MIX

PROFESSIONAL AUDIO AND MUSIC PRODUCTION

AES 2002

FILE FORMAT INTERCHANGE
Making OMF Work

DIGITAL ROUTERS
Is Your Patchbay Obsolete?

TRACK! EDIT! MIX!
Optimizing a Single CPU

MIXING FOR THE DANCEFLOOR
Top Remixers Punch It Up

SPOTLIGHT ON L.A. STUDIOS

- Ocean Way
- Sunset Sound
- Le Mobile...and many more!

TEC Awards Hall of Fame
GEOFF EMERICK

"This thing is gorgeous!" ...This is the typical response when audio professionals around the world first lay eyes on the ML series consoles from Allen&Heath. And who can blame them?

Consider the simple, logical, easy to use and ultimately familiar layout that's conspicuously void of annoying dual concentrics. It gives the ML-5000 a walk-up-and-play feeling that you just won't find in other consoles in this class.

Look closely at Allen&Heath innovations like LCRolus panning, along with the latest in VCA group implementation, mute group automation and monitoring facilities that are second to none. And all this is all available in a touring package designed and built to take the rigors of the road like nothing else.

The ML 5000 has built in to every mic channel our finest mic pre ever, a high performance discreet differential long tail pair design with a 100 kHz bandwidth and very low noise. Quite simply it redefines the term "sonic excellence".

From the fit and finish, to the obvious build quality, and the meticulous attention to detail throughout, there's just no question that world class doesn't begin to describe a console that's, dare we say it?.. a work of art.

If you like what you see, let us know and we'll arrange today for you to audition the ML5000 with your authorized Allen&Heath reseller. We're confident that you'll see (and hear) that Allen&Heath's ML5000 really is a thing of beauty.

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features
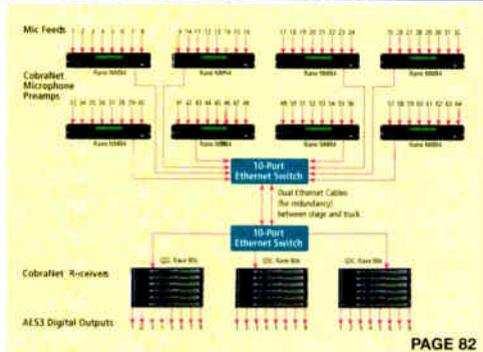
On the Cover: Studio A at Larrabee West, the flagship of the Mills' family-run facility in West Hollywood, took delivery of the first SSL K Series XL console. For more, see page 20. **Photo:** Ed Colver. **Screen Photo:** Courtesy NASA. **Inset Photo:** Gloria Waco.

Check Out Mix Online! http://www.mixonline.com

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AES 2002: Products and Technology

New products can be wonderful, often offering improved audio in smaller, less-expensive, lighter (or in the case of tube stuff, heavier) and more reliable packages. Unfortunately, in the increasingly complex pro audio environment, all of those oh-so-cool products are pretty useless when applied without the right *technology*.

When *Mix* began 25 years ago, technology was much simpler, even quaint by today's standards. Recording meant analog. Pro applications used +4dBu balanced line connections—XLR or barrier strip. Semipro gear rarely crossed the line into pro, where the only unbalanced connections were the band's instruments/amps. Garage 4- and 8-track studios used unbalanced -10dBV gear. Their main complication was a need for lots of RCA to ¼-inch adapters.

These days, signals arrive in every conceivable form and format. In my studio, I have MIDI and virtual instruments, and 32 channels of mic lines from a rack of pre-amps routing to the console or directly to Pro Tools, ADAT or analog multitrack. Mixing is either DAW-based, traditional console-style or a blend of both, storing to multi-channel or stereo to MasterLink, CD-R, PT or 30 ips 2-track. Projects can involve a lot of I/Os (wordclock, timecode, MIDI, AES/EBU, S/PDIF, Lightpipe, XLRs, RCAs, etc.) and multiple formats—analog/digital tape, CD-R, CD-ROM, SD2, PT session, AC-3, DTS, .WAV, MP3 and more.

Even in a modest studio, the need for an infrastructure is paramount. There's no point in investing in the best gear without a backbone of solid technology supporting it. A great performance can be ruined by something as simple as a bad cable or a ground loop. This AES provides an excellent opportunity to check out the nonglitzy technologies that might improve your life much more than yet another digital reverb or tube mic. A few suggestions include: AC power conditioning; acoustical treatments; quality cabling, from mic lines to snake and patching systems (and please get *correct* AES and S/PDIF cabling!); data backup systems; audio networking; and signal routers. To help you along, Gary Hall provides insights into routing technology on page 82, while on page 50, Ron Franklin begins a multipart article that will demystify the subject of file-format interchange.

