope Records. **Record Engineer:** Richard "Segal" Huredia. **Mixing Engineer:** Dr. Dre. **Producers:** Dr. Dre and Mel-Man. **Recording Studios:** Larabee North, Los Angeles; Encore Studios, Los Angeles. **Mastering Engineer:** Brian Gardner. **Mastering Facility:** Bernie Grundman Mastering.

**"Bye Bye Bye":** *No Strings Attached*. 'N Sync.

Zomba Recording Company. **Recording Engineer:** Mike Tucker. **Producers:** Kristian Lundin and Jake for Cheiron Productions. **Recording Studios:** Cheiron Studios, Stockholm, Sweden; Battery Studios, NYC; and Cove City Sound Studios, Glen Cove, NYC. **Mastering Engineer:** Chaz Harper. **Mastering Facility:** Battery Mastering, NYC.

**"Wonderful":** *Songs From an American Movie, Vol. 1*. Everclear.

Capitol Records Inc. **Recording Engineer/Mixing Engineer:** Neal Avron. **Producer:** A.P. Alexakis. **Recording Studio:** Art's basement and Encore Studios, Los Angeles. **Mastering Engineer:** Eddy Schreyer. **Mastering Studio:** Oasis Mastering, Los Angeles.

**"Country Grammar":** *Country Grammar*. Nelly. Universal Records. **Recording Engineer:** Steve Eigner. **Mixing Engineer:** Rich Trivali. **Producer:** Jason Epperson, Kevin Law. **Recording Studios:** Unique Studios, NYC; Sound on Sound, NYC. **Mastering Engineer:** Herb Powers. **Mastering Facility:** Powers House of Sound, NYC.

#### B. Record Production/Album

Awards go to all members of the production team, including the Recording Engineer, Mixing Engineer, Producer, Recording Studio, Mastering Engineer and Mastering Studio.

**The Marshall Mathers LP**. Eminem.

Aftermath Ent./Interscope Records. **Recording Engineer:** Richard "Segal" Huredia. **Mixing Engineer:** Dr. Dre, Eminem, Richard Huredia. **Producers:** Dr. Dre, Mel-Man, Eminem, F.B.T. **Recording Studios:** The Mix Room, Los Angeles; Encore Studios, Los Angeles; Larabee Sound Studios, Los Angeles; Chung King, NYC; Record Plant, Los Angeles; and 54 Sound, NYC. **Mastering Engineer:** Brian Gardner. **Mastering Facility:** Bernie Grundman Mastering, Los Angeles.

**Riding With The King**. B.B. King & Eric Clapton.

Reprise Records. **Recording Engineer:** Alan Douglas. **Mixing Engineers:** Alan Douglas and Mick Guzauski. **Producers:** Eric Clapton and Simon Climie. **Recording Studio:** Record One, Los Angeles. **Mastering Engineer:** Bob Ludwig. **Mastering Facility:** Gateway Mastering, Portland, ME.

**Music.** Madonna.

**Record Engineers:** Jake Davies (Pro Tools), Mark Ender, Sean Spuehler, Brad Munn and Geoff Foster (strings). **Producers:** Madonna, Mirwais Ahmadzai, William Orbit, Guy Sigsworth and Mark "Spike" Stent. **Recording Studios:** Sarm East and Sarm West, London; Guerilla Beach, Los Angeles; Hit Factory, NYC; Olympic Studios, London, Air Lindhurst Studios, U.K. **Mastering Engineer:** Tim Young. **Mastering Facility:** Metropolis Studios, London.

**No Strings Attached.** 'N Sync.

Zomba Recording Company. **Recording Engineers:** Mike Tucker, Chris Trevett, George Mayers and Frantz Verna, She'kspere, Riprock 'n Alex G and JC, David Cole, Joe Smith, Mario Luccy and Scott Humphrey, Carl Nappa, Jonathan Kaplan, John Amatello, Adam Barber. **Mixing Engineers:** Mike Tucker, Riprock 'n Alex G, JC, Pat McMakin, Kevin "KD" Davis, David Cole, Joe Smith, Mick Guzauski, Carl Nappa. **Producers:** Kristian Lundin and Jake, and Rami; Riprock 'n Alex G and JC; Teddy Riley, She'kspere, Richard Marx, Veit Renn, Guy Roche, Justin Timberlake, Kevin "K-Loonz" Antunes, Robin Wiley. **Recording Studios:** Cheiron Studios, Stockholm, Sweden; Battery Studios, NYC; Cove City Sound Studios, Glen Cove, NYC; Future Recording Studios, Virginia Beach, FL; Parc Studios, Altamonte Springs, FL; Larabee Sound North, Universal City; The "Hook Nook," Orlando, FL; Bananaboat Studios, Burbank, CA; Hit Factory, NYC; Emerald Sound Studios, Nashville, TN; Our House, Orlando, FL; The Treehouse, North Hollywood; Westlake Audio, Los Angeles; Village Recorder, Los Angeles; Barking Doctor Recording, Mount Kisco, NYC; Wire Studios, Orlando, FL; The Cave, Los Angeles; W.E.G. Studios, Orlando, FL. **Mastering Engineer:** Chaz Harper. **Mastering Facility:** Battery Mastering, NYC.

**Mad Season.** Matchbox 20.

Atlantic Recording Corporation. **Recording Engineer:** Noel Golden. **Mixing Engineer:** David Thoener. **Producer:** Matt Serletic. **Recording Studios:** Tree Sound Studios, Atlanta; East Iris Studios, Nashville; Ocean Way Studios, Nashville. **Mastering Engineers:** Stephen Marcussen and Stewart Whitmore. **Mastering Facility:** Stephen Marcussen Mastering, Hollywood.

#### C. Tour Production

Includes Tour Company, FOH Engineer and Monitor Engineer.

**Joni Mitchell.** Jason Sound/Grant McAree/Mark Frink.

**'N Sync.** Showco/Tim Miller/David Brooks.

**Nine Inch Nails.** Britannia Row/John Lemon/Clair Brothers, Brent Carpenter.

**Bruce Springsteen.** Audio Analysts/John Kerns, Nigel Green/Monty Carlo, Bob Cowan.

**Steely Dan.** Clair Brothers/David Morgan/Don Garber.

#### D. Remote Production/Recording or Broadcast

Includes Remote Facility and Remote Engineer, Production Mixer and Music Mixer (when applicable).

**2000 Grammy Awards.**

Effanel Music/John Harris/Ed Greene

**Hotter Than That with the Lincoln Center Jazz Orchestra.**

Record Plant Remote/Edward Haber/Irene Trudel/Sandy Palmer Grassi

**2000 MTV Music Video Awards.**

Effanel Music/John Harris and Jay Vicari/Terry Kulchar

**'N Sync Live From Madison Square Garden.**

Effanel Music/John Harris and Jay Vicari/Tim Miller and Don Worsham

**Supernatural Live.**

Design FX/Paul Sandweiss/Jim Gaines and John Harris.

#### E. Film Sound Production

Includes Production Mixer, Supervising Sound Editor, and Re-recording Engineer and Audio Post Facility.

**Cast Away** Supervising Sound Editor: Dennis Leonard. **Sound Designer:** Randy Thom. **Sound Recording Mixers:** Dennis Sands, Tom Johnson, Randy Thom. **Production Sound Mixers:** William B. Kaplan, Peggy Names, Earl Sampson. **Facility:** Skywalker Sound.

**Gladiator.** Supervising Sound Editor: Per Hallberg. **Sound Recording Mixers:** Bob Beemer, Scott Milan. **Production Sound Mixer:** Ken Weston. **Facility:** Livewire Studios.

**The Patriot.** Supervising Sound Editor: Per Hallberg. **Sound Re-recording Mixer:** Dan Sharp. **Production Sound Mixer:** Lee Orloff. **Facility:** Sony Picture Studios.

**U-571.** Supervising Sound Editor: Jon Johnson. **Sound Re-recording Mixer:** Rick Kline. **Sound Mixers:** Gregg Landaker, Steve Maslow. **Production Sound Mixer:** Ivan Sharrock. **Facility:** Universal Studios.

**Unbreakable.** Sound Designer/Supervising Sound Editor: Richard King. **Sound Re-recording Mixer:** Lee Dichter, Michael Semanick. **Production Sound Mixer:** Allan Byer. **Facility:** Sound One.

**F. Television Sound Production**

Includes Production Mixer, Supervising Sound Editor, and Re-recording Mixer and Audio Post Facility.

**Ken Burns Jazz.** PBS. Supervising Sound Editor:

Ira Stiegel. **Re-recording Mixers:** Lee Dichter, Dominick Tavella. **Audio Post Facility:** Sound One, NYC.

**Late Night With David Letterman.** CBS. **Production Mixer:** Jim Rose, Kevin Rogers. **Supervising Sound Editor:** Michael Delugg. **Re-recording Mixer:** Michael Delugg. **Audio Post Facility:** Ed Sullivan Theater, NYC.

**Saturday Night Live.** NBC

**The Sopranos.** HBO. **Production Mixer:** Mathew Price. **Supervising Sound Editor:** Anna MacKenzie.

**Re-recording Mixers:** Fred Tator, Kevin Burns, Todd Orr. **Audio Post Facility:** Liberty Livewire, Lantana, Santa Monica.

**West Wing.** NBC. **Production Mixers:** Mark Weingarten, Ken Fuller. **Supervising Sound Editor:** Walter Newman, Tom Harris. **Re-recording Mixers:** Gary D. Rogers, Dan Hiland. **Audio Post Facility:** Warner Bros., Burbank.



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## OUTSTANDING TECHNICAL ACHIEVEMENT

### A. Ancillary Equipment

**Aguilar DB900 Tube Direct Box:** The DB900 tube direct box works fine for every instrument. The low-distortion circuit, all-tube signal circuitry produces a warm and open sound throughout the entire frequency range. Specifications include: input impedance, 12.8 Megohm; balanced output impedance, 880 ohm; unbalanced output impedance, 150 ohm; noise, -98 dB; distortion, 0.025%; bandwidth, 10 Hz to 40 kHz  $\pm 0.5$ dB; tube complement, one 12AX7; and Jensen DBE output transformer.

**Equi+Tech ET12.5W Balanced Power System:** The newest version of Equi+Tech's acclaimed Wall Cabinet Balanced Power System represents the cutting edge in power products. The new Model ET12.5W features the convergence of several new technologies in transformer design, as well as expanded capacity and greater flexibility. Cleaner recordings with greater dynamics are routinely achievable with this power plant running the studio.

**Furman HDS-16/HRM-16 Headphone Cue System:** Designed for studio cue applications, the HDS-16/HRM-16 system consists of a rackmount HDS-16 unit that routes four stereo and eight mono signals from your console to up to six HRM-16 mic stand-mounted headphone stations. The HRM-16s allow players to create their own mixes from the stereo/mono sends, along with effect send/returns, master bass and treble pots, talkback and a main volume control.

**NTI Minilyzer ML1 Handheld Analyzer:** This battery-operated, state-of-the-art audio analyzer fits in the palm of your hand and provides essential functions for analyzing pro audio systems. Minilyzer continuously measures the signal and displays the desired results with all related information on an illuminated high-resolution LCD. Used in conjunction with the Minirator MRI signal generator, the ML1 forms a complete mobile test system for high-end audio applications.

**Omnirax F2 Workstation Furniture:** The F2 puts your 88-note controller/keyboard, mixer, near-fields, computer monitors and computer keyboard right where you want them, along with 54 rackspace. A sliding monitor bridge allows the computer monitor to move forward over the mixer table, which itself can slide forward over the synth keyboard. This allows an artist access to all the essential equipment used in the composing, recording and mixing process from one position.

**Prism Sound dScope Series III Analyzer:** This analog/digital test solution can generate arbitrary waveforms scripted in VBScript and standard sine/square/tramp types. An RTA and DVM provide functions similar to benchtop distortion analyzers, while the FFT analyzer provides greater flexibility and displays as time-domain (scope) and spectral traces. Digital interface testing offers waveform and eye-pattern view, jitter spectrum and channel status check. The sweep analyzer is comprehensive; automation features include snapshot files and VBScript for test procedures.

### B. Digital Converters

**Apogee Electronics Trak2:** This high-quality, 2-channel mic (or instrument) preamp with the latest Apogee 24-bit, 96kHz A/D converter feeds an 8-channel digital routing matrix supporting AES/EBU-S/PDIF outputs and two Apogee AMBus interface cards, allowing the Trak2 to connect to—or format convert between—Pro Tools, ADAT, TDIF, SSL, SDIF-2, Firewire, USB and other interfaces. An optional 2- or 8-channel D/A card with the same specs as the A/D can be installed.

**Benchmark Media/Sonic Sense AD2K+:** A collaboration of Benchmark Media and Sonic Sense, the Sonic AD2K+ is a compact, 24-bit/96kHz A/D converter. Features include 441/48/88.2/96kHz sampling, balanced analog XLR inputs, multiple 16/20/24-bit outputs on single- or dual-wire AES/EBU and S/PDIF. The unit operates nearly eight hours on a 12-volt/7.2-amp-hour battery, and a digital thru is provided for word-length reduction and format conversion.

**dB Technologies M\*AD-824:** The M\*AD-824 2-channel 24-bit/96kHz A/D converter is part of dB Technologies' 4496 Multi-Channel Conversion system. This high-res A-to-D converter is ideal for workstations, master mixes and mastering. It features up to 24 bits of resolution, 44.1/96kHz sample rates, analog and digital saturation (yielding 6dB of additional gain), and includes a reference meter.

**Euphonix FC727 Format Converter:** The FC727 is a multiple-format (AES/EBU, SDIF-2, Pro Tools, TDIF, ADAT and ProDigi) to MADI and MADI to multiple-format converter. The unit also provides premium-quality sample-rate conversion and bit-depth reduction on the fly in both directions, from 44.1, 48 and 96kHz sampling rates, at 16-, 20- or 24-bit depths, with system settings only affecting the signal in banks of eight channels.

**Lucid SRC 9624 Sample Rate Converter:** The 2-channel SRC 9624 features real-time, asynchronous sample rate conversion, locking to any resolution (16/20/24-bit, with or without triangular PDF dithering) and sample rate from 30 to 100 kHz, including variable speed and standard pull-up/down rates. Both single- and double-wire 96kHz connections can transmit/receive high-definition signals of either format. Other features include S/PDIF-to-AES and optical-to-co-ax transformers, and versatile digital routing modes.

**Prism Sound Dream ADA-8:** The ADA-8 provides eight channels of state-of-the-art A/D and D/A conversion. DSP includes Overkiller overload protection, MR-X bit-mapping, and DRE and SNS noise-shaping. Interface options include direct connection to Pro Tools and support for the two-wire AES interface on eight channels. Two analog and two digital module slots allow eight A/Ds and D/As or 16 channels of either. A stereo monitor output configures as a channel pair or a mix from several channels.

### C. Amplifier Technology

**Apogee Sound CA-1000:** Designed for touring, installations and commercial sound, the CA-1000 Series features 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. Power supplies use low ESR capacitors and uniform-wound toroidal transformers.

**Crest LT Series:** The first in a family of elevated efficiency amps, the LT Series uses a combination of a linear power supply and a Class-D output to deliver Crest Power in a compact, cost-effective package. A full complement of features and power-points make this series very versatile, whether powering nightclub systems or high school gymnasiums.

**Crown CE 4000:** The CE 4000 is Crown's most efficient amp to date. Borrowing the BCA topology of the popular K Series, the CE 4000 delivers massive amounts of power while generating just one-tenth the heat of a conventional amplifier. A switch-mode power supply, which incorporates Power Factor Correction for global power compatibility, means it weighs only 34 pounds while maintaining its rugged reliability.

**Haller GX2600:** Haller's GX amp series features optional plug-in cards with fourth-order, lowpass, highpass or full-range 500 or 800Hz crossover frequencies, a DIP switch-selectable time delay, continuously variable CD horn EQ and a phase inversion switch. The GX2600 is the mid-powered model, offering 600 watts/channel using a new Class-G circuitry based around Haller's patented TransNova platform.

**QSC PowerLight 236a:** The PowerLight 236a is a high-performance amplifier designed for touring and live sound professionals. With upwards of 1,850 watts/channel at 2 ohms, the PL236A features QSC's PowerWave™ switching power supply technology, high-efficiency Class-H output circuits, QSC's DataPort for remote computer control, and integrated analog signal processing, including HF attenuation, CD horn EQ, and an adjustable two-way, fourth-order Linkwitz-Riley crossover with LF delay for driver alignment.

**Stage Accompany ES 40:** The ES 40 has two individual power supplies including a 420 Joules capacitor bank rating, and a 2-ohm power output of 1,810/2,850 W/channel. Dynamic Damping Control™ (sensing) provides maximum speaker cone movement control for tight mids/bass. Extended Function Network processing modules for all SA systems maximize output with optimum sound quality, and Active Clip Eliminator offers inaudible clip protection without compression side-effects.

### D. Mic Preamplifier Technology

**Avalon AD2022:** This dual-mono, fully discrete, pure Class-A preamp offers both mic level and instrument inputs. Gain is switched in 2dB steps with a  $\pm 3$ dB line output trim. The AD2022 features mic input impedance matching, a -126dB EIN rating, input transformers, illuminated VU meters and twin peak LEDs. The AD2022 provides +36dB input before overload, a 20dB pad, and has sealed silver relays for all signal routings.

**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.

**Focusrite ISA 110:** The ISA 110 Mono Mic-Pre and Equalizer is based on the classic design created for Sir George Martin's AIR Studios in the mid-1980s. The unit uses a shared-gain, transformer-based design, plus transformer-driven line input for a flexible front end with phantom power and phase reverse. The 4-band EQ has two fully parametric mid-bands, swept shelving high/low bands and stepped, frequency-selectable high and lowpass filters.

**Grace Designs Model 101:** The model 101 is a single channel module of the critically acclaimed Grace Design mic preamp—a compact, affordable module designed to transform plain project studio tracks into stellar, high-fidelity recordings. Features include balanced transformerless mic and high-impedance instrument inputs, an 11-position silver-contact rotary gain switch, 75Hz highpass filter, minimal internal signal wiring and electrolytic capacitors in the signal path.

**Millennia Media STT-1 Origin:** Offering 134 analog product combinations in one chassis, the Origin expands the range of every artist's sonic palette. Select any combination of transformer, transformerless, vacuum tube or discrete solid-state signal paths for almost unlimited tonal creativity. The Origin includes Millennia's acclaimed HV-3 and M-2B preamps, NSEQ-2 Twin Topology parametric EQ, TCL-2 Twin Topology compressor/limiter and de-esser, vacuum tube DI input and eight input and output configurations.

**Oram Octasonic Plus:** Octasonic Plus offers eight channels of classic John Oram mic preamps as used in all his recent console designs. Each pre has switchable 48V phantom power and phase reversal. Whereas the conventional Octasonic has six mic channels of +70 dB and two channels of +35 dB gain for hot inputs, the Octasonic Plus has all eight channels of +70 dB of optimum low noise due to the remote high-energy power supply unit.

### E. Microphone Technology/Sound Reinforcement

**AKG Emotion D880:** The new standard for onstage vocal dynamic mics, this rugged supercardioid's outstanding performance is obtained via newly developed Tietzlieh Varimotion technology, which allows the mic to be tuned at the capsule, almost completely overcoming the need for tuning resonators. The AKG double-flex anti-vibration system eliminates handling and cable noise. An integrated wind and pop screen eliminates wind noise and sibilance.

**Audix VX-10:** Audix' flagship handheld vocal condenser has a smooth frequency response of 40 to 20kHz, and features a 16mm gold vapor diaphragm, a cardioid polar pattern, steel mesh grille, and the trademark Audix black satin finish. The VX-10 handles 140dB SPLs without distortion and provides over 20 dB of ambient noise rejection for feedback control onstage.

“Clean, rich and soaring reverbs with superclean tails...one of the most classy reverbs I have encountered and I would seriously consider giving it rack space for the reverb programs alone.”

—Rob James, Studio Sound



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—Dave Martin, Recording Magazine.



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**Beyerdynamic Opus 69:** This high-quality dynamic vocal mic features extremely high gain-before-feedback characteristics, and its ability to withstand high SPLs makes it suitable for close miking of instruments or speaker cabinets. Features include: supercardioid polar pattern; excellent isolation from unwanted sound; flat, wide-range frequency response for uncolored sound reproduction; and rugged construction.

**Earthworks SR69:** This cardioid condenser features frequency response extending beyond 20 kHz and 145dB SPL handling capability. Available in black, silver and crimson finishes, the SR69 includes a removable windscreen for use in instrumental live or studio applications.

**Electro-Voice Cobalt Co9:** The Co9 has become a favorite among vocalists across musical genres. A slight bass roll-off and accentuated midrange make this a superb transducer. Key product features include a dynamic neodymium element, cardioid polar pattern for high feedback rejection and acoustic isolation with a frequency response of 50 Hz to 18 kHz. The sensitivity is -50 dBV.

**Sennheiser Evolution e865:** The e865 condenser mic was designed to provide German precision engineering and American value to the world of condenser stage mics. Feedback rejection, high-SPL handling, uncolored sound reproduction and rugged construction highlight the e865's features and abilities. With the 865 condenser capsule (also available in wireless format in the Evolution wireless series), this mic is a natural fit for touring companies looking for sound quality.

## F. Microphone Technology/Studio

**AKG C2000B:** AKG's newest entry in its project studio line, the C2000B works in recording or live situations. Its almost ruler-flat response provides a crystal-clear up-front sound. A switchable bass filter eliminates proximity effect, and a 10dB preattenuation pad is included. A built-in pop screen reduces unwanted noise. Rugged construction and an elegant die-cast metal housing add to the C2000B's professional quality.

**B.L.U.E. Dragonfly:** This cardioid condenser employs the hand-crafted B.L.U.E. large-diaphragm capsule within an innovative rotating spherical grille that offers precise placement. Electronics are Class-A discrete, transformerless output with no integrated circuits in the signal path. The Dragonfly is ideal for recording vocals, percussion and acoustic instruments. It comes with integral shockmount and storage case.

**Brauner VM1 Klaus Heyne Edition:** A unique collaboration between premier mic designer Dirk Brauner and premier mic modifier Klaus Heyne of German Masterworks, the VM1 Klaus Heyne Edition takes Brauner's award-winning VM-1 studio tube mic to the next step. The resulting VM1-KHE combines both the versatility of a world-class cardioid vocal mic and multipattern instrument mic in one single microphone for users with the most discriminating tastes.

**Royer Labs SF-1:** Royer's latest "modern ribbon," the SF-1 is a compact, monaural version of its popular SF-12 stereo ribbon mic. 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 want the option of either spreading the ribbon elements out or recording in mono without purchasing the stereo model.

**Sennheiser MKH800:** Anticipating the recording industry's move to high-resolution digital, Sennheiser created the MKH800. With a frequency response of 30 Hz to 50 kHz and 100dB self-noise, the MKH800 brings out the best in any recording format, including DVD-Audio and SACD. Symmetrical capsule design and RF transduction provide distortion-free signal handling. Five polar patterns, line output level adjustment and selectable filtering complete this flagship microphone.

**Shure KSM44:** This multiple-pattern (cardioid, omnidirectional, bidirectional), externally biased, dual large-diaphragm condenser mic offers extremely low self-noise (7 dBA typical), wide dynamic range, and exceptional SPL handling. Developed

to deliver vivid reproduction of vocals, the transformerless design of the KSM44 excels in the most critical recording environments. Features include -15dB attenuation, three-position LF filter, three-stage integral pop/blast grille and ShureLock™ shockmount.

**Soundelux ELUX 251:** Modeled after the famous Telefunken 251, the ELUX 251 tube mic offers the same performance as vintage models, but at a significantly lower cost. The ELUX 251's "no compromise" construction is tediously hand-crafted, and all components are hard-wired. This meticulous attention to detail has created an exceptional, one-of-a-kind mic that requires no EQ to record perfect vocals, drums and ensemble settings.

## G. Wireless Technology

**Audio-Technica ATW-7373:** This handheld condenser wireless system combines the legendary AT4033 studio mic with the proven RF performance of Audio-Technica's 7000 Series frequency-agile UHF. This rugged, roadworthy unit provides superior audio quality for demanding stage performances. Embraced by top engineers and artists for use on the world's highest-profile tours, this critically acclaimed, true-diversity system delivers rich sound, unparalleled top-end clarity and superb off-axis rejection.

**Electro-Voice N/DYM SCU w/ClearScan:** The SCU Receiver features ClearScan™ Auto Channel Select and 10-channel frequency agility, combined with special functions for the contractor market. Systems include the N/DYM SCU Receiver with detachable rear-mount antennas, front audio and RF signal strength displays, rackmount hardware, and co-ax cables for front mounting of quarter-wave antennas. The SCU is compatible with all EV N/DYM transmitters.

**Samson AirLine AX1:** AirLine UHF features miniaturized transmitters that eliminate traditional body packs. A tiny AAA battery provides up to 14 hours of battery life. The AX1 handheld transmitter converts any dynamic into a wireless mic in seconds, and the tiny ARI UHF micro-receiver can be wall-mounted for ease of use.

**Sennheiser Digital 1000:** By eliminating companding circuitry necessary for noise suppression in analog RF transmission, the Digital 1000 Series offers something no other wireless can: true-to-life signals and extremely low noise. The 1092 body pack system has become the first choice for guitarists and bass players who have found the Digital 1000 to rival a straight cable for sound quality on their instruments. Freedom from typical RF interference also highlights this unique system.

**Shure PSM400:** The PSM400 personal (in-ear) monitor system provides full professional features for unprecedented control of the mix, enabling musicians to hear themselves clearly and safely without floor wedges. Features include 16 selectable UHF frequencies, onboard limiter, three operating modes (stereo, mono, and MixMode™), Shure's acclaimed E1 universal-fit earphones, and eight-hour battery life. With its P4M portable mixer, the Shure PSM400 Performance Pack affords artists new levels of freedom, fidelity and personal control.

## H. Sound Reinforcement Loudspeaker Technology

**BSS Audio FDS-334/-336 Minidrives:** Minidrives are cost-effective units bringing Omnidrive power, features and quality to a wider market, providing crossovers (Linkwitz-Riley, Bessel or Butterworth), mid-band limiters, EQ and input/output delay. The 2-in/4-out FDS-334 can drive a stereo 3-way house system, while the 2-in/6-out FDS-336 is at home in the monitor rack. Up to 38 bands of filtering are available in each unit.

**Community XLT500:** The XLT500 is a trapezoidal, full-range loudspeaker designed for optimum bass performance at an affordable price. Features: 1-inch HF driver and 15-inch LF drivers; new dual Intellisense™ 3-color LEDs on front and rear for worry-free operation; rugged construction; and permanent or portable use. Specs include: 120dB SPL/127dB SPL (peak); 97 dB at 1 Watt/1 meter; and a frequency range of 50 Hz to 16 kHz.

**dbx DriveRack 480:** DriveRack 480 is an all-inclusive loudspeaker management system versatile enough to suit any sound reinforcement, monitoring or installation application. The Drive Rack has been designed to be the only device necessary between the mixer and the power amps. Every tool you could ask for has been included and is completely configurable.

**JBL VerTec VT4889:** Released halfway into the eligibility year, VerTec has made a remarkable impact on the touring/special event sound industry. From televised awards shows and corporate A/V events to hard-rock concerts and festivals, the VT4889—a lightweight but powerful line array module—has shown itself to be a "rider-friendly" contender. Neodymium magnets, dual voice coils and patent-pending acoustical technologies make the system a technical standout for rental companies and performance venues worldwide.

**Mackie SR1530/SRS1500:** The SR1530 active powered system combines 500 watts of triamplification with a 3-way, horn-loaded, trapezoidal Baltic birch enclosure. An optimized wavefront horn mated to 6-inch MF and 1-inch exit compression drivers and a 15-inch woofer have onboard electronics for precise EQ, time and phase alignment control. The SRS1500 is a companion 600-watt sub box with 15-inch, high-excursion woofer that's capable of 127dB peak SPLs.

**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. Specs include: frequency response of 63 to 21k Hz; asymmetrical dispersion of 50° to 100° horizontal by 55° vertical; and power handling of 200W continuous, 400W peak.

## I. Studio Monitor Technology

**Event Electronics PS6:** An affordable bi-amplified reference monitor, Event PS6s feature a 6.5-inch polypropylene cone woofer and 1-inch ferrofluid-cooled natural silk dome tweeter driven by custom-designed amplifiers (70W to the woofer/30W to the tweeter). An asymmetrical fourth-order crossover assures phase coherence between the driver components. The dual front-port design—along with special electronics—result in excellent bass response and accurate reference mixes.

**Hafler M5:** The magnetically shielded M5 is a compact, vented 2-way passive reference monitor. The M5's 5/8-inch thick MDF cabinet has a 5.3-liter internal volume and a front-firing, slotted port tuning the system to 70 Hz. The 5.25-inch M-5 mid-bass driver is thermally and mechanically capable of handling the 200-watt system power rating. The M-5 crossover is a symmetrical fourth-order (24dB/octave) Linkwitz-Riley passive filter set at 32 kHz.

**KRK Systems V88:** Taking the acclaimed V8 design, KRK added a second 8-inch woven Kevlar woofer to produce low-end response. The V88 has an innovative high-output 1.25-inch polymer dome tweeter with elliptical waveguide for an extra wide sweet spot. The V88 delivers pinpoint accuracy, outstanding translation, and unprecedented clarity. It is ideal for someone looking for high SPLs, loads of bass and sonic accuracy.

**Meyer Sound Labs X-10:** The X-10 High Resolution Linear Control Room Monitor represents a fundamental redefinition of large-format studio monitors. The self-powered X-10 exhibits low distortion, near-perfect impulse response and uniform dispersion across a wide listening area. By employing cutting-edge control technology adapted from avionics, the X-10 demonstrates an extraordinarily linear response characteristic. From the threshold of audibility up to full output, the X-10 provides an accurate and consistently linear representation of the input signal.

**Quested VS3208:** Quested's largest self-powered monitor, the VS3208 is a 3-way active mid-field reference for larger rooms or can be used as mains in small to medium rooms. The bass drivers are two proprietary 8-inch units in individual driver chambers, as are the 3-inch soft dome mid and 1-1/8-inch soft dome tweeter. Each speaker is powered by built-in amplifiers providing more than 400W RMS.

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**Westlake Audio Lc5.75:** The Lc5.75 is a near-field monitor capable of delivering high output and extended bandwidth from an extremely compact enclosure. Measuring just 14.5-inches high and 6.5-inches wide, this mini monitor is an excellent choice for a variety of applications, from project studios to DAWs. The single-ported enclosure houses a 5-inch long-throw woofer and a 3/4-inch soft dome tweeter that combine to deliver pinpoint imaging and excellent transient response.

### J. Musical Instrument Technology

**E-mu E-IV Platinum:** The E-IV Platinum is E-mu's new top-of-the-line professional sampler running EOS Version 4.5 software and featuring E-mu's latest filter/mixing chips and the new RFX-32—E-mu's highly anticipated new FX engine (which allows routing external signals through its synth engine and the RFX-32). The E-IV Platinum comes standard with 128MB of RAM, 16 analog outs, 16 channels of ADAT out, six analog inputs, eight ADAT inputs, a library of 20 CD-ROMs and large internal IDE HD.

**Fender Cyber Twin:** Ideal for studio players, the Cyber-Twin programmable guitar amp has 120 factory/85 user preset effects/amp combos, including 11 reverbs and 28 effects, along with a 130-watt amp, dual 12-inch Celestion speakers and MIDI in/out for controlling amp settings via sequencers or pedal controllers. Standard are S/PDIF digital and XLR stereo line outs, as well as eight motorized rotary knobs that automatically turn to the current preset.

**Korg CX-3:** CX3 Combo Organs use Korg's Tone Wheel Organ Modeling system to accurately reproduce the aspects of tone wheel organs, including leakage, key-click, percussion and preset programs, and a Key Scan feature for ultra-fast response. Two sets of drawbars can be used for split keyboard applications or linked together in a special EX mode. Additional features include accurate rotary speaker simulation and reverb created with Korg's "REMS" modeling technology.

**Kurzweil PC2X:** The PC2X represents Kurzweil's continuing quest to achieve the highest musical and technical quality possible. Stunning new sounds, fantastic effects, precise control and excellent audio quality are only a few of the features that make the PC2X a fine instrument. The PC2X includes 64-note polyphony (expandable to 128), dual stereo digital multi-effects processors, a flexible arpeggiator and numerous programmable controller features.

**Native Instruments B4:** Software-based for Mac or PC systems, the B4 is a complete virtual tone wheel organ, capable of reproducing in authentic detail the sound of the legendary B3 organ and rotating speaker cabinet, including tube amplification and distortion. Beneath the attractive photo-realistic vintage-look graphics is an up-to-date audio engine, with perfect sound and lots of options for fine-tuning, all with full MIDI automation.

**Roland HPD-15:** The HPD-15 Hand Percussion Pad has a 10-inch diameter, 15-zone surface designed for finger/hand playing with the same pressure, muting and pitch control offered by congas and other hand percussion. Standard are 300 onboard stereo sounds (from around the world), two ribbon controllers, three real-time modifier knobs, trigger inputs and hi-hat jack.

### K. Signal Processing Technology/Hardware

**Alesis airFX:** An extreme, performance-oriented signal processor, airFX offers state-of-the-art filters and effects—from vinyl to vocoder, flanging to phasing—designed to modify the audio pathway of your choice. All controlled by simply moving your hand—or any other body part—through the invisible 3D infrared orb formed by the company's patent-pending Axyz™ technology. After using airFX, suddenly, everything else is so 20th century.

**CEDAR DNS1000:** Designed primarily for film production, the DNS1000 is ideal for use in dialog mixing, dubbing, outside broadcast (remote) and studio noise suppression, offering a fast, intuitive control panel. Two channels of 24-bit I/O and 40-bit floating-point processing give the DNS1000 better audio quality, control and selectivity than other systems. Most importantly, its near-zero latency means that it can be used in any situation without loss of lip-sync.

**Empirical Labs Model EL8-SX Distressor:** First unveiled in 1996, Distressor provides an automatic gain control device for music applications. But unlike a simple compressor or limiter, Distressor is digitally controlled, combining several products to offer a warm, vintage sound. The new "SX" version adds stereo linking capability, and a "British Mode" option serves up a new palette of compression textures including UREI-style 1176LN response for an aggressive, in-your-face sound.

**Focusrite ISA 430:** Based on the Rupert Neve-designed mic pre, equalizer and Class-A VCA technology, the ISA 430 incorporates Focusrite's dynamic control technology and 24-bit digital connectivity. The ISA 430 includes a transformer-based mic preamp, ISA110 parametric EQ, unique Class-A VCA design compressor, expander/gate, de-esser, and a multiband limiter. An optional 24-bit/96kHz output module offers AES/ EBU, TOSlink and S/PDIF digital capability and external wordclock.

**Lexicon 960L:** Continuing on the success of the 480L, Lexicon's 960L represents today's standard for stereo and multi-channel digital reverb and audio effects processing. With support for 16 channels of I/O and the ability to be configured as four independent multichannel (or eight independent stereo) processors, the 960L can meet the demands of any application. With expandable DSP and I/O architecture, the 960L is poised to remain the standard well into the future.

**TC Helicon VoicePrism:** This Vocal Formant Pitch Processor is a vocal processor for stage and studio featuring a full range of lead and backing harmony channel vocal processing under preset control. The VoicePrism also offers an expansion slot for additional processing power and the world's first professional implementation of Voice Modeling™ technology, with new varieties of ways to process vocals, including the ability to add breath, growl, rasp, head and chest resonance, inflection or vibrato.

### L. Signal Processing Technology/Software

**Antares Auto-Tune 3:** Auto-Tune 3 enhances Antares' world 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; improved pitch detection; a snazzy new interface; and much more. The TDM version adds optimized Mix Chip usage for up to four instantiations per chip, as well as AudioSuite functionality.

**Waves Renaissance Reverberator:** Featuring classic sound and vintage-style controls, the Renaissance Reverberator is easy to use with just a few straightforward controls and simple interfaces. It features rich reverb tails, plus a second-generation, early reflection system providing density and texture. The Renaissance Reverberator is available in the Waves Gold TDM package, Waves' Gold Native package (RTAS, Audiosuite, VST, DirectX, and MAS) and Renaissance Collection for TDM and Native (RTAS, Audiosuite, VST, DirectX, and MAS).

**Kind of Loud SmartCode Pro DTS Encoder:** SmartCode Pro™ streamlines the surround production process by providing DTS 5.1 encoding within Pro Tools. This AudioSuite program allows Pro Tools users to preview 5.1 surround mixes in real time, then encode and decode the mix to create a 6-channel surround master.

**McDSP MC2000 Multiband Compressor V1.0:** The MC2000 is a multiband compressor plug-in designed to emulate the sounds of vintage and modern compressors in 2/3/4-band configurations. Each compression band includes Output, Threshold, Compression, Attack, Release, Knee and Bite controls, multiple peak detection circuits, Solo and In/Out modes, and compression and input/output metering. Steep 24dB/octave crossover filters minimize signal leakage into adjacent bands.

**Metric Halo ChannelStrip MAS:** ChannelStrip brings the power of world-class consoles together with the precision of DAWs, allowing complete control of EQ, compression and gating. ChannelStrip delivers stunning sound quality, a seamless and logical interface and exceptional processing efficiency. ChannelStrip provides all of the main processing facilities in one complete plug-in, quickly giving you the sound you need.

**Wave Mechanics Speed:** This plug-in brings high-quality tempo alteration and pitch transposition of polyphonic audio tracks to the Pro Tools platform, making it possible to change the tempo and pitch of complex musical parts, even entire stereo mixes. It is free of the artifacts produced by previous generations of pitch and time change technology, and can preserve percussive transients while maintaining rock-solid tempo accuracy.

### M. Recording Devices

**Euphonix R-1 Version 3.0:** Designed for 24/48-track recording, the R-1 supports all formats up to 24-bit/96kHz and includes a 12x12 MADI router matrix for real-time routing. The R-1 is available in numerous versions—with or without converters—and a 24-track system is easily upgradable to 48 tracks. New Version 3.0 software integrates the system into a networked environment with sharing via Broadcast .wav files with other workstations.

**Fairlight Merlin:** Now available in a 48-track version, Merlin is a standalone 24-bit (96kHz-capable) recorder/editor with synchronized waveform display and full edit tools based on the Fairlight platform. Users can select from analog or AES/EBU digital I/O, and the system can interface via MediaLink to multiple MFX3plus, FAME and Prodigy workstations, Merlin recorders, outside file servers and Windows- or Mac-based DAWs for seamless file sharing.

**HHB CDR830 BurnIT:** The CDR830 BurnIT CD Recorder features excellent 24-bit delta-sigma AD/DA converters, an advanced laser assembly delivering consistent accurate recordings, CD Text, digital volume control and SCMS-free recording. Ease of use, the CD Text facility enabling disc, artist and track names to be displayed, compatibility with a wide range of CD players and superb sound quality have made the CDR830 ideally suited for use in the recording studio or broadcast environment.

**iZ RADAR 24:** This professional, hard disk equivalent to 2-inch, 24-track recorders offers rock-solid reliability, a simple-to-use interface and a reliable new BeOs operating system. RADAR 24's superb audio handling/performance is courtesy of iZ's proprietary ECA™ recording format and the 192kHz Adrenaline™ SCSI engine with the powerful Trinity chip.

**Mackie HDR 24/96:** This 24-bit/24-track recorder/editor functions standalone or can be fitted with an S-VGA monitor, PC keyboard and mouse for extensive editing operations. An internal hard drive is standard; a front panel second bay accepts interchangeable media. The deck supports 12-track/96kHz recording in double-wire mode, from third-party 96kHz ADCs. Standard features include MIDI/SMPTE sync, and 100BaseT Ethernet port for connecting to a computer or server.

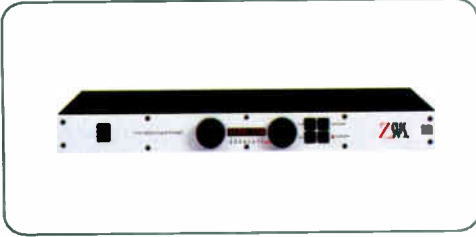
**Tascam MX-2424:** This disk-based, 24-bit recorder/editor offers 24 tracks at 48 kHz or 12 tracks at 96 kHz and features onboard MIDI and SMPTE sync, with S/PDIF and AES/EBU digital I/O. Card slots accommodate various I/O options ADAT/TDIF/analog/AES/ etc. Other features include a jog/shuttle wheel, an onboard hard drive, an open slot for a second internal drive, SCSI port and a Smart Media flashROM card.



# Digital Audio Essentials

from the digital audio interface experts

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## **NEW! ADAT ↔ S/PDIF conversion**

z-8.8a Lightpipe Detangler is a Lightpipe patch bay and also converts bidirectionally between ADAT Lightpipe format and S/PDIF (AES/EBU optional). S/PDIF inputs also feature defeatable sample rate conversion, allowing four asynchronous stereo digital sources to feed an eight-channel Lightpipe destination.



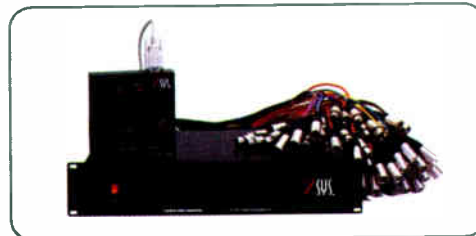
## **Digital Detangler automated digital audio patchbay**

Available with 8x8 or 16x16 inputs and outputs. Supports AES/EBU, S/PDIF optical & coaxial, ADAT Lightpipe optical (no format conversion to and from ADAT format). Mix and match port configurations to build the perfect solution for your studio (standard configurations also available).



## **Rack-mount sample rate converters**

With a full range of input and output formats, input and output wordwidths up to 24 bits at sample rates up to 96 kHz. Available in two-channel (z-3src) and eight-channel (z-8src) packages.



## **Digital Detangler Pro automated digital audio patchbay**

Available in 8x8, 16x16, 32x32, and 64x64 configurations. Can be controlled from dedicated remote controller, Mac, or PC software (network versions available).



## **NEW! 24/96 miniature sample rate converters**

z-link96 and z-link96+ support up to 24 bits at 96 kHz with user-selectable 16- or 24-bit output

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## N. Workstation Technology

**Digidesign Pro Tools 5.1:** Adding integrated surround mixing to Pro Tools TDM systems, Pro Tools 5.1 allows up to 64 tracks of simultaneous recording/playback, and supports control surfaces such as ProControl. An AVoption allows capture, import and playback of Avid video. Enhancements include integrated multichannel editing/mixing/processing, with support for all popular surround formats, multiple levels of undo and viewing of multiple plug-in windows in the Mix window.