Also in this issue, we say farewell to two of the finest and best-loved professionals in our industry.

Just before press time, we were saddened to hear of the death of mastering engineer Denny Purcell, who founded Nashville's Georgetown Masters studio in 1985. Denny was a warm, wonderful person who committed his life to the pursuit of audio excellence, and devoted each and every day to the songs he was working on. Please turn to page 14 for a tribute to our lost friend.

We were also saddened to hear of the death of producer Gus Dudgeon, best known for his work with Elton John. *Mix*'s Rick Clark had carried on a nine-month dialog with Gus, talking with him just days before a car crash took his and his wife's lives. His final interview is on page 98.

Don't forget, there's more to all of this than just gear...

George Petersen
Editorial Director

BRYSTON

ST POWER

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14B ST

World Radio History

Letters to Mix

HOORAY, DOLLY

I have never been a big fan of Dolly Parton ("Mix Interview," August 2002). I simply have not been exposed to much of her music. But, I will tell you this: I am a big fan of the woman. Her words ring so true that they are music to my soul.

Jeff Sherman
Santa Monica, Calif.

THE VOICE OF REASON

Paul Lehrman's July 2002 "Insider Audio" column generated a lot of affirmative head-nodding all around the audio industry. The letters started arriving last month. Here are a couple more that include advice on how to improve your own reception.

RADIO? GO DIGITAL

I thought Paul Lehrman's "Dumbing Down the Dial" piece ("Insider Audio," July 2002) was great. I work at a Class-A commercial station in Philadelphia. We put out 340 watts at 1,000 feet and have some of the same problems as WUMB—we are in the main antenna farm outside of Center City. Unfortunately, we have a single Class-B, WMMR, on 93.3 atop 1 Liberty Place in Center City. We don't have very good building penetration, and many of the new generation of tuners are overloaded from WMMR. We are the only commercial Class-A .n the city, and we pretty much drop off the dial in some areas. Grady Moates is actually the chief engineer of our Boston stations. I'm going up to assist him with our syndicated morning show's Boston broadcast later this month.

I just wanted to let you know about a very good, inexpensive tuner. Blaupunkt's DigiCeiver, which is packaged in most of their higher-end receivers. The lowest model with DigiCeiver is the Heidelberg CD51 and costs around $300 in stores. You can also usually find them new on eBay for $199. Make up a nice wood box, put it on a decent PS, attach it to your roof antenna and you're in business. The audio is also fantastic. I'm going with this setup in my house after dealing with the same problems you've had. The car stereo format will actually work out well because I can run the preamp outs directly to my McIntosh MC75s and play CDs, too! Adjusting the station's processing will hopefully get much easier.

I'm fairly new to radio engineering. I was a recording engineer before working here. I still always try to catch your articles. They always seem to really be on target with the new issues that present themselves daily. Keep up the great work.

Mike DePolo
Via e-mail

RADIO? GO OLD-FASHIONED

Paul Lehrman's July "Insider Audio" article struck a definite chord with me. I live in Vancouver, BC, where there are two college radio stations and one nonprofit community station; these contribute 95% of the interesting music and commentary on the air here. At work, our staff couldn't receive these stations on a dilapidated boombox, so I went looking for a good tabletop radio. Lo and behold, it was very hard to find a radio alone; almost everything except the ultracheap units had multiple features (CDs, etc.) that we didn't need. Even the tuners in the expensive retail units looked like junk.

What I ended up doing was buying two nice old tuners from a thrift shop (one an Akai analog AT-K02, and another a digital unit with LED displays), wiring in a ⅛-inch stereo jack in the back of each, buying two Altec Lansing AVS200 computer speaker systems and plugging them in. Voila! We got awesome reception, with cool old-school electronics. The total cost? Fifteen to 20 dollars Canadian for each tuner, and approximately $30 for each pair of computer speakers. That's about $50 here, which probably equals $13.25 U.S.

And by the way, these computer speakers sound better than any tabletop radio I've recently listened to.

Monty Martin
Vancouver, BC

FYI RE: MBHO

Thank you for including the MBHO 440 and 603 microphone series in the "You Can Never Have Enough Mics" feature in August 2002 *Mix*. The article mentions that MBHO is charging a surcharge for matched (stereo) pairs. This is not true. Unlike most of our competition, MBHO does not charge any surcharge or fees for matched pairs.

Marcus Demuth
MBHO U.S.
Brooklyn, N.Y.

I KNOW YOU, RIDER

In reference to Mark Frink's Live Mix column, "Your Tech Rider, Part 1" (July 2002 issue), I have one thing to say to Mark Frink: Thank you, thank you, thank you, thank you, thank you, thank you, and, oh, by the way, did I say thanks?

After working rental sound for festivals and the like for way too many years, and most recently as the technical director/FOH guy at a PAC/road house, I have seen my share of riders drawn on cocktail napkins, drawn with crayons, prepared quite nicely but five years old, or prepared in detail with all of the wrong names. ("Oh, he left two years ago.") And then there's the road manager who tells me on the phone when I advance the show that the band will be happy with "whatever I've got," but then when he hits the door, he wants to know where his 10 wedges, two sidefills, whoppin' drum box and eight monitor mixes are.

If you ever have any questions on how to prepare a rider, just take a look at the riders prepared by touring Broadway shows. They are sometimes 25 to 30 pages. The perfect rider/plot lies somewhere between that and the cocktail napkin. The advent of e-mail, PDFs and such are slowly making my job easier, but only when you road guys actually use these wonderful tools.

Mark Goff
Technical director/FOH engineer
Ford Theater at The Honeywell Center
Wabash, Ind.

UNDERRATED? NO, A CLASSIC!

I'd like to thank you for your coverage of Neil Finn. I've always thought him to be criminally underrated, even though he's been recording beautiful music for more than 20 years. His new album is as excellent as anything he's done—thanks for giving us a glimpse at the creative process behind it! How about a "Classic Track" on his biggest song, "Don't Dream It's Over"?

Tom Johnstone
Music student

Send Feedback to *Mix*
mixeditorial@primediabusiness.com

SURROUND

SATISFACTION

There is an undeniable satisfaction when you're surrounded by those little things in life, like the right refreshment, the right company, the right sound...

Introducing the 1029.LSE™ PowerPak...the one surround system that will convince you that good things can be brewed into small packages.

Starting with the 7060A LSE™ subwoofer, which serves as the cornerstone to the system with its full-featured 6.1 bass manager, the PowerPak also includes five award-winning 1029A compact active monitors. Each system comes with our surround sound Setup Guide and Genelec Acousti/Tape™ making installation quick and precise.

This surprisingly compact system delivers healthy doses [29Hz to 20kHz] of accuracy, dynamics and emotion in stereo or multichannel mode while saving precious control room real estate.

Surround yourself with satisfaction! Discover why GENELEC continues to lead the way in active multi-channel monitoring with the 1029.LSE™ PowerPak and let your satisfaction get the best of you.

1029.LSE™ PowerPak

www.genelec.com

GENELEC®

CURRENT

GOLD STAR STUDIOS REBORN...ONLINE

FOUNDERS LAUNCH INTERACTIVE WEBSITE

Fifty years ago, Gold Star Studios was the place to be—an independent, rock 'n' roll studio in a sea of label-owned labs. Today, you can revisit the birth of the modern recording studio at www.goldstarrecordingstudios.com, launched last month by Gold Star founders David S. Gold and Stan Ross.

The Website includes Gold's and Ross' illustrated biography of the studio—

Gold Star Recording Studios, early 1950.

The Gold Star Album—and a musical adaptation that, as of press time, was in negotiations with an unnamed Hollywood production company. The site will also host a feature where Gold and Ross will respond to users' questions.

"The art of recording over the past half-century has evolved from a simple data storage and retrieval system to a recognized art form," said Gold. "We were fortunate to be present at the dawning of that revolution, and now through our Website, we want to enable others to recognize their potential as recording artists."

Founded in 1950 by Gold and Ross at Santa Monica Boulevard and Vine Street in Hollywood, it is well-known as the home of Phil Spector's famous "Wall of Sound," which showcased the studio's custom-designed recording technology and echo chambers, as well as numerous groundbreaking and award-winning recordings.

After a final session with the Bee Gees' Maurice Gibb, circa February 1984, Gold (left) and Ross bid farewell to Gold Star's historic Studio B.