**Emagic Logic Audio Platinum V4.7:** The most powerful product of the Logic Audio series, Platinum V4.7 provides the ultimate synthesis of 24-bit audio recording, DSP, MIDI sequencing and notation. A flexible window architecture allows viewing the music in the appropriate way for whatever task is at hand. Additionally, Logic uses the same core code for both Mac and Windows 98 versions, so the Mac/PC choice is a simple matter of personal preference.

**MOTU Digital Performer 2.7:** New features in Version 2.7 include a drum editor; effects automation; adjustable PPO from 2 to 10,000; new Multimode Filter, Ring Modulator and Stereo Delay effects; and a Find Tempo function that searches selected hit markers and suggests a tempo that hits critical cue points. Other new features include QuickScribe enhancements, ReWire support, sound-bite merging, graphic time stretching, multiple punches on the fly and scrubbing while trimming. The upgrade integrates MOTU's MIDI Time Stamping hardware-based MIDI streaming technology and adds HUI support.

**Steinberg Nuendo 1.5:** Combining a 200-track production facility with an 8-channel surround mixing environment, Nuendo 1.5 offers host-based DSP with ASIO 2.0 support, a full array of post-based editing features, dynamic automation of VST plug-ins and more. Version 1.5 adds definable Auto Fades/Crossfades; VST Virtual Studio Instruments; ReWire 2.0; Track Sheet printing; TCE Tool; DirectShow & QuickTime support; improved 9-pin machine control; and much more.

**Yamaha AW4416:** This powerful, compact system records up to 16 tracks of true 24-bit digital audio, and includes motorized faders, DSP features, automation/snapshot capability, and phrase sampling. Other features include: full 32-bit DSP capabilities, 44 fully automated inputs, 17 motorized faders, four fader and mute groups, eight bus and eight aux sends plus stereo, stereo cue buses, 4-band full parametric EQ, direct out assignment and CD-RW drive.

## O. Sound Reinforcement Console Technology

**Allen & Heath ML5000:** This quintessential workhorse has redefined the meaning of flexibility and versatility. The ML5000 is a master of all trades in live audio applications, including monitor mixes and front of house. With such an extensive feature list ranging from eight VCA groups to its Intelligent PAFL system, it's no wonder that the ML5000 is at home in any house.

**Crest X-VCA:** This FOH console features full-parametric EQ on all mono input channels; full-facility stereo input channels for effect returns; eight channels of dynamics on group channels; full VCA control on input and group channels; 128 mute and VCA scenes storable in internal memory and 5-band EQ and RMS limiters on the stereo and mono outputs. X-VCA is available with 24, 32, 40 and 48 mono input channels, plus four stereo input channels.

**Midas Heritage 1000:** This compact-frame live performance console is ideal when space is at a premium. Features include a high number of outputs accessed via simple routing with comprehensive monitoring facilities. All routing may be automated via VCAs, auxiliaries or subgroups. Furthermore, each input includes a high-quality preamp and EQ section and a direct output that can double as a mix-minus bus. There is also an optional Audio-Follow-Video facility.

**Peavey SRM 2410 HC:** This pro monitor console built into a heavy-duty roadcase features 24 mic/line input channels, 24 true transformer splits, 4-band EQ with sweepable mid bands, and mute and PFL on each channel. Likewise, each channel has Peavey's patented FLS Feedback Locating System LED to pinpoint the feedback. The eight mono submasters have an adjustable highpass filter as well as two tunable notch filters with FLS.

**Soundcraft Series FOUR:** This fully modular, VCA-equipped console follows the acclaimed layout of Soundcraft's Series FIVE but in a smaller footprint. Available in 24- to 48-channel frame sizes, with each size having an additional four stereo inputs, the desk features eight subgroups, 10 auxiliary buses, eight VCAs, a built-in 16x8 matrix, eight mute groups plus 128 mute snapshots, 4-band fully parametric EQ on mono and stereo inputs, sweepable filters on all input channels, and more.

**Yamaha PMID:** Designed for live and installed sound applications, the PMID is one of Yamaha's most anticipated developments in digital technology, performing all mixing and audio processing functions completely in the digital domain. With 32-bit internal processing, configurable in both 48- and 96-channel versions, 48 mix buses, 24 matrices, 12 DCAs, top-quality 28-bit A/D and 27-bit D/A conversion, the PMID has set the standard for live sound console technology of the future.

## P. Small Format Console Technology

**Digidesign Control|24:** Control|24 is an analog front-end and ergonomic control surface for controlling Pro Tools. The system features 24 touch-sensitive moving faders, 16 Class-A Focusrite mic preamps, full 5.1 control room monitoring and dedicated controls for accessing record/transport/editing and DSP functions.

**Mackie 1642-VLZ PRO:** The first new, high-end compact mixer from Mackie in over four years the 1642-VLZ PRO features precision XDR™ Extended Dynamic Range preamps and can be thought of as a premium preamp rack that happens to have a 16-channel mixer attached to it. Features include four stereo aux returns, eight direct outs; 3-band sweep mid EQ with 75Hz HP filter on mono channels; and 4-band active EQ on stereo line channels.

**Manley Mastering Console:** Manley's history of building custom mastering consoles for the world's most demanding mastering engineers is unique in the industry. Over ten years, the console's feature sets and complexity have evolved, culminating in the highly developed design of the newest, most advanced models. Masterdisk, NYC, and Bob Ludwig's Gateway Mastering took delivery of these near-twin consoles, complete with full-featured monitor and processor control sections, M/S processing and dedicated metering.

**Shure FP24:** The FP24 is a studio-quality, 2-channel, portable stereo microphone mixer designed for use in demanding broadcast environments. Features include assignable LCR inputs, built-in slate mic, 1kHz tone oscillator, phantom power, three LED brightness levels and headphone monitoring. The low-noise, high-output audio performance and full, professional feature set make the FP24 a superb choice for radio, television, film and field production.

**Sony DMX-R100:** This 48-channel, 24-bit digital console offers snapshot or dynamic automation of all console parameters, moving faders, 44.1/48/88.2/96kHz support, and programmable 4-band parametric EQs and dynamics. Expansion slots for optional 8-channel I/O cards handle additional digital (AES/EBU, ADAT or TDIF) or analog signals. A high-res, SVGA touchscreen displays parameters, dynamics or EQ curves and provides touchscreen control of 5.1 surround panning functions.

**Tascam US-428 USB:** The US-428 is a 24-bit interface/hardware controller that connects with Windows and Mac-based sequencing platforms via a USB port. This no-audio-card-required workstation/control surface has eight hardware faders, with jog wheel, transport, EQ and control functions. It supports 16- or 24-bit resolution and 44.1 and 48kHz sampling rates, and has four analog and two S/PDIF ins, plus RCA and S/PDIF outs.

## Q. Large Format Console Technology

**Amek Media 51:** Supporting 51, 71, LCRS and LCRSS, Media 51 is a value-packed analog surround console with multichannel bussing, stem monitoring and down-mixing facilities. With up to 60 channels available, it is the first mid-level desk to incorporate an EQ/mic pre by Rupert Neve. Amek's renowned Supertrue V4 automation system is also included, providing fader, switch/event automation, Virtual Dynamics, Recall, motorized joystick control and comprehensive offline editing.

**Harrison MPC II:** A large-format digital film mixing console, the MPC II incorporates Harrison's powerful digital engine™ and accommodates up to three 2240x2240 routers. Harrison's rackmount I/O converter system allows 112 signals per unit, while expanded 64x8 film monitoring facilitates simultaneous recording in multiple formats. Surface features include four-layer fader panels, Sweet Spot, Control Linking, Graphic EQ and an attached "Toys" panel for plug-in control. The MPC II is the most powerful digital film/post-production console available.

**Neve 88R:** Neve's latest large-format analog console, the 88R combines the best of revered classic designs and newly available technologies. Capturing the energy and atmosphere of the original performance almost perfectly, the 88R is a remarkable advance on anything heard before. 88Rs are already installed in some of the world's most prestigious facilities, from London and Paris to Los Angeles and Tokyo.

**Oram BEQ Pro-24:** The Pro-24 Series of consoles represent the latest design and assembly technology from the John Oram team. Outstanding EQ and analog sonic perfection make this console one of the best-sounding 51 boards around. A unique feature is how the modules exchange with the Trident Series 80 51 modules so the studio can have a choice of classic vintage and 21st century sounds. Moving fader automation and large-format bodykit are optional.

**SSL SL 9000 J Scoring System:** The SL 9000 J Series Scoring System provides the same unrivalled audio excellence and operating ergonomics of the SL 9000 J Series, within a console specifically focused upon the requirements of Hollywood film scoring. The "preferred configuration" system provides unparalleled flexibility and dedicated features, including a 328 monitoring matrix, and has captured the imagination of the scoring community with seven systems already installed, becoming the choice of scoring professionals.

**Studer D950 M2:** The latest evolution of the acclaimed D950 Series of digital mixing systems, the innovative M2 combines extensive software enhancements, along with a newly designed control surface. Exclusive features such as the Central Assign Panel and built-in reverb, exemplify the advancements that have been incorporated into the D950 over the past two years. With over 110 systems sold worldwide, the M2 is indicative of Studer's commitment to listen strongly to the needs of its users.

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World Radio History

# TONY WALSTRA

## AT HOME AND ON THE CHEAP

Project studio owners use a variety of different tools, but they all need a system that can accommodate analog as well as digital signal, with plenty of processing power. Contained systems like Pro Tools have an undeniable attraction. Increasingly, though, producers like Tony Walstra are using less-expensive methods.

Walstra is a Connecticut native who produced pop singer Denise Levasseur's recent, eponymous, solo release out of his home. His day gig at Caruso Music gives Walstra the opportunity to demo loads of new equipment. Currently, his studio features a Ramsa DA7 console. Light-piped to this board is a Pentium II computer running Cakewalk, Cubase and Sound Forge.

As both a writer and executive producer on this album, Walstra farmed out some arranging and composing assignments. "With the technology available today, many aspects can be worked on the outside. I was constantly e-mailing MIDI and MP3 files for pre-production and FedExing ADAT tapes and CD-ROMs with .WAV files to writers."

Many producers feel that tracking vocals requires the kind of perfectly tuned room that major studios are known for, but Tony Walstra demurs. "I will only record Denise's vocals in my home at this point. The challenge of capturing the naturalness, mood and dynamic is the most rewarding part. Denise's voice is very resonant, powerful and dynamic. We tried her in some of the larger commercial studios, and I discovered I always would get a better sound at home. Most of the engineers did not have the commitment to detail to record her vocal the way I do, and everything felt pressured and rushed."

"Denise is such a dynamic singer that sometimes I will have to actually pad the mic when recording a loud chorus. She has this resonant frequency in her voice that on certain

words will cause the mic to clip, but then when she is whispering a gentle verse, I don't want the pad on the mic. So, on a song like that I will record the verses first and the choruses second. Then I match the levels in my computer.

"I use just a couple of dB of analog tube compression when I'm tracking; that way, I don't have to commit, and it still leaves a lot of dynamic for later when mixing. I love using the digital compressors on the Ramsa DA7 when I'm doing the mix because at that point, I'm 'massaging' the track into place, and I may make a lot of changes in the Automix. I really like the two-phase approach to compression, with a tad of high-end tube compression on the way in and digital on the way out. With the technology available today, there is no need to adjust a compressor for the one or two exaggerated peaks on the whole track. Simply bring the problem waveforms down a few dB in your computer and then let the compressor work on a more level track. That way, you avoid the squashed sound while still getting a bit of the compressed sound, if that is what you like.

"I auditioned a lot of mics and preamps on Denise," Walstra continues. "I love the RØDE Tube Classic mic through a Manley Mono Block preamp and then through a Demeter VTCL-2A Tube Optical Compressor. That combination has worked great for her voice. The audio path is completely tube; no transistors, no ICs until it hits the 24-bit converters on my Ramsa DA7 and becomes digital and stays that way. At this point, I



like a lot of tube gear on the front end of any type of digital recording.

"The drummer I use has Roland Pro V-drums, which I only used for the MIDI triggers. I had him play them using some of my modules, so when he left the session, I was able to manipulate the tracks and still have them sound human and real. I always like to have him present when I'm editing drums, because he had valuable input coming from a drummer's perspective. We would overdub real cymbals and use some hand percussion. I always use real bass guitar, except occasionally on a dance song. We DI that right into my Manley preamp."

Although working with digital audio sequencers and the Ramsa DA7 yielded satisfactory results on the Denise Levasseur project, Walstra is considering amending his tracking and mixing methods. "For my next project, I'm looking at [Ensoniq] PARIS Pro or a dedicated HDR. I'm not sure if I'm ready to go completely desktop because I still feel the need for a console. I'm also looking at the Sony DMX-R100 board." ■

*Gary Eskow is a Mix contributing editor.*

BY GARY ESKOW

"It's one I would love  
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genre of audiophile gear, it is one of the  
interpolation es to all in the 'you'd be  
not to own one (or two or three)!"



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# Sound

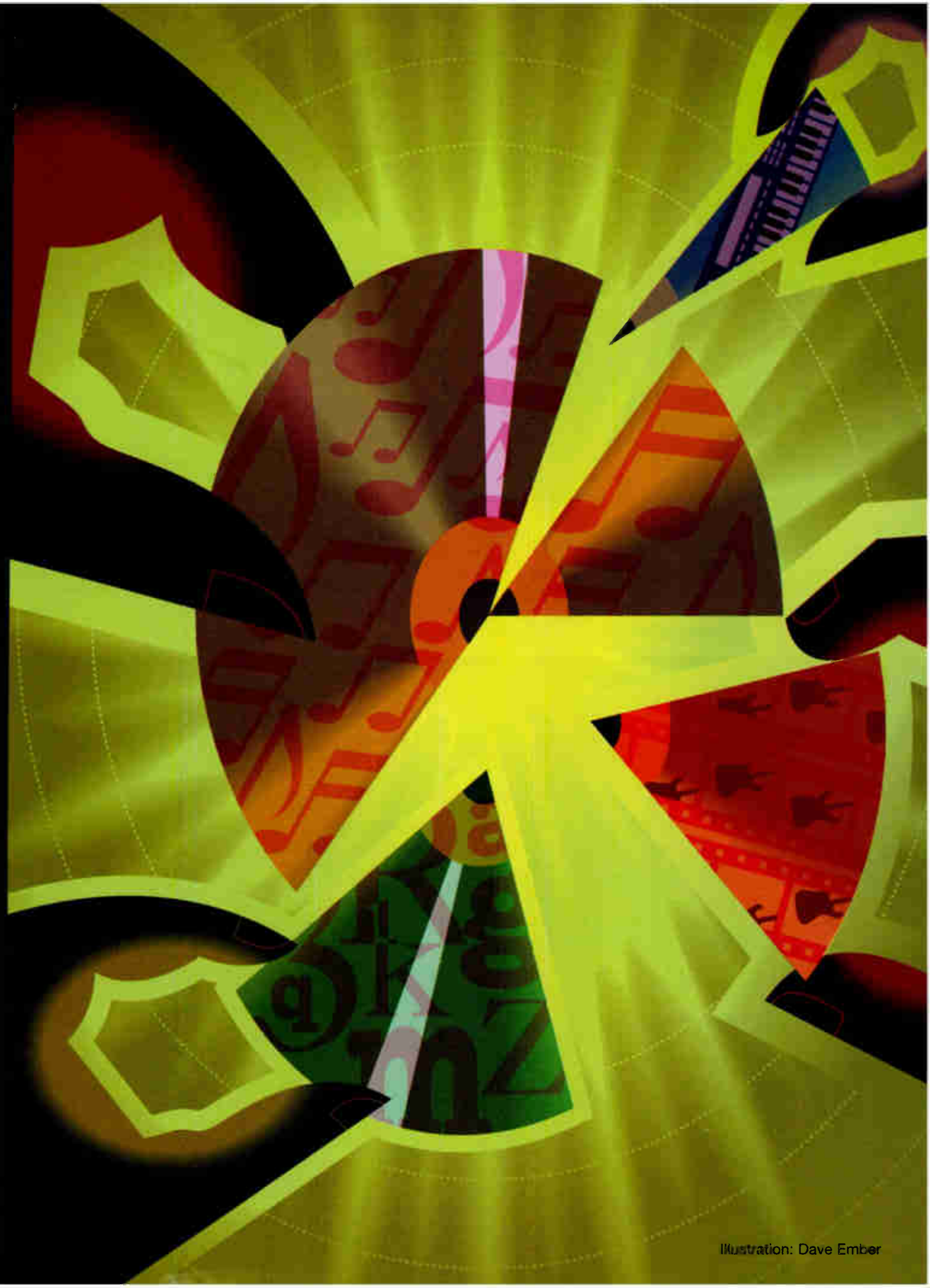
PUTTING TOGETHER THE DVD-AUDIO PUZZLE

THE DVD-AUDIO SPEC IS FINALLY IN PLACE. So, where is the flood of titles? While pro's await the impending consumer roll-out, there's still much to learn about what goes into creating DVD-Audio. Hint: It's more than 24/96 multichannel audio.

There's usually a stage in the life of a new consumer electronics product when all the technological elements have been put in place, but the marketing effort has yet to really hit its stride. Sooner or later, the format's proponents either get their message across—and the format takes off—or they fail to make a compelling case, and their wonderful invention never gets traction.

DVD-Audio is in this limbo stage right now. The format's development was as agonizingly slow as any in memory, and the "launch"—if one can call it that—appears to be more of the same. There's little evidence of a concerted effort like the one that kick-started the Compact Disc. The good news is that universal DVD players, which handle both DVD-Audio and DVD-Video, are available in stores, though they still make up a small percentage of the players on display (perhaps because they are priced significantly higher than basic DVD-Video players). But the same major labels that spent years working with electronics manufacturers to define the specification are in a state of suspended animation when it comes to putting out titles.

by Philip De Lancia



Aside from the obvious effect of leaving would-be "early adopters" without much to play in their new machines, the reluctance of major labels to take risks with DVD-Audio creates a vicious circle in the production realm. With few titles on the release schedule, there's little incentive for mastering houses or DVD facilities to invest the time and money that it takes to be able to create DVD-Audio masters. And the dearth of DVD-capable mastering houses seems to reinforce the labels' apparent judgment that the format just isn't ready for a big push.

Despite limited incentives, however, some facilities have forged ahead with acquisition of DVD-Audio capabilities. As in the early days of CD, these pioneers have been honing their technique with independent label projects while they wait for the majors to break open a more mainstream market. From their experience, we can learn about the why and how of making a DVD-Audio title.

**MORE THAN AUDIO**

The first thing to keep in mind about DVD-A is that it's more than simply an audio format. It's actually a multimedia for-

mat that supports high-resolution audio and uncompressed PCM surround sound. (For a complete explanation of DVD-Audio's capabilities and organization, see "Music Meets Multimedia: Understanding the DVD-Audio Format" in the December 2000 issue of *Mix*.)

With DVD-A, your album can be simply a very high-quality Pure Audio title, with 24-bit resolution at sample rates up to 192 kHz for stereo program and 96 kHz

for surround (up to six channels). But an album may also include features such as graphics, photos, animation, clickable lyrics and even music videos. And, unlike attempts to combine the features of music CDs and CD-ROM into an "enhanced" CD, DVD-A plays back on a set-top player, so you don't need to sit at a computer to enjoy a title's multimedia components.

DVD-A's multimedia capabilities serve to clarify for consumers—many of whom won't notice the improved audio resolution—the distinction between DVD-A and CD. But the same features actually blur the line between DVD-A and its close relative, DVD-Video. DVD-Video also supports uncompressed surround sound (20-bit/48 kHz for six channels), as well as higher resolution than CD (up to 24-bit/96 kHz for stereo). And its interactive video capabilities are more advanced than those of DVD-A.

Because DVD-A supports higher-fidelity, lossless surround, the format is what the record and recording industries have wanted for years.

Because the two formats share a single name (DVD) but vary in their capabilities, the similarities make confusion inevitable, not only among the general public, but even within the music industry. James Moore, technical director and operations manager at Metropolis DVD in New York City, says clients often "don't understand that DVD-A is very different than the DVD

# True blue.



## S-com plus Stereo Compressor/Limiter

It combines a feature-rich Compressor/Limiter, Expander/Gate and Enhancer offering precise control. And its logical front panel layout with extensive metering makes it easy to use. The *plus* is for its useful De-Esser that removes sibilance from vocals and reduces overly bright audio. Most importantly **S-com plus's** audio path employs super low-noise VCAs with vast headroom and imperceptible distortion for transparency and sonic integrity.

And it carries S Class's assurance for intelligent design, superior functionality and unparalleled performance.





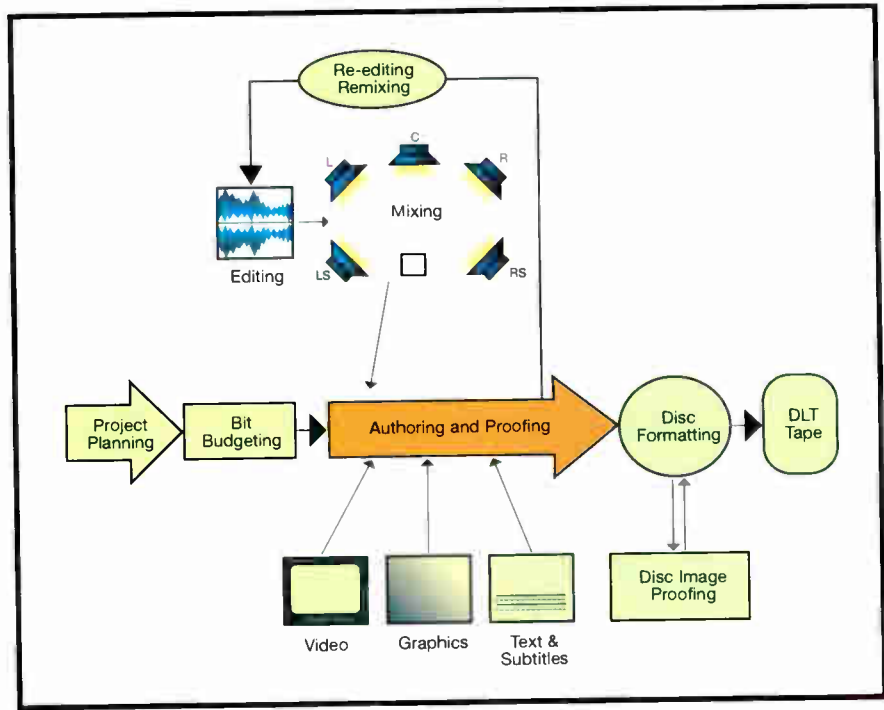
that they know, and that it requires a new player. Most people think that DVD-A is just a DVD with music instead of movies."

#### STUDIO EXPERIENCE IN THE HOME

With DVD-Video already well-established, why use a brand-new format with virtually no installed base of players? "The DVD-Audio format has some wonderful features, and I'm sure it will continue to flourish," says Brian Lee, chief DVD authoring and graphic design engineer at Gateway Mastering and DVD in Portland, Maine. "Its advantages are high-resolution audio streams, browseable stills with music playing, and the opportunity to play the disc without a TV monitor for playback in a car or Walkman."

"One of the main reasons clients have chosen DVD-Audio over DVD-Video is because of the quality of audio available on the format," adds Kurt Alexander of DVD-Audio client services at Panasonic Disc Services Corporation in Torrance, Calif. "DVD-Video can play back PCM audio, but due to the capacity limitations after video elements are accounted for, the preferred format in DVD-Video is generally Dolby Digital or DTS. This type of audio, unfortunately, uses a 'lossy' type of compression."

Because DVD-A supports higher-fi-



Workflow of an integrated DVD production environment

delity, lossless surround, Alexander continues, the format is what the record and recording industries have wanted for years. "Clients want to be able to place the listener into the actual recording environ-

ment that resembles what the music was intended to sound like in the studio," he says. "A 6-channel, 96kHz/24-bit recording will convey a new understanding and truer interpretation of what the artist or

## Different shades of blue.



### S-phone Four Channel Headphone Amplifier

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The **S-phone**, like the entire Samson S Class range, represents a new perspective on audio processing tools.

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band originally intended on the recording. Some clients see the current 2-channel, 16-bit/44.1kHz format as an option not worth attempting on future projects."

Ari Zagnit, DVD developer at Henninger Interactive Media Services in Arlington, Va., agrees with Alexander's assessment. "If you ever talk to an audio engineer," he says, "the one thing that they all seem to say about their productions is, 'Man, if they could only hear what I hear.' DVD-Audio can provide that experience. The primary goal in creating a DVD-Audio disc is to try and re-create the control room

experience in the home environment."

Unfortunately, according to Gateway's Bob Ludwig, DVD-Audio's potential fidelity is undermined somewhat by manufacturers' implementations of players. "DVD-Video maintains a huge advantage over DVD-A by offering stereo 24-bit/96kHz digital outputs to work with one's favorite audiophile D/A converter," Ludwig says. "We are unable to use our converters with DVD-A players, which is a shame. The quality of the converters built into DVD-A players, like those built into DAT machines, are quite poor in

comparison to a professional converter and unworthy of the format."

**WORKING IN BOTH WORLDS**

Whatever the relative technical merits of the two formats for music applications, there can be little argument that DVD-Video offers an installed base that dwarfs that of the newcomer. Through the end of 2000, 14 million DVD-Video players had been sold in the U.S. alone, with the worldwide installed base expected to top 28 million by the end of this year. For that reason, many of the independent labels testing the DVD-Audio waters are choosing to combine DVD-Audio and DVD-Video on the same disc (made possible by the versatility built into the underlying DVD specification). The discs are designed to play as DVD-Audio in DVD-Audio and Universal players, and as DVD-Video in DVD-Video players.

"Most clients want the high-resolution audio that DVD-Audio has to offer," Lee

**DVD-A is not something that you can just easily add to your existing mastering facility. The way it is now, it is complex, costly and time-consuming.**

*—James Moore, Metropolis DVD*

says, "but also want the backward compatibility of DVD-Video. To cover the widest installed base, every title we've produced is a hybrid DVD-Audio and Video title."

As an example of this phenomenon, Alexander says that one of PDSC's DVD-A clients, 5.1 Entertainment, already has a catalog of music DVD-Video titles. The titles are now being reissued as DVD-Audio discs that incorporate the original DVD-Video content.

Not surprisingly, covering two formats on one disc can complicate the title preparation process for DVD-Audio, which is already far more complex than that of CD. Depending on the types of titles and the production workflow, the various engineers involved will have to be familiar

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with a range of tools that used to be foreign to the production of audio formats.

"Our menu designs—static and motion—are completed using Discreet Edit and Combustion, Adobe After Effects, Adobe Photoshop, and 3D Studio MAX," Lee says. "Video and motion menus are encoded using hardware encoders from Optibase and Sonic Solutions. DVD-Audio authoring is done with Sonic DVD-Audio Tools, and DVD-Video authoring is done with Sonic Scenarist. We also use Macro-media Director, Visual Basic and Interactual PC Friendly to produce DVD-ROM content."

Clearly, there's a lot more going on here than in the typical audio mastering scenario. Of course, the entire process of DVD-A title preparation need not be handled by a single individual. In fact, in a high-throughput facility, the norm will be different specialists handling the various phases of production: An audio engineer will master the title's audio, video engineers will prepare and encode any motion video content, and graphic designers will create still images and the "look and feel" of menus.

The person in charge of pulling all these elements together is the title's au-

thor, a specialist in interactive multimedia who defines the menu structure and navigation and outputs the final master that goes to the disc replication plant. "The authoring engineer for a DVD-Audio title," Lee says, "needs to know the extremely complicated DVD-Audio and DVD-Video specifications inside and out."

#### A LONG AND WINDING ROAD

At PDSC, the title development process begins with the client, working to develop navigational flowcharts describing the behavior and functionality of the disc. These serve as a blueprint for authoring. At the same time, project elements created outside the facility are delivered to the various departments in their required formats.

Alexander says that PDSC's audio studio captures audio from many digital source formats, including Sonic Solutions HD sound files, Euphonix R-1 formatted sound files, Genex 8200 MO discs, .WAV files and .AIFF files. The studio converts these formats to PCM and is also equipped to encode to the Meridian Lossless Packing (MLP) format, which allows DVD-Audio to play back 6-channel, high-resolution

sound without exceeding the available bandwidth of just under 10 Megabits per second. The studio also handles Dolby Digital (AC-3) encoding, decoding and watermarking.

Video normally comes in on digital formats such as D-5 or Digital Betacam; D1 and DVCPro are also accepted. Encoding to the MPEG-2 format used in DVD is accomplished on a three-pass Panasonic video compression encoder.

As for artwork such as still graphics and menu backgrounds, Alexander says it can be supplied in a number of formats, and that color hard copies should be included for reference. "Our design group has full creation capabilities for development of static, motion and animated menus," he explains. "We can either create menus in-house from scratch or make minor changes for clients who prefer using outside design vendors." The design group also verifies that artwork meets the proper specifications for DVD-Audio, taking into account such factors as the resolution, color saturation and overscan (safe area) of the NTSC (or PAL) television system.

Once the incoming elements are distributed to the proper departments and encoded, the resulting "elementary streams"



PE 1 C - Program Equalizer



EQ 1 A - Equalizer



MEC 1 A - Recording Channel



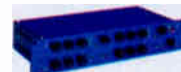
MP 1 A - Microphone Preamplifier



CL 2 A - Compressor



CL 1 B - Compressor



LCA 2 B - Stereo Compressor and Limiter

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# RAVE REVIEWS

*The Rode NT1000 Launches With Rave Reviews*



"...the lowest noise floor you can get."

"These microphones are standard-setters that the entire industry would do well to study."

- Bruce Richardson

Bruce Richardson - ProRec Recording Magazine  
The complete review is available at [www.prorec.com](http://www.prorec.com)

"The U87i was woolier, the NT1000 clearer and slightly brighter. Over time, I became bothered by the self-noise of the U87i, because it veiled the low-level detail that was audible with the NT1000 and NTK."

"In every situation, both the NT1000 and NTK had lower self noise than either U87."

- Ty Ford

Ty Ford - Mix Magazine  
The complete test report is available at [www.mixonline.com](http://www.mixonline.com)  
and in the June 2001 Issue of MIX magazine.

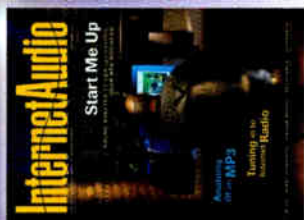
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# Internet Audio

(audio, video, still images and overlays such as lyrics) are quality-checked by a QA technician and/or the client. "If any corrections are needed," Alexander says, "project management will contact the client to discuss possible solutions. Depending on what needs to be corrected, the appropriate group will be contacted and the changes will be applied to the project. At that time, the client and/or a QA technician will review any changes and submit an approval."

When the project's elementary streams are approved, they are posted to a server and the project is assigned to an authoring engineer. Authoring procedures, Alexander explains, mainly consist of creating title structure and menu navigation, setting pre- and post-commands, and defining color palette, start-up logic and default player settings. Then the project is formatted by the authoring system into a DVD disc image, which is reviewed for any violations of the specification. "If the verification software finds any violations," he says, "corrections are made to the project while maintaining the original disc behavior that was approved by the client."

A verified disc image is then burned onto a DVD-R, which is submitted to the QA Group and to the client for preliminary testing. "The testing consists of a linear pass of all audio and video elements," Alexander says, as well as "complete navigational testing of all menus and pages with reference to the flowcharts supplied by the client. A checklist describing the specific behavior of disc functionality normally accompanies each QA test of a project." If corrections are required after testing, then the project will be resubmitted to the appropriate department, rebuilt and burned again to a DVD-R for further review.

Once the QA group and the client approve the project, verification software is again used to ensure that the final disc image doesn't include any violations of the specification. A DLT tape is created with all of the necessary flags for CSS, Macrovision and CPPM encryption. Alexander says the current system available for CPPM only works offline: The DLTs must be dumped back to a hard drive, the disc image scrambled using the encryption software, the result uploaded back to DLT and the whole thing verified again.

At this point, the project is ready for replication of check discs. "The testing procedures that were completed on a DVD-R are now reapplied to the check discs," Alexander says. "This provides more detailed information on disc behav-

ior, functionality and player compatibility." In addition to complete testing of audio, video and navigation, the disc is checked in several different models of DVD-A players. The discs are reviewed by the client as well, and when written approval is submitted, replication begins.

## A DEMANDING PROCESS

With such a demanding process, it's clear that putting together a DVD-A can be fairly costly, which no doubt contributes to the majors' malaise. Of course, a Pure Audio disc, with none of the navigational or multimedia components to complicate preparation, is much less difficult. And even for multimedia discs, the process is currently more challenging than it really needs to be, because authoring tools for DVD-A are, so far, much less developed than those available for DVD-Video.

"The tools that exist today," Moore says, "are very primitive. We're in dire need of proofing and programming tools that compare with those of other multimedia formats. DVD-A is not something that you can just easily add to your existing mastering facility. The way it is now, it is complex, costly and time-consuming."

That situation may change as Sonic Solutions integrates DVD-Audio tools from Matsushita (MEI) into its well-established DVD-Video authoring systems. "With the acquisition of MEI DVD-Audio tools by Sonic," Lee says, "we are hoping for a faster way to develop DVD-A titles. The authoring tools need to become more user-friendly. This will help speed up the development of current titles, though having an entire format based on a single supplier is a little scary."

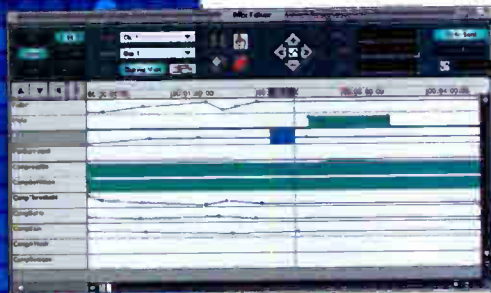
Better tools alone, however, are unlikely to be the crucial factor in DVD-Audio's success. Eventually, it will come down to consumers, and whether they've been adequately wooed by labels and hardware makers. "As the prices on players begin to drop," Zagnit says, "we should see more people buying Universal DVD players as opposed to DVD-Video only players. Will it reach the acceptance level and achieve the sales pace that DVD-Video has attained? I sure hope so. But I don't know that anyone can say with any certainty." ■

*Neu-technologies editor Philip De Lancie is a freelance writer on media production techniques and technology, and is co-author of the book DVD Production from Focal Press.*

# WE'VE ADDED SO MANY NEW FEATURES THAT WE SHOULD PROBABLY CALL IT THE DIGITAL 8-BUS MK. 3.0



*Mackie Real Time OS™ 3.0 Fat Channel Screen.*



*New 3.0 Mix Editor Window*



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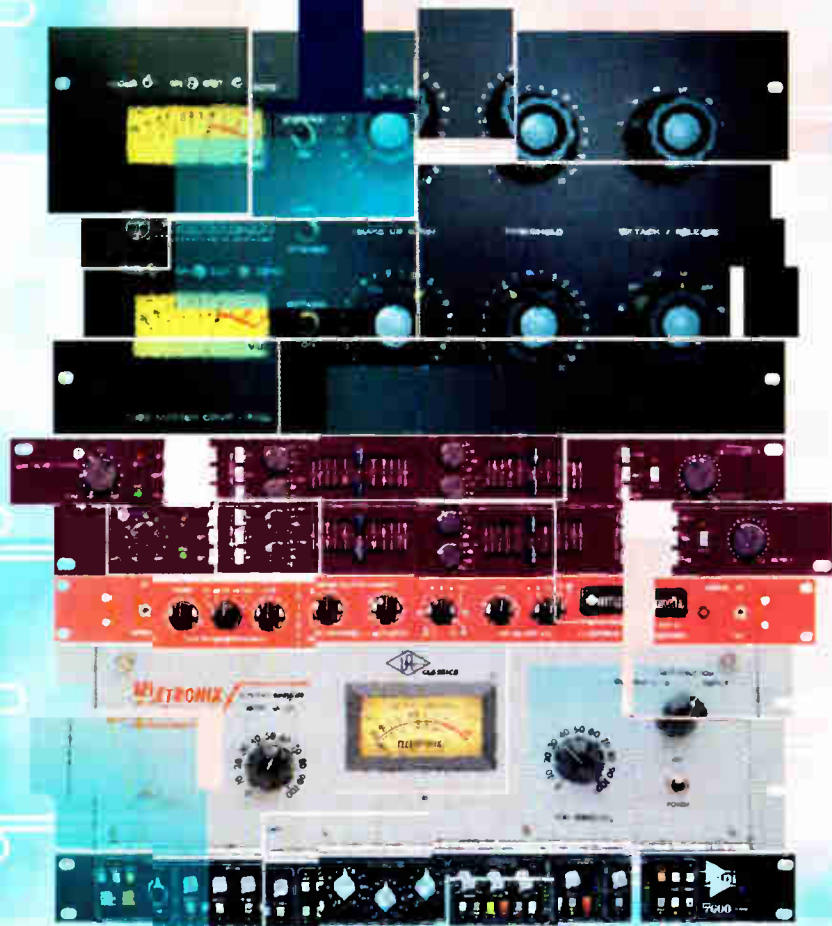
We could go on and on. But the main point is that if you buy a Mackie Digital 8•Bus now, you're not just getting a superb, productivity-boosting creative tool. You're buying the only digital console with an open architecture that provides for future enhancements, too. Mackie Real Time OS™ 3.0 is dramatic proof...and there's more to come.

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# SN Neo-Retro Analog Signal P Processors



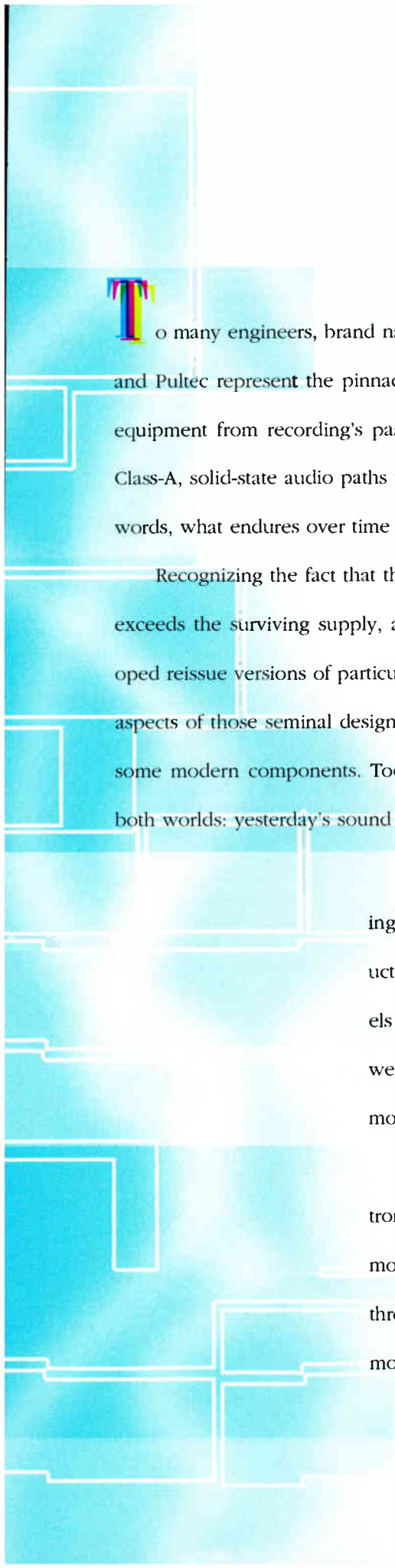
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**NEW FACE**





**T**o many engineers, brand names such as Teletronix, Fairchild, Neve and Pultec represent the pinnacle of audio quality. The most heralded equipment from recording's past typically features all-tube or discrete, Class-A, solid-state audio paths with point-to-point handwiring. In other words, what endures over time endures for good reason.

Recognizing the fact that the demand for vintage signal processors exceeds the surviving supply, a number of manufacturers have developed reissue versions of particularly desirable designs, or have adapted aspects of those seminal designs to new creations that also incorporate some modern components. Today, it seems, we can have the best of both worlds: yesterday's sound in a brand-new box.

We've spotlighted a selection of these "neo-retro" offerings, including analog compressor/limiters, EQs and mic preamps. All of these products are closely based on vintage gear designed before 1980; some models are straight reissues. And for the purist who prefers the originals, we've also listed companies that offer new rack housings for vintage modules (see "Restoring the Genuine Article," page 108).

Whether you're looking for an up-to-date repackaging of classic electronics or a "new retro" device, the goal of combining vintage sounds with modern reliability is no longer an elusive dream. The following presents three dozen such products, listed alphabetically by manufacturer, and for more information, a section of phone and Web contacts is provided.



API 7600

## ANTHONY DEMARIA LABS ADL 1000 AND ADL 1500

The ADL 1000 Mono Tube Compressor (\$1,695 list) is closely based on the famed Teletronix LA-2A optical leveling amplifier and employs that unit's original T4 electro-optical cell and Allen-Bradley pots. The 1000's all-tube audio path features input and output transformers that are produced in-house. And while the off-the-shelf 12AX7A tubes, power transformer, power supply, caps and resistors differ from the respective

(\$825) is a single-channel module based on the original, 1967-vintage API 512. Designed around the API 2520 op amp, the 512c fits into 2, 4 and 10-slot API-powered racks, as well as API Legacy and Classic Consoles. For convenience, rear panel XLR mic and 1/4-inch, hi-Z, unbalanced line inputs are duplicated on the front panel. There are front panel switches for polarity inversion, 48V

phantom power, -20dB mic/line input pad and mic/line input switching. Metering is via a 7-segment LED (with VU ballistics). The continuously variable gain control dishes out 10 to 65 dB of gain for mic signals, and 14 to 50 dB for line/DI signals. The 512c will take up to +30 dBu before barking.

company's original 525 solid-state comp/limiter from the early '70s. Designed to fit 2, 4 or 10-slot API-powered racks, the fully discrete 525 packs a lot of controls onto its economical faceplate: input and output level control knobs, ratio switches (2:1 or 20:1), Auto Release mode switches (offering 0.1, 0.5, 1.5 and 2.0 seconds release time), a switchable de-essing filter for the sidechain, VU-type gain reduction meter and hardwire bypass switch. Additionally, a "ceiling" fine-tune knob simultaneously varies the threshold and makeup gain to keep output levels constant. The 525's attack time is fixed at a warp-speed 15 microseconds, and up to 25 dB of gain reduction is possible. API's proprietary 2510 and 2520 op amps give the 525 its distinctive sound.