DREAMS DO COME TRUE

NAMM ANNOUNCES SUMMER SESSION DREAM STUDIO WINNER

A "Dream Studio" was given away to Stephen Simmons, a singer/songwriter from Antioch, Tenn., at this year's Summer NAMM. "Demos are a pain for struggling musicians, so this equipment was better than cash for me!" Simmons said. For more info on Stephen, visit www.stephensimmonsmusic.com.

Sponsored by *Electronic Musician, Mix* and *Remix* magazines, in tandem with NAMM, the giveaway was valued at $21,129 and included items from ADK, Akai, AKG, Artist-Pro, Behringer, Crown, dbx, *Electronic Musician,* Electro-Voice/Telex, Eventide, Fostex, Hosa, JBL, Line 6, Marshall Electronics, The Martin Guitar Company, *Mix,* Music Industries, Peavey, Peterson, *Remix,* Roland, Rolls Corp., Shure, Tascam, TC Electronic, Technics, Ultimate Support and Yamaha.

LDI 2002: THE ENTERTAINMENT TECHNOLOGY SHOW

This month, thousands of professionals who are involved with designing entertainment venues, architectural lighting, sound design, clubs, performance spaces and themed environments will gather at the Las Vegas Conference Center for the LDI 2002, October 18-20, 2002.

In addition to three days of exhibits with 400 companies showcasing the latest in entertainment and architectural lighting, pro audio, staging, rigging, pyrotechnics, lasers and special effects, LDI 2002 features the LDInstitute®, offering in-depth technical training for entertainment design pros before the exhibit hall and conference sessions open. A full slate of conferences, workshops and tutorials are also planned. Sponsored by *Remix* magazine, an all-new LDI addition for 2002 is the Club Pavillion, which features lighting and sound product exhibits for the dance club market.

As an added convenience, *Tour Guide* magazine's Tour Link Show is co-located just outside LDI 2002, focusing on products and services for the live entertainment industry, including transportation and tour pass companies, production and business managers, hotels, sound companies and staging firms.

Media sponsors for LDI 2002 include *Lighting Dimensions, Entertainment Design, Millimeter, Mix, Remix, Sound & Video Contractor, Staging Rental Operations* and *Video Systems* magazines, as well as the Entertainment Services and Technology Association (ESTA). For more, go to www.ldishow.com.

SOUNDS OF NATURE 24/7

Last month, the CBC began to broadcast continuous natural soundscape recordings on its Galaxie pay-audio service channels. Eighteen of these recordings were mixed on-site and in real time, thanks to a delivery system supplied and installed by Wild Sanctuary. This digital audio system—dubbed ISS™ (Intelligent Show System)—was designed to deliver high-quality audio content nonredundantly; this installation is the first in pay-audio service to feature this type of performance model.

"While the ISS is a multifunction show control system designed for a variety of media delivery uses, this particular CBC application is formatted to present natural soundscapes naturally, and is programmed for related random occurences, just as events occur in the wild," said Dr. Bernie Krause, president of Wild Sanctuary. "The non-repeating feature lends heightened realism to our environmental recordings and provides a continually fresh and highly genuine audio experience for the listener."

For more, visit www.wildsanctuary.com.