Anthony DeMaria Labs ADL 1500

components used in the original LA-2A, all are interchangeable with the vintage leveler's parts. The archetypal two-knob design (employing peak reduction and gain controls) facilitates fast and easy setup. XLR I/O, VU metering and stereo-linking capabilities are standard.

The ADL 1500 Stereo Tube Compressor (\$2,995 list) is a dual-channel version of the ADL 1000, featuring virtually the same circuit design. Independent controls and VU meters serve the two independent channels.

## API 212L, 512C, 525, 550B, 7600

Part of API's L200-powered rack system, the API 212L Mic Preamp Module (\$625) uses the same circuit design as the legendary API 512b preamp and the preamps in the company's Legacy Series Console. The modular unit's all-discrete, solid-state circuitry utilizes API's proprietary 2520 op amp, an RE-115K input transformer and an AP-2623 output transformer. The clip point is a hefty +28 dBm. Features include switchable 48-volt phantom power and -20dB pad, a 5-segment LED meter with VU ballistics and a continuously variable gain control that offers up to 55 dB of gain.

The API 512c Mic/Line Preamp/DI

The API 525 Feedback Compressor/Limiter (\$1,295) is a reissue of the com-

pany's original 525 solid-state comp/limiter from the early '70s. Designed to fit 2, 4 or 10-slot API-powered racks, the fully discrete 525 packs a lot of controls onto its economical faceplate: input and output level control knobs, ratio switches (2:1 or 20:1), Auto Release mode switches (offering 0.1, 0.5, 1.5 and 2.0 seconds release time), a switchable de-essing filter for the sidechain, VU-type gain reduction meter and hardwire bypass switch. Additionally, a "ceiling" fine-tune knob simultaneously varies the threshold and makeup gain to keep output levels constant. The 525's attack time is fixed at a warp-speed 15 microseconds, and up to 25 dB of gain reduction is possible. API's proprietary 2510 and 2520 op amps give the 525 its distinctive sound.

The API 550b 4-Band Switchable Equalizer (\$1,295) is a reissue of the 1967-era 550 EQ, but with the addition of an extra frequency band and several new frequencies. Each band offers peaking filters with  $\pm 12$  dB of boost/cut and a choice of seven center frequencies spanning four or five octaves. There is considerable overlap between frequency bands, and bands 1 and 4 can be switched to shelving-type response. API's "Proportional Q" circuit design automatically narrows the filter's Q as boost/cut is increased. The 550b uses the API 2520 op amp and can



Fairman TMC

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# Neo-Retro Analog Signal Processors

take levels up to +30 dBu before clipping. The module is built to live in 2, 4 or 10-slot API-powered racks.

The API 7600 Input Module (\$2,995) is a rackmountable, 4-bus channel strip. It's loaded with a mic pre, equalizer, compressor, sends, buses and solo. The mic pre is the 212L from the 200 Series Legacy Console. The EQ is basically a reissue of the vintage 550A 3-band EQ,



Langevin EQP1-A

except that it offers seven center frequencies per band. The compressor is the 225L, found in current all-discrete API Legacy Consoles. Other features include panning, mute group, insert and metering facilities, the latter consisting of three 7-segment LED displays with VU

ballistics. The API 2520 op amp does the heavy lifting in this internally powered jack-of-all-trades. All I/Os are on the rear panel. Several 7600s can be linked together and interfaced with the API 7800 Master Module (\$2,495), which provides the functionality of a mixer's master section, to create a custom console.

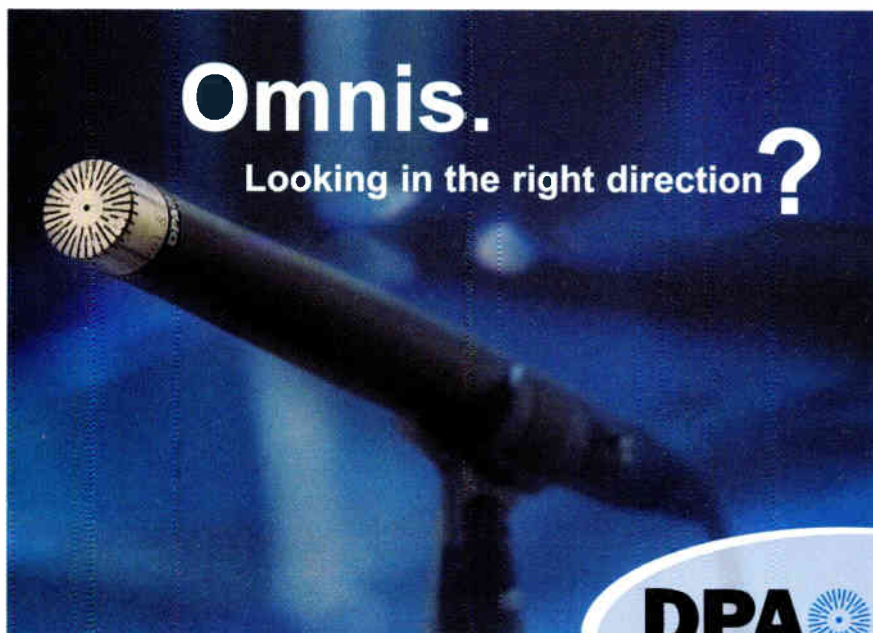
## EAR 660, 822Q, 823MQ

Esoteric Audio Research's 660 Fairchild-type (hybrid) tube limiter/compressor (\$4,250) is designed to operate with the minimum of interference below threshold. Attack/release times are similar to other comp/limiters, but its characteristics around the "knee" of the attack/decay envelope contribute to its excellent performance. EAR's 822Q Pultec-type program equalizer (\$3,290) has passive filters—designed for minimal phase shift/ringing—followed by a balanced tube output amplifier stage. Variations include low-pass, highpass, bandpass filters and HF/LF shelf, with variable Q and turnover frequency. The EAR 823MQ mid-EQ (\$3,290) is a mid band variant on the 822Q, with fewer but more closely spaced facilities over a narrower frequency span for greater precision in this critical band.

## FAIRMAN TMC AND TMEQ

Based on the classic Fairchild 660 (mono) and 670 (stereo) tube compressors, the Fairman Tube Master Compressor, or TMC (\$8,000 U.S. list), sports independent makeup gain controls that are adjustable in 0.5dB increments. The unit's threshold controls are switched in 0.125 to 0.5dB increments throughout its range. Combination attack/release controls are also provided for each channel. The rackmountable, 6U, 55-pound behemoth can be linked for stereo operation. Large VU meters show audio levels or gain reduction. Sixteen tubes glow inside the unit: two quartets of matched ECC81s and ECC82s per channel. Input and output transformers are handwound over mu-metal cores. Other features include a Class-A VCA; 20-position, gold-plated switches; and an externally located main transformer (to preclude hum).

The Fairman Tube Master Equalizer, or TMEQ (\$8,000 U.S. list), uses the same



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# Stereo-Retro Analog Signal Processors

frequency-controlled tube amplifier design as was used in the Klein+Hummel Universal Equalizer UE-100 in the late '60s. In order to maintain precise control when treating stereo program material, this 2-channel, 6-band, all-tube equalizer features only switch controllers for adjusting center frequency, boost/cut and Q settings. Each channel sports two parametric mid bands, separate low-cut and low-boost bands, and separate high-cut and high-boost bands, with considerable overlap between bands. The 6U, rack-

mountable unit is completely handbuilt and houses no less than 22 tubes! Other features include independent hardwired bypasses for all 12 amplifier circuits, a master hardwire bypass, and input/output gain switches that provide  $\pm 6\text{dB}$  boost/cut in 0.75dB increments.

## MANLEY STEREO VARIABLE-MU LIMITER COMPRESSOR, ENHANCED PULTEC EQP1A, MID-FREQUENCY EQUALIZER AND MIC/EQ 500 AND LANGEVIN EQP1-A

Based on the old Danish DISA limiter, the Manley Stereo Variable-Mu Limiter Compressor (\$4,000) uses 5670 variable-mu, dual-triode tubes as the gain control elements for its two channels. A ganged input level control is shared by both channels, suggesting mixing and mastering

applications as the unit's *raison d'être*. However, the channels can be linked or operated independently, and you can make different adjustments to the independent threshold, attack, recovery (release) and make-up gain controls on each channel for dual-mono applications. Independent Limit/Compress switches further facilitate this flexibility. In Compress mode, the Variable-Mu delivers a mild 1.5:1 ratio. Limit mode gradually increases the ratio from 4:1 to 20:1 as increasing input gain is applied to the 5670 tubes. Large, illuminated Sifam VU meters, balanced I/O and independent bypass switches further grace each channel of this all-tube-path squeeze machine.

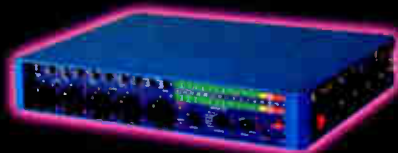
Manley Laboratories is the only authorized manufacturer of the original Western Electric passive EQ circuitry that was used in the highly sought-after vintage Pultec. The Manley Enhanced Pultec EQP1A (\$2,150) and Mid-Frequency Equalizer (MEQ-5-type; \$1,750) are updated versions of these seminal *ton-meisters*, offering additional frequencies to those found in the original Pultecs. Manley also used its own tube stage and power supply designs, plus modern componentry with higher tolerances throughout the signal path, to bring the



Manley Stereo Variable-Mu Limiter Compressor

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# Neo-Retro Analog Signal Processors

two 1U, rackmountable EQs into the 21st century (a 2U, stereo version of the EQP1-A is also available for \$3,300). Both units can be set to flat response or bypassed entirely. The EQP1A uses one 12AU7WA and one 6414 tube in its all-tube makeup gain stage. Manley also offers the Langevin EQP1A (\$1,275), which is essentially identical to the Manley unit having the same model number, except that the Langevin employs an all-discrete, solid-state makeup gain stage.

The EQP1A and Mid-Frequency equalizers both provide transformer-balanced and transformerless, unbalanced rear panel I/Os, while all I/Os for the Langevin EQP1A are transformerless. The Manley Mid-Frequency Equalizer offers sharper dip/peak curves than the Manley EQP1A and also fills in some of the frequency gaps of the latter unit.

The Manley Mic/EQ 500 Combo (\$2,900) is, as the name suggests, a combination mic preamp and equalizer. Both processing sections can be used independently of one another. The unit's passive EQ section is closely based on the Art Davis EQ 500 design from the '60s, but differs in that it offers a choice of Peak or Shelf modes for each band. Manley also used its own differential tube stages and power supply for the unit. Davis' 2dB stepped switching design never puts more than three components in the audio path, maintaining signal purity. The fully differential, all-tube, single-channel Mic/EQ 500 offers a VU meter, insert point, high-current 48V phantom power, mic input phase reverse and up to 55 dB of total gain from input to output. As with all of the above-mentioned Manley and Langevin models, a special mastering version is available.



*Mercury 66 Limiting Amplifier*

## RESTORING THE GENUINE ARTICLE

A few manufacturers specialize in "rehousing" vintage signal processors in new rackmount hardware. In many instances, the modules are recapped and refurbished to meet original specifications. Here's a quick look at who's putting a new face on old favorites.

**Boutique Audio & Design** makes custom and standard rackmount housings for a variety of vintage audio devices, such as Neve (1272, 1066, 1073, 1081 and 1084) and Telefunken (V76 and V72) modules. All include rear panel XLRs and power supplies.

**Brent Averill Enterprises** offers classic Neve 1272 mic preamps; Neve 1064/A, 1066, 1089 and 1073 equalizer/preamps; the Neve 2254 compressor/limiter; the Calrec 1061/1161 equalizer/preamp module; and mic pre's made from vintage API components. Most units are rackmountable and have their own power supply. The API

pre's require an API or Aphex LunchBox-powered rack.

Looking for a pair of Telefunken/Siemens V72s or V76s? **Marquette Audio Labs** offers these in rack housings. Also available are Telefunken V672 module pairs; Neve 1073, 1084, 1081 and 33114/33115 preamp/EQ dual modules; the Neve 1272; Langevin AM16 pairs and "six packs"; Calrec 1061, 1161, PQ14 and PQ15 modules; and miscellaneous Siemens, Telefunken and Neumann discrete preamps and EQs from the '70s.

**Vintage King Audio** takes Neve 1066, 1073, 1089, 1081 and 1095 modules and gives them a brand-new home. Amenities include an internal power supply, rear panel XLR I/O, switchable 48V phantom power and DI input—all in a custom, self-enclosed rack. Vintage King also offers the Audix 35102, the Calrec 1161, and Decca, Telefunken and Helios equalizer/pre's.

### MERCURY 66, EQ-H, EQ-P, M72 AND M76

All of Mercury Recording Equipment's products feature all-tube audio paths, transformer-balanced I/O and point-to-point handwiring. Chassis and front panels sport a distinctive 1950s look, with engraved lettering and either powder coating or baked-enamel finishes.

Due out this fall, the Mercury 66 Limiting Amplifier (\$5,999 list) is based on the famed Fairchild 660 Variable-Mu compressor. The Mercury 66 offers 2:1 compression and 20:1 limiting, as well as all ratios in between (transitioning gradually to the higher ratios as input levels increasingly exceed the threshold). The 66 dishes out a lickety-split 50-microsecond attack time. The release time varies from

0.3 ms to 25 seconds, with three of the unit's six presets functioning in a program-dependent manner. The 4U rackmountable unit also offers input, threshold and metering controls. Glowing inside are 6BC8, (2) 6V6, 12BH7, 12AX7, EL34, GZ 34 and 5751 tubes.

Due to ship sometime this summer, the Mercury EQ-H Program Equalizer (\$2,399 list) is based on the Pultec equalizers of yesteryear. Continuously variable controls afford  $\pm 16$ dB boost/cut on high frequencies and 13.5 dB of boost and 17 dB of cut on lows. The transformer-balanced I/O and single-ended makeup gain amplifier remain true to the original Pultec. At your command are five low-shelf boost and cut frequencies, nine mid- and high-boost frequencies and a high-shelf cut at 10 kHz. 12AX7 and 12BH7 tubes warm things up.

Also due to ship sometime this summer is the Mercury EQ-P Program Equalizer (\$2,899 list), another Pultec-type spin-off. It departs most noticeably from the EQ-H in its offering of three high-shelving cut frequencies at 5, 10 and 20 kHz, and slightly greater amount of boost in the mid- and high-peaking filters. Also, the tubes that are used are 12AX7 and 12AU7. Continuously variable gain controls, transformer-balanced I/O and a fully balanced (push-pull) makeup gain amplifier remain true to



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# S Neo-Retro Analog Signal Processors

the original Pultec EQ. The only modern twist here is a rear panel switch that allows you to remove an interstage transformer for a different sound.

Due to ship this winter, the Mercury M72 Studio Microphone Amplifier (STBA) is a dual-channel offering in the tradition of the classic Telefunken Studioverstärker V72, which was used by The Beatles in

their early recordings at Abbey Road Studios. Features will include 34 to 56 dB of gain, phase reverse, -15dB input pad, switchable phantom power and a transformer-balanced DI input. Two EF 86 tubes will light up your world.

Also watch for the Mercury M76 Studio Microphone Amplifier (STBA) sometime this winter. Based on the Telefunken Studio-Mikrofonverstärker V76 of the late '50s and '60s, the dual-channel M76 will add a line input, imped-



Neve 33609/J (top) & 1081

ance selector and output fader to the classic design. Other features will include phase reverse, -15dB pad, switchable phantom power and a transformer-balanced DI input. Two EF 86 tubes are used here, as well.

#### NEVE 1081 AND 33609/J

The Neve 1081 Channel Amplifier was first produced in 1972 for use in Neve consoles such as the 8048. The combination mic preamp and equalizer is available as a stand-alone module or in either of two multitrack forms: The 3U rack-mountable AM3631 gives you two units mounted horizontally, or the 7U rack-mountable AM3630 provides eight units mounted vertically. Both multitrack forms provide transformer-balanced mic/line I/O on XLRs, unbalanced outs on a "D" connector, phantom power and main power supply. The mic pre offers +10 to +80dB gain in 5dB steps; -15 to +20 dB of gain is available for line inputs. The EQ section consists of five switched high and five switched low frequencies (bell or shelf response), plus 10 switched high and 10 switched low-peaking frequencies with switchable high and low Q. All of these filters offer ±18dB continuously variable boost/cut. High- and lowpass filters (HPF, LPF) feature five switched center frequencies for each. Phase invert and EQ bypass switches are also included.

The Neve 33609/J Precision Stereo Limiter/Compressor is based on the circuit design first used in the classic Neve 2254 limiter/compressor, circa 1969. The 2-channel, 2U rackmountable processor is geared toward both music recording and broadcast applications. Independent sidechains and threshold, attack and recovery controls are provided for both the limiter and compressor sections on each channel. Compression ratios are switch-selectable from 1.5:1 to 6:1 in five steps, and gain reduction is shown on

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# Neo-Retro Analog Signal Processors

independent moving coil meters for each channel. The compressor's 0 to +20dB makeup gain (in 2dB steps) is situated before the limiter section. The "J" in the model name denotes the addition of illuminated master switches (Bypass, Mono/Stereo, Int/Ext) and provision for remote control. Multiple units can be linked for multichannel operation.

## PURPLE AUDIO MC76

The Purple Audio MC76 (\$2,000) is a monaural FET peak-limiting amplifier based on the UREI 1176. Attack times range from a blistering 20 microseconds



Purple Audio MC76

to 800 microseconds, enabling unique sound-sculpting capabilities that are difficult to obtain from most non-FET devices. Release times range from 50 ms to 1.1 second. As with the 1176, ratios are 4:1, 8:1, 12:1 and 20:1. The all-discrete, solid-state MC76 features transformer-balanced I/O on XLRs; a VU meter for showing output gain and gain reduction levels; a single-element, Class-A output amplifier; toroidal power transformer; heavy-gauge, stainless steel case; and numerous other "hardening" improvements.

## SHEP SN8, SN12, SNC6 AND SNDC6

UK manufacturer Shep and Associates has enlisted the help of Mr. Rupert Neve to produce several processors based on classic Neve designs.

The Shep SN8 Classic EQ Module (\$2,700) features the same basic circuit de-



Shep SN8

sign and chassis as the classic Neve 1073 mic preamp/equalizer and uses the original transformers, wire, switches and Class-A circuit architecture. However, Shep has updated the unit with a fourth band of EQ and additional passive frequency selections, making the SN8 more like a Class-A version of the Neve 1081. The head amp's sensitivity can be switched to accept either mic or line inputs via the multipin, transformer-balanced Amphenol connector on

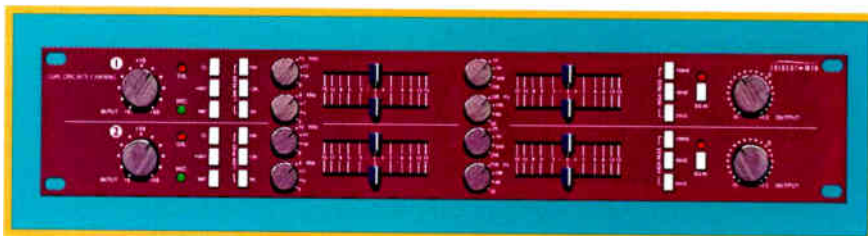
sole slots to fill out missing modules.

The Shep SN12 Classic EQ Module (\$3,425) is equivalent to the Neve 31105 (as used in the 8078 Series Neve consoles) and features the same Class AB circuit design, transformers and switches, but has been updated with a Class-A output stage similar to that used in the Neve 1073. The head amp's sensitivity can be switched to accept mic or line inputs. The EQ facilities go way beyond those offered in the SN8, adding switchable high Q settings for the low-mid and high-mid bands, switchable peak/shelving curves for the lows, an additional low-pass filter with five switched frequencies and more choices of corner frequencies for the highpass filter. The 12-inch-high module can be used to fill out same-sized slots on existing Neve consoles, interfaced via an Amphenol connector.

The Shep SNC6 Compressor Limiter Module (\$2,750) is based on the Neve 32264a compressor used in the Neve 8058, 8068 and 8078 consoles. Features include limiter threshold and recovery controls; compressor threshold, recovery, ratio and makeup gain controls; gain reduction meter; stereo link toggle; and independent bypasses for limiter and compressor sections and for the entire unit. Two Auto Attack/Release modes complement four fixed recovery settings for both the compressor and the limiter. The Shep SNDC6 (\$4,370) is basically two SNC6 modules in a 2U, rackmountable chassis, and comes complete with internal power supply and switchable stereo linking.

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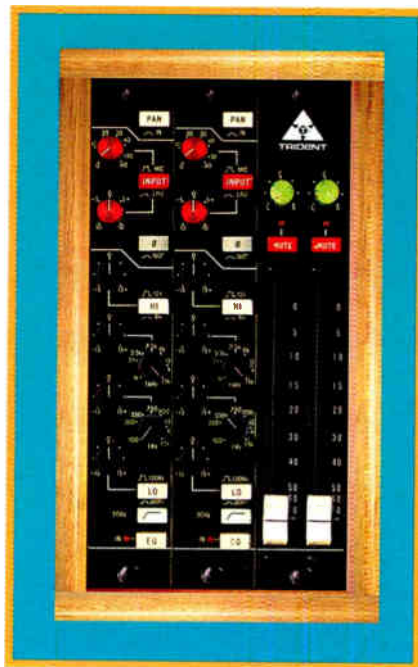
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# Neo-Retro Analog Signal Processors

channel module from the 1973 vintage Trident A Series console with minimal modifications. The Trident-MTA A-Series Dual-Discrete Channel Module (\$3,699.99 list) is a stand-alone, rack-mountable, dual-channel unit that features a transformer-coupled mic pre-amp; highpass and lowpass filters (each offering a choice of three fixed frequencies); a 4-band, inductive EQ section with a choice of four fixed frequencies per band; and a new output gain control for each channel. The mic pre provides stepped input gain control, phase reverse and phantom power. LPFs and HPFs remain true to the original unit's all-discrete, Class-A, second-order filters. Controlling the series and parallel inductive tuned circuits are 70mm linear faders in the discrete, Class-A EQ sections, and provide up to 15dB boost/cut. The new, wide-ranging output gain stage varies from +28 dB to Off. The EQ can be bypassed.



Trident Audio Developments S80

## TRIDENT AUDIO DEVELOPMENTS S80

Based on John Oram's electronic design for the 1975 Trident Series 80 console is the S80 Producer Box from Trident Audio Developments. Housed in a wood-

en box made of English ash, the S80 is essentially two input channels, but with the addition of a 48 VDC phantom power switch and balanced insert points. Features include mic and line inputs, 4-band EQ with sweep mids and high/low shelving, XLR direct channel outs, and a L/R mix bus output with pan, mute and 100mm faders. Retail: \$3,499.

## UNIVERSAL AUDIO TELETRONIX LA-2A, 1176LN AND 2-610

The Universal Audio Teletronix LA-2A Leveling Amplifier (\$3,495) is an authentic reissue of the legendary, all-tube compressor from the '60s. Virtually all-original parts were used in the reissue, including the T4 electro-optical cell, HA-100X input transformer, UTC A-24 output transformer and identical tube complement. The single-channel, 3U, rackmountable LA-2A features peak reduction and makeup gain control knobs, XLR and barrier strip I/O, and a Compress/Limit switch. Compression mode delivers a soft-knee curve with a 4:1 ratio. In Limit mode, the unit provides an infinity:1 ratio. A large, illuminated VU meter can be switched to show either gain reduction or output level, with the latter referenced to either +4 dBm or +10 dBm. The LA-2A provides up to 40 dB

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# Neo-Retro Analog Signal Processors

of gain reduction.

The Universal Audio 1176LN Limiting Amplifier (\$2,295) is a faithful reissue of the late '60s-era, blackface (D and E revisions), solid-state dynamics processor. The 1176LN's FET gain control element delivers lightning-fast attack times as short as 20 microseconds (and as long as 800 microseconds), allowing creative sound sculpting on drums (and other sources) that's just not possible with most non-FET-based compressors. Release times range from 50 ms to 1.1 seconds. Ratio values (4:1, 8:1, 12:1 and 20:1) are switched by push buttons on the front panel; pushing two or more buttons simultaneously creates a unique, urgent sound. Front panel features include continuously variable input, output, attack and release control knobs. An illuminated VU meter can be switched to show either output or gain reduction level. Rear panel connections are via XLRs and barrier terminals.

## MANUFACTURER'S CONTACT INFORMATION

**Anthony DeMaria Labs** 845/256-0032; www.adl-tube.com  
**API** 410/381-7879; www.apiaudio.com  
**Boutique Audio & Design** 818/340-6930; www.boutiqueaudio.com  
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**Vintage King Audio** 313/965-0645; www.vintageking.com  
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The Universal Audio 2-610 Microphone Preamplifier (\$2,295) incorporates the mic preamp section from the 1950s-era 610 tube recording console, which was used to record Frank Sinatra, Sarah Vaughan, the Beach Boys and others. The 2U, rack-

mountable 2-610 uses the same tube complement and componentry values as the vintage console, but a higher-quality power supply, polypropylene caps and metal film resistors bring the mic pre up to today's standards. Newly added features for

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One of the best vocal mics in the world is the \$300 Studio Projects C1. You can spend way more for "one of those" mics from Germany if your ego demands it, but the C1 is certainly the sonic equivalent.

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# I CAN DO IT ALL BY MYSELF.



The Yamaha AW4416 is all the studio you need to single-handedly record, mix and master a multi-platinum CD. This digital audio powerhouse comes fully equipped with every feature, specification and extra you could possibly want, including many crucial items our competition inexplicably left out. And it's all integrated with the signature style, performance and innovation that's put Yamaha digital gear in a class by itself. Once again, Yamaha gives you more for less.

**NO DATA COMPRESSION** – The AW4416 delivers full-fidelity 24-bit or 16-bit audio all the time on all 16 tracks

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**02R LEVEL DIGITAL MIXER** – Motorized fader automation accompanies an internal digital patchbay providing infinite routing options

**STUDIO-GRADE EFFECTS** – Yamaha loaded the AW4416 with dedicated 4-band parametric EQ and dynamics on all channels, plus two patchable multi-effects processors

**INSERT I/O** – Patch your analog gear onto any track to augment the AW4416's capabilities

**EXPANDABILITY** – Dual card slots let you add analog and digital I/O options, Apogee® converters or the new WAVES® multi-effects processor card

**YAMAHA CD BURNER ON-BOARD** – CD mastering and backup are always available and easily accessible

**DEDICATED METER BRIDGE** – It's not a pricey option, it's included

**MAXIMUM PORTABILITY** – The AW4416 is small and light enough to carry on location in our new hardshell case\*

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## YAMAHA

WWW.AW4416.COM



For literature, call (800) 937-7171 ext. 627. Visit [www.AW4416.com](http://www.AW4416.com) and [www.yamaha.com/proaudio](http://www.yamaha.com/proaudio). \*Case is optional. \*\*Estimated street price. All trademarks are the property of their respective companies. © 2001 Yamaha Corporation of America/Pro Audio Products, P.O. Box 6600, Buena Park, CA 90622. All rights reserved. Yamaha is a registered trademark of Yamaha Corporation.

# S Neo-Retro Analog Signal Processors

the dual-channel unit include switchable polarity inversion and phantom power; a transformerless, high-impedance input (for DI or line input); rear panel XLR I/O; and enhanced shelving EQ. Low-shelving center frequencies are 70, 100 and 200 Hz. High shelving can be switched in at 4.5, 7 or 10 kHz. Also, front panel controls vary the mic input impedance.

## VINTECH AUDIO X73 AND 1272

The Vintech Audio X73 Microphone Pre-amp with Equalizer (\$1,995) is based on the Neve 1073 module; the single-channel X73 includes the 1073's Class-A amplifier design, inductors and transformers. Building on the 1073's feature set, the X73 has been given a greater selection of switchable high-shelving EQ, with corner frequencies now at 10, 12, 14 and 16 kHz. The 1U rackmountable unit offers up to 80 dB of gain, three bands of EQ (bypassable and including an HPF), switchable phantom power, both DI and

transformer-balanced line inputs, and an output level meter. The X73 requires an outboard power supply (\$225), but the supply can power up to four modules.

Also from Vintech, the 1272 Microphone Preamplifier (\$1,595) is a 2-channel, all-discrete, Class-A mic preamplifier closely based on the Neve 1272. The 2U, rackmountable Vintech 1272 is trans-

former-balanced and provides up to 50 dB of gain. Features include an input attenuator, output control, DI input, output level meter, and switches for polarity inversion and phantom power.

*Michael Cooper is a Mix contributing editor and owner of Michael Cooper Recording in beautiful Sisters, Ore.*



Universal Audio 1176LN (top) and LA-2A

## Giga·pho·ri·a (gĭg-ə-fôr'ě-ə) n.

A feeling of great happiness or well-being when running Gigastudio(TM) on an official Sound Chaser GigaDAW.

Giga-phor'ic (gĭg-ə-fôr 'ik) adj.

Giga-phor'i-cal-ly adv.

"I love my GigaDAW!"

- Mark Isham - Musician/ Film Composer

"Five-Star Technical Support"

-Cliff Martinez - Musician/ Film Composer: Traffic, Sex Lies and Videotape

"...surpassed my spec in every way."

- ProRec: Jan 2000

"... the most powerful tool in my studio!"

-Don Felder - Musician/ Song Writer: Eagles

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Makers of GigaDAW and NCStudio PC Workstations.  
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**NEMESYS™**

The creators of Gigastudio (TM) & Gigasampler (TM)  
Innovative, disk based sampling technology.

# Take Control of Your Room!

## London-14 Studio



- 1 Europa Flutter Wall
- 2 Scandia Scatter Blocks
- 3 Orientique Washboard
- 4 Australis Bass Trap

Face it. Most project studios and post-production rooms are built in typical rectangular rooms. You spend thousands of dollars on gear only to battle standing waves, flutter echo, and all the hash that makes it difficult to get a good mix. Battle no more.

Introducing Primacoustic. A new concept in broadband acoustical treatment that is easy to install, affordable, and has the look and performance of an architecturally designed studio.

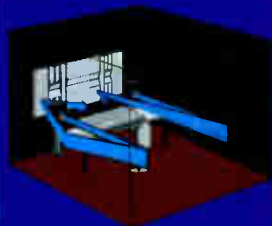
Primacoustic is based on a modular concept whereby precision-cut acoustical absorbers are combined to resolve the four main problems common to all square rooms: The Europa Flutter Wall controls 'front to back' flutter and works with the Scandia Scatter Blocks to reduce standing waves. The Orientique Washboards reduce side wash and powerful primary reflections. The Australis Bass Trap is a corner wedge that tightens up bass and brings balance back into your room.

### Calling London for Under \$600\*

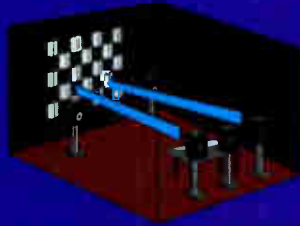
The London-14 is one of the more than dozen studio packages available. London combines all four acoustical systems into one affordable package (London Studios start at \$450\*.) Other packages include the New York Voice Over Booths, Rio Video Suites and Montreal Studios. With complete rooms starting at \$200\* - no other acoustical treatment is as affordable or so effective! We even include the glue.

For more information call Primacoustic and ask for a brochure, visit our web site, or go to your local pro audio shop.

Tell 'em you want to Take Control



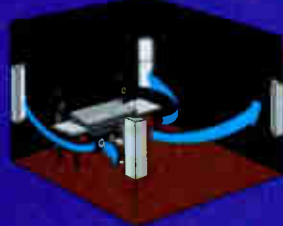
- 1 **Europa Flutter Wall**  
Reduces 'front to back' echo, standing waves and monitor fold back. Over 28 creative patterns to choose from. Prices start at \$150\*.



- 2 **Scandia Scatter Blocks**  
Affordable alternative to diffusion. Keeps room live and reduces standing waves. Over 12 creative patterns to choose from. Prices start at \$100\*.



- 3 **Orientique Washboard**  
Absorbs primary reflections and side-to-side flutter. Six creative patterns to choose from. Prices start at \$80\*.



- 4 **Australis Bass Trap**  
Effective down to 45Hz, tightens up bass and reduces smear. Can be used in corners or on walls. Priced at \$100\* each.

\*Suggested US retail price

# NEW SOFTWARE/HARDWARE FOR AUDIO PRODUCTION



## WAVEFRAME7

Completely redesigned for increased processing power, WaveFrame7 from WaveFrame ([www.waveframe.com](http://www.waveframe.com)) is based on Windows 2000, running on Merging Technologies' Mykerinos hardware platform. The workstation combines WaveFrame's familiar editing interface with 24-bit resolution, 5.1 surround mixing, DSP plug-in effects, networking capabilities and up to 32 channels of I/O. Digital audio interfaces include AES/EBU, MADI, ADAT and TDIIE. New Sound Selector and Volume Manager tools optimize working in a fully networked environment. Rather than WaveFrame's previous proprietary disk file format, WaveFrame7 natively records/plays industry-standard Broadcast Wave files to standard FAT-32 (Windows PC)-formatted drives and can import WaveFrame V.

6.x files and Sound Designer II audio files recorded on Mac HFS volumes. Other file compatibility options include import/export of Avid OMF, OpenTL (Tascam MX-2424) and WaveFrame 6.x projects, with future support of AES/31 and Akai files. Specialized post-production features include comprehensive machine control, auto-assembly, Spotting Sheets, Special (over) ADR/Foley recording and editing, and Cue Sheet printing.

## SONICSTUDIO HD 1.6

SonicStudio HD Version 1.6 from Sonic Solutions ([www.sonic.com](http://www.sonic.com)) offers a Playhead Scrub mode for jogwheel-style scrubbing,

support and new multichannel track ordering capabilities. New processing functions include sample rate conversion on input, varispeed on playback and real-time NoNOISE processing. AutoSonic 24-bit soundfile output supports audio generated by AutoSonic in DVD Creator, DVD Fusion and OneClick DVD. Other upgrades include a new timecode status window, high-density audio support in dual-wire AES mode, 24-bit mono and split-mono interleaved soundfile support, and buffer volume selection for flowthrough.

## OBERHEIM OB-TUNE

The OB-Tune real-time pitch correction plug-in

Sync Matching (to align matched portions of audio for A/B comparisons), an Edit Soundfile During Record function, and a Loop and Fill command. Other new editing features include copy/paste editing of desk events, EDI, track naming

for DirectX from Oberheim Electronics ([www.gibson.com/products/oberheim](http://www.gibson.com/products/oberheim)) uses core DSP technology licensed from Antares (maker of Auto-Tune), with an interface designed by Oberheim, to detect the incoming pitch of a voice or solo instrument in real time and correct it. Standard major, minor and chromatic scales, as well as 26 historical, ethnic and microtonal scales are preprogrammed; scale parameters and correction adjustments can be modified. OB-Tune is compatible with Cakewalk Pro and Home Studio, Steinberg Cubase and Wavelab, Emagic Logic, Sonic Foundry Acid and Sound Forge, and other applications that support DirectX. The software is available exclusively on the Internet, from [www.MusicYo.com](http://www.MusicYo.com), and can be downloaded directly to PC for an MSRP of \$49.99.

## SADIE CD-R TOWER

New from SADIE ([www.sadie.com](http://www.sadie.com)), the CD-R Tower duplicator is a multiple CD burner for SADIE DAWs. The CD-R Tower is available in either a 4- or 8-disc recorder



configuration, and towers can be connected for simultaneous recordings of up to 64 discs. All models have an internal HD that stores up to 20 bit-accurate CD images; the system can copy from a CD or from a disc image on the hard drive. An Online mode allows the CD-R Tower to write from the host SADIe DAW system via RAID multiple disc technology, configuring the entire recorder system to act as a single drive. Multiple discs can be simultaneously written directly from the DAW. In Offline mode, the CD-R

Tower can copy CDs without a computer. In Online mode, the CD-R Tower operates at up to 4x with disc shadowing (a disc image is written to the hard drive while writing CDs to the CD-R drive). Synchronized audio play capability enables the user to switch between the audio jacks of the CD-R drives and listen to the same track of music on multiple drives, eliminating the need for a separate player for verification.

#### STEINBERG NUENDO DOLBY DIGITAL ENCODER

Steinberg ([www.us.steinberg](http://www.us.steinberg)

.net) announces the Nuendo Dolby Digital Encoder, a plug-in allowing Steinberg Nuendo projects to be coded into Dolby Digital. Licensed by Dolby Laboratories, the encoder offers the same full functionality as the original Dolby hardware, supporting encoded bit rates from 56 to 640 kbps and channel configurations from mono to 5.1. Dolby's Bitstream mode, Dialog Normalization, Surround and Center Downmixing Level settings are all included; up to six files from the export dialog or the entire Nuendo project can

easily be selected and sent to the plug-in for immediate encoding. The software will be available this quarter.

#### UNIVERSAL AUDIO COMPRESSOR POWERED PLUG-INS

Universal Audio ([www.uaudio.com](http://www.uaudio.com)) adds Vintage Compressor plug-ins, emulations of the 1176N and Teletronix LA-2A compressors, to its Powered Plug-Ins product line. Instead of modeling compression curves, UA modeled the actual compressor circuitry for accurate digital emulation. Powered Plug-Ins are designed to run with UA's UAD-I DSP card; the complete bundle also includes RealVerb Pro, CS-I Channel Strip and other effects, plus the UAD-I DSP card. The plug-ins support VST/PC and are compatible with Steinberg's Cubase and Nuendo, and Emagic's Logic Audio. Retail: \$995.

## UPGRADES AND UPDATES

Steinberg announced that Cubase VST 5.0 Release 4 for Windows now supports ReWire 2. For details, visit [www.us.steinberg.net](http://www.us.steinberg.net)...SEK'D ([www.sekd.com](http://www.sekd.com)) has exclusively licensed the Audio Restoration Suite by Dr. Christoph Musialik, which is now available as a software plug-in for SEK'D's Sequoia editing and mastering software. List: \$1,249...Antares Audio Technologies ([www.antarestech.com](http://www.antarestech.com)) entered into a third-party development agreement with TC Works ([www.tcworks.de](http://www.tcworks.de)) to bring its Auto-Tune 3 pitch-correcting plug-in to TC-Works' Powercore DSP accelerator board...Waves now supports Digidesign's RTAS on Windows-based PCs. The Waves Window RTAS support is free to all registered Waves

Version 3.0 users and can be downloaded through an upgrade at [www.waves.com](http://www.waves.com)...Cycling '74 recently launched c74, a record label that showcases music in a wide variety of genres, created by the community of composers and performers who use Cycling '74 software products such as Max and MSP. Visit [www.cycling74.com](http://www.cycling74.com) for more information...NemeSys is now distributing Alien Connections' ReValver music amplifier modeling effects processor for NFX-based platforms. Visit [www.nemesysmusic.com](http://www.nemesysmusic.com)...Digidesign's Control|24 Cable Kit is a custom cable kit that allows you to easily connect your Control|24 to Pro Tools interfaces or external audio gear. The kit includes seven custom color-coded, custom-labeled, 25-foot, 8-channel cable snakes that feature a lifetime warranty. Visit [www.digidesign.com](http://www.digidesign.com). ■

#### YAMAHA LIGHTSPEED2 20X CD-RW

Yamaha ([www.yamaha.com](http://www.yamaha.com)) steps up the CD-RW speed-war with its LightSpeed2™ CRW2200 Series, said to be the first 20x burner that also rips audio at 40x. All LightSpeed2 CD recorders include Ahead's Nero software for PC and Mac users. The CRW2200 also features SafeBurn™, which provides an advanced buffer underrun control system to complement its 8MB buffer. Drives are available in various internal and external models with E-IDE (ATAPI), Ultra SCSI (SCSI-3) or IEEE 1394 FireWire interfaces.

# PREVIEW



## SSL MTP DIGITAL CONSOLE

Solid State Logic ([www.solid-state-logic.com](http://www.solid-state-logic.com)) has introduced the MT Production (MTP) Digital Console. Based on SSL's MT Plus in-line digital console, the MTP features comprehensive control grouping, snapshot/reset capabilities, flexible subgroup busing and full multiformat surround sound capabilities. Featuring SSL's new HS Control Processor, the MTP has an in-line mixing architecture with simultaneous multichannel surround sound outputs. The configurable panning and output bus structure allow the 12 main mix buses to support two simultaneous but different output feeds, with both in 5.1 surround format. The NiTECH Super-Pre A/D input stage exceeds the performance of the SL 9000 J Series

console. The new INFO Faders give visual and mechanical feedback of null points, and an alphanumeric display shows grouping, automation and system status. The system accepts an SVGA video input, and MTP users can access external workstations directly from the console's surface.

## TC SYSTEM 6000 EXPANSION

TC Electronic ([www.tcelectronic.com](http://www.tcelectronic.com)) releases two new stereo algorithms for the System 6000. UnWrap automatically creates a 5.1 mix of stereo material, providing System 6000 users with both advanced up-conversion and down-conversion between stereo and 5.1 formats. VSS-4 offers a significantly enhanced stereo reverb and, like other algorithms in System 6000, operates at up to 96 kHz. A new AES-8 digital expansion card (\$1,995) for System 6000 expands the Audio Mainframe

to a maximum 16 AES/EBU I/Os, running at rates up to 96 kHz. In other System 6000 news, software Version 1.30 includes a new noise-reduction algorithm, improvements to the multi-channel VSS-5.1 Reverb algorithm and support for multiple ICON controllers linked to the same Mainframe. For details and downloads, visit [www.System6000.com](http://www.System6000.com).

## LUCID STUDIO SYNC GENERATOR

Lucid ([www.lucidaudio.com](http://www.lucidaudio.com)) is now shipping the SSG192 studio sync generator. Designed to provide comprehensive digital synchronization functions, the SSG192 can drive a studio via an internal clock set to any one of 11 standard frequencies (32-192 kHz) or via an external clock derived from wordclock, AES11 or video blackburst. Nine outputs include video sync, wordclock (four outputs), AES11 (two outputs), Digidesign's 256X Superclock and Lucid's proprietary 1024X Ultraclock. The SSG192 supports NTSC 59.94 or PAL/SECAM 50Hz video formats with a front panel

LED array that provides a simple calculation for all common pull-up/pull-down rates. The SSG192 is \$1,799.