CEDAR for SADiE
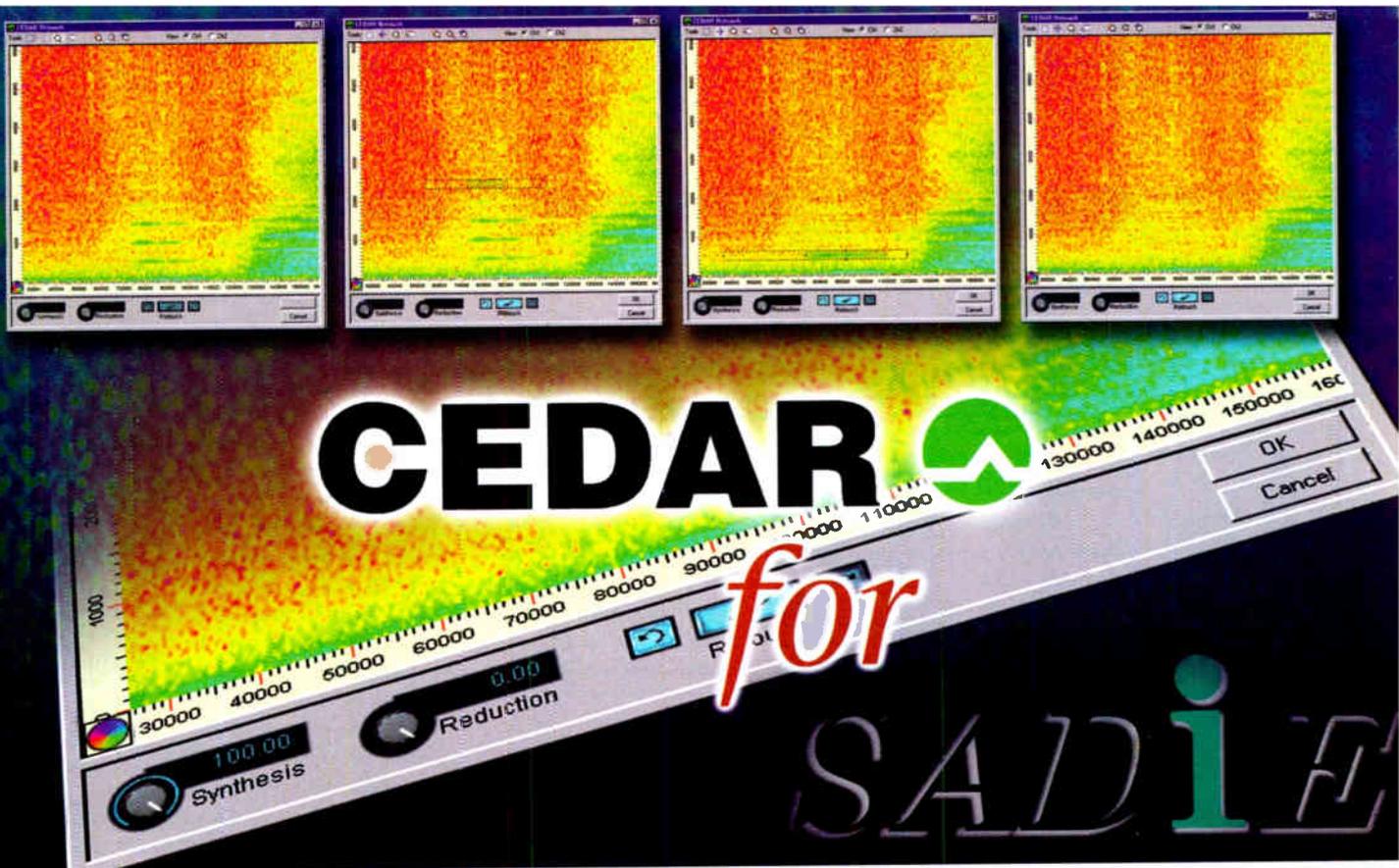
Retouch™ your Mix

A serious mastering system needs serious audio restoration tools. The highly successful cooperation between the two leading developers of these two disciplines, with over a decade of experience, has culminated in the most powerful mastering and restoration system available today.

The new **SADiE V4.2** editing software for the **SADiE** range of digital workstations offers the sound engineer an awesome range of new tools and displays, making audio editing faster and more concise than ever before. In combination with the implementation of such industry standards as DDP, DDP to Network, Exabyte, AES31 etc., **SADiE** users now benefit from the world's most advanced and professional mastering system, backed up by the availability of regular software upgrades at no-charge, plus unrivalled customer support that the others can only dream about.

Utilising **SADiE V4.2** as the base platform, **CEDAR** has developed a revolutionary tool to remove unwanted acoustic events such as page turns, creaking piano pedals or even car horns.

This development has culminated in the remarkable new **CEDAR Retouch™** for **SADiE**.

Retouch™ expands the renowned **CEDAR for SADiE** range with a remarkable patented process that is simply not available from any other manufacturer.

By using an innovative spectrogram display, the sound engineer can identify an unwanted sound in time, frequency and amplitude. Once identified, **Retouch™** seamlessly replaces the unwanted sound with material generated from the surrounding signal.

In combination with the other legendary **CEDAR for SADiE** processes such as **DeClick**, **DeCrackle**, **DeThump** and **DeNoise**, clicks up to 2000 samples and thumps up to 50 000 samples or longer can be removed with no audible side effects.

So if you are seeking innovation, reliability and service combined with the integration of powerful restoration tools, contact your local

SADiE dealer or office for further information and to arrange a demonstration.

SADiE

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MIX LOOKS BACK

For *Mix*'s 25th anniversary this year, we begin looking back at where we started. Here are the Number One album and single from *Billboard*, October 1977, with special props to the engineers, producers and studios who make the magic.

NUMBER ONE ALBUM

For the seventh consecutive month: Rumours, Fleetwood Mac. Producers: Fleetwood Mac, Ken Caillat, Richard Dashut. Engineers: Ken Caillat, Richard Dashut. Studios: The Record Plant (Sausalito, CA), Wally Heider (Los Angeles), Criteria (Miami), Davlen (North Hollywood), Producer's Workshop (Hollywood). Mastering: Ken Perry/Capitol.

NUMBER ONE SINGLES

Meco's "Star Wars Theme/Cantina Band." Producers: Harold Wheeler, Pat Lawrence, Meco Monardo, Tony Bongiovi. Engineer: Harvey Hoffman. Studio information not available.

Debby Boone's "You Light Up My Life." Producer: Joe Brooks. Studio information not available.

ON THE MOVE

Who: Dave Lebolt
What: VP, general manager at Digidesign
Main responsibilities: Overall management of Digidesign division of Avid Technology, including strategy and operations.
Previous Lives:
• VP, product strategy, Digidesign
• director of product strategy, Digidesign
• Pro Tools product line manager, Digidesign
• Professional keyboardist/producer/arranger/composer.
1988-1994, worked in advertising music and a principal partner in a music production house

I really miss this from when I used to produce/arrange/compose...the notion of finishing a project with a small set of collaborators. In a company like Digidesign, the teams are larger, and the work is just "never done" when you have an evolving software "organism" called Pro Tools.

This one time, on tour...with Laurie Anderson in Caligiari, Italy, we had the bad luck to have a gig on the same date as the World Cup match. It was a 2,000-seat theater, and Italy was playing in the match. We played the gig to a rapt audience of three cleaning women who stared blank-faced at us after each selection. (Projectors, music, animation—it was all going on).

My favorite synth is... Old favorites: my MiniMoog and MemoryMoog. New favorites: Access Virus (plug-in and tabletop), also Native Instruments' Reaktor and Absynth.

The last great movie I saw was... Stayed up late watching Orson Welles' *A Touch of Evil* the other night on TV—the ultimate film noir classic.

Currently in my CD changer is...Gorillaz, Coldplay's *Parachutes*, Duke Ellington's 1958 Paris Concert, Norah Jones, Radiohead's *Kid A*, The Roots' *Things Fall Apart*, DJ Shadow's new release.

If I'm not in the office, you can usually catch me... Reading, working on music projects, hanging out with friends and family, and trying to catch some zzz's.

Industry News

Bringing with him 30 years of senior management expertise, **Robert A. McDonald** joins **Mackie's** Woodinville, Wash.,-based office as the new executive VP of engineering and product development...**Shure** (Niles, IL) opened a new division to enhance and expand the company's support system, aptly titled **Global Support Services**, which will cover product distribution, product service, customer service, customer credit and applications engineering. VP **Jim Furst**, former VP of international operations, heads up this new division...Tampa-based **Phonic America**, a division of Phonic Corp., welcomed **Ken Fuente** as its newly appointed executive VP...Industry vet **Allan Nichols** has been named sales director for **Allen & Heath USA** (Agoura Hills, CA). He will be based out of Nashville...**Martin Seidl** joins **JBL Professional** (Northridge, CA) as its new director of European sales...Tackling all sales responsibilities for **Meyer Sound** (Berkeley, CA) west of the Rockies will be **Jim Sides**...Based out of Highlands Ranch, Colo., **Charell Robinson** will be working with **Sound Advance Systems Inc.** (Santa Ana, CA) as the new central region sales manager.

Robert McDonald

Allan Nichols
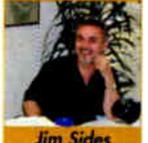
Jim Sides

NOTES FROM THE NET

NAPSTER PERMANENTLY OFFLINE

A Delaware bankruptcy court denied the bankrupt Napster its $92 million proposed sale to Bertelsmann AG.

Chief Judge Peter J. Walsh of the U.S. Bankruptcy Court in Wilmington refused to allow the sale after Bertelsmann could not come up with enough evidence to show that its investment was made in good faith and not as an equity stake in Napster.

The online start-up has laid off most of its staff—including co-founder Shawn Fanning. Napster CFO Carolyn Jensen will stay onboard to prepare a Chapter 7 bankruptcy filing to liquidate the company's assets.