## AUDIO-TECHNICA AT4033/SE

Ten years ago, Audio-Technica ([www.audio-technica.com](http://www.audio-technica.com)) changed the studio mic market with its AT4033, a low-cost, high performance cardioid condenser that became a popular choice among top producers and engineers. Now, A-T marks the anniversary with the AT4033/SE, offering the same sound as the original, but in a special edition model with improved shock-mount, a custom mic dust cover and wooden case.

## GENEX MULTIFORMAT RECORDER

Genex (distributed by HHB, [www.hhbusa.com](http://www.hhbusa.com)) offers the GX8500 multiformat disk recorder, which records in all existing digital audio formats, including the Direct Stream Digital (DSD) bit-stream that is the basis for Super Audio CD (SACD). Said to be the only commercially available DSD-compatible

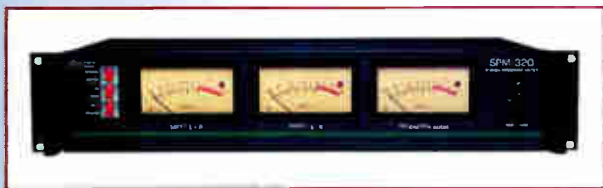


# PREVIEW

ble recorder, the GX8500 is capable of 24-bit, 192kHz PCM performance and is able to record eight channels of DSD, storing a 5.1 and stereo mix of the same material. I/Os include AES EBU, SDF-2 and DSD, a SCSI interface and RS-422 and RS-232 ports. Additional features include word clock and timecode I/O, optional 5.2GB MO disk drive or fixed hard drive.

## BENCHMARK UPGRADES VU METER SYSTEMS

Benchmark Media Systems' (www.benchmarkmedia.com) 20 meter systems will include previously optional features at no charge. Both the dual-meter SPM-220 and three-meter SPM-320 feature true VU volume indicators with XLR loop-through inputs (balanced 100 kohm), BNC scope outputs for Lissajous monitoring and a high-output stereo headphone amp. Standard features include selectable VU or PPM metering on VU meters, selectable discrete stereo or matrix metering, and peak hold capability even in VU Metering mode. The SPM-320's third meter may be used with SCA or SAP, or internally assigned for continuous mono monitoring. Price of the stereo SPM-220 is \$1,410; the three-meter SPM-320 is \$1,865.



## LOGICAL SYSTEMS PERSONAL MONITOR STATION

Logical Systems Inc. (www.logicalsystemsinc.com) offers the LSI-MS97 Monitor Station, a stand-mounted mini-mixer that enables musicians to create and modify their own headphone mixes. Up to eight MS97 Monitor Stations are powerable from one LSI-DA-88 distribution amp. The MS97 has individual level controls for a mic, a mono/stereo instrument and four stereo line inputs. Mic and instrument signals may be split to the recording mixer via internal "direct boxes" and XLR outputs. Options include isolation transformers and an automatic stereo compressor/limiter with ratios ranging from 1:1 to 1:∞. Prices range from \$329 for a single MS97-NL Monitor Station with two Output Direct Boxes to \$599 for a system

with Jensen transformers. The LSI-DA 4-input 8-group distribution amp is \$389, and the DA-EXT 4-input/12-group DA is \$349.

## CLM DYNAMICS 8-CHANNEL PREAMP

The DB8000s from CLM Dynamics (www.clmdynamics.com) is a rackmount unit with eight preamps for use with balanced mics or hi-Z direct inputs for instruments or line-level. Each preamp has a balanced direct out; two additional channel outs (+4 dBu/-10 dBV switchable) allow the DB8000s to be used as an active mic splitter. Each input features a 12-position gain control (up to +66dB gain) and switches for -20dB pad, phantom power, polarity reverse and an 80Hz HP filter. Composite digital outputs provide for direct-to-ADAT or hard disk recording, and each preamp has a variable threshold SoftStop over-load protection limiter. Adjacent channels can be linked for M/S decoding, and the SoftStop limiters are linkable for stereo, M/S or surround sound operation. Metering is via peak-

reading bar graphs with peak hold on each channel. Distributed in the U.S. by Wave Distribution (www.wavedistribution.com), the DB8000s is \$2,295.

## AMS NEVE AUDIOFILE UPDATE

New SC2.10 software for the AMS Neve (www.ams-neve.com) AudioFile SC high-speed editing system features DSP plug-ins and the ability to import Pro Tools session files, which can be rendered during import or converted to AudioFile real-time fades. Once imported, the data is presented as an AudioFile events list for playback or editing as desired. Time-based plug-ins include SuperTimeflex, pitch change, delay, delay with modulation, room echo and Doppler effects. Frequency-based plug-ins offer single and 4-band EQ with a choice of different algorithms. Creative plug-ins consist of a suite of creative sound effects, including ring modulation, resonance, multiband resonance, multiband frequency selective delay, distortion, harmonizer



# PREVIEW

and feedback. Other new features of Version SC2.10 include user-created zones and events and the ability to transfer sound effects from the



## HOT OFF THE SHELF

Caig Laboratories ProGold GxL Contact/Connector Conditioning Treatment has an extended temperature range of -45°C to 400°C for use on all connectors and contacts, including edge connectors, plugs, sockets, switches and relays. Formulated for extreme temperatures, ProGold GxL deoxidizes and cleans surface contamination, penetrating plated surfaces, and molecularly bonds to the base metals. For more information, call 800/224-4123 or visit [www.caig.com](http://www.caig.com). Verbatim Corporation has introduced DataLifePlus 4.7GB rewritable DVD discs, recordable DVD-RW media that allows users to edit and incrementally update data on the discs. A single 4.7GB

mSoft Serversound browser to the AudioFile.

### SENNHEISER HEADPHONES

Sennheiser ([www.sennheiser-usa.com](http://www.sennheiser-usa.com)) offers the HD 280 pro headphone, a closed-back model that attenuates ambient noise up

DVD-RW disc can store 4,700 full-color photos, two hours of theater-quality video, 14+ hours of MP3-compressed audio files or more than 400,000 docu-

ments. Verbatim's DVD-RW discs have a data life of more than 50 years, and users can overwrite the disc up to 1,000 times. Price is \$30 for single-sided 4.7GB discs. Call 800/421-4188 or visit [www.verbatim.com](http://www.verbatim.com). Neutrik's EtherCon® Series RJ-45-style connectors are easy to assemble, accept all standard RJ-45 plugs, are Category 5 unshielded compliant and are compatible with 10 Base-T and 100 Base-TX systems. Call 732/901-9488 or visit [www.neutrikusa.com](http://www.neutrikusa.com). Palmetto Logic Software offers the Sound Advice V. 2.0 audio-electronics reference tool for Palm OS-based handheld computers. With Sound Advice V. 2.0, users can quickly look up definitions for more than 200 audio terms and find answers to common audio problems. The software calculates power, current, re-

to 32 dB and provides an SPL of 102 dB (per IEC 268-7). Available in stereo and single-sided versions with a noise-compensated microphone for talkback applications, the headset has a frequency response of 8-25k Hz (-10 dB). Parts subject to wear and tear are replaceable.



sistance and voltage and converts among RMS, average and peak values. Registered users receive free upgrades for three years. Download a free 30-day trial at [www.palmgear.com](http://www.palmgear.com) or [www.handango.com](http://www.handango.com). EMTEC Pro Media offers the Premium Audio Magneto-Optical Disk (MOD), which includes a certification routine that eliminates "retries" when data blocks cannot be written immediately. This feature is particularly necessary in real-time recording applications where interruptions of the data stream are unacceptable. For more info, call 888/295-5551 or visit [www.emtec-usa.com](http://www.emtec-usa.com). Middle Atlantic Products S24DG isolation rack is a 24-space equipment rack that is lined with absorptive material and includes gasketed front and rear doors for optimum sound insulation. Additional features include a built-in quiet fan and filter. Call 973/839-1011 or visit [www.middleatlantic.com](http://www.middleatlantic.com). The 2001 AVAS/VIP catalog has 200 pages of audio and video products, including presentation systems, mics, wireless systems, speakers, head-

phones and amps. Call 800/631-0868 or visit [www.avasvip.com](http://www.avasvip.com). The 2001 Comprehensive Video Catalog has an extensive listing of cables, connectors, distribution amplifiers and switchers. Call 800/526-0242 or visit [www.comprehensivevideo.com](http://www.comprehensivevideo.com). Gepeco International has introduced its next generation of 110-ohm AES/EBU digital audio multipair cable. Optimized for 96kHz bandwidth requirements, the 5596GFC Series transmits all formats of AES3 digital audio and is available in 4/8/12-pair configurations. Call 800/966-0069 or visit [www.gepeco.com](http://www.gepeco.com). The Hollywood Edge has released The Sentinel Vault Archives, an 8-CD collection of sound effects originally created for award-winning films by director Francis Ford Coppola, including *Apocalypse Now*, *The Black Stallion* and *Tucker*. Divided into 10 categories (Exterior Backgrounds, Interior Backgrounds, Walla, etc.), the collection has been gleaned from the extensive American Zoetrope archives. Call 323/603-3226 or visit [www.hollywoodedge.com](http://www.hollywoodedge.com). ■



# APOGEE DIGITAL. FROM MIC TO MIX.

**TRAK2**  
mic preamp & digital converter.

**"I just plug in and it sounds incredible!"**  
says mega-hit songwriter Steve Kipner.

Steve Kipner in his hillside studio with the AD-8000SE and Trak2.



**M**AYBE you haven't heard of Steve Kipner. But you've certainly heard his hit songs. For 30 years, he's co-produced and penned songs for some of the world's best-selling artists, with international #1 hits from *Let's Get Physical* to *Genie in a Bottle*. And for many of those years, he's relied on Apogee.

Steve chose Apogee's **Trak2** both for its mic preamps and for its superb quality 24/96 analog to digital conversion.

But first, he listened.

"We were in London working with Victoria Beckham – Posh Spice. We had the **Trak2** and other well-known mic preamps, including some tube models, and held a shootout right there. The **Trak2** won hands down," he says enthusiastically.

"It's so easy: I just plug a guitar into the front panel or use the rear panel mic inputs – hardly any EQ or anything – and it just sounds incredible. I don't need to do a lot of stuff, or use much outboard gear."



*One for the record: Steve Kipner produced, recorded and arranged, with David Frank, Christina Aguilera's 10-million-selling hit, Genie in a Bottle. And Apogee was in the mix!*

Apogee's **Trak2** simplifies Steve's life. "Before I had the **Trak2**, I was always trying hard to make things sound better. Now it sounds great straight away," he says. "I record straight into Logic, so the **Trak2**'s built in mic pre, 8-channel routing and direct Pro Tools connection make it an ideal solution."

Today, Steve Kipner uses the **Trak2** on virtually all his projects. You'll find it's the same for you.

**Hear Apogee's Trak2 for yourself – at your authorized Apogee dealer.**



**APOGEE**  
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World Radio History

# GROOVE TUBES VIPRE

## VARIABLE IMPEDANCE TUBE PREAMPLIFIER

The Vipre is an all-tube, single-channel microphone preamplifier that precisely matches any microphone—new or old—with a choice of four different input-load impedances. Front panel controls may be used to vary the preamp's actual internal circuitry for different transient-response performance characteristics, ranging from the vintage microphone preamps of yesteryear all the way to the super-fast performance of modern, high-slew rate mic preamplifiers. The Vipre has a whopping 75 dB of total gain and flat frequency response from 7 to 100k Hz.

Vipre uses eight tubes for both the Class-A, fully balanced and complementary, differential amplifier and the Class-A, balanced, push-pull output stage. (Keeping the entire signal path balanced from input to the output dictates the use of expensive, multilayer rotary switches rather than cheaper pots.) All eight tubes are thermally insulated and shock-mounted. The entire unit is hand-assembled and wired using the finest components, switches and, of course, Groove Tubes. There are no solid-state devices, integrated circuits or electrolytic capacitors anywhere in the audio signal path. The cabinet and front panel are finished in matte black and feature large, custom-molded RCA vintage-style phenolic knobs and larger-size toggle switches. With its chrome rack handles, a giant old-school-style lighted VU meter and overbuilt left (weight is 32 pounds), the Vipre is one impressive hombre!

The Vipre offers four input modes, accessible via the input selector knob. On the far-left side of the panel is an instrument input jack designed for direct recording of guitar, bass or synths. This input feeds a special high-impedance (47-kilohm) circuit centered around its own GT 6205 tube. I liked the fat sound of this direct path and now use it all the time. There is also a -20dB instrument input position for hotter levels,

useful for synths or guitars with active electronics. The next mode/position is the fully balanced transformerless bridging input (12-kilohm impedance), which is closer to the input impedance of many modern preamps, followed by the main variable impedance input. Both of these modes use the rear panel XLR connector, and there is an additional rear panel TRS mic/line input that accepts levels 20 dB hotter than the XLR. If both the XLR and TRS jacks are active, then they will mix internally. (They enter the amplifier circuitry at different points.) Toggle switches engage a Phase Flip switch and a gentle, 4dB-per-octave highpass filter starting at 100 Hz.

The Impedance Selector knob selects among 300, 600, 1,200 and 2,400-ohm input impedances by switching between four different sets of primary windings of a specially designed input transformer. This very large "hum-bucking" transformer, which is manufactured by Tom Reinchenbach at CineMag, is encased in two mu-metal shielded cans and offers a technically correct way to alter input impedance—by using different windings and *not* by just adding loading resistors.

My favorite controls on the Vipre are the two large, stepped Gain control knobs. The coarse Gain control is graduated in 5dB steps from 20 to 70 dB, and the fine Gain control adds or subtracts from the coarse setting in 1dB steps from -5 to +5 dB. In operation, I set my "ballpark" gain setting with the coarse control and then dialed in a final level in 1dB steps—no audible pops or clicks when rotating

either control. This method offers exact repeatability but does not allow gain riding for smooth changes in level while recording, because, to maintain fully balanced operation throughout, the Vipre has no output level pot.

Between the two Gain controls is a large, lighted VU meter. The RMS reading meter is augmented with two clip LEDs; a green LED lights up at -3 dB before clip and the red LED indi-



cates full clip. The Vipre is capable of +30dBm (24.4-volts RMS or about 1 watt!) maximum output at the output XLR, but there is an additional ¼-inch TRS balanced output jack from a separate output transformer winding that is referenced to -10 dBv.

To the right of the meter is a unique feature, the VU Meter Range control. The Vipre has a meter driver circuit board for enhanced metering. At the 0VU Meter Range switch position and when the needle reads 0VU, the meter shows an actual +4dBm output level. Three more ranges "re-reference" 0VU on the meter to +10, +20 and +30dBm levels, respectively. These higher scales provide for accurate measurement when sending super-hot output levels to 24-bit digital systems—without them, the meter would be pegged! Finally, the Expand VU mode broadens the range of the meter from a typical VU meter range of -20 to +3

BY BARRY RUDOLPH

# Champagne Tastes...

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dB up to a wider -60 to +13dB range. Expanded mode is great for wide dynamic range recordings such as vocals, Foley work and classical music, and makes it easy to "see" potential problems such as air conditioning or room rumble.

The Rise Time control sets the amplifier's rise time or slew rate. Five different settings range from the Slow position (about 0.75 volts per microsecond, a commonly used setting for vintage audio equipment) to Fast at 6 volts per second, a more typical spec for modern preamps. The net effect of such manipulation is a sort of control over the aggressiveness of the Vipre's sound. I found that percussion and similar sounds were clearer and (apparently) brighter on the Fast mode setting. Slow mode was better for sounds and vocals that tended toward the harsh, and effectively smoothed or rounded out edginess. In use, I found the in-between switch positions extremely subtle and wound up using only the two extremes, Slow and Fast.

The Vipre has a +48V phantom power on/off and the often-overlooked output Mute switch, a feature that is too rarely included in outboard mic preamps. The Vipre has two power switches. The manual states that, to prolong tube life, it is advisable to first power-up the unit with the Standby/B+ switch in standby while the B+ (high voltage) stays off until the filaments have warmed up properly. The manual also recommends that the Standby switch be used during session down-times and that the Vipre should be powered down with the main Power switch at

the end of the day.

While using the Vipre, I found that it was hard to read the front panel markings in the darkened control room. Groove Tubes explained that the initial front panel run came in with excessively dark silk-screening, and all future units will have the classic GT cream-colored marked panels, which are easy to see in any light. In fact, it doesn't really matter much, because the unit is so simple to use once you have selected source, impedance and rise time.

I also tested the Vipre by recording female vocals through a U67, M49, a B.L.U.E. Tube or a Shure KSM44. In each case, the impedance switching changed my opinions about each of these mics. In general, the vintage mics (including the B.L.U.E.) sounded fuller, louder and had more gain when the impedance switch was in the 300-ohm position. The newer Shure was happy at any position and sounded the best I have ever heard it. The effect of changing the rise time while recording vocals is subtle, but you can hear a little difference in the high frequencies. I usually selected the Slow position, as I was going for a "mellow" sound on one particular song. I also used a Tube-Tech CL-1B compressor after the Vipre when recording vocals and found that getting good, hot levels with as much (or as little) control as I needed was extremely easy. Because the Vipre allowed me to easily put a +10dB level or more into the compressor, off-mic dynamics sounded clear and focused.

Electric guitars shine well through the Vipre. I tried my Royer R-121 ribbons, and they were happy at 600 ohms and the Fast rise time position. Even SM57s sounded

good, with a little more roundness than I usually get with other preamps.

On percussion, I used the Fast position and the transformerless input. Most of the time, I prefer to start out with very quick transients on percussive sounds as they have a tendency to get "sanded down" with successive processing. I liked that I could, with a flip of the switch, audition the transformerless against the variable impedance when the musician is on mic.

I recorded a direct bass and had some fun by deliberately overdriving the Vipre using about twice the amount of gain required. The +20dB meter range was useful here, because I had to reduce the output at my Pro Tools I/O input to come back *down* to a full 24-bit digital level. Overdriving the Vipre produces an extremely aggressive distortion reminiscent of those 1950s blues records where you can hear the singer occasionally blow up the mic and/or preamp.

The Vipre offers the engineer a whole new world of tube sound choices in a single, well-made, great-sounding unit. The culmination of over three years of work by Aspen Pittman and Groove Tubes' engineering staff, the Vipre is the epitome of vintage tube amplification perfected for these digital times. MSRP is \$2,999.

Groove Tubes, 543 Truman St., San Fernando, CA 91340; 818/361-4500; [www.gtelectronics.com](http://www.gtelectronics.com). ■

*Special thanks and a lotta love go to Neil Giraldo and Pat Benatar for helping evaluate the Vipre while engineering their upcoming album. Barry Rudolph is an L.A.-based recording engineer. Visit his Website at [www.barryrudolph.com](http://www.barryrudolph.com).*

## Why Variable Impedance?

Aside from a resistive input level attenuator pad and a phantom power switch, a lot of microphone preamps give the recording engineer just a single control: gain. Essentially, there is no way to "customize" or match the microphone preamp to the particular microphone or other source. The preamp's input impedance is just fixed (internally) and is usually high enough that, electrically, it will work okay in most any situation. This seems odd, given the fact that music sources undergo their biggest and most important change in level at this first critical amplification stage. A condenser microphone's output level can require from 30 to 50 dB of gain (depending on the mic and singer) to raise it to a nominal +4dBm line-level ready for any further processing and subsequent recording. Today's 24-bit digital systems require even more amplification (gain), better dynamic range and lower noise, all factors that put even more importance on the microphone preamp.

Additionally, the same microphones sound different when used with different mic preamps. We all have our favorite mic

pre/microphone combinations for specific recording tasks, and many engineers, producers and studios have amassed large and varied preamp collections over the years. Among microphones with similar topology Class-A preamps, it is mostly the effects of different input characteristics that we hear.

Early audio circuits were designed for maximum power transfer (called the Transfer Function) between units. Input and output impedances would be matched carefully for best efficiency and the most gain. Vintage condenser and ribbon microphones were designed to sound best when loaded or terminated by the specific load impedance of the mic preamp's front end transformer. Modern transformerless, solid-state microphone preamps (as well as most all modern audio gear) have from 10 to 20x higher input impedance than most sources plugged into them. These are called bridging inputs, and they present nearly no load to the microphone source and certainly do not present the load the microphone was originally optimized for.

—Barry Rudolph

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# FOSTEX D2424

## DISK-BASED 24-TRACK 24-BIT/96KHZ RECORDING SYSTEM

There are numerous multitrack hard disk recorders on the market today, and most are being made by relative newcomers. Fostex, however, is a rare exception with nearly a decade of experience in the field. While many of us wrestled with jammed tapes and crashing computers, Fostex was quietly perfecting its dedicated hardware systems. The company's latest pro system is the D2424.

Housed in a compact, three-rack-space chassis, the Fostex D2424 is a 24-track recorder at standard 44.1/48kHz sample rates, and the jump from 16 to 24 bits reduces recording time but not the total available tracks. At doubled (88.1/96kHz) sample rates, the D2424 becomes a 24-bit-only 8-track recorder.

At all 44.1/48kHz rates/resolutions, there are no drive-size limitations. Essentially, a 10GB drive has room for 1,888 track-minutes (78 minutes of 24-track recording in Standard mode) or up to 628 minutes in 8-track High-Resolution mode. Besides the 24 "real" tracks, 32 virtual tracks (or 48 virtual tracks in High-Res mode) are available.

The most basic Fostex D2424 (model D2424/O) ships with RS-422 and Word I/O—without hard drive—and retails for \$3,695. A wide assortment of versions with various features and options are available, ranging out to the super-deluxe \$6,495 model D2424TCA (with pre-installed time-code option, drives, AES/EBU I/O and more), but more typical is the \$4,695 D2424 System—a 24-bit/96kHz, PC-ready, 24-track recorder with 15.1 GB HD, RMS Hammerfall 9652 (24-channel I/O card), C-Console software, eight balanced inputs, 24 balanced outs and 24 ADAT optical in/out.

### HARDWARE

The test unit shipped with a single 30GB drive in a removable caddy with room for a second removable drive. It is very easy to install a drive



into a caddy and prepare it for recording. The machine will query the drive(s) and report their status. If blank, the options are Quick Format (really fast) or Standard Format. (Depending on drive size, this equates to an overnight hotel stay, a European meal or both!) Backup options include DVD-RAM, as well as S/PDIF. On the rear, there is a half-pitch (high-density) 50-pin SCSI connector that supports a single drive.

Drive Access is behind the removable front panel, which becomes the remote control with an optional 30-foot (max) extension cable. The high-density 15-pin D-sub looks just like a computer monitor connector. Definitely order this cable at the time of purchase. The front panel includes a fluorescent display for viewing track levels, status indicators (sample rate, chase enable, lock, etc.), error messages, plus song and track names.

The front panel is straightforward, and rather than bore you with a feature overload, let me get right to the point: The Fostex D2424 wins major points for ease of use; it behaves pretty much like a tape recorder, only better and faster. It's about as "plug-and-play" as you can get. Spend just a little time with the front panel and you'll be ready to record. There is ample documentation. At 160 pages, the Reference Manual

may be a bit overwhelming, so most users will appreciate the 24-page Quick Operation guide.

About the only idiosyncrasy of digital recording in general is the fact that you must choose the sample rate and bit depth up front, *before* formatting the hard drive. After formatting, I handed the unit over to my friend Ted, who transferred a CD's worth of songs—24 tracks in one pass—from three ADATs, no manual. The Fostex D2424 has three pairs of optical I/Os that converse in either ADAT Lightpipe or standard stereo as S/PDIF. Analog I/O includes 24 outputs and 8 inputs. Operating/reference levels and bal/unbal options are selected from the front panel. This is an extremely smart and considerate feature.

The songs transferred into the Fostex D2424 were then exported, eight tracks at a time, to a Soundscape HDR-1 workstation. This required an optical-to-TDIF interface and a MIDI cable. The D2424 slaved to the workstation better than vice versa. For this application, I would have loved an all-optical digital patchbay—internal or external—to eliminate repeat visits to the rear panel for each group of eight tracks. Other MIDI and music-related features include tempo map, time signature and a built-in metronome. In addition to standard time, the D2424 can also display musical time in bars and beats, including offsets.

BY EDDIE CILETTI

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## FIELD TEST

### KITCHEN SYNC

The SMPTE I/O option includes video reference I/O. I installed the SMPTE board without much difficulty, although it is recommended that this be done by an authorized dealer/service center. Once physically installed, the additional features were enabled.

The reference timecode can be either MTC (MIDI Time Code) or LTC (the "virtual" Linear Time Code). Supported frame rates are 24, 25, 29.97nd, 29.97df, 30nd and 30df. In addition to its internal clock, the Fostex D2424 will lock to wordclock as well as a video reference, provided the 8345 SMPTE card has been installed. There is a Sync Preset option so the unit always boots in a predictable manner; nothing is more painful than unlocked digital clocks! There is also an RS-422 port that is compatible with Sony 9-pin protocol.

I took advantage of the SMPTE capabilities of both the Fostex D2424 (via XLR) and the Tascam DA-78HR (via RCA), requiring only an XLR-to-RCA adapter. Considering the random access of HD vs. linear access of tape, it was more practical to slave the D2424 to the tape machine. Here, I encountered what is perhaps the only flaw in the D2424, and that was simply the lack of "feedback" when the sample rates did not agree.

When the HD is formatted at 44.1kHz/16-bit and the incoming signal is 48kHz/16-bit, the Fostex D2424 will do everything but record and tell you why. In Stop, it will input a digital signal, and in Chase it will attempt to sync but not lock. I can't imagine it would be difficult to implement a warning feature for situations such as this. If it is already there, then it was not obvious enough. The solution was simply to mount a new hard drive. Because the review machine did not come with a spare caddy, the process took five minutes instead of 2.5 minutes. No big whoop! Say "yes" to Quick Format and you're back in business.

### LOCK AROUND THE CLOCK

When you are synchronizing, there are two basic options, Vari and Free. In Vari mode, the D2424 will achieve lock with the incoming timecode by minute variations on clock speed (sample rate) to maintain frame accuracy. In Free mode, the clock reverts to internal (or word) after Lock is achieved, unless the difference between master and slave exceeds 10 frames. Minute variations in clock speed/sample rate affects the digital outputs, making it hard for the destination device—a digital mixer, for example—to maintain clock lock.

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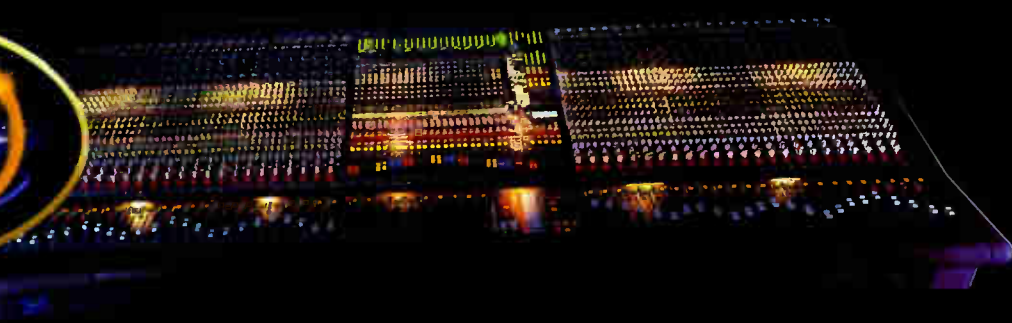
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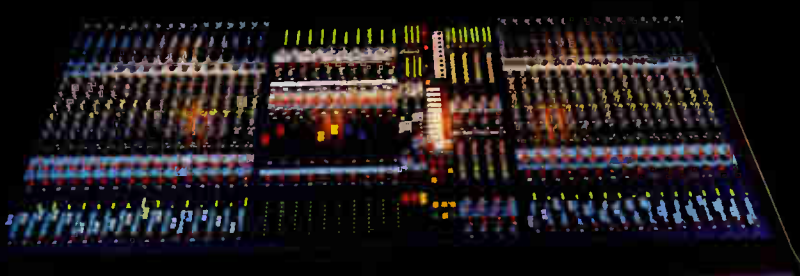




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### FIELD TEST

Whenever the user is synchronizing, it is always a good idea to confirm that a "real lock-up" actually occurred. I did this by transferring the same tracks from the DA-78HR twice—first to tracks 1-8 and then to tracks 9-16 of the Fostex D2424. During the first transfer, I did not pay attention to the settings. The next day, while transferring to tracks 9-16, the machines were locked but sounded like they were a sample or two away from each other. The immediately obvious tip-off was the comb filter effect when any two "identical" tracks were compared.

After switching to Vari mode, I listened during a transfer and could hear the track pairs "phasing," which was less desirable than being a sample or two delayed. Finally, I retransferred from scratch, in Free mode both times. Now, all tracks simply combined as if muled, confirming the sync accuracy of both the Tascam DA-78HR and the Fostex D2424.

### OUT OF BOX EXPERIENCE

The Fostex D2424 has basic digital on-board editing including cut, paste and copy. Beyond that, the company includes the versatile Hammerfall PCI card as part of the standard package. This same card is supplied with Steinberg's Nuendo and features three pairs of ADAT-compatible optical I/O (one I/O pair also speaks S/PDIF), plus coaxial S/PDIF and Word I/O.

I tested the Fostex D2424 along with the Hammerfall PCI I/O card interfaced with Cool Edit Pro (CEP), an affordable (about \$300), intuitive workstation that is remarkably powerful. Achieving the best configuration with any native product/hardware combo can be randomly gnarly or surprisingly easy, but I did eventually nail it down, importing tracks from the D2424 all at once as well as 8 tracks at a time just to confirm CEP's ability to sync. It works. The software choice is yours.

### ONE PRODUCT, MANY USES

The Fostex D2424 is well-suited to many applications. As a stand-alone 24-track recorder, it is simple and reliable. In High-Resolution mode, it does what no digital 8-track tape machine can do—88.2/96 kHz and 24 bits. Both the D2424 and the "media" are affordable and portable enough to do exactly what we did: using it as an intermediary, transferring all 24 tracks rather than three 8-track tapes, then importing to a workstation in another part of town.

The unit's ability to monitor via the analog outputs before and during transfer into the workstation was most appreciated. Regarding the D2424's audio quality, I heard no "distractions," no harshness and no noises other than what had been originally recorded.

The aforementioned tests used the Fostex D2424 essentially as a "data" recorder/editor via its digital I/O. For a more "traditional" session, I took the D2424 to LatchLake, a local studio. We began with a stereo high-res recording of drums/bass amp/guitar amp, using a pair of Neumann TLM193 cardioid mics. A 4-channel, transformerless mic preamp from Ampria (a local company that shares its design knowledge with Great River Electronics) was connected directly to the D2424's analog inputs. Recording at 88.2 kHz, 24-bit, the kick's bottom-end was massive with plenty of beater and deep stereo imaging. Both the studio owner and the band were impressed.

We then switched to Standard mode, recording at 48 kHz/24-bit as dictated by the studio's Yamaha 02R console. Starting with the same mic configuration, a Sennheiser e609 was added to snare, an AKG D112 on guitar amp plus a DI on bass. Recording the basic tracks went smoothly, except during a "rolling" punch-out, when the machine did not return to the originally recorded signal. A multitrack's ability to seamlessly punch in/out is an important feature; however, this bug did not prevent us from live recording. The work-around was to record multiple takes and edit the best into a composite. [Note: According to Fostex, the punch-out problem is a glitch in the D2424's file allocation system and they are working on a remedy.—Editors]

The Fostex D2424 is equally at home in a video facility or a project studio; it's responsive and full of features for each application. The PCI interface opens up a whole world of creative editing options, interfacing the D2424 directly with your workstation and reducing the "load" on native-based systems so they can start behaving a bit more like dedicated hardware. Depending on the application, the D2424 may also free up the host processor to run more plug-ins.

The time is right to combine the power of native editing and processing with the stability and versatility of a dedicated piece of hardware. Don't let this stealth digital multitrack slip under your radar.

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# PENDULUM AUDIO MDP-1 & ES-8

## VACUUM TUBE MIC DI PREAMP AND VARIABLE MU TUBE LIMITER

Rather than try to re-create vintage tube gear, Pendulum Audio designs tube processors that incorporate modern, extended-bandwidth, Class-A circuit designs. Both the MDP-1 tube preamp (\$2,495) and the ES-8 variable Mu tube limiter (\$3,495) are 2U, dual-channel units that feature transformerless outputs, low noise and a frequency response from below 20 Hz out to 65 kHz (75 kHz for the ES-8). Classy aesthetics, positive-action knobs and switches, gold-plated I/O connectors, and large, illuminated ANSI VU meters suggest the rigorous attention to quality that lurks below the hood. There you'll find gold-plated switch/relay contacts and tube sockets, polypropylene caps, metal film resistors and custom toroidal power transformers with hum-blocking shields.

### TUBE MIC/DI PREAMP

The MDP-1 can be ordered with either Jensen 13K7 transformers or custom transformers for the balanced audio inputs. (My review unit had the Jensen transformers installed.) Each channel's audio path passes through one 12AX7A and one 6922 tube. On the rear panel, an XLR connector for each channel accommodates mic inputs, and unbalanced 1/4-inch phone jacks service mic/line DI inputs. These DI jacks have a 1-megaohm input impedance when a DI input switch on the unit's front panel is set for instrument input. When this same switch is set for line input, the rear panel DI input jack's impedance becomes 100 kilohms, and a 20dB pad is inserted into the audio path. The circuit path is transformerless for all DI inputs.

Conveniently, the unit's front panel also features DI inputs on unbalanced phone jacks. When you insert a plug into a front panel jack, the rear panel DI jack for the same channel becomes disabled. The front panel DI

jacks each have an input impedance of 10 megaohms for instrument inputs and, like the rear DI jacks, 100-kilohm impedance for line inputs. I found that electric bass tended to have a slightly tighter bottom but less top end "air" when plugged into a rear DI input, as compared to plugging in through a front panel jack. It's great to have such flexibility to get sounds.

The MDP-1's rear panel outputs are unbalanced XLR and 1/4-inch phone jacks, wired in parallel. The transformerless, tube output stage

makes the MDP-1 a very versatile beast, allowing you to dial in a variety of sounds, from ultra-clean to slightly funky. I've heard cheaper units that offer tube overdrive topologies, and many make your tracks sound like bumblebees trapped inside tinfoil. The MDP-1, however, gives you that sweet splatter of harmonics you lust for.

Yet another rotary switch for each channel allows you to roll off the low end for mic signals at 10 different corner frequencies from 20 to 180



The MDP-1 vacuum tube mic/DI preamp's front panel features DI inputs on unbalanced phone jacks.

can handle blazing output levels as hot as +35 dBu. A rear panel Power switch feeds a soft-start circuit that mutes the audio output and preserves tube life.

The MDP-1's front panel is replete with useful knobs and switches, yet it remains very user-friendly. Separate toggle switches are provided for each channel to enable 48V phantom power, switch in a 20dB mic input pad, flip the mic signal's polarity, and switch between mic and DI inputs.

Each channel sports a switched, rotary gain knob—fixed in 3dB steps—that controls the tube gain stage. The gain range spans 30 dB but varies for each type of input: +33 to +63 dB for mic input; +20 to +50 dB for DI instrument input; and 0 to +30 dB for DI line input. Additionally, continuously variable rotary knobs allow you to passively attenuate each channel's output level. By cranking the gain knob that serves the tube stage and lowering the output gain level, you can overdrive the tubes and introduce subtle distortion. This feature

Hz, with an 11th setting for flat response. Finally, a three-way switch for each channel allows you to source the VU meters to show tube gain (pre-attenuator) or output level (post-attenuator) or to turn the meters off when you're pinning. Sourcing tube gain allows you to gauge whether or not you're overdriving the tubes and by how much.

My first test of the MDP-1 was on male lead vocals. This singer had a very woolly voice, for which my AKG TL-II was the perfect mic. But I've never heard my solid-state TL-II sound as good as this. The vocals were beautifully articulate, sweetly scintillating, tonally balanced and clear as a bell, yet eminently warm. The overall sound was lush, brimming with nuance and possessing great depth. I got similarly great results using a Lawson L47MP tube condenser mic on another vocalist.

On acoustic guitar, recorded with a spaced pair of B&K 4011 mics, I was, again, completely blown away. The stereo imaging was hands-down the widest I've ever heard with any mic pre. Transient response was outstand-

BY MICHAEL COOPER



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## FIELD TEST

ing, offering copious detail but without a hint of stridency. For comparison purposes, the MDP-1 was more understated in the upper bass/low mids than a Millennia HV-3 mic preamp, but, nevertheless, was much warmer sounding (love that glowin' glass!).

Next, I A/B'd the MDP-1's DI path against that of my super-pristine Aguilar DB 900 tube direct box—a tough opponent. On electric bass, the DB 900 sounded cleaner and clearer with a sweeter tone. The MDP-1 sounded slightly honky and veiled in comparison, but also bigger, lusher and more aggressive. Overdriving the MDP-1's tube stage and daisy chaining into an Empirical Labs Distressor yielded a hawdy, burpy bass, gushing with overtones.

Next, I DI'd my '62 Strat. Again comparing to the DB 900, the MDP-1 at its cleanest settings produced a tone that had less air and nuance but fuller and creamier low mids, making for a beautifully mellow sound. Overdriving the MDP-1's tube stage to various degrees, I could get ultra-clean or subtly gritty tones. Interestingly, overdriving prerecorded ADAT tracks via the MDP-1's DI inputs (set to "Line") yielded far more subtle results. And, without overdriv-

ing the tubes, the line inputs sounded basically neutral—nothing added, nothing taken away.

Outstanding transient response, superior depth, superb spectral balance, unbelievably wide stereo imaging, extended frequency response, low noise and a lusciously warm sound make this fully featured and class-looking mic preamp a great value at \$2,495.

Fast and Manual modes complement the six "Fairchild" presets.

Inputs are via balanced XLR and 1/4-inch TRS phone jacks, wired in parallel. Outputs are via balanced XLR and unbalanced 1/4-inch phone jacks, also wired in parallel. A sidechain insert is provided for each channel on 1/4-inch TRS jacks, enabling frequency-sensitive processing applications such as de-essing.



The ES-8 Variable Mu Tube Limiter employs six ES8 tubes, one per channel.

### VARIABLE MU TUBE LIMITER

The ES-8 is basically the same device as the Pendulum 6386 Variable Mu Tube Limiter, except that the ES-8 employs six ES8 tubes (one per channel) for gain control in lieu of 6386 tubes, which are in increasingly short supply. The dual-channel ES-8 offers the same compression curves as the Fairchild 660 and 670, but the ES-8 departs from those vintage designs in that a Class-A, solid-state makeup gain stage is used to drive its transformerless balanced outputs.

As one would expect from a variable Mu limiter, the ES-8 does not offer a ratio control. The compression characteristic is soft knee, with a smooth transition from compression to limiting as you hit the device harder. The ES-8 can provide up to 12 dB of gain reduction.

Continuously variable rotary knobs provide control over input attenuation, output gain boost/cut and threshold. The unit is optimized for +4dBu nominal levels. Maximum makeup gain is set at 12 dB

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at the factory, but you can adjust trims inside the chassis to increase the output control's maximum boost to 20 dB.

A three-way rotary switch lets you choose between three compression modes for each channel: Fast, Presets or Manual. Fast mode features fixed 0.5ms attack and 50ms release times.

The Presets mode activates a six-position rotary switch that implements different Fairchild presets. The first four presets offer release times of 0.1 second, 0.3 second, 1 second and 2 seconds, respectively. Presets 5 and 6 provide program-dependent, two-stage release times, ranging from 1 to 4 seconds for preset 5, and 5 to 20 seconds for preset 6. In both presets 5 and 6, an initially quick release time is followed by a longer decay back to zero gain reduction. Attack times range from 1 to 4 ms for all six Fairchild presets.

Switching the ES-8 to Manual mode activates continuously variable attack and release rotary control knobs that are provided for each channel. Manual attack times range from 1 to 100 ms. Manual release times range between 0.1 and 2 seconds.

The ES-8's two channels can be operated independently or linked via a front panel switch. When linked, channel 1's settings control thresholds, all dynamics processing (modes and attack and release times) and bypass switching for both channels. Only the input, output and meter mode controls remain independent when the channels are linked—a logical arrangement.

My first test of the ES-8 was on arpeggiated acoustic guitar, played with a flat pick. Switched to Fast mode, the ES-8 sounded outstanding. The processed track was utterly devoid of audible amplitude modulation artifacts, with 3 dB of gain reduction showing on the meters. (Peak gain reduction levels were obviously higher than what the VU meters showed.) The ES-8 produced a smoother timbre than most compressors I've heard in this application. Even with 7 dB of gain reduction, amplitude modulation artifacts were barely audible.

Fast and Manual modes provided great dynamics control for lead vocals. Pushing the ES-8 hard in Manual mode, I coaxed wonderfully warm, dense and crunchy tones out of my '62 Strat. The ES-8 also performed well on kick and snare drums, although a variable Mu limiter is too slow to give you explosive UREI 1176LN-type snare sounds. Disappointingly, the ES-8 lent a tone to electric bass that was a little too soft—almost cottony—for my taste.

The program-dependent Fairchild presets worked best for stereo bus compression. The ES-8's dynamics processing was laudably transparent. The unit lent a slight-

ly euphonic, softer sound to the mix, while perfectly preserving spectral balance. The harder you hit the ES-8, the creamier it sounds. Purists might bark at me, but 8 to 10 dB of gain reduction on a stereo mix sounded great.

The only big beef I have with the ES-8 is that its inputs lack headroom. Pumping +26dBu mixes into the unit from my Yamaha 02R's analog outputs, I had to lower the input levels about 8 dB down from unity to avoid audible distortion. I should also note that the ES-8's +4dBu gain structure does not accommodate -10dBV levels very well, as the input control is strictly an attenuator. For most pro tracking applications, these is-

ues should not be a problem.

The ES-8 is a clean, transparent tube limiter that performs admirably on the acid test for compressor/limiters—percussive, broadband program material. The unit is not heavily colored, lending more of a soft sound, rather than bursting with overtones. Its only weaknesses are its limited headroom at input and practical incompatibility with -10dBV systems. Boasting a plethora of features and elegant looks that more than justify the \$3,495 price, the ES-8 is bound to find a home in many pro studios.

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D.A.S.