Bertelsmann would have provided about $10 million in cash to creditors, reports said. Bertelsmann said that it would forgive more than $85 million in other loans.

dbx Just Sounds Better!

Sidechain Enable allows for quick A/B selection of the sound with or without sidechain processing. No re-patching required

dbx's exclusive OverEasy® allows for faster attack times and higher compression ratios while still maintaining the natural characteristics of the sound.

Tells you when the zero-attack, dbx-exclusive PeakStopPlus™ limiter is working.

Link both channels with True RMS Power Summing. The proper way to achieve stereo compression.

dbx's patented 3-segment precision LED OverEasy® indicator helps you precisely dial in just the right amount of compression.

12-segment gain reduction meter allows precision monitoring of compression.

Over/Under LED's let you know at a glance if you're expanding or gating.

Patented peak-reading meter allows easy setting of optimum input and output levels.

dbx—the only choice when your sound matters

CHANNEL ONE   CHANNEL TWO   1066 Compressor/Limiter/Gate

Flexible expander/gate works over a 70 dB range.

The Contour switch is extremely useful in keeping low frequencies from "muffling" or "punching" holes in your sound.

Monitor either input or output signals.

Our patented switches are designed to be easily seen in the light or the dark

Detented controls and soft-touch knobs assure precision adjustments.

Patented PeakStopPlus™ circuit intelligently tames signal peaks.

Sidechain Monitor selection connects the sidechain return signal to the 1066's output. This allows monitoring of any signal that is inserted into the sidechain loop to assist in setup.

Independently set attack and release times or use Auto mode to get that classic dbx sound.

Vary the Ratio to select anywhere from gentle down-ward expansion to gating.

Adjusts from mild compression to ∞ : 1 limiting.

Add make-up gain or match levels over a 40 dB range.

Internal power supply with easily replaceable power cord.

Heavy-duty steel chassis will take years of road use and abuse.

Easily accessible fuse — you'll probably never need to find out how easy.

Connect the unit hassle free using either unbalanced or balanced 1/4" TRS or balanced XLR connectors.

Ensure signal path integrity with gold plated locking Neutrik® XLR connectors.

Add processing to detector path (using the sidechain) for frequency-conscious compression/gating special effects.

Servo-balanced outputs drive up to +22dBu

Separate sidechain send and return jacks—no special "insert Y-cables" required.

Convert semi-pro -10dBV signals to the dbx 1066's professional +4dBu internal level.

Precision balanced inputs reject hum and noise in tough audio environments.

dbx compressors have been the standard in signal processing for over thirty years. After all, our processors are in daily use all around the world with major touring companies, world class recording studios, radio and television broadcast facilities and anywhere else that audio professionals ply their trade.

Why do the best ears in the business time and time again turn to dbx for their processing needs? Maybe it's because we invented the modern day compressor. Perhaps it's because we have over 30 patents to our credit. It could that our technology like OverEasy and PeakStopPlus won't be found in any other compressor. However, we think it's because dbx just sounds better.

It's no wonder that countless gold and platinum albums have used

dbx processing and that eight out of the top ten U.S. tours use dbx each night because their sound is too valuable to trust to anyone else. But don't take our word for it, head on down to your local dealer today and hear for yourself why dbx just sounds better.

dbx's industry-standards: 166XL and 266XL

166XL
266XL

dbx
PROFESSIONAL PRODUCTS
The Professional's Choice In Signal Processing

Larrabee Studios

By Maureen Droney

Larrabee Studios started out, literally, as a "mom and pop" business when, back in 1969, music producer Jackie Mills and his wife, Dolores, purchased a two-room, 16-track facility from songwriter Gerry Goffin. Owned since the mid-'80s by their son Kevin, Larrabee today is one of the largest studios in Los Angeles, encompassing seven studios spread over 30,000 square feet in three locations.

It's a bit ironic that Kevin Mills ended up as a studio owner; although he labored at Larrabee's front desk while in college, he was originally determined to avoid the family business. After graduating with a degree in economics, he launched a career as a stockbroker, but his fate took a turn in 1986 when his parents put their studio on the market. "I'd wanted nothing to do with the record business," he says with a laugh. "But when my parents wanted to sell the studios, they had no takers. I decided to take over, and we agreed that I'd buy it from them."