# CM LABS MOTORMIX

## DIGITAL MIXER WORKSURFACE

The advent of computer-based DAWs has brought not only incredible power and complete recall of all internally controlled functions—effects, EQ, edits, level and mute—but it has also made the threat of repetitive stress injuries very real. With this in mind, and given the convenience of its fingertip moving fader control, I was anxious to review CM Labs' MotorMix with my Soundscape workstation. The unit is also supported by Digidesign (Pro Tools TDM and Digi 001/Pro Tools LE); Emagic Logic Audio; Steinberg Nuendo and VST; MOTU Digital Performer; Minnetonka MX-Trax; SEK'D Samplitude; and Symbolic Sound Kyma.

### PIECES OF EIGHT

Priced at \$995, MotorMix is perhaps the most compact unit of its kind that I have seen, with eight tightly spaced motorized faders. CM Labs seems acutely aware of the variety of studio situations in which this product is bound to be used. MotorMix conserves physical space, yet the layout is roomy and comfortable. In addition, multiple MotorMix controllers can be mechanically connected into a single "linear" package or with "wedge" inserts (available from CMLABS.net) to form an arc. Some of the 56 back-lit switches are labeled, while others are strictly user-defined, and *all* can be applied to a variety of mixer, transport and plug-in functions.

The first thing you'll notice about MotorMix is its rock-solid feel. From the full-throw 100mm faders to the 40-column by two-row alphanumeric display, the unit feels totally pro with no "flexing" of any kind when a switch is pressed. A quick peek under the hood reveals high-quality Fiberglass-epoxy circuit boards with plenty of support. This is not a disposable product but one that can grow with your needs. CM Labs also makes "Dashboard", a dedicated transport controller with a large jog/shuttle wheel.



MotorMix connects to your workstation via MIDI in and out ports. (There is also a 9-pin accessory connector.) Some workstations support multiple MotorMix units—Pro Tools accepts up to four. Workstation manufacturers are responsible for supplying the appropriate drivers. For example, Console Manager is the Soundscape applet that allows users to select MotorMix from a list of supported controllers. Within Soundscape's Settings menu is a user option to boot Console Manager along with the workstation. Once this is done the first time, simply select "Save Settings," and it becomes transparent.

### MIX THIS

The unit I tested was running Version 1.08 firmware with Version 2.0 of the operator's manual. Firmware can be updated in the field. While the manual focuses on the Pro Tools inter-

face, MotorMix can be used with a variety of workstations, including Minnetonka's stereo and 5.1 surround software.

Working on my Soundscape system, I got right to work on a mix from scratch, and it sure was great to be able to put down the mouse and simply audition individual tracks. All of my onscreen track labels showed up in MotorMix's LCD above each channel strip. MotorMix can only display four characters for each channel. Thus, I modified some of the onscreen track descriptions to make the most of what could be displayed on the LCD. At the upper left corner of the controller is a pair of View buttons that advance channel access to either the next bank of eight or the next group of four, depending on which of those switches is selected.

To take full advantage of the 100mm faders and of Soundscape's automation, some global levels are set onscreen. For example, "overdriven"

BY EDDIE CILETTI



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**FIELD TEST**

electric guitars can be recorded hot, resulting in fader positions 20 dB down from nominal. Automation systems do not have as much resolution in this area; trimming the track's level down 20 dB allowed the fader to "live" at nominal. From this point, I made all fader and mute moves from MotorMix, including lead vocal composites. Aside from my errors while learning Soundscape's automation protocol, MotorMix always responded with speed and precision.

My main complaint about MotorMix concerns panning. The eight rotary controls across the top row are continuous—a great feature for panning a surround mix. For traditional left/right positioning however, finding the Center position requires the user to look at the computer screen.

**HERE'S LOOKING UP YOUR OLD ADDRESS**

Table 1 shows the front panel layout of MotorMix. The most used functions are Solo (Q-X), Mute (Y-Z) and Record Enable (I-P). MotorMix also includes several plastic overlays, so the unit can be relabeled to reflect a specific workstation. There are five rows of buttons on the upper half of MotorMix. The first row is labeled 1 through 8, while others go from A to Z, ending with 0, 9, \*, =, / and "." so users (and programmers) can keep track of the available button resources until a function is assigned.

Table 1 is annotated to indicate the "soft buttons" that Soundscape uses. Although you can see the transport control functions (switches 1 through 8) on the bottom row of the display, also note that

F1- F4 perform a similar function when activated by Shift-F1. Shift-F2 turns switches 1 through 8 into Locate functions. Shift-F3 turns switches 1 through 8 into Zoom/Scroll functions. Table 1 shows how these Soundscape functions are mapped to the display and the buttons immediately below. See Table 2 for full details of these functions.

On the upper right of MotorMix are four buttons relabeled on my overlay as Track, eff-1, eff-2 and eff-3. Pressing the button alone activates the green LED, while pressing Shift and the button activates the yellow LED.

**IMPLEMENTATION**

It is basically the job of the workstation manufacturer to "port" its graphic interface to the physical interface, thus taking maximum advantage of MotorMix or any controller. This is no small task when you consider the variety of plug-ins and controllers available.

Just as a word processor has short-cut keys that allow access to special characters, so too should workstations provide an optional "layer" or window that allows users to link the controller with the available mixer features—especially plug-ins. There will always be a natural lag from the time a plug-in is released to the time

**Table 2: Details of functions activated by soft keys Shift-F1 to Shift-F3.**

**Transport: Shift-F1**

- Rew:** Puts recorder into Rewind mode
- FF:** Puts recorder into Fast Forward mode
- Stop:** Stops the recorder
- Play:** Puts recorder into Play mode
- Rec:** Puts recorder into Record mode
- Pin:** Controls punch-in flag
- Pout:** Controls punch-out flag
- Loop:** Controls loop flag

**Locate: Shift-F2**

- DrLl:** Drop left locator on current locator position
- DrRl:** Drop right locator on current locator position
- GtLl:** Move current locator to left locator
- GtRl:** Move current locator to right locator
- GtAs:** Move current locator to start of arrangement
- GtAe:** Move current locator to end of arrangement

**Zoom/Scroll (monitor): Shift-F3**

- ZHIn:** Zoom arrangement window horizontal in
- ZHOut:** Zoom arrangement window horizontal out
- ZVIn:** Zoom arrangement window vertical in
- ZVOut:** Zoom arrangement window vertical out
- ScLe:** Scroll arrangement left
- ScRi:** Scroll arrangement right
- ScUp:** Scroll arrangement up
- ScDo:** Scroll arrangement down

the controller interface can be created. Why not give users the option rather than have no controller access at all?

**PRINT IT**

MotorMix gave my "mouse hand" a much-needed break, allowing the full range of expression that only a linear fader can give. MotorMix does not eliminate

the need for a monitor or a mouse, but it does respect your need for space and inspire confidence with its solid pro feel. MotorMix *will* inspire your mixes as well as reduce the risk of repetitive stress injury to your hands and wrists.

CM Labs' ([www.cm-labs.net](http://www.cm-labs.net)) Motormix is distributed by Digidesign, 3401-A Hillview Ave., Palo Alto, CA 94304; 650/842-7900; [www.digidesign.com](http://www.digidesign.com). ■

Visit Eddie Ciletti's Website at [www.tangible-technology.com](http://www.tangible-technology.com).

⇐ View ⇒	Track 1	Track 2	Track 3	Track 4	Track 5	Track 6	Track 7	Track 8	Upper Row
⇧ Bank = 8	Track 1	Track 2	Track 3	Track 4	Track 5	Track 6	Track 7	Track 8	Upper Row
⇩ Group = 4	Track 5	Track 6	Track 7	Track 8	Track 9	Track 10	Track 11	Track 12	
Shift-F1	Rew	FF	Stop	Play	Rec	Pin	Pout	Loop	Lower Row
Shift-F2	DrLl	DrRl	GtLl	GtRl	X xxx	Xxxx	GtAs	GtAe	
Shift-F3	ZHIn	ZHOut	ZVIn	ZVOut	ScL ⇐	ScR ⇨	ScU ⇧	ScD ⇩	
Buttons	1	2	3	4	5	6	7	8	

**Table 1: On the upper row, the LCD will indicate track names from the mixer. On the lower row are three sets of examples of what can be seen, plus the buttons activated immediately below. (See Table 2 for the complete detail of these functions.)**

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# INA-GRM GRM TOOLS

## TDM SIGNAL-PROCESSING PLUG-IN BUNDLE

The GRM Tools plug-in bundle was created by the Groupe de Recherches Musicales de l'Institut National de l'Audiovisuel (aka, Ina-GRM) in Paris. The bundle consists of eight mind-warping plug-ins that are the culmination of more than 15 years of R&D.

GRM Tools is available in three different flavors: VST, RTAS and TDM. The plug-ins are identical in the RTAS and VST versions: Band Pass, Comb Filter, Pitch Accum, Shuffling, Delay, Doppler, Freeze and Reson. (The first four make up Volume 1, and the second Volume 2 of the VST bundles.) However, the TDM bundle replaces Reson with Equalizer.

Electronic Music Foundation (Albany, N.Y.) distributes the TDM and RTAS versions of the bundle (\$459 and \$349, respectively). The VST version is distributed by Steinberg, and instead of one bundle with eight plug-ins, there are two bundles of four plug-ins each. These retail separately for \$199. This field test focuses on the TDM bundle (Version 1.3).

Installing the GRM Tools bundle is routine. Pop the CD-ROM in your computer and hit Install. All of the plug-ins are installed in the Plug-Ins folder of your DAE folder. You get two weeks to try out the plug-ins before you need to authorize them. Copy protection is by challenge/response. The response can be obtained via e-mail, phone or fax.

### UNIVERSAL CONTROLS

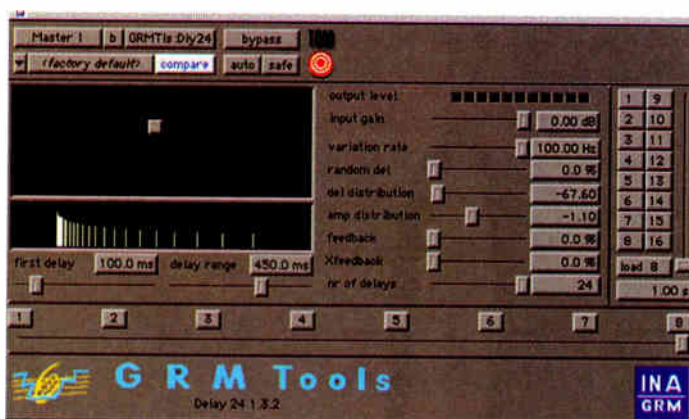
Each plug-in format sports its own GUI look, and every plug-in has its own set of unique parameters, but they also have several common control elements that make the GRM Tools especially powerful for sound design and serious audio morphing tasks, because they allow multiple parameters to be changed simultaneously. There are four elements: a preset bar with 16 individual program keys, a long horizontal fader dubbed a Super Slider, a rate of

change control and something that's best described as a 2-D potentiometer. All of these features can be automated in Pro Tools fashion except the 2-D potentiometer.

The preset bar lets you save and load patches to any of its 16 keys. These patches are in addition to the Pro Tools plug-in window's save and load feature. In fact, saving and loading presets through the Pro Tools menu recalls all of the plug-ins' internal patches. The ability to have 16 patches at the click of a mouse without the hassle of pop-up menus is excellent; it really makes group pa-

nal patches, giving you the option of arranging a group of eight patches in any order. By using the Super Slider you can manually morph between the selected presets at any rate, forward or backward—super cool.

The 2-D potentiometer consists of a small square element that you can drag around, vertically and horizontally, in a window. Moving the element lets you change the relative values of two preset parameters. For example, in the Band Pass plug-in, it controls the high and low cutoff frequencies. The parameters that are tied to the potentiometer are usually located direct-



Although GRM plug-ins feature unique interfaces, they share common control elements. Shown, TDM Delay.

parameter changes quick and easy.

By clicking on a preset bar key, the rate at which the current parameters change to the new parameters can be set from zero to an ample 30 seconds. Interpolation time is adjusted by using an associated vertical fader or by entering a value directly into the text field just below the fader. Set the interpolation time to a value above zero, click on a preset key and watch the plug-ins' parameters morph.

The Super Slider lets you manually control interpolation times between specific presets. Directly above the Super Slider are eight keys that address any of the plug-ins' 16 inter-

ly above or below its window. These parameters can be precisely monitored, because the associated text fields' values change as you move the potentiometer. Automating the potentiometer would be sweet, but because this isn't possible, I found the potentiometer useful mainly as a tool for writing new patches. The potentiometer is found on all of the plug-ins except the Comb Filter and Equalizer.

### PLUG-IN LINE UP

All of the plug-ins are available in either mono or stereo versions. The Delay, Doppler, Freezing, Pitch Accum and Shuffling also do mono to stereo. Every plug-in has input gain attenuation, and all but Doppler,

BY ERIK HAWKINS

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### FIELD TEST

Pitch Accum and Shuffling have an output level meter. Though the RTAS and VST versions of the plug-ins have a wet/dry mix control, the TDM plug-ins do not—a major bummer. I hope Ina-GRM fixes this in the near future.

The Comb Filter comes in 1- and 5-band versions. There are frequency, resonance and lowpass parameters. The 5-band version offers five discrete filters for each of the above-mentioned parameters along with a master. Comb Filter is a great plug-in for dramatic filter sweeps and resonant effects. I really enjoyed processing synth pads by automating the effect in time to a beat—great for dance music.

There aren't a lot of parameters on Band Pass, but what's there sounds really good. You get frequency and bandwidth controls, and a key for selecting between either bandpass or band-reject operation. The low and high-pass faders have 512 steps, from 23 to 22k Hz, and are excellent for honing in on the desired filter effect. Using the potentiometer to sweep these two parameters at the same time is great fun and perfect for tailoring sounds to picture.

Equalizer is a graphic equalizer and has 23 fixed bands, equally spaced at  $\frac{1}{2}$ -octave bands from 40 to 13k Hz. The Super Slider and Interpolation controls make this plug-in more flexible than your average graphic EQ. The Equalizer Pro Tools Mix | 24 version is designated as Equalizer Mix.

There is also a Mix | 24 version of Delay, Delay 24. This plug-in offers up to 24 delay lines (the RTAS and VST versions do up to 128 delays—if your computer has the processing power, of course), and there are several unique control parameters. You can adjust the number, distribution (how the delays cluster) and amplitude envelope of the delays. The potentiometer controls the delays' ranges (0 to 683 ms) and when the first delay is heard (out to 683 ms). There is the ubiquitous feedback parameter and a fader to introduce random variations in the delay lines. Below the potentiometer is a discrete window that shows exactly how the delays are falling; it's very useful for visualizing the outcome of your tweaks. If delay lines are your thing, then Delay 24 can help with many of your more creative jobs.

There's nothing quite like Doppler to simulate a sound moving through space. As its name implies, this plug-in allows

you to create a Doppler effect—it's quite convincing. You can control the sound's passing speed, amplitude change and pitch change for that perfect drive-by every time. Additionally, radical movements can be cooked up, including rotating a sound around a central position and simultaneously moving it through the stereo field. (Imagine a fly buzzing around your head as you run madly away trying to escape it.) The potentiometer gives you manual control over the sound's position in the stereo field on X and Y axes. Automate this plug-in's parameters and pop



The Doppler plug-in lets you control passing speed, amplitude change and pitch change.

on some headphones for a real trip.

Freeze is probably Ina-GRM's best-known plug-in, most likely for its extreme sound mangling capabilities. You can sample up to 99 ms, select a loop from the sample and have as many as eight loops going at once. (In the RTAS and VST versions, you can grab up to 3 seconds and have as many as 32 loops.) Parameters include synchronizing loop playback, pitch change and randomizing pitch and loop duration. The potentiometer in Freeze is a wonderful tool to adjust loop start and end points. But don't think Freeze is a typical loop playback machine; individual loops are not adjustable. For example, when you choose a number of loops to work with, they are all on at once, that's it. Freeze's tuning and randomizing parameters are what create the complex and off-beat layered sounds it's known for. This plug-in is a difficult fit for musical applications, but makes crafting sound effects a piece of cake.

Initially, Shuffling sounds similar to Freeze. But instead of looping a section of the audio, Shuffling plays fragments (up to 683 ms, or 2937 ms with the RTAS and VST formats) of the source track. There is control over the duration, pitch, delay before playback and how often the fragments play. A simple amplitude envelope can be



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## FIELD TEST

superimposed on the fragments, and feedback is also available. At its extremes, Shuffling sounds like a random stereo gate with a wildly pitch-shifting source to really nasty radio static. This plug-in is another shoe-in for the audio mutilation awards.

The Pitch Accum is like a harmonizer on LSD. With two discrete pitch shifters, it's possible to cook up some decent harmony parts. You can transpose up or down 24 semitones, there are periodic and random modulation parameters, and harmony parts can be delayed up to 671 ms. And much stranger sounds can be concocted. Using the feedback, feedback mix, and a transposed sound's duration and blend parameters, a vocal performance is easily turned into an out-of-control, sci-fi phaser battle. While I wasn't blown away by the quality of Pitch Accum's harmony parts, they can work with the right track. This plug-in's bizarre effect possibilities are the real attention grabbers.

## ENDLESS CHOICES

There are a ton of wonderful sonic possibilities with the GRM Tools bundle. And the plug-in's unique controls really help get the most out of these processors. Bear in mind that all these neat effects do come at a heavy DSP cost. A single instance for most of these plug-ins eats up 50 to 100% of one Mix DSP chip. Got power? You'll need it if you start stacking up Delay 24 and Shuffling plug-ins.

Looking at how much other TDM bundles with multiple plug-ins cost makes you realize what an outstanding value the GRM Tools bundle is. However, if what you are looking for is a bundle of work—a day-to-day, utility-type plug-in—then the GRM Tools pack probably isn't for you. There are a lot of very creative plug-ins that are the cat's meow for sound design and dance music production, but these plug-ins won't get you through a basic tracking session. Reserve the GRM Tools plug-ins for when you really want to expand your sonic palette, and you won't be disappointed.

The GRM Tools TDM and RTAS bundles are distributed by Electronic Music Foundation, 116 North Lake Ave., Albany, NY 12206; 888/749-9998; fax 518/434-4110; [www.grmtools.org](http://www.grmtools.org). ■

*Erik Hawkins is a musician/producer working in Los Angeles County and the San Francisco Bay Area. Visit him at [www.erikhawkins.com](http://www.erikhawkins.com) for more equipment chitchat and tips on what's hot for the project studio.*

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# SNAPSHOT PRODUCT REVIEWS

## ANTHONY DEMARIA LABS

### ADL 100-G

#### Tube Direct Box

△ The ADL 100-G is a single-channel tube DI featuring two Sovtek 6922 twin triodes in its all-tube



audio path. The unit has all of the standard direct box features, plus a few nice extras. The 10-megohm impedance of the unbalanced instrument inputs is high enough that it shouldn't load down piezo pickups. Other features include a low-impedance, mic level, balanced XLR output; a high-impedance output on an unbalanced 1/4-inch jack; ground lift switch; power switch (with ultra-cool, neon-blue LED); and captive AC power cord.

The hi-Z, unbalanced output is useful for splitting the DI's signal out to an amp. A switch allows you to choose between a direct out signal (muted off the instrument input) and a signal taken after the tube input buffer. The mic level, XLR output is always through the box's tubes and is served by a rotary gain knob. The continuously variable knob is strictly an attenuator for the tube output stage, providing roughly 13 to 34 dB of attenuation across its range. I prefer an unattenuated output (or, at least, attenuation starting at unity/0 dB) for most studio applications.

Unfortunately, the gain control cannot be bypassed.

The ADL 100-G offers a similar spectral balance to the company's ADL 1500 Stereo Tube Compressor. Fans of vintage tube equipment will appreciate the 100-G's fat, tubey timbre and soft top end. My '62 Strat oozed liquid, round, bell-like tones through the unit. On electric bass, my Aguilar DB 900 Tube Direct Box sounded a bit more lush and open compared to the ADL 100-G. But the differences were subtle, and the 100-G's slightly darker tone was nevertheless flatteringly fat. At \$599 list, the ADL 100-G is an excellent choice for DI duties and is sure to please the tube enthusiast.

Anthony DeMaria Labs; [www.adl-tube.com](http://www.adl-tube.com); 845/256-0032.

—Michael Cooper

## GOLD LINE/PMI TK51

### The 5.1 Audio Toolkit DVD

△ Audio reference discs are nothing new, but when somebody creates a DVD with audio tones in 5.1 surround format, you gotta take notice. Produced by Gold Line and Performance Media Industries, the TK51 "The 5.1 Audio Toolkit" is just that—a collection of useful signals, test tones, and reference materials for calibrating, setup and troubleshooting 5.1 surround systems with THX Surround EX.

Retailing at \$149.95, the TK51 offers more than 80 test signals presented in Dolby Digital format for playback on any DVD player. Tracks include Midrange Pink Noise, Wideband Pink Noise, LF Pink Noise, Crossover Point Check Signals, Imaging Tests, Third-

Octave Pink Noise, 1-Octave Pink Noise, Third-Octave Burst Headroom Test, Noise Leakage Tests, Sinewave Signals, Swept Sinewave Signals and "A Whole Lotta Bass"—a track designed specifically for checking up subwoofer (LFE) performance. The disc also provides a variety of well-recorded musical selections, ranging from classical to rock and big band, as well as the now-classic Dolby Digital ("City," "Train" and "Egypt") theatrical trailers, which put both picture and audio playback to the test.

Navigation through the menus is easy and fast, and the disc also includes "cycled" tones that play one at a time through the L-C-R-Sr-Sc-SI channels to ensure that levels are set properly. Although the disc works best with an RTA or SPL meter, most tests require little more than a well-trained set of ears to make sure playback levels are matched or to listen for rattles, hums or buzz. My only complaint with "The 5.1 Audio Toolkit" DVD is that it should have included some 5.1 DTS and LCRS Dolby Pro Logic material as well as a few simple picture performance checks, such as colorbars, convergence grids and focus checks. Those minor shortcomings aside, this is a must-have accessory for anyone installing, mixing or using surround gear.

Gold Line; [www.gold-line.com](http://www.gold-line.com); 203/938-2588.

—George Petersen

## STEDMAN PROSCREEN

### PS100/PS101

#### Pop Screen Filters

△ A couple years ago, after reviewing almost every pop filter on the market, I swore I'd never review another one—today, there are way too many "me-too" and knock-





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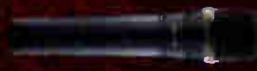
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## AUDITIONS

off screen products available. However, when the truly unique Stedman Proscreen came out, I had to check it out.

Like other screens on the market, Proscreen is available in two versions: The \$47.50 PS100 has a 180° swivel on a standard 3/8-inch, 27-thread mount; and the \$59 PS101 has a 13-inch gooseneck with a clamp that attaches to any mic stand or boom. However, what really sets Proscreen apart from the rest of the pack is its unique metal screen material that is not simply perforated but lowered; the slight angle redirects ultralow-frequency breath blasts and pops downward out the back of the screen. This process does not attenuate high frequencies—as do most fabric screens—and leaves the vocal performance unaffected. Even blowing directly into the screen has almost no effect on the mic. As a further plus, the Proscreen is easy to clean and is ruggedly built for a lifetime of service—in fact, the unit includes a lifetime warranty. This one works!

Stedman Corp.; [www.stedmancorp.com](http://www.stedmancorp.com); 888/629-5960.

—George Petersen

## PRIMERA COMPOSER Optical Disk Duplicator

Primer Technology offers the Composer Optical Disk Duplicator, an affordable solution for short-run CD-R duplication tasks. The Composer is available with or without the optional Signature III color printer or the Inscripta™ Thermal



CD Printer. The Composer interfaces with a host PC (Windows 95, 98, NT and 2000 compatible) and is designed to duplicate (at speeds up to 12x) and print without an attendant. The unit ships with the PrimoCD

software suite, which handles both duplication and printing duties. The test unit included the Signature III printer, and the entire package lists for \$2,495.

Setting the unit up is a “no-brainer.” All one has to do is set the printer up on its stand, attach it to the back of the duplicator and remove a few pieces of Styrofoam from the underside of the robotic arm that secure it for shipping. Installing the software, attaching all of the necessary cables and dealing with SCSI conflicts can prove to be a bit of a headache. But once up and running, the unit performed pretty much without a glitch.

I found the most efficient way to use the Composer was to split up the tasks, first duplicating the CDs and then printing the labels. The unit will copy about seven CDs an hour and will continue copying as long as its blank CD-R bin is refilled. The printing process is much quicker (about a minute per disc) and, as with the duplication process, the printer will keep rolling unattended. Splitting up the process seemed to take a bit of the load off the CPU and get things going a little quicker.

Other available options include a DVD



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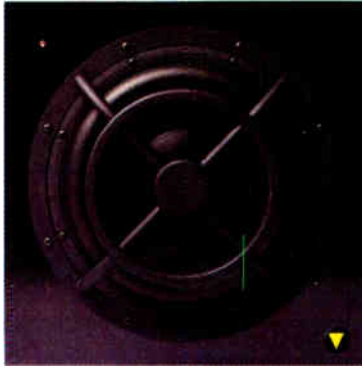
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## AUDITIONS

version and a print-only version. Some users might also opt to use another Windows-based graphics program. All in all,



the Composer is a slick and very affordable product that would make a handsome addition to any midlevel or project studio.

Primer Technology; [www.primeratech.com](http://www.primeratech.com); 763/475-6676.

—Robert Hanson

## NHT PRO B-20 Stereo Subwoofer System

Formerly marketed under the Verge brand, NHT Pro is back as the professional division of NHT. To take

company's own flagship A-20 monitors (reviewed June 1999) or other monitors—either in stereo or for LFE in 5.1 arrays.

The B-20 package consists of two 38-pound, 14-inch cube acoustic suspension enclosures with high-excursion, 10-inch woofers behind kick-proof grilles. The beefy 37-pound rack unit provides 250W/channel, and status LEDs indicate Power, Clip, Bypass and Mono/Stereo modes. Controls adjust input sensitivity, highpass filtering on the satellite feeds (35/65/85/110 Hz and full range) and five-position bass boundary compensation. The bass phase may be switched over a wide range (180/90/0/-90/-180°) to optimize subwoofer summing with the satellites; there is a sub lowpass control to limit the highest frequency the sub will reproduce (70/85/95/105 Hz and full range). Finally, a sub gain rotary attenuator (0 to -20 dB) matches the sub level with the satellites. All necessary cabling is included.

Like the A-20 system, the heart of the B-20 is in the control amp. Unlike other powered subs, all the tweakable parameters for optimizing the sub's system response to your monitoring environment are on the rack unit's front panel, so any adjustments can easily be made at the listening position. There's no need to leave

a twist on the milk slogan, "everybody needs *lots* of bass," especially when keeping up with 5.1 monitoring systems and high-powered near-fields. With that in mind, NHT Pro offers the B-20, a well-thought-out system that interfaces with the

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If 5.1 surround or accurate deep bass is your goal, just add the matching SW10 subwoofer. Its unique 3 input arrangement, combined with a long-throw 10" woofer and 180 watt, self-contained amplifier, makes it suitable for either stereo or surround applications.

Sound expensive? You'll be very pleasantly surprised—they're less than half the cost of competition that sounds this good. The MSP10 and SW10. Once again, Yamaha gives you more for less.



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## AUDITIONS

the sweet spot to make a change during setup, so beyond some experimenting to find the right placement, it's relatively easy to optimize reproduction and minimize room interaction. Once the system is set up and matched to your speakers and room, you can "set-and-forget." The B-20 also includes a useful hardwired remote control for switching from stereo to mono or bypassing the sub during playback—



ideal for checking for phase problems or mono incompatibility in the tracks or getting a real-world assessment of the mix without the subs engaged.

We tested the B-20 as a mono-fed LFE in a 5.1 system with five TOA 280ME-AV near-fields and as a stereo subwoofer supplementing a pair of bi-amped Meyer HD-1s. The B-20's system performance is stated as 29 to 100 Hz with a peak acoustical output of 110 dB at 40 Hz. The TOAs are low-efficiency, sealed three-ways that almost brickwall below 100 Hz and *really* need a sub, whereas the Meyers are flat down below 40 Hz—two very different scenarios. In both cases, the B-20 addition made a significant improvement in the sound, offering bass response that was natural, tight and seamlessly integrated with the other speakers. We also paired the B-20 with a pair of Martin Logan Aerius electrostatics owned by *Mix's* resident audiophile, Dan Hernandez. The result was nothing short of awesome: huge and full—yet fast and responsive!

Listing at \$2,000, the NHT Pro B-20 isn't cheap, but with its 2x250-watt amps, control electronics and dual high-output subs, the system offers a solid solution for enhancing existing or new monitoring systems in the pro or project room.

NHT Professional; [www.nhtpro.com](http://www.nhtpro.com); 707/748-5940.

—George Petersen

## CARVER ZEROPOINT 3-D SESSION High-Definition Cables

Having tried expensive boutique cables before, I approached Carver Professional's ZEROpoint high-definition cables with suspicion. On the other hand, as I have often said, it only takes one cheap cable to mess up a million-dollar sound system or recording.

Unlike cables that are simply oxygen-free, ZEROpoint cables use the patented Ohno continuous casting method to draw pure copper into a single unidirectional crystal structure, a construction method that cannot be fully appreciated until you open up the cable. The cable has a double shield, using a copper outer braid and an inner Mylar foil shield with a drain wire. The shield is telescoped to the source end, indicated on the instrument cable by purple heat-shrink labeled "Input." Two oversized 18-gauge conductors are wrapped in cross-linked polyethylene to minimize dielectric absorption, and an extra PVC layer under the shields absorbs noise.

Like the mic cable, the 1/4-inch instrument version uses two conductors, with the shield unused for the signal path.

Why pay extra for a product? Because it sounds better. The ZEROpoint mic cable offered a slight, but noticeable, improvement to the sound of an inexpensive dynamic mic. It was more obvious with a condenser mic, and it seems the more expensive the mic, the greater the difference. The ZEROpoint instrument cables yielded similar results, opening up the sound of Highlander, Baggs and Fishman acoustic guitar pickups, a Fender Strat and sounding especially surprising on a Precision Bass. The audio benefits from an openness, a transparency and clarity in the highs, and a tighter focus in the lows. Most pro engineers or musicians would pay hundreds of dollars to get this effect in a processor. The musicians invited to the critical listening session were blown away that a cable could make this much difference.

ZEROpoint cables are available in lengths from one to 50 feet, with XLRs or rugged gold-plated brass 1/4-inch plugs (straight and right angle). The 20-foot version lists for \$96, and they all come with a lifetime warranty and a hook-and-loop cable wrap. They are also sold as the Fender Pro Tone instrument cables in 3, 12 and 18-foot lengths, and ZEROpoint cable is also available in bulk on 200-foot spools.

Carver Professional; [www.carverpro.com](http://www.carverpro.com); 503/978-3344.

—Mark Frink



# “...easy to use and priced right.”

(from Mix Magazine's review of our HDR24/96 Recorder/Editor)

According to Editor George Petersen, “... *This one rocks! The HDR24/96 is a stunning development with excellent sonic quality... The unit offers an ease of use that should make disk-recording novices comfortable while including an impressive feature set that will appeal to seasoned pros.*

*“The recorder's faceplate holds few mysteries and most users can be up and recording just minutes after unpacking the HDR24/96.”*

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According to Britain's Audio Media magazine, “*As a recorder (the HDR24/96) is transparent. As a tool, it's powerful. As a creative helper it's perfect. With focus on functional, inexpensive, simple-to-use 24-track recording, Mackie has hit the mark.*”

## The non-linear, nondestructive HDR24/96 versus linear hard disk recorders.

Ever since the invention of magnetic tape, recording over something means it's gone... which makes doing “punch-ins” a dicey gamble. This is called *linear* (destructive) recording. Even some hard disk recorders use this old-fashioned technology!

The HDR24/96 employs true, nondestructive, *non-linear* recording and editing. That means you can record as many versions of a track or track segment as you want without destroying the original. During playback, the recorder recombines the non-linear segments into a seamless soundstream.

And unlike linear-style recorders that treat disk space like digital tape, the HDR24/96 doesn't automatically eat up 24 tracks of disk space

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# KEEPING YOUR DIGITAL TAPE IN THE GREEN

## THE MEDIA IS THE MESSAGE

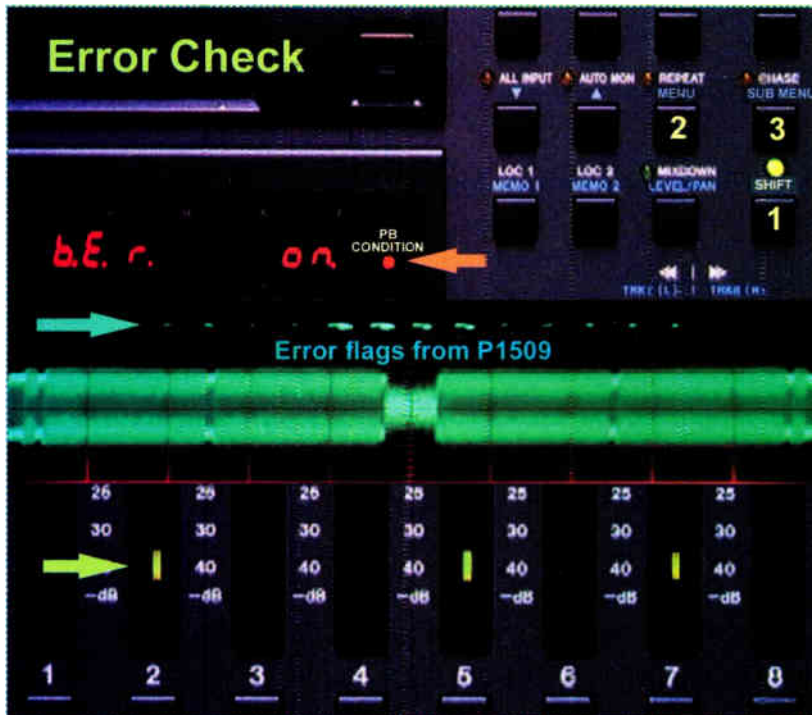


Figure 1: A composite image showing the keystrokes to access the Block Error Rate (bEr) on both the DA-38 and the DA-78HR. Errors are indicated on the bar graph display. In the middle, the signal from tape is monitored via oscilloscope. The dots above also indicate errors.

Lots of people are predicting the death of digital tape. I'll spare you the Mark Twain quote, but digital tape machines—whether as DASH multi-tracks or cassette-based MDMs—are still here, and with plenty of them in the field, they should be around for some time to come. Just out of diapers, workstation technology is a work in progress. I love my workstation, but nothing beats the convenience of popping in a tape and pressing Play.

Many of the new hard disk recorders (such as the Fostex D2424 reviewed in this issue) are cool because—as dedicated devices—they behave like tape machines, only faster. Random access has made rewind and fast forward obsolete, locating is instantaneous and looping a piece of cake. Hard drives are super-affordable now—ironically, all that storage technology costs about the same as a reel of 2-inch tape, and these days, a 20GB

hard drive can cost less than a pair of decent Sony headphones! Short-term storage is affordable, but DVD—the most logical long-term storage—is not yet the cheap fast food that CD-Rs have become.

Whenever data is being exchanged—through wire, Ethernet, disc or tape—there is a minimum quality required to deliver an uncompromised signal. I call the usable information above the minimum, “data headroom.” You want headroom in both the analog domain and in the digital domain—to avoid clipping and the nasty hash, respectively. Digital tape, CDs and DVDs are capable of maintaining the data stream even with dropouts, fingerprints and scratches. Redundant data is encoded into the stream to make the process more robust.

That said, the challenge of squeezing more information into the same physical

space places more emphasis on the medium and ultimately its relationship with the transport. For example, a 16-bit DTRS user may find that a 24-bit machine may have its own tape preference.

At one time, some early DA-88s did not perform well with Fuji (and TDK) tape until a resistor change made the machine more tolerant. Now, Tascam ships Fuji DPD Series Metal Particle tape with its 24-bit MDMs. In between, Tascam approved a formulation for tape manufacturers, allowing them use of the DTRS logo and making the choice easy for the end-user. Maxell tape works well also. Still, I was curious to know whether there was much difference between Fuji tape and the other previously approved DTRS formulations.

### SOUND CHECK

Checking the Error Rate is the best preventive maintenance because it clearly indicates the amount of data headroom available. Figure 1 is a composite of three images. At the top, three buttons are labeled 1, 2 and 3. Press Shift, then Menu and continue pressing Menu until “Maintain” appears. Then press Sub-menu until “bEr” appears using the up/down buttons to select “On.”

The Block Error Rate (bEr) is displayed using the LED meters: A-head on 1, 3, 5 and 7; B-head on 2, 4, 6 and 8.

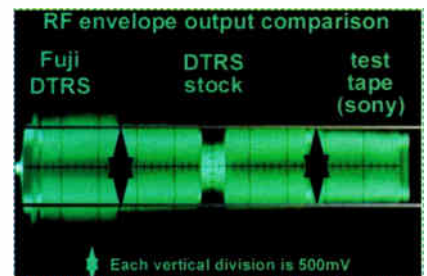


Figure 2: The “eye” pattern is observed by oscilloscope using the highest sweep setting, 0.1 $\mu$ S/div, in this case. The “eyes” are the dark spots created by the combination of 3.15- and 6.3MHz modulated signals. Equalization adjustments optimize the eye pattern and minimize the error rate.

BY EDDIE CILETTI



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The meters are only accurate when the machine is in Playback mode. From Stop to Playback, the meters will peak, then settle. If no LEDs light up, then there is plenty of data headroom; an occasional flicker could indicate tape dropouts. The example shown in the lower half of Fig. 1 shows three LEDs consistently lit. This indicates that something is compromising performance, though not enough to illuminate the PB Condition LED.

Note: The PB Condition LED is on when bEr-on is displayed and the Shift LED is illuminated. Press Shift and the

machine stays in bEr mode, the eight-bar graphs display tape errors and the PB Condition LED toggles on and off. When bEr is off, the PB Condition LED should be off 99.99% of the time. A major dropout might flash the LED, but it is mostly there to tell you when it's too late.

The middle of Fig. 1 also features a "geek insert," a view of the RF envelope (the signal from tape) on top of which are error flags derived from pin-2 of TP-1509. The errors are from the same tape that consistently lit the LEDs below. Anyone familiar with the RF envelope will know that this one looks quite good, yet something is wrong that will eventually cause

a problem. If you are nontechnical and stop reading now, just remember that any lit LED segments (when in bEr mode) are a sign you should stop. Do not attempt an overdub. Clean the heads, clone the tape and check error rate again.

#### SOLVING THE MYSTERY

There are two ways to tackle the mystery tape issue: user and geek. Users should try any of the available DTRS tapes—new stock only—knowing that all of them have a similar characteristic. I tried a brand-new BASF/EMTEC DA-30 MP on the DA-78HR in 24-bit mode with excellent results.

The short story is this: Tape is made from rust, glue and plastic, each possessing potentially variable properties. Tape heads are remarkably complex devices that are also subject to manufacturing tolerances. If "optimum" is the middle of the specification, then a tape that is left of center and a machine that is right of center could trigger the error LEDs.

Warning: Readers who don't comprehend geek-speak may skip the next section, but should at least read the last paragraphs of the article.

Geeks and the curious should take a closer look at the RF signals in Fig. 2. Set the horizontal sweep as far as it will go (at least 0.1 $\mu$ S/div) and trigger on the incoming signal at TP3 and TP4. (This test does not require an external trigger.) The difference between the 16-bit and 24-bit eye patterns clearly demonstrate the amount of additional information being squeezed onto the tape. (The "eyes" are the dark spots.) The brighter low-frequency is 3.15 MHz, recorded when formatting. The data in the background is 6.3 MHz. Adjusting the playback EQ—R53/54 for MP, R51/52 for ME tape—should enhance the eye pattern; the 3.15MHz signal should also be square and not tilted.

#### BIGGER IS BETTER

From right to left, Fig. 3 shows the progression of increased signal (to and from tape) from the birth of DTRS through the present. Each vertical division represents 500 mV. My ancient Tascam Test Tape, MTT-88101, is on Sony stock. Notice how its envelope (at right) falls below 1,000 mV. The DTRS stock in the middle, recorded on the DA-78HR, "kisses" the window, while the Fuji stock (also recorded on the DA-78HR) exceeds 1,000 mV in a healthy way.

Increased output level is one way to improve data headroom. A clear "eye" pattern is another, relying on the quality of the head gap plus a little EQ. The answer to the mystery tape question was a

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**NOMINEE**



batch of Sony DARS-113MP. It wasn't new stock, and it must have been just a little harder to erase than the EMTEC stock. I experimented with record current with the adjustments at near-maximum. Turning them all the way up just about made the LEDs go away completely. Then I tried Fuji stock, turning the record current down to simulate the reading of the mystery tape. The Fuji tape requires less record current even when blasting away previously recorded material.

**MORAL OF THE STORY**

Check error rate before a session. It's the only way to weed out potential problems—machine or medium—especially those caused by tolerance issues. Mass production lives and dies by its ability to stay within specified tolerances—that's what ISO-9000 certification is about, though you don't often see it touted in our industry. For all machines that have dual-resolution capability, a problem in High-Res mode may not exist in Standard mode. Proving this is another way of confirming the available data headroom.

Many people ask me if it's okay to recycle tape. For both digital and analog,

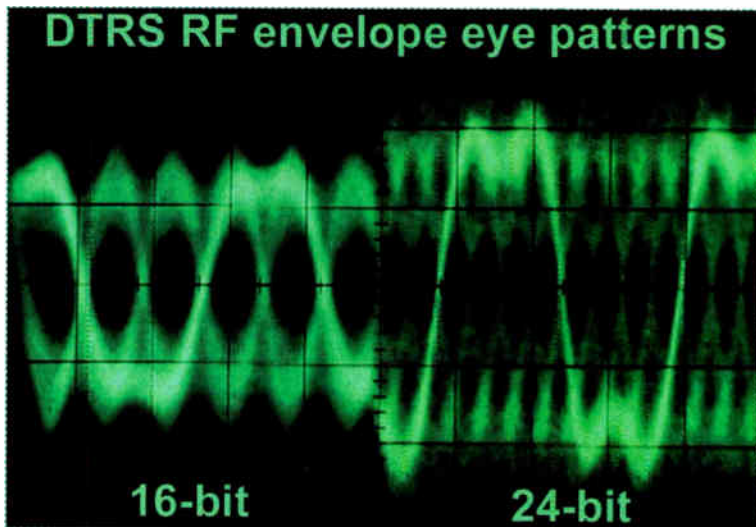


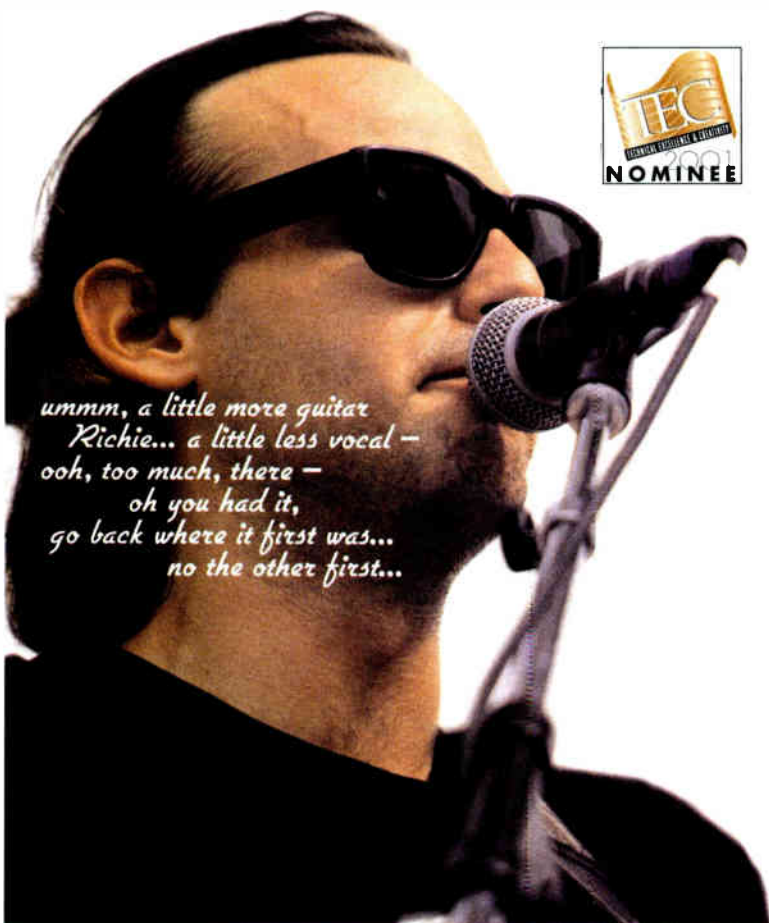
Figure 3: From right to left, the output level of the signal from tape increases as improvements have been made to the DTRS heads and their electronics, and with a little help from tape formulation tweaks.

the ability to reuse tape is based on the machine's record and erase current, respectively, combined with head efficiency. Panasonic DAT recorders are most vulnerable, especially those made after 1994 (or if the heads have been replaced). Try recording over previously recorded material comparing a Sony DAT against a Maxell DAT, checking error rate before and after. It might convince you to

keep buying new tape.

Eddie thanks: Phil Sanchez at Tascam for use of the DA-78HR, Jean Tardibuono and Natalie Stocker at EMTEC for their tape stock, and John Calder of Heartland Marketing for the Fuji tape stock. ■

By the time you read this, Eddie will be a daddy for the second time. Visit [www.tangible-technology.com](http://www.tangible-technology.com) for pictures.



*ummm, a little more guitar  
Richie... a little less vocal -  
ooh, too much, there -  
oh you had it,  
go back where it first was...  
no the other first...*

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Last month we looked at festival mixing, with an eye on front of house. This month we focus on the stage itself, looking at ways to keep the show moving. Whether you're mixing at a regional jazzfest or a Lollapalooza-type national event, the ability to get a multi-act music concert to run on time is all about the wires—getting the gear quickly repatched as it moves on and offstage.

## OFF THE STAGE

### STRATEGIES TO KEEP PACE AT FESTIVALS

BY MARK FRINK

#### SHARING THE BACKLINE

The difference between “real” festivals and “generic” festivals is that for the latter, backline equipment is shared by a number of acts. When the drums, guitar amps and keyboards are all provided by a rental company, the stage can be prewired to accommodate the widest number of bands on the bill. Each band's equipment needs are coordinated by the stage manager or a backline tech from the rental company, so a handful of stagehands can make changeovers quickly.

When the vocals, drum and backline mics remain in place from one act to the next, stage changes are simple. Apart from pushing amps from one side to the other, sound techs need only confirm levels on direct boxes and check the monitors. Unused mics can be simply set aside and muted without being unplugged.

More common are the kinds of festivals where many of the bands—and not just the headliners—bring everything except the main speakers. During the summer months, many bands tour without a P.A. and simply drop their production into a variety of “festival” venues—everything from county fairs and casinos to sheds. By carrying their own consoles, bands can ensure a stable foundation for their show, and the sound crew can often get by with only a minimal line-check

and may even blow off the soundcheck, a time-saver that is always popular with festival stage managers. For those bands who rely on in-ear monitoring, the only variable will be the sound of the main speakers, which is unlikely to affect what the musicians hear.

Another scenario is the situation in which a band brings their own mics, stands and DIs, along with mic cable looms and, perhaps, sub-snakes. Even the band's regular onstage AC power needs can be provided for by taping stage equipment AC lines together with the sub-snakes. By bringing familiar input sources, such bands significantly reduce the number of variables facing their FOH and monitor engineers. By carrying a chart of console input settings—gain, nominal EQ and aux bus assignments, etc.—the engineers can preset a new desk relatively easily. With sufficient preparation, the engineers can go “faders up” with confidence, even without a soundcheck.

#### ROLLING THROUGH THE ALLEY

Short of sharing backline, the only way to make quick changes on a festival stage is by using rolling risers. Top-name national acts usually require their own backline, so it is essential that a multi-act festival provide enough rolling risers or stage space to accommodate every group

who use their own set of band-gear. Also essential is enough offstage space to assemble and strike each setup before and after the performance.

The ideal stage layout incorporates a backstage crossover alley that allows the stage crew to move risers from one side of the stage to the other while a group is performing—and out of sight of the audience. If properly planned, such a route can allow band gear to go from being built upstage, rolled out onto the stage and finally pushed to the far side to be struck, all in a circular, unimpeded flow. Risers can then be recycled, and three complete sets of risers should allow for one band performing onstage, a second being set up and a third being struck. Ideally, each band that soundchecks should be allowed to keep its risers assembled between check and performance, which means that, in addition to the upstage crossover alley, there also must be “parking” space. It's worth noting that not all risers need to be eight feet square. Small 2x6-foot rolling risers, dubbed “skateboards,” were used extensively for guitar amps on the Lilith Fair tour; in a pinch, three skateboards could be C-clamped or strapped together to make a small drum riser.

In order to make the best use of

—CONTINUED ON PAGE 170



ILLUSTRATION: CHARLES STUBBS

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## EXCEL AND PRINTER

Perhaps the most necessary ingredient for a smooth-running festival is the paperwork that lists each band's inputs and shows

how each band's lineup fits into the overall festival input list. My favorite tool for visualizing each band's assignments is an Excel spreadsheet. Here is a simple example from a 10-band showcase at South By Southwest. (Because the FOH mixer was a Yamaha 02R, the input list was limited to 24 channels.)

The form has columns with the input assignments for each band, in order of appearance, left to right. Preceding each band's inputs is a thin column to indicate channels that are

repatched (X) or simply moved (M). This allows the patchmaster to focus on the changes for each group and tells the console engineers what gets moved and should be checked, plus what gets repatched and therefore *must* be checked to see if it is working. Note that each input's name includes its stage position (e.g., DSR for downstage right), which helps locate them quickly in the heat of a stage change.

At the top of the form, along with the bands' names, are their engineers' names, their set times, plus their sequence order and soundcheck time. Another row is used for assigning colors used for spike tape. Without unique colors for marking the positions of each band's equipment, it can be difficult to find the correct marks during a set change. In addition to spiking the stage, it's a good idea to use the same color to label the gear with its location onstage for that act. Rented backline

### MIC AND MONITOR ASSIGNMENT CHART FOR SXSXW

Check:			(10) - 5 PM	(9) - 4 PM	(8) - 3 PM	(7) - 2 PM	(6) - 1 PM
Spike Color:			Preset	Preset	ORANGE	GRAY	YELLOW
Reset/Show Times:			NA/6:50	NA/7:10	10/7:35	10/8:05	10/8:30
Engineer:			Jeff	Lonnie	Mark	Darren S.	Dingo
CH	MIC	Band:	1: CURFMAN	2: APARO	3: DIDO	4: GRAY	5: SEARCY
1	KMS 105	STAR VOC	SHANNON		DIDO RF VOC	M DAVID	PETER
2	KMS 105	VOC USR					M ACO DSC
3	KMS 105	VOC SR	BG VOC			M TIM SR V	M ACO DSL
4	KMS 105	VOC SL		ANGIE			M GREG SL VOC
5	Beta 58	VOC DRUM				CLUNE DR V	
6	DI	ACO 1		ACO DSL	ACO 1	M ACO 1 DSC	M ACO DSR
7	DI	ACO 2		BULLET MIC	ACO 2		M CELLO USC
8	Beta 56	GTR 1	GTR 1			M GTR 1 USC	
9	Beta 56	GTR 2	GTR 2			X CDL XLR @K	X
10	DI	DI 1		KEY USR	DJ L	X CDR XLR @K	X
11	DI	DI 2			DJ R	X K XLR USR	X
12	DI/Beta 52	INST 1			DRUM DI	X K XLR USR	X
13	DI/Beta 56	INST 2			DRUM FX	X PNO L USR	X
14	DI/Beta 56	INST 3				X PNO R USR	X
15	DI	BASS			B DI	B USL	
16	RF B 58	Mathew N.	HOST	HOST	HOST	HOST	HOST
17	Beta 52	KICK		TOY KICK OSL	X	K	
18	Beta 56	SNARE				S	
19	AKG 460	HAT				H	
20	SM 98	RACK 1		TOY OH OSL			PERC
21	SM 98	RACK 2				R	
22	SM 98	FLOOR				F	
23	AKG 414	OH SR				OH SR	
24	AKG 414	OH SL				OH SL	
Mon	MIX	Band:	1: CURFMAN	2: APARO	3: DIDO	4: GRAY	5: SEARCY
1	USR	Key			DJ	Tim	
2	DSR	Far			Vinnie		
3	DSC	Star	Shannon		Dido	David	Peter
4	DSL	Next		Angie	Alex		
5	OSL	Near			Keith	Rob	
6	USC	Drum				Clune	

equipment may get used for several bands, so these equipment labels remind the stagehands where they go for each act.

As shown on the chart, each channel has a generic festival name, which allows engineers to describe it accurately without having to look up the channel number. Keeping similar inputs in the same channels throughout the day minimizes the need for gain and EQ adjustments. Thus, the first guitar channel, generically called "GTR1" or even "G1," is always an electric guitar amp. Acoustic guitar direct boxes (ACO) are cabled from downstage center with mic cables long enough to reach either side of the stage. Similarly, the mics for the backline inputs, though they cable from upstage center, also have enough cable to get them to either side upstage. Inputs are dedicated for electric guitar amps (GTR) and direct boxes (DI), usually keyboards. Three more are simply

called instrument inputs (INST), because they change from DIs to mics over the course of the day, and these wild-card inputs, sometimes call P-channels (for generic Production) are the go-tos for odd inputs.

No matter how well the show is advanced, there are always a few changes to each band's stage plot and input list. That's okay, as long as these changes are communicated to the engineers manning the consoles. It is the patch-master's responsibility to meet with each band's engineer and confirm their inputs and stage plan. The generic names on the festival input list lead to logical places to put last-minute additions. Though it takes some time to create a festival spreadsheet from scratch, they can be recycled easily for future festivals. Now go roll your own.

—Mark Frink

	(2) - 6 PM TUE	(1) - 5 PM TUE	(5) - 11:15	(4) - 10:15	(3) - 9 AM
	BLUE	RED	BLACK	WHITE	PINK
	15/9:05	10/9:35	15/10:10	10/10:40	10/11:10
	Eric	Damien	Dave Allen	Pam	Barre
	6: BRADLEY	7: MEAD	8: REV. HEAT	9: BRAMHALL	10: SMITH CH
M	ROBERT	M DAVID	M HORTON	M DOYLE B.	PATTI 1
X	KEY USR V	KEY USR V			X OLIVER OSR 2
M	GTR SR V			M SUS. SR V	TONY SR V 3
	BASS SL V	BASS SL V	M JIM SL V M		M LENNY SL V 4
	DR V		SCOTT DR V	J.J. DR V	5
M	K ACO USR	M ACO 1 DSC			PS ACO DSC 6
M	ACO 2 DSC				M LEN ACO USL 7
M	K GTR USR	M GTR 1 USC	M GTR ON USR	GTR DB USR	GTR OLI USR 8
X	GTR 2 SR		M GTR OFF USR	M GTR BILL USL	GTR LEN USL 9
X	DR DI	M WURL DI L			X GTR PS USC 10
X	KORG USR	M WURL DI R			X OL. ACO USR 11
X	LES LO USR	LES LO			12
X	LES HI L USR	LES HI L			M D'JEMBE USC 13
X	LES HI R USR	LES HI R			M BONGO USC 14
	B USL	B USL	B USL	BASS	X BASS SR 15
	HOST	HOST	HOST	HOST	HOST 16
	K	K	K	K	K 17
	S	S	S	S	S 18
	H	H	H	H	H 19
					20
	R	R	R	R	R 21
	F	F	F	F	F 22
	OH SR	OH SR	OH SR	OH SR	OH SR 23
	OH SL	OH SL	OH SL	OH SL	OH SL 24
	6: BRADLEY	7: MEAD	8: REV. HEAT	9: BRAMHALL	10: SMITH Mon
	Tim	Key			OLIVER 1
	Michael		Horton	Susannah	TONY 2
	Robert	David		Doyle B.	PATTI 3
	Andrew		Jimbo	Chris	LENNY 4
		Bass		Billy	5
	Jeff	Drum	Scott	J. J.	DRUM 6

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—FROM PAGE 166, KEEPING PACE

rolling risers, there should be enough mics, cables and stands to cover the backline requirements for a minimum of three bands. One way to reduce the number of stands onstage is by using clip-on mics or claws for the drums, and Z-bars for the guitar amps. Leslie cabinet mics can similarly be mounted to the cabinet with claws or inside it on flanges with Velcro. With some planning, the total number of mic stands needed can be reduced to vocal booms (which remain in place on the front-line), overheads, hi-hat, and perhaps the kick and snare mic stands. With enough claws and Z-bars, a couple dozen stands can cover four bands without doubling up.

### IT'S ALL ABOUT THE WIRES

Not all sound companies can afford the luxury of sub-snake input boxes that disconnect from their cables; this feature just about doubles the cost of a sub-snake. Without multipin disconnects, which would allow sub-snake input boxes to remain prewired on their respective rolling risers, inputs must be individually repatched during a changeover. One approach is to leave sub-snakes patched at the main stage box, label the sub-boxes with the generic list of festival input names and repatch at the sub-boxes. Some main stage boxes incorporate multipin disconnects as well as individual XLR inputs, a scheme that allows one band (usually the headliner) to be checked and struck with their sub-boxes intact on the risers.

Sub-box assignments are easily defined for each area of the stage. Locating the backline instruments sub-box at the front of the drum riser allows for backline mics and DIs to be moved to either side of the stage as needed. Similarly, leaving the sub-boxes plugged into the main stage box and making mic changes by moving or extending cables reduces the chance of a mismatch. A basic rule for a festival patch is *never* unplug anything that's not labeled.

### ESSENTIAL FESTIVAL TOOLS

Two sets of switched mics feeding small

powered speakers at each end of the snake makes an efficient way for FOH and monitor engineers to talk to each other throughout the day. The monitor engineer will usually also have a second switched mic feeding the monitors so that he can talk to the musicians from the monitor mix position. But what about the stage itself?

On all but the smallest festivals, a third person onstage, dubbed the "patch-master" or "mic wrangler," makes sure that the inputs are correctly plugged in for each act. Providing the patch-master with a wireless mic that is routed to the monitor engineer's powered squawk-box will allow the patch-master to roam the stage and coordinate monitor levels without having to resort to hand signals.

A more sophisticated approach provides the patch-master with a wireless in-ear monitor system. Feeding the patch-master's in-ear system with a summed mono signal of both the cue output of the monitor desk and the intercom allows him to roam the stage hands-free. (With a Clear-Com system, it's not even necessary to use an adapter.) The monitor desk's cue bus signal allows the patch-master to hear whatever the monitor engineer is listening to, which is useful for identifying problems. Troubleshooting with a suspect input cued up is quicker, because the trouble-shooter can follow the signal back to the stage-box and get immediate feedback on the signal at each point in the chain. With the third guy tapping out mics, line checks can be directed by both engineers over intercom, and because it's not heard through the monitors, these conversations are completely private, providing the illusion that the stage is quietly sorting itself out.

Another useful tool for the patch-master to carry around is a condenser and a dynamic mic. If they are taped together, facing in opposite directions, then it's a simple matter to speak into one mic or the other. I recommend having the mics cabled with a Y-cord and a short mic cable. Whether an input relies on phantom power or not, this combination will always provide the means to check it out, without having to make a trip to the workbox. One more item that speeds line checks is a female XLR to ¼-inch adapter; simply connect this to a dynamic mic, plug the jack into a direct box and recite the "one, two" mantra—quicker than finding a bass guitar and an instrument cable.

*Mark Frink is Mix's sound reinforcement editor.*

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## TOUR PROFILE

# DAVE MATTHEWS BAND AT PACIFIC BELL PARK

ULTRASOUND/PRO MEDIA STEP UP  
TO THE PLATE FOR THE BALLPARK'S  
FIRST CONCERT

by David Ogilvy

ALL PHOTOS BY STEVE JENNINGS



Following a string of dates at outdoor amphitheatres, the Dave Matthews Band (DMB) began the stadium leg of their current tour with two nights at Pacific Bell Park, the new home of the San Francisco Giants baseball team. With support acts Angelique Kidjo and Macy Gray on the bill, both of the performances were sold out by showtime.

Completed in time for the 2000 baseball season, PacBell Park had not previously been used as a music venue (except for a private party last year where Barenaked Ladies performed). The Dave Matthews Band was to be the first major rock act to perform in concert at the ballpark, and the local newspaper made much of the preventive measures taken to protect the playing field. (Curiously, the articles failed to note that a season's worth of XFL football matches had been held on the same field.) Due to



concern for the playing surface, the outfield was covered with plastic panels that allowed the grass to breathe, and the infield was fenced off. The lighting control area covered second base, while the FOH mix position was placed opposite the right speaker stack in shallow right field.

UltraSound, a division of Pro Media (El Sobrante, Calif.), has been providing sound systems and crew for the DMB for the past seven years. At PacBell Park, UltraSound set up two main P.A. towers flanking the stage, each containing six Meyer Sound MSL-10s, 14 MSL-3s and 16 650 subwoofers. Two MSL-2s were used for front fill, and four delay towers contained two MSL-10s and two MSL-2s each, with the speakers rigged at the height of the second level of seats in the stands. An analog line from the FOH position to the closest delay tower looped from there to the other towers, while the FOH send to the main P.A. system was a 24-bit digital signal. All of the Meyer speakers were driven with Crest amplifiers.

### FOH SLIMS DOWN

At FOH mix position, DMB engineer Jeff Thomas mixed on a modified Gamble EX66. UltraSound also provided a Midas Heritage 3000 for Macy Gray and a Crest VX40 for opening act Angelique Kidjo. Though much of the FOH compound was taken up with DMB's recording gear (see sidebar), it contained a surprisingly small number of "drive racks." Instead, UltraSound has been using the BSS Soundweb. As system engineer Derek Featherstone explains, "We had a 22-space drive rack with tons of EQ in it, and I thought, 'If we can take all these EQs and assign them to zones, and run the system with up to 12 zones and convert it to a one-rackspace Soundweb with horsepower, we'd have something.'"

In consultation with Featherstone and DMB FOH engineer Jeff Thomas, UltraSound principal Don Pearson has developed a Soundweb program that allows the entire sound system to be controlled from a laptop, allowing for zone-by-zone EQ adjustments. In fact, says Featherstone, the entire sound system can be monitored and controlled from two laptops; the second one runs SIA's Smaart Pro 4.5 software and is used for real-time analysis. Any of four microphones positioned around the venue can be switched to the Smaart system inputs, allowing the engineers to look at the FFT response in that section of the venue.

The Smaart system also allows the crew to compensate for changes in temperature, humidity and wind speed. And, says Featherstone, "You can sit with a computer connected



On May 18, the Dave Matthews Band became the first rock band to appear at San Francisco's Pacific Bell Park. The stage and main P.A. were set up directly in front of the scoreboard; four delay towers helped distribute sound to the permanent seats. Temporary seating was restricted to the ballpark's outfield, which was covered in order to protect the pitch.

to a T1 line in every building we go to, and we can see, through satellites, what the weather is doing. We can prepare ourselves for both the physical challenge of being rained out and the need for system tuning changes brought on by weather and temperature movement."

Asked about his choice of components in the main speaker system, Featherstone praises the horizontal array characteristics of the Meyer MSL-10s. "Over time, we determined that MSL-3s, tight-packed together, create a lot of 12-inch speaker buildup," he explains, noting that the result shows up as extra energy in the 240Hz range. "By the nature of how the MSL-10s are laid out, and these points we flew off, we achieved a good horizontal and vertical [coverage pattern] and broke up some of the 12-inch coupling." The subwoofer stacks, made up of Meyer 650s, tower 16 cabinets high. "We have safety cables halfway up that are tensioned out to the side to remove oscillations in the stack caused by wind," says Featherstone. "The result is a safe 40-inch-tall stack that can throw sub power up to 350 feet."

Coincidentally, the ballpark's permanently installed JBL speakers are part of a design put in place by UltraSound's senior partner, Pro Media. Though Featherstone made a line available for patching a supplementary FOH mix into areas of the park as needed, it turned out to be unnecessary.

Although signal processing at FOH is comprehensive, Featherstone notes that "we've gotten to the point at FOH where there are no gates." As Thomas explains, "Carter [Beauford] is an extremely dynamic drummer, and we don't want to miss a single note." For dynamic control, Thomas uses one side of a Tube-Tech LCA 2B for the kick drum,

## THE DMB CREW

Band engineer: Jeff Thomas  
Monitor engineer: Ian Kuhn  
System engineer: Derek Featherstone  
FOH technician: Tim "Quake" Mark  
Crew chief: Lonnie Quinn  
Technician, stage left: Tom Lyon  
Technician, stage right: Jeff Child  
Technician, delay towers: Scott Harvey  
Technician: James Corbin  
Live recording/archiving technician: Ryan Nichols

## MULTITRACK RECORDING AND ARCHIVING ON THE ROAD

Designed by Dave Matthews Band FOH mixer Jeff Thomas and UltraSound's Derek Featherstone and Gustav Hobel, the DMB's road-ready multitrack recording rig can roll right into the studio and plug in. As Featherstone points out, "You don't want to build it for six months of touring and then park it for six months; you want to get a better return for your money."

For recording, passive splits from the mic pre's in the FOH console are routed to a bank of API 212L mic pre's in the recording rack. Their outputs are then split into both Tascam DA-78s and MX-242s with removable hard drives, ensuring that the performance will be captured on at least one of the two media formats. A left/right mix is run through an Apogee A/D converter and into two CD-R machines and a DAT recorder.

In order to monitor playback and check on a previous night's performance, the line-level outputs from the multitracks are run into a device built by Jeff Peters, which drops the level back down to mic level, allowing the tape outputs to run back into the inputs of the Gamble FOH board. "That allows us to not change the gain settings on the board, and since the signal that went to tape is not compressed, gated or processed, all the EQ on this board is relative to the original inputs," explains Featherstone. "So basically we're playing back the band again. Jeff [Thomas] can adjust the levels so he doesn't have to change his mix from the night before, and he can work on a specific instrument or the way the mix is laid out, effects, anything."

"You can also use it to fire up the monitor systems," adds Thomas. "You can take the best couple of minutes from a

previous show, throw it up on the system right after you EQ the room and touch it up. And when prepping a tour, you can take the multitracks, play them through the board, lay out your compressors, your effects, and walk into the first show with a mix, so to speak."

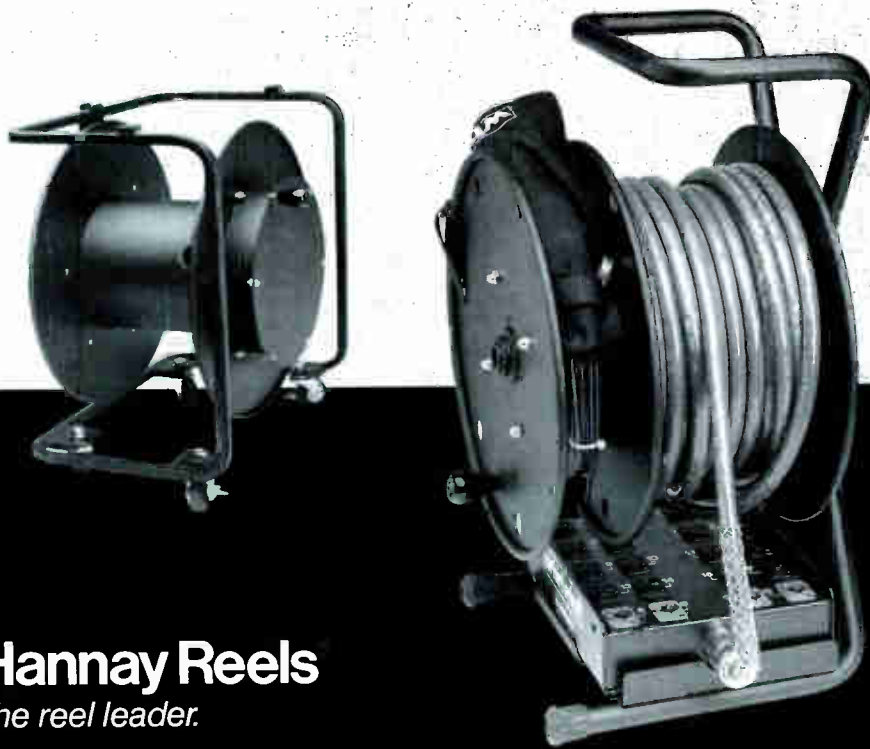
Ryan Nichols, who monitors the recording through headphones during the show, explained the comprehensive archiving process. "The computer database designed by Ian Kuhn covers set lists, all our production information—from load-in times to what the facility provides for us—crew calls, any sort of merchandise, accounting or guest list information. The archive section is enormous. There are copious notes that go down for every show—all kinds of data about any overs on tracks, any guest musicians, the multitrack input list, etc. And then it generates serial numbers for each tape, in every type of media that we use. Each one gets an Avery label that is printed out here by the database."

"Every show that gets done on hard disk gets mailed home to Charlottesville [Va.] in one of these Pelican cases," Nichols continues. "Each case holds two shows. We have an archivist there who empties all the files off the hard drives onto compact disc. Compact disc, megabyte per dollar, seems to be the cheapest medium out there. You can do 8x burning, and each show generates about 10 hours of data transfer."

"Each multitrack show turns into about 110 compact discs. We hold onto the magnetic tape side of the redundant multitrack recording out here on tour, until the archivist gives us the okay—that his data transfer went okay. After the archivist dumps the hard drives, he sends them back to us on tour. We have 20 hard drives, and we use about four a show, so we have about a five-show leeway. And we don't usually do five shows in a week. But we can't have too many spares lying around at \$500 a hard drive."

—David Ogilby

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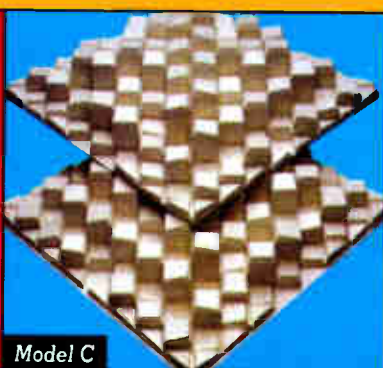
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## LIVE MIX

### Dave Matthews Band Input List

Input	Instrument	Mic
1	Kick	Audio Technica ATM2
2	Snare top	Shure Beta 57
3	Snare bottom	Shure Beta 57
4	Timbale	Shure Beta 57
5	Floor tom	B&K 4011
6	Tom 4	B&K 4021
7	Tom 3	B&K 4021
8	Tom 2	B&K 4021
9	Tom 1	B&K 4021
10	Hi-hat	B&K 4021
11	Chime	AKG 414
12	Block	A-T 4051
13	Ride	B&K 4011
14	Toys	AKG 414
15	Gong	A-T 4051
16	OH SR	Shure VP88
17	OH SL	Shure VP88
18	Violin dry	DI
19	Violin wet	DI
20	Guitar 6-str.	DI
21	Guitar 12-str.	DI
22	Guitar el.	Shure SM7
23	Guitar wet	DI
24	Bass dry	DI
25	Bass wet	DI
26	Sax top	B&K 4011
27	Sax bottom	B&K 4011
28	Sax clip	A-T AT35
29	Flute	Shure 89
30	Leroi	4500 DI
31	Leroi	M5000 DI
32	Boyd vocal	Shure Beta 87C
33	Dave vocal	Neumann KMS105
34	Leroi vocal	Crown CM310
35	Carter vocal	Crown CM310
36	Backing voc.1	Shure Beta 87C
37	Backing voc.2	Shure Beta 87C
38	Backing voc.3	Shure Beta 87C
39	Keys 1	DI
40	Keys 2	DI

—FROM PAGE 174, DAVE MATTHEWS BAND  
we've done in this area. It can then be modified so the fans get a different show than last time."

While the concert was going on in their hometown, the San Francisco Giants were playing in Atlanta, where rain delays caused the game to last longer than the concert. At about the time that Trey Anastasio left the stage, Barry Bonds hit his third home run of the day.

*Producer/engineer David Ogilvy lives in Northern California and has witnessed over 3,000 live performances.*

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# Mark

Richard Bennett: electric and acoustic guitars, mandolin, fiddle, harmonica, vocals



Guy Fletcher: electronic keyboards, vocals



Geraint Watkins: piano, organ, accordion, guitar, vocals



Glen Warf: electric bass, acoustic bass



**M**ark Knopfler released his latest solo album, *Sailing To Philadelphia*, in September 2000, and is now on a worldwide tour to promote it. Starting in Mexico in March, the tour—Knopfler's first since Dire Straits' swan song in 1992—swept through U.S. theaters and arenas in May before continuing across England and Europe in June and July, ending that leg with shows in St. Petersburg and Moscow. Performing his solo work from both the current album and 1996's *Golden Heart*, along with a mixture of ever-popular Dire Straits classics, Knopfler is accompanied by a stellar collection of musicians. *Mix* caught the red hot band during two nights at the Berkeley Community Theater (Berkeley, Calif.), where Knopfler alternately delighted the audience with his guitar playing and charmed them with his rambling introductions and between-song reveries.

# Knopfler

Crew chief Jim Hamon (below left) and FOH engineer Robbie McGrath. An independent engineer, McGrath has been touring for over 25 years and has mixed for the Rolling Stones, AC/DC, the Boomtown Rats and Richard Ashcroft, to name only a few.

McGrath is mixing on a Midas XL4 console with eight stereo channels. He assigns Alan Smart compressors across the vocal subgroup and main left and right outputs; most other subgroups get BSS Varicurves. The FOH and monitor mixing systems are supplied by London's ML Executives. The Electro-Voice X-Array P.A. system is from Chicago's dB Sound.

PHOTOS AND TEXT  
BY STEVE JENNINGS



Knopfler is using in-ear monitors (IEMs) for the first time on this tour. Monitor engineer Rory Madden is using seven different reverbs to add dimensionality to the IEM mixes. Unusually, all of the monitor mixes are sent post-fader. "When Mark or one of the other bandmembers wants something, they all want it—they're all so in tune with their instruments," explains Madden. "I've never had that in 25 years of mixing monitors."



Monitor engineer Rory Madden first worked with Mark Knopfler about 20 years ago and toured with Dire Straits until 1982. "I've worked with Tino Turner for 20 years, Joe Cocker for about 15 years, and everyone from The Clash to John Denver," says Madden.



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## ART SMART POWER 4X4

The Smart Power 4x4 Metered Power Conditioner and Light Module from Applied Research and Technology ([www.artproaudio.com](http://www.artproaudio.com)) features an RFI Surge and Spike Protection System, plus a front panel VU meter to monitor input voltage. Four of the eight AC outputs on the rear panel are 1.25 inches apart, accommodating wide power cables and multiple wallwart devices; the unit has a power capacity of 1,800 watts. Additional features include an on/off power switch, a separate on/off light switch, two dimmable, shock-mounted light posts and a front panel circuit breaker reset switch. Retail: \$159.



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## MARK MOTHERSBAUGH

**SURFIN' NERD  
(AND OTHER TALL TALES)**

by Blair Jackson

Okay, one of the basic tenets of rock writing is that you give your subject the benefit of the doubt—you let him or her present the latest hype without any biased, cynical, rock crit judgment getting in the way. You know, you let the artist say, "This is my best album ever because..." even if you know every person on the planet will disagree. That's courtesy and respect. But talking with Mark Mothersbaugh—the once and future mastermind of Devo, currently enjoying a second career as a television and film composer—you have to suspend disbelief even more than with most musicians, 'cause he's always got some tall tale he's trying to lay on the poor, unsuspecting press. Just look at the blarney he and his principal partner in De-evolution, Gerald Casale, used to unload endlessly on music journalists, year after year. We're talking *very* creative and entertaining fiction.

So here he is, sitting in his L.A. studio—Mutato Musika—promoting an extremely twisted surf music CD he made with two of his old Devo-mates, brother Bob Mothersbaugh (the artist formerly known as Bob One) and Robert Casale (Bob Two), and drummer Josh Mancell; known collectively as The Wipeouters. Inside the CD booklet, there's a hilarious, *possibly* doctored photo of the guys in the band looking like geeky 13-year-olds in about 1964, because, you see, Mothersbaugh's story this time around is that these four guys actually played as The Wipe-



outers in their pre-Devo days in lovely Akron, Ohio, and this CD is sort of a reunion for them. Oh, *riiiiight*. The Akron surf sound. But don't use that skeptical tone of voice around Mark Mothersbaugh, because he's not giving an inch. It's his story and he's stickin' to it!

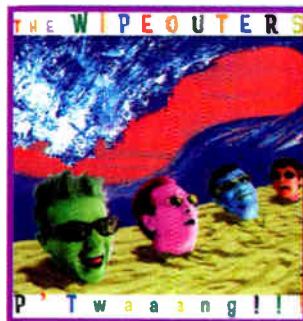
"The Wipeouters CD was kind of a by-product of another project," he says. "I got asked to write the theme song for a TV series called *Rocket Power* [a very cool cartoon on the Nickelodeon network]. So when they sent us some tapes and storyboards of what they

*Rocket Power* theme song [all 46 seconds of which is included on the disc], we went back and mined that territory. It was fun enough that we all sat down and found out that we still knew all these songs we used to do. And now we actually know how to tune our guitars!"

He's just warming up, folks. "Years ago, when we first heard this stuff they called West Coast surf music, we were a bit disappointed, because so much of it sounded like a barber shop quartet with some simpy rock music in the background," he continues. "The Beach Boys, Jan & Dean... We were *repulsed!*"

I innocently ask whether he used to surf the flaming Cuyahoga River. "Surfing was a much more visceral experience for us than it was for people in California," he says seriously. "When we came out here with Devo, in about 1977, Bob One and Bob Two went out to Malibu to check out the surfing and they came back to where we were staying totally in shock. I said to them, 'What's the story?' They said, 'They *cheat*.' I said, 'What do you mean?' They said, 'Well, they use *boards*.' You see, when we surfed in Ohio, it was a totally

—CONTINUED ON PAGE 192



were doing, I thought, 'Wow, this goes all the way back to the Dark Ages of pre-Devo Ohio.' These [Wipeouters] songs were all written when we were in junior high. It was just a fun thing before any of us were really serious about music. Then, after we did the

## A WHOLE NEW SHAWN COLVIN

AN INTERVIEW WITH PRODUCER/COLLABORATOR JOHN LEVENTHAL

by David John Farinella

"On this record, the white elephant in the closet was: Are we going to come up with another hit? We didn't even consider that on the last record," explains producer John Leventhal of Shawn Colvin's *Whole New You* release. "So, it's interesting how we dealt with that. I think we sort of, for better or worse, tried to grab the brass ring."

While the longtime songwriting team of Colvin and Leventhal turned in a collection of radio-friendly folk/pop songs this time around, there

were two songs that they nudged for Top 40 radio consideration. Of course, those two songs—"Whole New You" and "Anywhere You Go"—would have never even warranted that sort of treatment had Colvin's "Sunny Came Home" not been the phenomenon it was in 1997. That song shot up the charts, earned the team a Grammy and rocked her into a new level of stardom. As if that wasn't enough to deal with, Colvin found herself in uncharted waters with a new husband and baby. "It was a different framework for her in which to write lyrics," Leventhal explains. "She tends to write lyrics that come from a personal place, although I think people assume her lyrics are about her, and they are and they aren't. I think it took her awhile to understand what she wanted to write about."

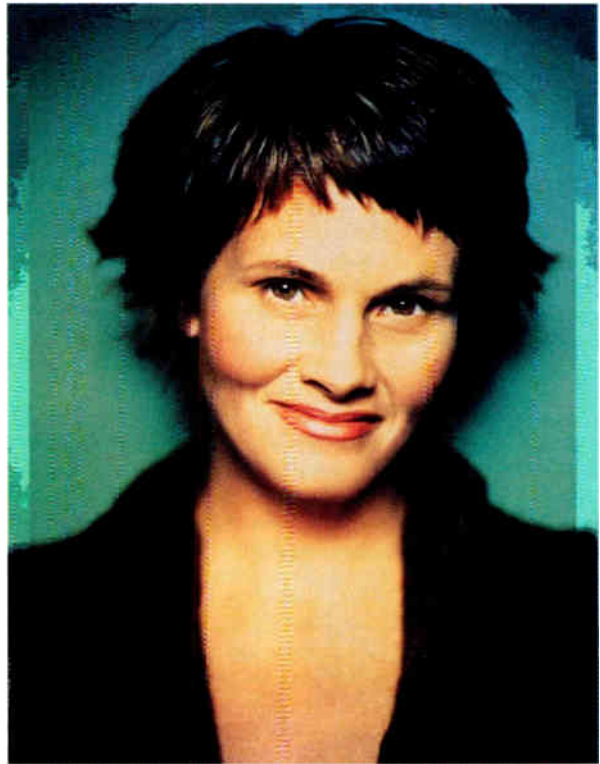


PHOTO: FRANK OCKENFELS

Colvin's quest for lyrics gave Leventhal a chance to work on music. "We had a lot of the music in place before the lyrics were finalized, which was a little unusual and not optimum for record making," he admits. Although, he adds, the initial

creative bursts are his favorite times. "I find my best ideas come when it's spontaneous and I'm really unconscious. There's no judgment attached. I've really figured out over the years that that is my best stuff."

—CONTINUED ON PAGE 198

## DIANNE REEVES

A TRIBUTE TO SARAH VAUGHAN

by Chris J. Walker

Over the course of 13 recordings and hundreds of live performances, Dianne Reeves has developed a reputation as a versatile and vivacious singer who takes her fans on a roller-coaster ride of emotions and rhythms. Her CDs have included myriad styles, from mainstream jazz to more pop-oriented material. For many years now, she has been favorably compared to such masters of jazz singing as Ella Fitzgerald, Dinah Washington, Carmen McRae and Sarah Vaughan, and hailed for her seemingly unlimited potential. Now, with the release of *The Calling*, her tribute to Sarah



PHOTO: CLAY PATRICK MCBIRDE

Vaughan, it appears that Reeves has truly *arrived*.

"I knew somewhere down the line that she would do a project like this," says the album's producer, George

Duke. From his well-appointed studio, known as LeGonks, tucked away in the Hollywood Hills, he adds, "It just seemed like it was logical to have Dianne be an extension

of those who've come before her—Carmen McRae, Sarah Vaughan and others." Duke has played an integral part in her career development and success—he's produced all of Reeves' Blue Note albums since she signed with the label in the late '80s, and he also happens to be her cousin. Coincidentally, Duke also played keyboards on Vaughan's final album, *Brazilian Romance*, in 1987.

Reeves says she looked at the album as a way of connecting with a legend who's been a strong, positive influence on her. "It's a celebration of a great, great jazz artist—Sarah Vaughan," she says from her home in Denver, "and an opportunity for me to pay tribute to someone who, in the very beginning of my career, through her music, really

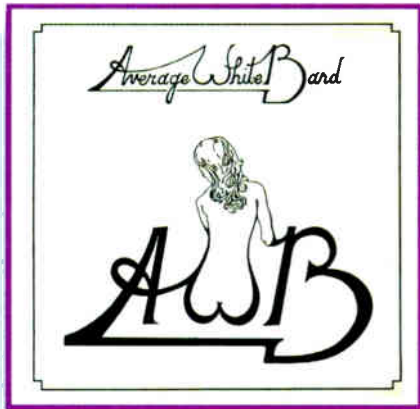
—CONTINUED ON PAGE 201

# THE AVERAGE WHITE BAND'S "PICK UP THE PIECES"

by Gary Eskow

There was something audacious about it: a group from Scotland calling itself The Average White Band. If the funk don't fly, then the honky jokes surely will. But these guys had clearly absorbed their share of James Brown, The Stax roster and the essence of American R&B. They could really play. Still, when AWB was formed in 1972, the music industry was starting to move away from the dance-based funk that was the group's specialty, and there was little reason to believe that within a few years they would be riding the charts with a Number One debut album and a Number One single, "Pick Up the Pieces."

"The band was put together in London," says rhythm guitarist Onnie McIntyre,



tyre. "Glam rock was big—David Bowie, Gary Glitter and makeup were the rage. On the other side of the scale was progressive rock. A leftover from the days of Clapton and Hendrix, progressive rock consisted of endless guitar solos and an audience holding up matches as a tribute to their heroes. We formed the band as a reaction against the whole thing."

AWB featured Alan Gorrie on vocals, bass and guitar; Hamish Stuart, who traded off with Gorrie on bass and guitar and shared vocals with him; Roger Ball on keys, alto and baritone sax; Malcolm "Molly" Duncan on tenor and soprano sax and flute; Owen "Onnie" McIntyre on guitar and background vocals; and drummer Robbie McIntosh. The band would suffer



The original lineup, left to right: Robbie McIntosh, Malcolm "Molly" Duncan, Roger Ball, Hamish Stuart, Owen "Onnie" McIntyre and Alan Gorrie.

a serious loss when McIntosh, the provider of crackling licks and a relentlessly solid foundation, died of an accidental drug overdose in 1974. Fortunately, AWB was able to attract Steve Ferrone to fill that seat for the next decade or so.

The original band started playing gigs in London without fanfare, but word quickly spread: AWB was a good-time bar band. "People started dancing," McIntyre says. "Club owners loved us because they sold a lot of drinks when we played!" A cult following and a recording contract with the European division of MCA came in short order. However, their 1973 album, *Show Your Hand*, failed to generate significant sales. It was time for a move.

"We headed off to L.A.," McIntyre recalls. "We fell right into that scene, where we found ourselves recording with Bobby Womack, Sly Stone and were introduced to lots of fabulous American musicians." Owing MCA a second album, the group camped out at a friend's house in the Hollywood Hills and began woodshedding the material that would form the basis of *AWB*, also known as "the white album." The song "Pick Up the Pieces" was written during this period. McIntyre notes, "Hamish has a way of coming up with clever guitar parts, and the song developed out of the single-line lick that he played one day. Roger went off and wrote the horn line [played in unison by Ball on alto and Duncan on tenor], and the next day the rest of us fleshed it out." Add McIntyre's "chang-a-lang" rhythm guitar (panned hard left to complement Stuart's chromatically inflected hook on the right),

Robbie McIntosh's hi-hat-heavy drum part and the lock-down bass line of Alan Gorrie, and only one ingredient is missing. "We wanted to have a vocal hook like James Brown used in 'Pass the Peas,'" McIntyre says. Playing around with various alliterations, the group finally settled on "Pick Up the Pieces."

It turns out writing the song was the easy part; tracking it was more challenging. "We actually recorded the album twice," says McIntyre. "The first time around, we went into Clover Studios in Hollywood. Though the arrangements are different, [producer] Arif Mardin tightened them up and helped us focus on what was essential when we got to Atlantic; the material is mostly the same."

AWB thought that they had a hit record when they turned their effort into MCA's California office. But they ran into a problem that turned into a windfall when MCA rejected the disc and returned the rights to the group. Then, McIntyre says, "We heard that Jerry Wexler was in L.A. and were determined to get the album to him. He loved it and signed us to Atlantic."

However, Atlantic felt the album needed a pair of new songs, and when "Nothing You Can Do" and "You Got It" were completed, the band was flown to Criteria Studios in Miami. "The sound quality was so much better than the work we'd done in Hollywood that Atlantic decided to fly us to New York to re-record seven tracks in their Manhattan studios," McIntyre says. These sessions yielded the aforementioned Number One album and single, and a Grammy nomination for

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"Pick Up the Pieces" for Best R&B Single.

It's hard to believe, but once there was a day when records were made without the benefit of 196 virtual tracks, digital pitch correction and surgical waveform editing. At Atlantic Records' fabled midtown studios, it was all about capturing the moment. Classic records by the ton were tracked and mixed there—Aretha, Ray Charles, all the Atlantic masters had passed through the facility before AWB showed up. Many of them had been recorded by Gene Paul, the engineer assigned to the white album sessions.

Paul had an early education in music and recording at the feet of his father, Les Paul. "I grew up in the studio with my dad," he says. "I even played drums with him on the road." By the late 1960s, though, Gene tired of the drums and decided to make a career in the studio, on the other side of the glass. "I was so fortunate to get a job at Atlantic," he says. "The philosophy there was very much in tune with dad's. Dad had a great collection of vintage mics, and his recording sessions started with a very simple question: What's the frequency response of the instrument you want to record? He'd put a [RCA] 77 on something when no one else would. Mics were his priority. He always used to tell me that it's a mistake to overload a mic with frequencies that mean nothing.

"It's funny. Everyone remembers dad for his multitrack innovations, but his first thought was, 'How do you capture the environment?' When I got to Atlantic, I was shocked at first. There were all these tools available, especially EQ! Lots of engineers there would plug in everything they could get their hands on. Then I hooked up with Tom Dowd and Arif Mardin. They went directly to the source, just as dad had, using as little extra gear as possible. The change in sound that Tom would get simply by making mic placement changes, moving an amplifier, was amazing."

Paul already had a half-dozen Aretha Franklin albums under his belt, plus sessions with the Rolling Stones, Gladys Knight & The Pips and Wilson Pickett, when he was tapped to track AWB. "Pick Up the Pieces" was the first song he worked on with the group. "They were a phenomenal band," he notes. "You knew immediately that they *had it*. 'Pick Up the Pieces' was so strong! Funny as it sounds, they put out another single first, and I couldn't understand why!

"Mixing-wise," he continues, "I remember that we used Neumann 67s on the drums mostly, certainly on the hi-hat. We used an RE-55 on the snare and an SK-46 on the foot. That's a bizarre ribbon mic, used by ham operators at RCA. But it's phe-

## Cool Spins

The Mix Staff Members Pick Their Current Favorites



### 16 Horsepower: *Hoarse* (Checked Past Records)

Whenever somebody asks what 16 Horsepower sound like, I say, "like Nick Cave with banjos." They have that incredible religious intensity that Cave has, that same dark battle between good and evil clashing in their songs, and their sound. When Cave plays his music live at a piano, it's like an undertaker's cabaret, but 16 Horsepower's instrumentation is based on strings and accordion: Give me that gothic, howling, old-time religion. The first live album from this Denver-based quartet, *Hoarse* includes a variety of songs from their first three studio releases, as well as suitably ghoulish covers of John Fogerty's "Bad Moon Rising" and Joy Division's "Day of the Lords." Crawl into a hole and blast this one.

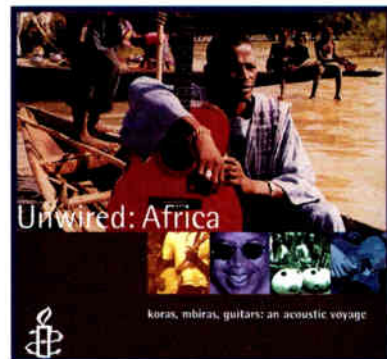
Producers: Bob Ferbrache and 16 HP. Recording, mixing and mastering engineer: Bob Ferbrache. FOH Engineer: Shane Hottle. Mixing/mastering studio: Absinthe Studio, of course (Denver).

—Barbara Schultz

### Various Artists: *Unwired: Africa* (World Music Network)

There is no single "African" style of music, any more than there is an "American" style. Geography and culture have made it so that the music of Egypt bears little similarity to that played on the island of Madagascar. Yet there is a certain unity to the 14 tracks that make up this valuable compilation of acoustic songs—perhaps it is something as simple as the joy and beauty evident in nearly every track. The instrumentation is mostly simple and uncluttered: acoustic guitars played in various styles, hand drums, and regional particulars such as the kora (a type of harp), mbira (thumb

piano) and balafon (an African marimba). As a casual fan of African music, I was already familiar with a few of the artists—Oumou Sangare (Mali), Mose Fan Fan (Congo), Toumani Diabate (Mali), Tarika (Madagascar), Oliver Mutukudzi (Zimbabwe), Abdullah Ibrahim (South Africa)—but most were new to me; all are impressive in some way. There's plenty of variety, as you might expect, from spry dance numbers to lovely soft ballads to Abdullah Ibrahim's sober piano jazz turn that closes the album. I'm filing this next to *The Indestructible Beat of Soweto*, *Africa Moves* and



*A World Out of Time* as an essential compilation of great African music.

Compilation Producer: Phil Stanton. No recording information provided. Mastering: Laurence Cedar.

—Blair Jackson

### Stereomud: *Perfect Self* (Loud Records)

Put together the melodic guitar chords of Papa Roach, the screeching vocals of Linkin Park and just a dash of Ministry's "I hate the world and I hate you" vocals, and you've



got *Perfect Self*, the 13-song debut album from Stereomud. Powerful, uncompromising and spitting out just the right amount of pissed-off anthems to rock-out to, this album is definitely addictive. Among the strong points of the album (and not often

—CONTINUED ON PAGE 204

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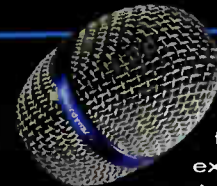
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nominal on the foot! It has that bottom end that you not only heard but *felt*. I remember that I used that mic to good effect on Roberta Flack's 'Killing Me Softly,' as well. Back then, we were really into using Neumanns on the horns, too; they have a big, round sound. Remember, back at Atlantic, it was all about capturing a session, not processing and changing the sound."

When Paul was hired by Atlantic, the studio had just recently moved from 8- to 16-track recording. "We had MCI consoles and recorders, running at 15 ips. Amazing, but they weren't interested in quality in this area either! The industry was two or three steps ahead of Atlantic, technically. It was not a high-tech studio. In fact, my dad had a better studio out in New Jersey! We had a console with 16 faders, pan pots, switchers, and that's it. If you wanted EQ, you had to go in the back and grab one! But look—that's the room they cut Ray Charles in! My dad and I used to study those records."

AWB's album was mixed by Gene Paul and producer Arif Mardin. "It was a straightforward mix," says Paul. "This was in the early days of Arif adding mixing to his production skill. I'd set up the rhythm section and he'd set up other things—horn parts, for example—and fold them into the mix. He'd guide things, from the



*The Average White Band with Ben E. King at Atlantic Studios in 1977 from left to right: Mally Duncan, Alan Gorrie, Ben E. King, Hamish Stuart, Onnie McIntyre, Roger Ball and drummer Steve Ferrare.*

tracking through the mixing. We had a great deal of respect for one another."

Arif Mardin, too, has clear memories of the early AWB sessions. "The energy of the band was special," he says. "All we had to do was get it on tape. Fortunately, we developed an instant friendship, and that showed in the music we recorded. As far as mixing the album, I used a distinct for-

mula that was given to me by Tom Dowd. We'd put the bass nearly equal to the vocals in the mix, using an oscillator to check levels. Then we'd drop the kick drum 1 to 2 dB softer. Today, the kick leads. That's the formula that Tom used in all of the classic Ray Charles and Aretha records. Then AWB had its own successful formula, which we simply tried to highlight—two

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guitar parts playing off each other, an active bass part and strong melodies."

If Mardin downplays his own contribution to the band's success, then McIntyre has another opinion. "It's true that our records were very much a band effort, with Robbie at the helm. Arif saw the strength in that and made few changes. But I recently heard the original version of 'Pick Up the Pieces,' and Arif's contribution to the later, better version was clear. He tightened up the arrangement, beefed up the horn section and highlighted the chant."

AWB followed up their initial offering with a series of albums that yielded stronger material. *Person To Person*, *Cut the Cake*, their version of the Isley Brothers' "Work to Do," all show the band's love for R&B and their own take on this quintessentially American art form. After almost 30 years, "Pick Up the Pieces" is still a living part of popular culture. Why? "I think 'Pick Up the Pieces' has something timeless about it," comments Mardin.

Perhaps it's the guileless love of R&B played by a group of young men from distant shores that shines through, combined with a touch of Bird-influenced "out" jazz (can you sing the horn line?) that glues "Pick Up the Pieces" to the public mind. Whatever it is, it's sticking: The track served as the underscore to a Mitsubishi advertising campaign in 2000, was prominently used in a pair of major films recently—*Boufing* and *Blue Streak*—and is, not surprisingly, a staple of AWB's still-popular road show. ■

—FROM PAGE 184, MARK MOTHERSBAUGH

different thing, and the music we were writing was actually a celebration of the experience of the way we used to surf. We were in seventh and eighth grade at the time and pretty skinny. We were often the brunt of the wrath of older, sadistic sub-humans that coexisted in the same space as us. Our first experience with surfing came from being shoved in the trunks of the cars of these older goons who would get drunk as they drove from Akron to Lake Erie, and then they'd open the trunk, pull us out and skip us like stones across the surface of Lake Erie. You'd get eight or nine skips before you'd sink. And after a while you learned how to direct your path a bit through the water to avoid rocks and bouys. So then we celebrated that on our Galante guitars in *The Wipeouts*...

You gotta admit the guy spins a good yarn. And the fact is, *The Wipeouts*' CD, called *Ptivaang!!!*, is a nifty piece of neo-surf music, mostly instrumental in the tra-

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dition of The Ventures and other early genre pioneers, but unmistakably filtered through Devo sensibilities, which means there's all sorts of interesting sonic weirdness and funny stuff going on; about what you'd expect from the Devo crowd. Some of it is rip-it-up surf 'n' roll, other tunes sound like they were pulled from the soundtrack of a really stupid '60s surf flick. And, yes, a lot of it sounds like good Devo. You gotta love a disc with titles like "Dangerdog," "Surf's Up On Goon Island," "Wedgie Wipeout," "Ravin' Surf" and "Wounded Surfer." You can almost see the tiki lights!

"We think there will be imitators," Mothersbaugh says. "Now, the music that was written first is coming out at last!" His story out of the way, he finally drops his guard a bit. "For us, it's like you have music you do as a job and sometimes that's really satisfying and sometimes it's just a job. And then you have music you do just for the fun of it, and that's what The Wipeouters was. There was no more intention put to it than the fun of recording it. And it was a lot of fun. Obviously there's a lot of MIDI, a lot of sampling and synths on sequences. It was [a] Pro Tools project, so we were doing things like my brother and I would play guitar solos over the entire length of a whole piece and then we'd edit them down afterward and move them around and re-create our guitar solos. Mine needed a lot more work, since he's a better guitarist than I am. I need all the help I can get from Pro Tools," he says with a laugh.

The CD was recorded at Mutato Musika, the four-room studio complex that serves as the nerve center for the Devo boys' various projects. Bob Mothersbaugh has a regular gig scoring the popular *Rugrats* animated series for Nickelodeon, the original theme for which was written by brother Mark years ago. Bob Casale is the studio's technical guru and principal engineer—he cut The Wipeouters' disc, works regularly with Mark and has engineered Devo's sporadic projects since their fourth album, *New Traditionalists*. And Mark has established himself as a dependably odd and eccentric composer, with credits in television (various Nickelodeon series, *The Chris Isaak Show*), interactive games (*Crash Bandicoot*, etc.) and a variety of feature films, including the two very successful *Rugrats* movies, *Rocky & Bullwinkle* and three by Wes Anderson—*Bottle Rocket*, *Rushmore* and the forthcoming *Royal Tennenbaums*.

Devo was one of the most visually oriented bands to come out of the '70s new wave, so it's not surprising that they've all

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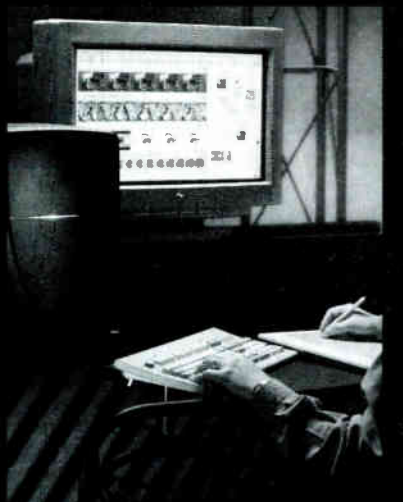
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embraced film and television to such a large degree. (Gerald Casale is even a successful director.) And Devo's music always had that bright cartoonish edge to it that made Mark Mothersbaugh's transition into scoring children's television seem completely natural. He started as one of a number of hip guys doing music for the late, great *Pee-wee's Playhouse*, and that job helped him land the gig working on the early *Rugrats* cartoons for Nickelodeon. "Plus," he adds, "Gabor Csupo, who was one of the creators of *Rugrats* and a big avant-garde music fan, found this odd electronic record I'd recorded—this solo album that came out in Japan called *Music for Insomniacs*. I was just writing music to do stuff around the house to, and he said it would be good for children [he affects an indeterminate foreign accent] 'because it's simple and very childish, Mark.' He liked that and so I said, 'Let me create something new in that style.' So I created a music universe for *Rugrats*. Then, when I finally met the president and VP of Nickelodeon, it turns out they had been fans of Devo when they were in college."

When I mention that a lot of his early cartoon music sounded like both music and effects at once, Mothersbaugh agrees and then adds, "It has a lot to do with the



**The Wipeouters**

background it came from and with the technology that was available for working on TV shows. The budgets haven't been there for orchestras or large ensembles. And in the process of the bean counters squeezing budgets downward so the creative people are getting less of a piece of the pie than ever before...well, MIDI became something they were *very* interested

in and supported. So I was always looking for sounds that were more interesting than crappy samples, and to do that you had to go a bit into sound effects. Coming from Devo, we were *always* looking for different sound palettes to work with so we weren't locked into clichés of what a piece of music is supposed to sound like. We were big fans of people like Perry

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Kingsley and Spike Jones—the *Pee-wee's Playhouse* theme song was, in a way, inspired by Spike Jones.”

Though Devo continues to rear its head periodically—there were Lollapalooza appearances a few years back, a tour opening for Beck a little over a year ago and various albums in their catalog, especially *Greatest Hits*, continue to win new converts—Mothersbaugh clearly views his film, TV and game work as his primary career right now, and the other bandmembers seem content with a life spent more out of the public eye. “The trajectory of our career here has changed its course over the past 10 years,” he notes. “It goes through different phases. Although I enjoy touring, and the guys in the band enjoyed touring at one time, it’s kind of like we’ve moved into another part of our lives. For me, the past three years has been making up for the schooling I lacked in orchestral arrangements. I did it by scoring three films in a row with 100-piece orchestras and working with orchestrators and arrangers who taught me how to get over my fear of orchestras.”

In many ways, it’s remarkable that the Devo team has stayed together to the degree that it has, much less thrived as independents under the Mutato umbrella and managed to keep Devo’s name relatively untarnished all these years. It helps that they were friends who were underdogs who made it against all odds. It helped, too, that they were family, literally and figuratively. As Mothersbaugh says, “Devo was two sets of brothers and we were used to collaborating. I *still* love collaborating. That’s one of the big payoffs for me. I like working with the guys [from Devo] and I like working outside the group, too. And it’s even more interesting to collaborate with someone who’s working in a different field than music, because you can help them out so much. It’s very satisfying to be doing music for features because you’re the last thing in line—music. They’ve finished the whole thing and then they get to you. They’re seeing their movie finished for the first time when they’re in there with you, and there’s something about that that’s exciting.”

No matter how successful a film composer Mothersbaugh becomes, one senses there will always be some time for Devo in one corner of his life. There’s serious talk of releasing their pioneering videos from the ’70s and ’80s on DVD; in fact, I’d say it’s long overdue. And the group’s songs continue to turn up in the strangest places: Anyone who owns a television has no doubt seen the ad campaign by Target stores that uses “It’s a

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Beautiful World" as its theme song. Evidently, the company doesn't understand that Devo meant the song ironically. The video was a scathing indictment of Western civilization. "Yeah, that's true," Mothersbaugh says with a laugh. "What can I say? Irony is foreign to some people." Stupid, devolved corporate mutants! Oh well—Booji Boy is laughing all the way to the bank. ■

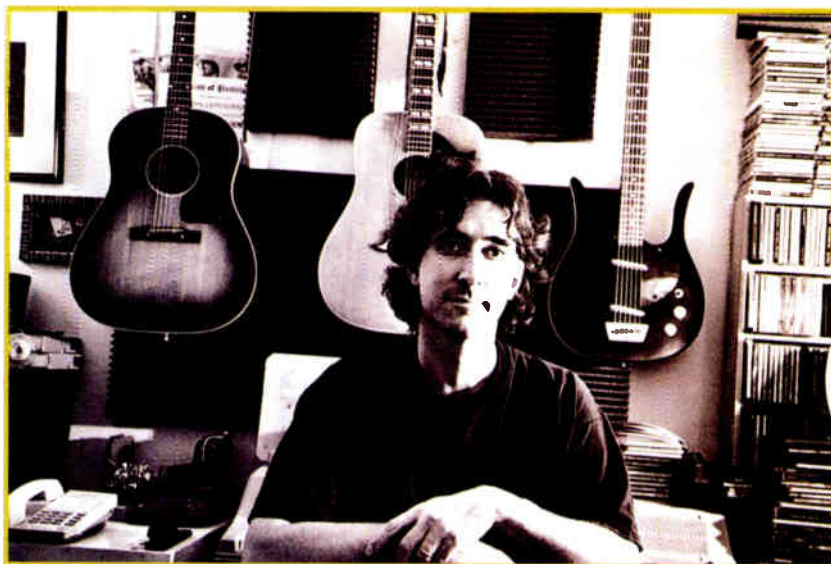
—FROM PAGE 185, SHAWN COLVIN

Once those ideas have been hatched, Leventhal will get them onto tape right away. "If I put one little thing down, I'll want to put another little thing down, because I'll get excited and inspired. Nine times out of 10, that ends up being what's on the record—if not that actual performance, a version of it."

Those early sessions are tracked at Leventhal's own 12th Street Studios in Manhattan. Laughing, the producer admits that the studio is not exactly a technical wonderland—"Very embarrassing for all your technical readers. At this point, I'm thoroughly humiliated by my totally *not* hip set up," he says. Actually, the Leventhal gear list is nothing to be ashamed of—it includes 24 tracks of 20-bit ADAT, outboard gear including mic pre's by Daking and Millennia Media, a Distressor, UREI 1176 and Tube-Tech compressors, Apogee D/A converters and a fine selection of microphones: a couple of Neumann 67s, an AKG C-60, Neumann CMV563, Shure 57s, Beyerdynamic M88s, Gefell and a couple of Coles ribbon mics. "Those are quite great on drums, overheads, room mics," he says of the Coles. "I like 'em on percussion. I saw the pictures in The Beatles' recording book and I was like, 'I need those.' I'm a huge Beatles fan and Ringo's drums just always sounded so cool."

Even after reporting the gear list, Leventhal says, "This is not my area of expertise, please put that in the interview. There are producers that the gear thing is it and they can go on and on. It's not that I don't respect that, because I think it's kind of seductive, but I don't find it all that interesting. Life is too short for me to get too deep into that."

That's a point he drives home while discussing his drum programming tools. "It's going to be embarrassing. I have this version of Performer from before you were born," he says. "I have an Akai 950 12-bit sampler and a Roland R-8." Often, he'll run those tracks through filters or a bit of analog delay. If he needs to cut a live drum track, more often than not the



John Leventhal

studio drummer will play to a percussion track he's built. "It's more musical and it's more fun. It will give more of a sense of what the tune is about," he explains.

While Pro Tools was used during the recording of the Colvin sessions—mostly for editing out performances Leventhal knew he wouldn't need—the producer isn't yet a convert. "I would like to get Pro Tools, and I'm sure I would find it worlds easier and creative and inspiring," he says. "But I guess I'm a little afraid of getting sucked into the Pro Tools vacuum, which is sitting in front of a computer screen and watching music instead of hearing it. I've seen very musical people end up staring at their computer screen, and you can't help but get seduced by what Pro Tools has to offer. I'm not knocking it, because I can see the benefit of it. I'm just not sure it's the best thing at the end of the day for me."

"What I really like to do is play, so I'm not sure if I want to play four bars and then loop it," he continues. And play he does. On this disc, Tom Schick handled the bulk of the engineering, while Leventhal played and produced. There are pros and cons. he suggests, of producing yourself. "Sometimes I wonder if it would be good to have a little editor on top of me, sort of checking out what I'm doing," Leventhal says. "I trust myself at this point and I trust my intuitive sense about stuff. I think the hardest part for me, since I enjoy the process so much and I can play a bunch of instruments—I should say I *own* a bunch of instruments, I can *make noise* on a variety of instruments—that I'm concerned that I'm doing too much."

He's heard those accusations, especially in the case of an artist like Colvin, and acknowledges them. "A lot of people perceive her as a folk artist," he explains.

"They are more than happy to hear just an acoustic guitar and her voice, which, of course, the record company isn't *remotely* interested in hearing. So finding that middle ground where you're doing something compelling in the pop music sense, but not losing the essence of who she is, can be a little challenging."

A song such as "Nothing Like You," where Leventhal played all of the instruments, was an interesting study in his musical habits. The initial idea for the song came well after the midway point of the album, which is not unusual for him. "Almost every record I do where I'm involved in the writing, at some point during the course of the making of the record I start to want to write more songs. Particularly if I'm getting a sense that we're missing an element. On this record, it was that we needed a good old acoustic guitar-based song." He put some ideas down on tape, played it for Colvin over the



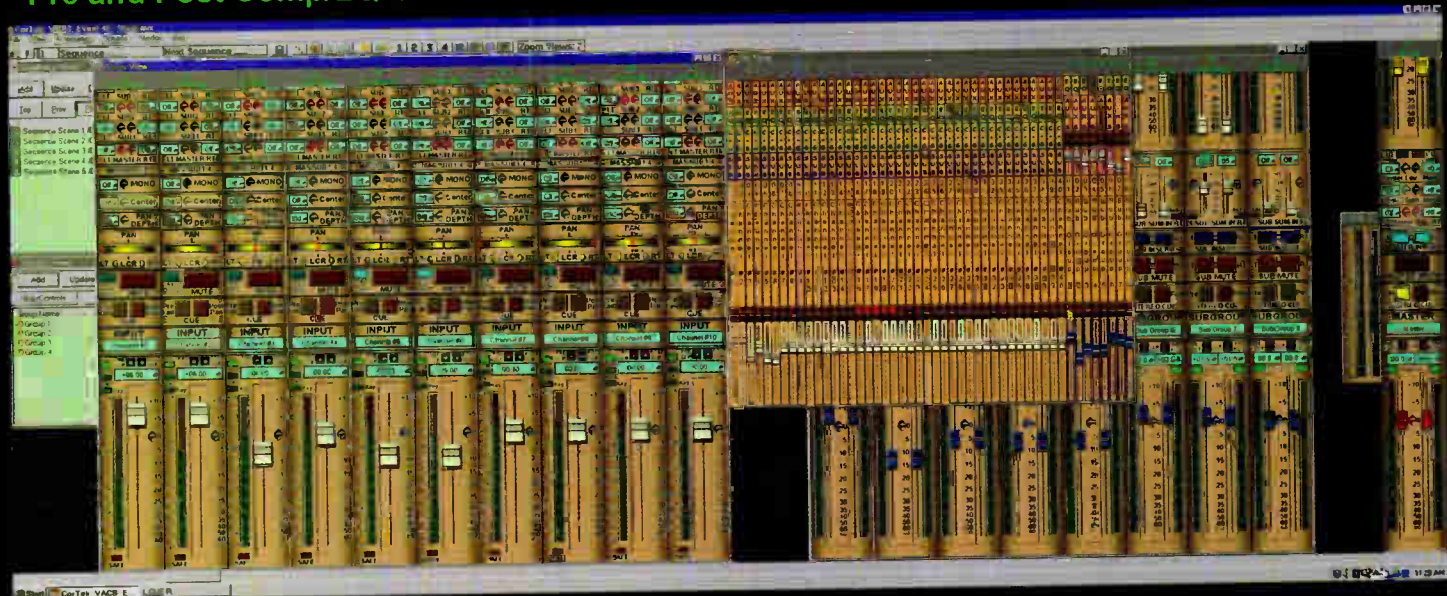
phone and the next time they got together, she had some melodic ideas, some lyrics and a title. Inspired, Leventhal continued to work alone at the 12th Street





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Studio. "What I discovered in that case was that I was really liking what I was doing in my home studio. I figured I could go all the way with this and it might have a charm to it that it wouldn't have if I went in with a drummer and a bass player and tried to re-create this."

"Nothing Like You" and "Matter of Minutes" were two of the easier tracks for Leventhal to work on during the recording. The rest of the album was more challenging. "I think we both felt like we didn't want to repeat ourselves," he reports. "It's that thing of wanting to stretch a little bit, but you want to stay true to who you are. You don't want to stretch

just to do that. You want to come up with something that's really fresh, but something that's really compelling and true to the artist. Also, Shawn wasn't as confident as she's been in the past, which can't help but make the producer feel like it's not the right song or the right production."

Specifically, "One Small Year" tested him, because it was different from anything else either had done. "The phrasing seems different, the kind of track it is is different for me." Indeed, Leventhal says it was inspired by such idiosyncratic pop stalwarts as Brian Wilson, Burt Bacharach and Randy Newman, so it's no surprise that the song has such a non-traditional

musical bed. "I wasn't at all sure that Shawn was going to like it, but she liked it quite a bit," he notes. "She had the melodic bit in the verse and the phrase 'one small year' very early on, but it took her a long time to come up with the lyric for it and to feel honest about singing it. I think she felt it was a little contrived. It's a strange tune. The production is a little more linear and it was really challenging."

Just as important as the music is the quality of Colvin's vocal tracks. Many of the vocal sessions took place at Leventhal's studio, with the balance done at Shelter Island Sound in New York. The music tracks were mostly recorded at Sear Sound. For Colvin's vocal, a Neumann 67 handled most of the load, with the signal running through a Distressor. Finding the right microphone is particularly crucial, Leventhal says, when he's producing a singer/songwriter-type of artist. "I get feedback when people say, 'God, the vocal is so great and centered.' I say, 'Well, I just make it louder than anything else.' If you listen to my records, I think the vocals are louder than on most people's records. I wouldn't mind working with someone like the Rolling Stones, where Mick was always apparently wanting his vocal to be softer. That's a lot easier, because you just get the track up. The challenge is to come up with a track that has some substance and some power to it with a really loud vocal. It's not always that easy. I think that is my particular cross to bear."

Production always involves juggling different sets of expectations—from the artist, the label and the fans. This album was no exception. "There were any number of directions we could have gone on this record," Leventhal says. And that includes the pair of tunes they aimed toward radio. "Maybe we should have done that or maybe we shouldn't have done it. Talk to me at the end of the year to see if we've had a hit. If we haven't had a hit, maybe it wasn't the right thing to do. Maybe we should have not even concerned ourselves with radio. It's not like we went over backward!"

Yet the pressure was huge and the issue is complicated by the fact that the radio landscape has changed considerably since "Sunny Came Home" was on the charts. "Then it's complicated even more by the fact that Shawn is a 45-year-old woman with a child. It's not that I pay super-attention to these things, but I can't help but notice that there haven't been any 40-year-old women on the charts since we were on the charts, except for maybe Cher," he says laughing. "So, it's kind of a funny position to be in, and she's got two

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strikes against her, demographically speaking. So we'll see what happens. I'm starting to have some small regrets that I paid any attention to Top 40 radio in my thinking, and I think Shawn may feel the same way, but sometimes you've got to do these things to discover it." ■

—FROM PAGE 185, DIANNE REEVES

opened doors for me artistically in terms of the possibilities of voice and expression.

"Previously, I did a record called *The Grand Encounter* that featured a lot of legendary musicians, like Harry 'Sweets' Edison, Toots Thielemans and the late, great Joe Williams. These were people who encouraged me or whom I had the opportunity to work with at a very, very young age. As a mature adult, I wanted to consciously make a record with them. Then, on the *Quiet After the Storm* album, I paid tribute to Cannonball Adderly. That's always been very, very important to me, because the way that you keep memories alive is by talking about people."

Duke says that he and Reeves were already talking about making the Vaughan tribute three years ago when she was

working on an album called *Bridges*. "She hadn't picked the songs," he notes, "but she was laying the groundwork for it. We did *Bridges* and we did the live record, *In the Moment*. While doing that, her head was into the string recording [for *The Calling*] and arrangements were being done."

Duke has worked with many top-flight artists through the years, including Al Jarreau, Jeffrey Osborne and Rachelle Ferrell. He doesn't think of himself as having any particular production style: "I just try to keep the quality of the music up, with the help of [my engineer] Mr. Eric Zobler. I've never been the kind of producer who wanted to have a stamp—where someone could say, 'Okay, this is a George Duke record.' You can recognize a Babyface [recording] or some of the other producers who are out there now. But the artists I work with are generally not those types. They really have something to say and their own point of view. And I think all their records sound different. The only George Duke stamp is that, hopefully, it sounds unique to the artist; that's what I'm about."

Reeves agrees with Duke's self-assessment, noting, "When you're in the studio with him, he's someone who really allows your voice to shine. He doesn't impose himself on your sound. From the very be-

ginning, when we started working together in '87, I started to learn to trust my own instincts and my own voice in a recording. I always have this thing where I feel recordings will live a lot longer than you will, hopefully, so you want to put down what you're really feeling."

Although Reeves isn't very technically inclined, she did have an idea of the type of sound she wanted for the disc. The sound of her CD is very "live." Before production began, Reeves conferred with Zobler and Duke and decided to keep the sound as natural and unprocessed as possible, while still sounding like a modern recording.

"I think I got what I wanted," she states, "because I worked on everything prior to going in the studio. There was a range of things I had worked on to make certain things feel right for me. I had been listening to lot of different records with strings. And more than anything, I wanted the strings to sound warm but also full, because we weren't using a full orchestra. [It's a 42-piece orchestra.] One of the things I was really excited about was that I had a great engineer, Eric Zobler, who's done a lot of records.

"But I didn't know if there was a miking technique or something he could use

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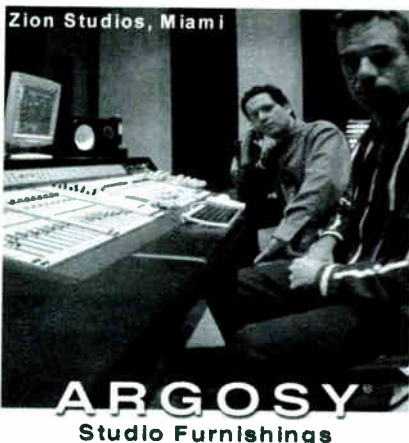
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to really bring it a little closer, make it richer and work with it to make it sound bigger than it really was. I know we didn't want to double it or anything like that. We just wanted it to be what it was, and I think we achieved that. I really like the sound of it. There was a lot of separation that we were able to use with the drums and bass. I used a really old, reworked RCA 44 ribbon mic that they had at the old Capitol Studio. It's a real thick tube mic and it's real warm. I can get up close to it and make it really personal."

Unfortunately, that microphone selection didn't work out. Once in the studio, they found its sound was too archaic and wanted a more modern sound. "We did one vocal with the 44 ribbon," says engineer Zobler. "It sounds quite nice, actually, but that particular vocal had to be processed a lot more than the other ones in order to sound uniform. So we ended up using the Telefunken 251 for vocals. I also used some Royer ribbon mics in different places for the orchestra."

As a producer, Duke is extremely organized and always has a plan of attack. But having a "feel" for whatever he's working on is the main imperative. "That never gets lost," cites Zobler. "That's George's best quality as a producer, I think. He never loses track of the 'feel'; it always has to feel good. If you listen to the way he plays, everything he plays feels good. He can't help himself—he'll play a cello part and it'll feel good and be funky."

However, re-creating the mood of a bygone classic jazz era with 21st century sophistication, incorporating both an orchestra and a jazz ensemble, is far from being a casual endeavor, even for George Duke. Logistically speaking, Reeves' new project was probably the most complex of any he's been involved with. "It worked out pretty well," he says. "But if I had to play, it would have been awful. Instead, I was able to listen and make decisions. I had a computer there and I made notes. The hardest thing was keeping the schedule going. If it was all the same orchestra, it wouldn't have mattered, but every song was different. Players were coming in and out, and we had to make sure we were finished before the next player could come in. Once we got through that first day, we were rolling."

With his plate full, Duke opted to have someone else do the arrangements. "I generally do all the arranging for my records," he points out. "Dianne asked me if I wanted to do them for this one and I said, 'No, I think I need to be in the booth. There's enough to do and this is a big project, so let someone else do it.'" So Billy Childs, an

emerging Los Angeles-based jazz/classical pianist and longtime colleague of Reeves', did the bulk of the arrangements. Supplementing Childs' work for several tracks was Robert Freedman.

"She approached me and wanted to do the tribute in a unique way," Childs recalled in a telephone interview from Denver, where he was overseeing the arrangements for a performance Reeves was doing with the Colorado Symphony Orchestra. "She wanted to explore the influences that we both had come from. We were influenced by music of the late '60s/early '70s, music [that had] a lot of different genres put together. Fusion, they called it then, but the term has a backlash now. But back then it was real music; it was positive and powerful. So our approach was to do music that represented different things and try to organically synthesize and put them together in unique ways."

"Dianne has worked with Billy for years," Duke says, "so he instinctively knew what she wanted. She had to say very little to Billy. Bob [Freedman], on the other hand, was someone whom she didn't know. She actually went to [his home in] Phoenix and sat down with him for a few days. They went over the material that he was going to do, talked about how she wanted it and what she expected. Once the arrangements were finished, Billy would do a little piano mock-up to explain how everything would work. She would then approve or disapprove, sometimes requesting slight alterations such as key changes and breaks. Essentially, she was intricately involved in every piece of music. It was almost like designing a dress for her; the music was designed for her. This all happened about three months before we went into the studio."

Fortunately, the time recording *The Calling* at O'Henry's in Burbank went quicker than the preparation leading up to it. The studio, a favorite of both Duke and Zobler, was selected for its large recording area and ample isolation space. Reeves comments, "I think every record that I've ever done has been a live record. I think it's important to have that intimate exchange with the musicians. Once the string players realized what this project was about, they would listen to the playback and take notes to make sure everything was correct. It was really more than a recording session; it was a celebration, because everyone wanted it to be right. And that was nice."

Included in the jazz ensemble were well-known compatriots of Reeves' including pianist Mulgrew Miller, guitarist Russell Malone, saxophonist Steve Wil-

son, trumpeter Clark Terry (who is one of the singer's original mentors) and others.

Reeves and Duke averaged about three tracks per day for four days. Zobler admits that the prospect of recording the orchestra was "intimidating for someone like me, because I don't do that much of it. When I started out at San Francisco State University, I learned to record orchestras, big bands and different types of music. I've always known how to do it and have done it for years, but I'm not a film scorer. I don't do it day-in and day-out every week. I do it a couple of times a year. So, for me, it was little nerve-racking. That first day we had some technical problems, which pushed back the start times and made everybody nervous about getting all the work done. But by the end of the day, we did get everything done." The orchestra was tracked live using three mics spread across the front of the room.

"I always try to record *everything*, as much as possible," Zobler says, "because a lot of gems go by when the tape is not running or the disc is not spinning. If something is not right sonically, I deal with it later as best as I can, because the performance is always senior to the sound. If you have a great performance and poor sound, you still have a great performance. But the best of both worlds is to get them both and that's what I try to do. But whenever they're ready to go, I'm ready to record."

Due to the acoustic focus of the project, Zobler used very little signal processing. "I kept that to a minimum with mostly just a little EQ and using mic placement [instead]," he says. "My intention was to get as natural a sound as I could. I used some compression on Dianne and on the bass. Occasionally, I would compress the harp—when you have a lot going on musically and there's a harp in there that you want to speak through, you have to compress it. I did use some overall bus compression on the whole project, because I wanted the record to not be too soft. There's been a race on for the last five years to get hotter and hotter CDs, something that went away when CDs first came out. Everyone reveled in the dynamic range for about three months and then the race was back on. I actually don't like that there's no headroom anymore; everything is just squashed up to the top. But that's kind of the way it is these days."

Mixing on the project took place at Duke's studio, using his 52-channel Euphonix CS 2000 console. Other equipment in the studio includes a Euphonix R-1 hard disk recorder, an Otari RADAR 24-track



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digital deck, Jensen mic pre's, a TC Electronic M3000 reverb unit, EMT 250 reverb unit, a Finalizer, various compressors and other gear. Although Reeves isn't a "hands-on"-type particularly, she usually likes to be around for the mix. However, she was only able to watch the mix for the first day or so due to concert date commitments. After years of working with Zobler and Duke, she knows her work is in good hands.

"What I love about them," Reeves says, "is that when Eric is there, his instrument is the board. It becomes a part of the music, and he's the person that's over the music. And then here you have George, who has great technical and musical knowledge. I hear things, but not like he does. So it's really cool that everyone allows everybody to do what they do the best. That makes it really wonderful."

Zobler feels that the mixing went smoothly overall. "Most of the takes were live. We might have gone in and fixed a phrase here or there, but some of the tracks didn't have any fixes at all. I always end up with one or two vocal comp tracks. We might have alternates on one line and we haven't decided, so we'll save it until everything is in the proper perspective. When you can hear everything, sometimes it's easier to make a decision

on which take you like.

"The two tracks that were most challenging were 'Fascinating Rhythm' and 'Obsession,' because everybody was just wailing and going 90 miles an hour. And with an orchestra and jazz quartet both going at it, you really have to work at getting it all balanced. Also, the drummer was in a booth by himself and was hearing the orchestra through his headphones. So his dynamics for me were wider than the orchestra's. So I had to chill him out a little bit and make him match the orchestra. But he was great and played his behind off. 'Fascinating Rhythm' was a wild arrangement that Billy Childs did. He was on hand for most of the mixing, and, of course, he wants to hear all the parts. And I want to hear them, too, so it's tough getting it so that you hear everything. As Quincy would say, "There's only so much water that can go down the pipe."

Zobler has nothing but praise for the Alesis MasterLink, which allowed them to master at 96k, 24-bit. "That \$1,500 to \$1,700 machine sounds amazing," he says. "Up until this project, we were mixing to Pro Tools. But when this Alesis showed up and I was able to mix a higher sampling frequency, I pretty much moved over to that. I'm looking forward

to when Pro Tools moves up to 96k. But if I hear something that sounds better, I'm going to use it."

Summing up the orchestral recording, Duke says, "I feel blessed to be able to work with my cousin, the talent that she is. Believe me, she's like a daughter to me. Hopefully this album will do wonders for her and Billy's careers—he's the unsung hero in all of this. He even worked all night on the arrangement for the title track, which was decided on at the last minute during the sessions. He did a great job. Overall, I think it was a very, very successful project and Dianne sounds great." ■

—FROM PAGE 188, COOL SPINS

the case in many metal/rock releases) are the easy transitions from one track to the next—the album incorporates everything from slow, tuneful hooks to hard-hitting, edgy jabs of unadulterated guitars that work well off of each other. Tracks like "Old Man," which seesaws between rage and surprisingly smooth vocals, and "Pain," which sponsors a gimmick-free undeniable raw grit, are the stand-outs on this outing. Collaborating with some of the best producers in rock/metal these days—no

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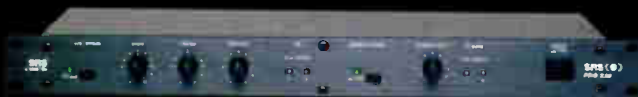
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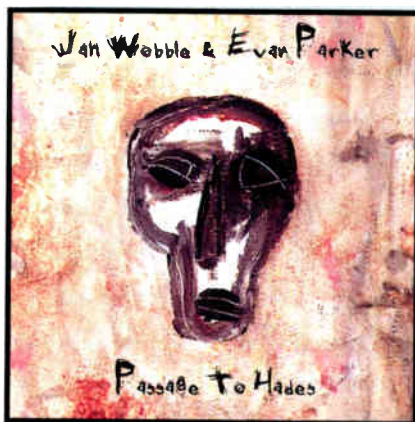
small feat for a beginning band—Stereomud's latest release has quickly become a favorite in today's metal boy bands sweepstakes.

Producers: Don Gilmore (tracks 1, 2 and 10), Rick Parashar (tracks 3,4,5,6,7,8,9,11), John Davis (track 12), and Howie Beno and Corey Lowrey (track 13). Mixer: Jay Baumgardner.

—Sarah Benzuly

**Jah Wobble and Evan Parker: *Passage to Hades* (30 Hertz Records)**

Since his highly visible days with Public Image, bassist Jah Wobble (nee John Warble) has taken the road less traveled on project after project, working with all sorts of fascinating players in every genre imaginable. A champion of various world music styles, as well as avant-garde and improvised rock, Wobble is a first-class collaborator who always has his hand in something unusual. I can't claim to have heard the bulk of his solo output (30 Hertz is his own label and he's quite prolific), but this one caught my eye because it features the very talented and adventurous British sax player Evan Parker. The four long pieces on this CD blend elements of freeform jazz, Middle Eastern trance and other unusual forms into a compelling and hypnotic whole. I particularly like the title track, which unfolds eerily, sprawls over 13½ minutes, and features the unusual combination of tenor sax, bagpipes, harmonica, bass and drums.



Wobble and drummer Mark Sanders always keep the bottom strong on these tracks, which alternately float through the ether or are propelled briskly on bursts of saxophone notes and the steady beats of such unusual instruments as "stereo goathorns" and the "bass crumhorn." Strange, but rewarding. Not for the squeamish.

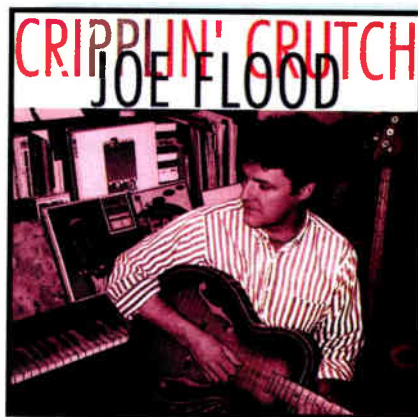
Producer: Jah Wobble. Engineer: Cai Murphy. Studio: Intimate Studio. Mastering: Richard Dowling/Transfermaton. —Blair Jackson

**Joe Flood: *Crippin' Crutch* (Diesel Only)**

This is bar-band fun. Flood is a fine singer/songwriter with considerable talent for playing guitar, mandolin and fiddle. The title track

sounds very John Mellencamp (with a less humorless vocal), and it's no surprise that one of the artist's songs has been covered by The Band, because that influence is a strong presence as well in the interplay of honky-tonk piano and acoustic guitars. The album was produced by Eric "Roscoe" Ambel, whose credits include the Bottle Rockets, Nils Lofgren and Mojo Nixon, which means lots of fun and no fluff.

Producer/engineer: Eric "Roscoe" Ambel. Studios: Power Station New England (Waterford, Conn.) and Cowboy Technical Services (Brooklyn, N.Y.). Mastering: Scott Hull/Classic Sound. —Barbara Schultz ■



**THE FAST LANE**

—FROM PAGE 16, TIME IS ON MY SIDE

by us, but in this unique case, by the artist (or criminal as it were). The offending painter knows exactly how long each of us will see his work, because he knows the traffic patterns and speed that we will be traveling at when we go by his tag. Same for trains and subways, where they now do frames meant to be seen in sequence.

What power! And that is a big part of why they do it—to display territorial control.

**OR JUST IN TIME**

Then there are the art forms that live and function within the boundaries of time, like movies, plays and music. While a movie may take a year to make, a play three to 10 years to move from conception to stage, or an album three months to track and mix, they are always viewed and heard within linear time. By that I mean that the audience does not control the rate at which the story is told—the creator does.

The film or theater creator paces the unfolding of the story and uses his absolute control of the observer's time and

even point of view to create emotions—anticipation, tension, resolution, peace. These creators directly control another dimension, time itself, literally. They may choose to compress or expand the flow of time for different parts of their story, or even fracture the continuity altogether and present the story nonlinearly, with segments out of chronological sequence, as in *Pulp Fiction*.

When this is done, it is in many ways similar to the graffiti example—a display of the creator's prowess at controlling time to such an extent that this component alone is noticed, if not shocking.

**OR IS IT FOUR FOUR TIME?**

Now we get to our own turf, our home ground—music. This one's a bit different. Not that we don't have our own graffiti. It is no accident that rap has lasted and evolved, but that's another story.

Music. This is an art form where time is so crucial that we don't even call it time, we call it timing, beat, tempo, feel.

When you walk down a street and casually observe the other people walking beside and against you, the first, the very first determination that you make about each and every one of them is

their sex. No matter what women's rights groups say, no matter how you try to elevate yourself intellectually, when you see a dot approaching on the horizon, the very first thing you work to determine is that dot's sex. Why? Because it is the first factor in determining potential for both danger and or procreation. Primal factors that will exist as long as we do.

And when you hear the first note of a song, you wait for the second so that you can determine the most important thing about the song, its tempo. Oh, sure, we all like to pretend that nothing that simple could be more important than the actual musical content, but...

Tempo and pitch (is your "A" 440, 438 or maybe 444?) set the mood. Once set, content works or fails for that mood. So now that humankind has more or less settled on 440, we pick a key, and a tempo, and go from there.

And just where do we go? Why is music such a unique form of art? And why does one kind of music stand alone in our world as the ultimate expression of art?

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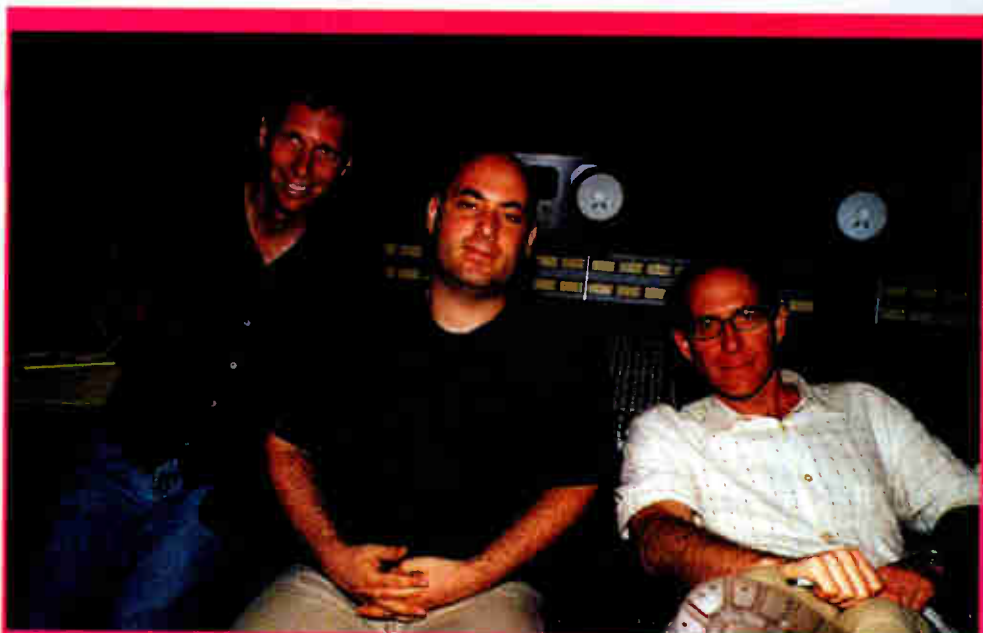
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World Radio History

# COAST TO



Churning out those soundtracks at Royaltone Studios, from left, staff engineer Chris Wonzer, Pro Tools operator Tal Hertsberg and producer Ron Fair.

## NY METRO REPORT

by Paul Verna

Although most of the multi-channel audio activity to date has been focused on remixing classic recordings for any number of surround media, Gizmo Enterprises co-owner Brian Mackewich and producer/engineer Rich Tozzoli are determined to focus on current product instead of archival material. To that end, they have created a multichannel-only label, 333 Entertainment, through which they plan to release new surround recordings, starting with the upcoming release *Un*

—CONTINUED ON PAGE 213

## L.A. GRAPEVINE

by Maureen Droney

Hot off the success of *Moulin Rouge's* "Lady Marmalade"—on which he served as vocal producer for budding divas Christina Aguilera, Lil' Kim, Mya and Pink—producer and A&M president Ron Fair was ensconced at Royaltone Studios in Burbank, overseeing a crunch to finish soundtrack songs for MGM's *Legally Blonde*.

Fair is no stranger to the hectic soundtrack process; he's been executive producer as well as hands-on song producer for numerous other soundtracks, including *Pretty Woman* and *Reality Bites*.

"I've hated soundtracks, but I've had quite a bit of success with them," he confides.

—CONTINUED ON PAGE 210



Shown in Gizmo's Studio 8—a surround room featuring a Digidesign Pro Control console—are producer/engineer Rich Tozzoli (left) and studio co-owner/engineer Brian Mackewich.

# COAST

## NASHVILLE SKYLINE

by Dan Daley

More than 30 years after Johnny Cash's landmark Folsom Prison live album, recording artist Mark Collie has joined forces with country producer and MCA Records president Tony Brown, and pop/rock/blues producer David Z, to put together and document a live concert at Tennessee's Brushy Mountain State Prison. This project has the potential to capture as much imagination as it does market, and re-inject some meaning into country music.

An all-star band, tentatively including Waddy Wachtel, Willie Weeks, Kenny Aronoff and Kelly Willis, would take a stage constructed by prisoners in the recreation yard of the Victorian-era correctional facility. Brushy Mountain is one of the oldest and most foreboding penal institutions in the U.S. and is surrounded by thousands of square miles of dense forest and craggy mountains. During David Z's first walk through the facility, the warden commented, "Once you get outside these walls, there's nothing but you and the snakes."

Brown—who has produced numerous Platinum country acts, including Reba McEntire and Vince Gill, as well as some edgier artists, such as Steve Earle, David Z, Fine Young Cannibals and Johnny Lang—will co-produce a live recording of the prison concert, which is also being filmed by award-winning documentary filmmaker Barbara Koppel. In addition



Blink-182 at Bernie Grundman Mastering (Hollywood), L-R: producer Jerry "Caesar" Finn, bassist/vocalist Mark Hoppus, mastering engineer Brian "Big Bass" Gardner and drummer Travis Barker.

to the band, guest artists would also be lined up to appear, as will certain "lifer" inmates, who will be picked with input from the guards. "The guards know the inmates like brothers," says Z. "They know which of these guys have talent, and there is talent behind those walls."

The recording will be done by Kooster McAllister and his Record Plant Remote truck. The P.A. system will be designed and run by Hugh Johnson, an independent Nashville live sound engineer, who for the last 12 years has been the FOH mixer and production manager for recording artist Vince Gill.

McAllister and Z have worked together before, on a live Johnny Lang concert recording at Disney World in

—CONTINUED ON PAGE 215

## SESSIONS & STUDIO NEWS

### NORTHEAST

Blues guitar legend Buddy Guy recently visited Indre Studios (Philadelphia) for a "Live at the World Café" taping for WXPB radio. Guy performed songs from his new album, *Sweet Tea*, as well as favorites like "Damn Right I Got the Blues." The session was engineered by Indre owner Michael Comstock with Brian Naab and Mike Armstrong in to assist. Artist Joe Huntly has been working with engineer Roger Sherman this week on some live recordings at Bristol Studios (Boston). In-house producer and engineer Viktor Kray is currently working with

Boston College a capella group The BC Dynamics, remastering their debut album, *Cabin Fever*. Bristol recording artist Kevin Foster is also currently teaming up with Sherman; they're tracking one of Foster's songs called "Make It Right"...Out at Sound on Sound Recording (NYC), Giuwine was busy mixing a new 5.1 project for Epic Records. Producer Cory Rooney oversaw the project with engineer Jimmy Douglass and assistant Richard Furch...LoHo Studios (NYC) recently hosted Thelonus Monk Jr., who stopped in to record with engineers Vance Garcia and Joe Hogan. Artist/producer Evan Lurie is currently working with engineers Tom Lazarus and Hogan. Also at LoHo, artist Natalie Gamzu just wrapped up a session

—CONTINUED ON PAGE 216

—FROM PAGE 208, L.A. GRAPEVINE

a bit ruefully. "Actually, awhile ago, I'd retired from them, because, generally, what happens is that songs are identified as good for a project kind of late in the life of a film. And the turnaround time for completing a film is a lot different than for a record. The schedules are very difficult. It's tough enough to make great artists' records. But to make great artists' records and then to fit them into the context of someone else's vision—that's even more challenging. It can be daunting and unfun, especially because I care a lot. I don't want to just license other people's songs and cram them into the picture. I take it very seriously, and I try to achieve, if not overachieve, a great match of the scene, the song, the artist and the vibe, while also keeping in mind the target audience of who the film is for—matching up the recording artists who fit the demographic of the film."

Fair signed on to the *Legally Blonde* soundtrack partly because it became a

showcase for artists in the Interscope/Geffen/A&M family. There are cuts by Valeria, Samantha Mumba, Vanessa Carlton, Lisa Loeb, Black Eyed Peas with Terry Dexter, new Chicago group Superchick and the L.A. all-girl rock band LowBall.

A bevy of happening producers and

engineers, including Rockwilder, Patrick Leonard, Tal Hertsberg, Eric Dawkins and Michael C. Ross, were also camped out at Royaltone battling to meet the deadlines, while Fair alternated between vocal producing, executive producing and artist relations.

"It's a ton of work," Fair continues.



Studio owner Perry Margouleff snuggling up to his console at Pie Studios

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"We're pushing the absolute limit here: nine original songs for a soundtrack done from scratch in two months. We were still choosing songs up until three days ago, and the album is being mastered Wednesday! We'll have finished goods the following Tuesday for the premiere—the cover, the album sequence and credits are all done. It's really difficult to keep quality high when you have this kind of time limit. That's why this multiple room thing really helps out. It's very comfortable here at Royaltone and very convenient. I just sort of migrate among the rooms and do my respective gig in each, as necessary."

A "who's who" of top engineers were handling mixing chores at various studios as Fair finished up recording, among them Mike Fraser, Dave Pensado, Mike Shipley, Jack Joseph Puig and Chris Lord-Alge.

The soundtrack CD process uses all of Fair's classic A&R talents, from song selection to the choice of artist to perform each song, to arranging, vocal production, mix supervision and album sequencing.

"For me," he explains, "it's about having full command of the entire musical vocabulary—being able to play, write and arrange. It's all woven into doing my job. It's my power with my artists, because they know I'm not guessing."

"There's a lot of us, actually, who do this—people like David Kahne, Rob Cavallo, Jimmy Iovine...There's that stereotype out there of the record exec who knows nothing about music—some suit or bean counter—and it's not like that. I'm down here sweating every eighth-note with all my records. They're all carefully crafted; it's time-consuming and difficult."

"I've been doing this my whole life, and I have to say that producing records now is harder than ever," he concludes. "That's one of the reasons I don't produce everything I sign. There are only certain records that I'm the right guy for, and I think I'm pretty good at picking them."

East Coast studio owner/producer/engineer/guitar consultant Perry Margouleff has set up shop on the Left Coast, where he's scouting for new talent. A serious gear collector, Margouleff is the owner of Pie Studios in Glen Cove, Long Island (aka "Noah's Audio Ark," due to its owner's penchant for stocking two of everything audio). A portion of that primo collection now graces Margouleff's new Valley Village production facility.

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owned by Toto drummer Jeff Porcaro, is home to a compact Neve 5316 custom broadcast console originally built for NBC television and (of course) Pro Tools. It's also fitted with the classic pieces of gear that Margouleff couldn't bear to leave behind, among them a Flickinger 2269 compressor used on numerous hit Stevie Wonder vocals and an almost virgin Fairchild 670, found in what Margouleff calls "the Polish equivalent of Congress," and protected with a very cool Lexan faceplate.

"Collecting audio gear is like a disease," Margouleff cheerfully admits. "There really ought to be an Audio Anonymous. When I built my studio in New York, it started with a Neve module and a U47, but now it's insane."

Other highlights of the collection include Neve 8078 modules, a Roger Mayer RM58 compressor, Geoff Daking, Compex and Altec 436 compressors, and RCA and Telefunken mic pre's. There's also an RCA BA6A, about which he says: "When I started buying them, people were calling them boat anchors—they thought they were just too slow. I learned about them the first time I worked with Jimmy Page, who had about six of them. There was a country

artist whose acoustic guitar sound Jimmy had always admired, and when he finally met him he found out that the secret was a BA6A. Now, I use it for acoustic guitars, vocals and sometimes drum rooms. They need some TLC, because they are 50 years old, but they're really fantastic."

All this gear, both old and new, is being used to further Margouleff's stated goal of bringing talented and musically proficient new artists to the attention of the industry and the public. His talent search of the L.A. club scene has already turned up a number of acts that he's begun recording, among them the teenaged Jancy Groove and Santa Cruz-based singer/songwriter/guitarist Gabriel Gordon.

"They can all really play and sing," he comments. "And I think that's coming around again. We've had all the cotton candy, now there's going to be room for some meat and potatoes. Historically, when the economy is flush and people are doing really well, music is not that relevant. But when people are struggling and trying to figure out the meaning of life, art, painting, music—it all takes an upswing because people are looking for something to identify with.

"The industry may think that if it isn't

contrived and fixed up, it can't be good music. But there are people out there who are going to figure their way around it. There's a lot of good music out there that isn't getting attention, and I want to help change that."

*Got L.A. news? E-mail to MsMDK@aol.com.*

—FROM PAGE 208, NY METRO REPORT

*Segundo, Una Vida* (One Second, One Life), by Argentinian guitarist Hernán Romero.

"We're dedicated to multichannel sound," says Mackewich. "It's become a huge passion in our lives."

Tozzoli adds, "Every record I do now is conceived for multichannel, recorded and monitored in multichannel, mixed in multichannel and released in multichannel. It expands the marketability of each project. Plus, from a creative standpoint, I don't think I could go back to stereo only."

On the Romero album, Tozzoli (who is co-producing with the artist, as well as engineering and mixing) and Mackewich (who engineered some of the material) insisted on tracking—and monitoring—every session with the surround platform foremost in mind.

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"Monitoring in surround while you're recording is incredible," says Tozzoli. "It allows you to move mic positions as needed, and it allows the musicians to fine-tune their performances according to the surround field."

Tozzoli adds that the members of Romero's band—bassist Mario Rodriguez, percussionist David Silliman and soprano saxophonist/flutist Oscar Feldman—were already familiar with multichannel audio from recording and mixing the live album *Trinity Church*. However, the current studio project pushed the multichannel envelope for all the musicians and technicians involved.

"The whole band, including Hernán as a composer, understood surround because we had worked in the medium before," says Tozzoli. "Everybody heard their parts in multichannel, and it positively affected their playing. When we were recording the strings, we knew they'd be around us. Whether that made Hernán compose differently, I don't know, but our headspace was surround from day one."

*Un Segundo, Una Vida* was recorded primarily at the Clubhouse, a studio in nearby Rhinebeck, N.Y., that, at press time, was not yet open commercially, according to Mackewich.

"We tracked directly into Pro Tools through the Sony R-100 board," says Mackewich. "I can't speak highly enough about the quality of that console. The pre-amps are outstanding, and the routing capabilities are awesome. We were able to work in the Clubhouse before the studio had its patchbay installed because the R-100 allowed us to route signals any way we needed to."

The mic selection on the project included Sony 800Gs, B&K omnis and Alesis/GT models. Although there was some discussion about tracking the project at 24/96, Tozzoli and Mackewich decided instead to keep it at 24/48.

"We wanted to have the ability to control everything in-house, as well as be able to take the system into other rooms if necessary," explains Mackewich. "We're extremely pleased with the quality. It's one of the few recordings I've been involved with where it actually sounds like the source."

From a musical standpoint, *Un Segundo, Una Vida* touches on Latin, flamenco, jazz instrumental, jazz vocal, world music and even new age styles. Approximately half of its songs are sung, either in Spanish or in wordless vocals, and the rest feature Romero's fiery guitar as the lead instrument.

Although Mackewich's energy is focused on finishing the Romero album—

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and plotting its eventual marketing campaign—333 is busy with other projects in development.

"If Gizmo is the four-walled, brick-and-mortar structure, then 333 is a liquid entity that goes out and searches for projects that fit our mission statement. We're really hoping the market develops for multichannel sound."

Meanwhile, Gizmo—a five-year-old post house with three Pro Tools-based recording studios and three Avid edit rooms—is hopping with other activity, according to Mackewich.

"We just did a two-hour KISS documentary for MTV, some audio and video promo packages for the MTV *Movie Awards*, a series of spots for J. Brown Advertising and an 'advergaming' DVD-ROM for Cadillac," he says. "There's never a dull moment around here."

**Better Lathe than Never:** When Digi-Rom mastering engineer Paul Gold began thinking about acquiring a vinyl cutting lathe for the New York-based studio, he undertook a grass roots market research project that harkens back to the pre-digital age. He went around to all the record stores he could find and personally polled the owners or managers for their opinions on the wisdom of investing in vinyl.

"I was looking around for a way to make the studio busier," says Gold. "While walking around the East Village and NYU area, I noticed all the record stores were record stores again. They actually carried vinyl! So I went into all these DJ-oriented stores and asked, 'Do you think there's room in town for another lathe?' Almost everyone said, 'Definitely. Go for it!'"

A long Internet search turned up a Neumann VMS 62 Special (circa 1963) with an SX-74 cutter head (circa late '70s/early '80s), and '70s-era VG-66 cutting electronics.

"It was a difficult search, because lathes are extremely hard to find," reports Gold, noting that Digi-Rom invested approximately \$25,000 in the system. "I found this particular one through a broker in L.A. It was originally owned by Rite Records in Cincinnati and sold to an engineer in Marion, Ohio, in '96."

Digi-Rom owner Harry Hirsch says the studio's vinyl investment reflects a resurgence of interest in the format.

"We're in the midst of a serious revival of vinyl as a distribution format for DJs," he notes. "Two turntables and a mixer is the de facto standard in clubs."

Although other New York mastering studios are still in the vinyl business—

servicing a combination of DJ clients and audiophile customers—many facilities have sold their lathes and focused on digital rooms.

"With the advent of digital mastering, many studios and engineers no longer want to deal with the maintenance requirements of owning a lathe," says Hirsch. "Only a handful of facilities in the metropolitan area can cut lacquers today. It's funny—the weaknesses of vinyl, which inspired the CD, are now part of its strength. It can sound very different on different systems and remains very tactile. The art of DJ'ing is growing. Kids who may have bought a guitar 10 years ago are buying turntables now and riffing with records."

Among Digi-Rom's vinyl customers are such labels as Island/Def Jam, Rockafella and Spitfire. Besides club DJs, the studio's target market includes indie rock acts, who in recent years have released their work on vinyl as well as CD and cassette.

Send you NY Metro news to [pverna@vernacularmusic.com](mailto:pverna@vernacularmusic.com).

—FROM PAGE 209, NASHVILLE SKYLINE

Orlando, but both say they've never approached anything like this before. "The place is unbelievably spooky," says Z. Aside from the understandable frisson that comes with walking through the prison's daunting corridors, there are logistical concerns that neither of them has ever encountered before. "We had to figure out if we were going to be able to bring the truck all the way in, or just run a really long wire out to it," says Z. McAllister adds, "It's a maximum-security prison, so everything that we need to do in any normal live concert recording situation is magnified by considering the security issues in every instance. It's a lot to think about."

When Hugh Johnson did his walk-through of the prison with Z and McAllister in May, he made mental notes about rigging the P.A. system. "I figure I'll use the Sound Image carbon-fibre box, which is light and comes with its own flying hardware," he says. "And I expect to hang the wedges off of the pipes that hold up the basketball goals in the prison yard. They look like they'll hold up."

Collie is perhaps the perfect artist for this project. He has performed as an actor as well as a recording artist, and he portrayed Johnny Cash in a 10-minute short, *I Still Miss Someone*, which won an award at last year's New York Film Festival. "Not bad for a bunch of hillbillies

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Working at Ocean Way (Nashville), from left, are string contractor Carl Gordesky, Trisha Yearwood, arranger David Campbell and producer Mark Wright.

makin' a movie," he says, his voice a mixture of gravel and razor blades. And word has it that Cash hopes Collie will do it again when a movie of the Man in Black's autobiography is made.

"In doing my research for playing the role of Johnny Cash, I found that when he did his prison outreach program, one of the inmates [at the San Quentin concerts] was Merle Haggard. Merle credits that experience with turning his rage into a muse. Without that moment, we would not have had Merle. And without Merle, we would not have had artists like George Strait and the many, many others who were inspired by Merle Haggard."

Collie says that, while the Brushy Mountain concert project has no political or social agenda, he hopes it may offer some inspiration to a few inmates. "It's obvious that the penal system in America is under a great deal of stress," he says. "Obviously, if we're going to try to rehabilitate and reintroduce to society the fallen, we have to be aware of what they're trying to say to us. The recidivism rate at American prisons is 55 percent, which stinks. I think that music takes down the barriers to communication. I've already started interviewing some of the guys in the prison, and I'm learning that they can share things through song that can't be communicated through sworn testimony or humble confessional. If one truth is revealed, if one life is saved, then this is all worth it, 'cause there are songs that change minds and change lives."

I expect to cover the concert when

it takes place in October—the month was chosen because the prison has no air conditioning and August at Brushy Mountain can be hell on earth. It's not the kind of venue you really want the all-access backstage pass for, as Collie points out: "Gettin' in is the easy part. It's gettin' out that takes some doin'."

Send your Nashville news to danwriter@aol.com.

—FROM PAGE 209, SESSIONS AND STUDIO NEWS with producer Steve Santoro and engineer Bob St. John.

## SOUTHERN CALIFORNIA

Blink-182 were hanging out at Bernie Grundman Mastering (Hollywood) with producer Jerry "Caesar" Finn and mastering engineer Brian "Big Bass" Gardner, putting the final touches on the band's latest MCA release *Take off Your Pant and Jacket*. Also at Bernie's, jazz outfit The Bill Cunliffe Trio cut their new LP *Live at Bernies'* direct-to-disk. The group simply set up in the studio lounge and let it rip. Grundman himself was on hand to engineer along with producer Joe Harley, recording engineer Michael C. Ross and assistant Mike Aarvold...At Sunburst Recording (Culver City, CA), multi-Grammy-winning producer John Runette was in recording music for George Carlin's upcoming CD *Napalm and Silly Putty*. Also tickling the funny bone this summer is The Firesign Theatre working on their new Rhino

Records CD *The Bride of Firesign*. Due out in September, this album will also be mixed in 5.1 for release on DVD-A and DVD-V...Studio Atlantis (Hollywood) recently hosted Universal/Dreamworks recording artist Chris Tart in Studio A. Tart was working on his final mixes for his upcoming release with producer John King of the Dust Brothers...A busy spring at Rumbo Recorders (Canoga Park): Former Guns 'N Roses guitarist Izzy Stradlin was in Studio A recording for a new album. Stradlin produced the sessions with Shawn Berman engineering. Posie Muliadi assisted. Producer Matt Serletic was recently in Studio B with Melis-



Brian Setzer (left) and producer John Holbrook hard at work at The Village (Los Angeles).



Susann Wallace of Switchblade Symphony (left) and studio owner/engineer Walt Szalva at Planet 3 Productions (San Francisco).

ma recording artists The Exies. Noel Golden engineered the effort with Sam Storey assisting. Serletic was also in Studio A with Island/Def Jam artist Willie Nelson. David Thoener and Golden handled the engineering duties with Storey in to assist. Ultimatum recording artists Sugar Cult were in Studios B and C with producer Matt Wallace. Mike Landolt engineered the sessions with Mudiadi assisting. Bill Ward (Black Sabbath) was in Studio A with producer/engineer Barry Goldberg; Storey assisted the sessions. Road Runner recording artists Coal Chamber was in Studio B with producer/engineer Ross Hogarth. Jeremy Blair assisted the sessions... Brian Setzer and his new band '68 Comeback Special were in at The Village (Los Angeles) with producer John Holbrook to work on their debut effort *Ignition*.

#### SOUTHEAST

Trisha Yearwood cruised into Ocean Way (Nashville) to work on her new album with producer Mark Wright and engineer Greg Dollman. Arista recording artist Lennon Murphy also spent some time at Ocean Way. Locking out Studio B, Murphy worked on overdubs with producers Jeff Pringle, Scotty Smith and Spider Warren Riker was in to engineer the project with assistant Leslie Richter... Dreamworks recording artists Lifehouse stopped by APC Studios (Atlanta, GA) recently to promote their album *No Name Face*. The band sat down in front of a few lucky contest winners for an acoustic set sponsored by local radio station WNNX. A few days later saw RCA recording artist David Gray, who took a break from his tour to do the same... Epic artists Fuel treated some lucky radio-contest winners at Tree Sound Stu-

dios (Norcross, GA). The event was hosted by 96 Rock, and the band's set was recorded by house engineer Robert Hannon with Mark Rains and Brad Todd in to assist. The live sound chores were handled by Tree Sound's Matt Carrier.

#### NORTHWEST

On the "other side" of the Bay Bridge at Studio 880 (Oakland, CA), film producer Ismail Merchant tracked and mixed his film score for the movie *The Mystic Masseur*. A full orchestra was brought in, and major contributors to the score included tabla player Zakir Hussain and percussionist Karl Perazzo (who has worked with Santana). Reto Peter engineered the project with Marco Martin assisting; Michael Denten handled the 5.1 mix... Switchblade Symphony have been busy putting together a new remix CD for Cleopatra Records... Bandmember Susan Wallace stopped in at Planet 3 Productions (San Francisco) to work with studio owner/engineer Walt Szalva on a remix for the track "Wicked." The completed CD should be out later this year.

#### MIDWEST

Narcissus completed their second release for Take Hold Records at Immortal Productions Studios (Canal Fulton, OH), with producer Cal Moore. May also brought in the team of longtime producer Marty Mooney and manager Chip Killinger (Glass Harp, Warner Bros., etc.) with their latest discovery, Colorwheel. The popular jam band finished up their first studio album with Moore co-producing and engineering.

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—FROM PAGE 22, SMPTE-ED OFF

it was discovered that the new color signals were susceptible to interference from 60Hz AC fields, and if there was any difference between the line frequency and the scan rate of the received signal, then it would show up as a visual "beating." But if you altered the field rate enough, then the beating would speed up to the point that it was no longer visible.

Unfortunately, this version is simply not true. Line-frequency beating never was a problem. And if it were, the cure is worse than the illness: At a field rate of 59.94 Hz,

if there really was beating caused by AC-line leakage, then you'd see a bar roll across the screen about every 17 seconds. Not pretty.

The real reason, and the one those in the know profess, is this: The lower frame/field rate is designed to prevent potential visual beating between the color ("chrominance") subcarrier in the broadcast signal and the audio subcarrier. Why is this a problem, and how does changing the frame rate help? Well, for various esoteric reasons, the color subcarrier frequency in the television signal needs to be modulated onto the picture carrier at 455/2 times the horizontal line frequency.

At 30 frames per second, and with 525 horizontal scan lines per frame, this frequency is 15.750 kHz, which means that the color subcarrier would have to be at 3.583125 MHz. The sound subcarrier (as established on the first monochrome TV systems) is at 4.5 MHz. If the two subcarriers were to interfere and beat against each other, then the 916.875kHz difference might be visible; and, in fact, according to one report presented to the NTSC, it was visible in some monochrome sets at the time, under some conditions. Because backward compatibility was a major consideration for the NTSC (and the reason the CBS-developed system was abandoned in favor of the more finicky RCA system), this was a problem.

This report, written by an obscure General Electric engineer, went on to say that if the difference signal happened to be an odd multiple of one-half the scan rate, then this beating would be reduced. If the frame rate was dropped 0.10001%, then the scanning frequency would be 15.734264 kHz, the chrominance subcarrier would be 3.579545 MHz, and the beat product (if there was one) would be 920.455 kHz, which is very, very close to the 117th multiple of half the scan rate. Did you get all that?

But a close look at the technical documents and the committee proceedings around this point seem to show that the problem never really existed. According to Mark Schubert, longtime technical editor and columnist for *Videography* magazine (to whom I am indebted for leading me to some excellent primary sources in dealing with this issue), there should not have been any cause for concern. "Remember, the sound carrier is FM," he told me recently. "The frequency swings and is never in its nominal position anyway, and so any beating wouldn't be steady, and therefore not visible."

Another video engineering expert, Tim Stoffel, says that a higher chrominance subcarrier frequency could have been used (495/2 fs), and the audio subcarrier also increased slightly to make the difference signal fall on the right multiple of the scan rate, and despite the change, "most [black and white] sets would have tolerated it at the time." However, the TV set manufacturers' association "screamed bloody murder," and so the decision was made to leave the carriers where they were (or pretty close) and change the horizontal scanning frequency—and, consequently, the frame rate—instead. This didn't make the transmitter manufacturers or the stations very happy, says Stoffel, because, "It meant much expensive alterations to transmission

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equipment, as the AC line could no longer be used as a frequency reference for sync!"

An engineer who was there at the beginning, Rollie Zavada of Eastman Kodak, diplomatically calls the decision to change the frame rate "debatable." Other sources say that the very first generation of color sets, and also the black-and-white sets that were made by the time the color standard was adopted, had good enough filters on the audio section so that leakage between the subcarriers was simply not an issue.

The decision to lower the frame rate was probably, according to Schubin, a political decision more than anything else: "I've talked to people who were there at the time who also think it wasn't necessary, but it was several people's entrenched position [to change the frame rate], so others went along with it, because, otherwise, the standard might be blocked forever. RCA was apparently among those not in favor of 59.94."

"Thus," as he wrote in his April 1993 magazine column, "all of the problems of NTSC's 29.97 frame-per-second rate may have been caused because 'some' 1952 TV sets 'may' have had a problem sometimes," and changing the carrier frequencies "was said to reduce (not eliminate) the problem." In the same column, he points to another potential problem—interference between stations located some geographical distance apart but on the same channel, which was also thought of at the time to be serious, and which might have been solved by a similar "interleaving" of frequencies. It turned out not to be an issue at all.

While it's depressing and frustrating to realize that changing the frame rate to an irrational number probably wasn't necessary, what's sadder still is to realize that apparently we're never going to get away from it, although we recently had the opportunity to do so. We are, after all, on the cusp of a new age of television: Digital TV and HDTV (which are not to be confused with each other, although the second is a subset of the first) are already on the air. The original HDTV standards (and there are many) all specified a frame rate of 30 fps.

Progressive, interleaved, 1080, 720, whatever variation you looked at, there was no mention of 29.97 anywhere in the proposals. But the HDTV programs now in production and going out over the air are running at—you guessed it—29.97 frames. The FCC mandate for HDTV is incredibly vague and has over the years been increasingly dictated by the broad-



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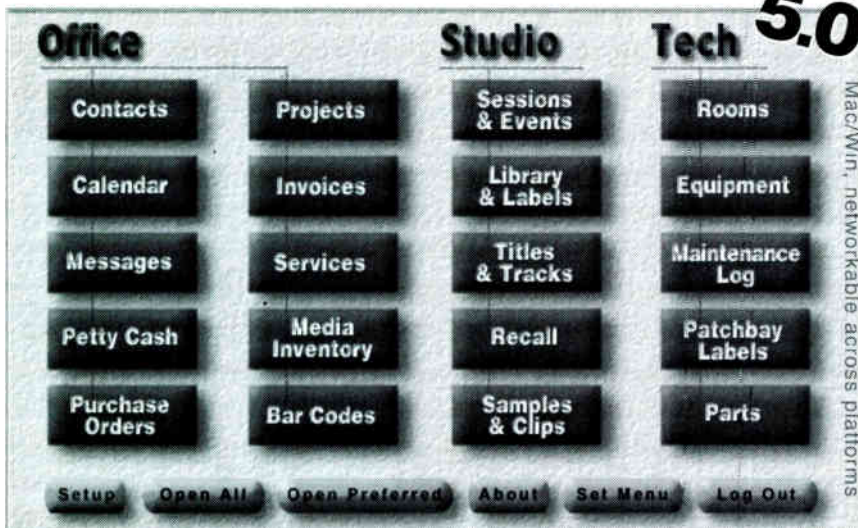
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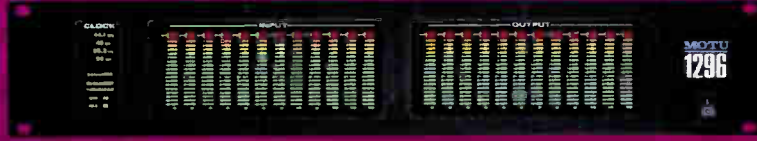
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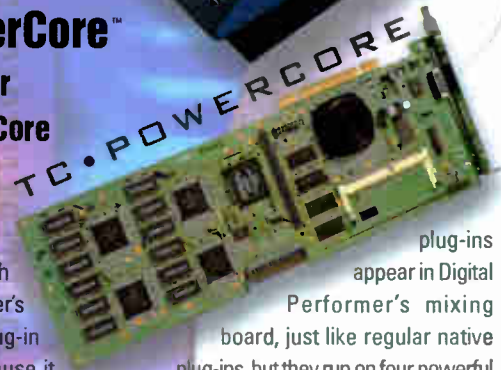
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plug-ins appear in Digital Performer's mixing board, just like regular native plug-ins, but they run on four powerful 56K DSP chips on the TC•PowerCore PCI card. It's like adding four G4 processors (equal to 2.8 gigahertz of extra processing power!) to your computer. Run 12 studio-quality TC plug-ins with no hit on your CPU power, and run other native plug-ins at the same time! TC•PowerCore is an open platform, so it will also run plug-ins from other respected 3rd party developers, too (details TBA).



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# DOLBY DP569

## SURROUND ENCODING AND THE ART OF METADATA MAINTENANCE

The Dolby Digital Encoder DP569 includes useful presets, but to get the highest quality encoding for audio delivery, knowing how and when to tweak the defaults is essential. The general defaults

real time. Using Dolby's DP562 companion decoder at various downmix settings to mimic less than optimal playback environments is also part of the professional routine. You should, however, author a DVD-R and take it

Line mode and compression (compr) in RF mode. We're usually concerned with dynrng, and we typically set it to None. Although there are presets for music, such as Music Light with very little compression, we like to hear de-



work well for broadcast, yet audio destined for DVD-Video discs must be prepared, encoded and monitored with careful attention to detail, particularly for DVDs in which music is synched to quick-cut video and material in which the video is secondary to the audio program. Three parameters you should check every time are dialog level (dialnorm), dynamic range (dynrng) and downmixing.

### BUT THIS ONE GOES TO 11...NOT!

If you like to mix stereo with 2 dB of dynamic range and several consecutive full-scale samples occur each time a peak desperately tries to break above 0 dBFS, *lose the habit*. Dolby Digital encoders offer downmix overload protection (should the summation of channels prove too large to squeeze through fewer channels); however, it's still possible to have a disastrous result. AC3 is a lossy coder. Constraining all frequencies of an audio signal to a small dynamic range can cause misinterpretation of which information is necessary and which may be deleted.

### LOSING SOMETHING IN THE TRANSLATION?

The best monitoring setup for AC3 encoding includes matched main channel speakers (with dual subwoofers and bass management if the mains are not full-range) and hardware encoder and decoder set up via an encoding loop so that you can hear discrete original tracks vs. decoded results in

to environments with high- and low-end consumer equipment. Surround monitoring efficiency varies with room dimensions and flat-surface textures as well as with equipment specs. Listening in a finely tuned room with the DP562 set to emulate a poor environment is no substitute for experiencing your audio in a small room with 3-inch cubes for the mains and a tiny subwoofer.

### LET THE MUSIC DO THE TALKING

Even if your audio program is only music, you need to know about Dialog level (also called dialog normalization or dialnorm). Why? The default of -27 ensures your audio will play back lower in volume on a consumer decoder than a DTS-encoded track from the same discrete channels. Consumer decoders default to dialnorm "on" with the level you set. So if you're sending a DVD-R to someone who is checking it primarily for the audio, set this parameter to -31—especially if you include a DTS track. This translates to no level shift in the consumer decoder. If you need to match levels with other program material later, then the audio must be re-encoded with the appropriate dialnorm value.

### TO COMPRESS OR NOT TO COMPRESS...

Dynamic Range Control comes in two flavors: dynamic range (dynrng) in

coded material with the same dynamic range as our discrete tracks. However, pay close attention to the target audience—in some situations, the consumer may not have access to this control in the decoder. When encoding music for PC speaker playback, you probably will want to start with the Music Standard preset.

### THE DOLBY RECORDER YOU NEED

The Dolby Recorder PC software utility is a must-have for studios that use software AC3 encoders and for engineers who provide audio to DVD authoring houses. Meant for use as a capture utility for DP569 owners, it's also useful for playing back AC3 files from software encoders such as Kind of Loud's SmartCode Pro. You'll need an audio card with a digital output and a decoder with a digital input. The Dolby Recorder supports embedded timecode, and it's an economical way to avoid authoring a DVD-R to verify your encoded AC3 stream hit points match the original video cut, even if the downstream DVD authoring station is dropping video frames in preview.

### SAMPLE THIS

Finally, always, always, always verify your discrete audio tracks are 48 kHz if your target is DVD-Video or DTV. ■

*K. K. Proffitt is chief audio engineer of JamSync in Nashville.*

BY K. K. PROFFITT



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The RCF Precision™ HF compression driver and midrange transducer are integrated into a single Optimized Wavefront™ horn for flatter response and wider dispersion. The cast-frame 15-inch LF transducer features our exclusive Inside/Outside voice coil for maximum heat resistance.

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The SRI530 just looks like an SR speaker. Actually it has a three-way electronic crossover, three FR Series™ power amps with 500 total watts RMS delivered to the transducers, three parametric equalizers and an electronic time corrector...built into an astonishing SR speaker.



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