Once he became involved, Mills became a hands-on owner and a passionate gear collector. Over the years, he's combined that passion with a drive for excellence and a series of solid business decisions. Larrabee's long-standing relationship with SSL, which began in 1979 with the purchase of one of that manufacturer's first consoles, started a trend. A second SSL soon followed, and Larrabee became known for top-of-the-line mixing, cranking out innumerable hits throughout the '80s. When the company expanded north in 1990, adding a three-studio complex on Lankershim Boulevard, it was no surprise that SSLs were part of the equation. The spacious North was capable of accommodating entire multiroom projects; among them have been such high-profile sessions as Michael Jackson's *Dangerous* and *History*, and Madonna's *Ray of Light* and *Evita*.

In 1996, Larrabee became the first Los Angeles studio to purchase an SSL 9000. "SSL brought me and Dave Way—a client whose opinion and judgment I trusted—to their headquarters in England to demo the console," Mills recalls. "We'd become known for mixing in the '80s, but for North in the '90s, we wanted to be more complete and multifunctional. That made a 9000 the best choice. People really liked the preamps

and EQ, and its sound quality even won over people who traditionally liked older 80 Series Neves."

Larrabee ended the '90s on a high note; in 1999, after 12 months of construction, North's Studio 3, the first ground-up 5.1 SSL 9000 J studio in Los Angeles, was completed. Also in 1999, Mills acquired Andorra Studios, a two-suite Neve 8078 tracking and mix facility. Now known as Larrabee East, the complex has been renovated and updated with the assistance of head technician Steve Anderson.

Growth continues at Larrabee: In 2000, a large atrium with extensive lounge space added a new dimension to North. With that project complete, Mills turned his attention to the original studios, which are housed in a designated historic building on Larrabee and Santa Monica Boulevard in West Hollywood. A 2002 renovation of what is now called Larrabee West left Studio B's popular SSL 68-in E Series desk in place, while Studio A became home to Los Angeles' first SSL 9000 K Series XL console, pictured on this month's cover.

"Larrabee West, which is in an old bank building, is clearly different architecturally from most studios," Mills notes. "It was time to freshen it up, so we redid lounges, the entry area and, most importantly, Studio A. We wanted to take what had been our flagship room in the '70s and '80s and make it our best room, using everything we've learned over the years. We concentrated first on the recording area, with new wood floors, wall and ceiling treatments, and antique stained-glass hanging fixtures that provide a warmer feel. A's control room has always been popular, so we didn't want to rebuild it. We just improved it—the acoustics, the wiring and updating the outboard gear. The reviews have been great: The good news is that clients who already liked A still do, while some people who preferred other rooms of ours now also really like A."

According to Mills, the response to the K Series desk has been unanimously positive.

Larrabee Studios owner Kevin Mills

"People love the J technology," he states, "and the channel strips on the K Series are the same. It's the J with a faster computer and a lot of other improvements, like the flip-up display, the new software and better bandwidth. What's really great about the K—unlike some other new-generation introductions—is that it's been bulletproof. We haven't had one minute of down time."

Mills' studios continue to turn out hits from an industry Who's Who. All seven Larrabee rooms now offer either Pro Tools MIX Plus 888/Apogee 8000SE or HD systems with all current plug-ins and multiple flat-screen displays. In addition, a dedicated Pro Tools technician has been added to the studios' six full-time maintenance staff. "I try, month by month and year by year, to provide a better studio in terms of service and facilities," Mills concludes. "I'm always trying to make Larrabee a better company than it was six months ago." ∎

WHO REALLY CARES HOW THE MUSIC SOUNDS?

Apple store, and I couldn't believe how much they sucked. I mean they really sucked.

Not only did they suck my brains out, but I think they took a third of my lungs and my left eye, as well. I had never realized how little noise reduction the tiny busters were doing below 150 Hz until I put on the Bose. But that's not all. The Bose did substantially better noise removal across the board. If I had to guess, which I do, as there are no real specs to compare to, I'd say the Bose removes roughly 1,000 dB more noise. Yeah, that's about right. And they have a nice, healthy bottom end to boot. No more wimpy explosions.

But they are friggin' *huge*! These full closed-ear cans are so big that they won't even fit in my laptop case's side pouch. A .40-caliber Glock, two sets of sunglasses, three nice Cubans, a cell phone, an iPod, 10 DVDs, two Almond Joys and a banana will fit in that pouch, but not these cans. But Bose knows this, so they come with all kinds of very nice accessories, including two carrying cases—a very well-made black hangman's hood and an over-the-top semirigid monster with two zippered compartments and internal netted sub-

compartments for included real-world adapters. All for $300 American.

These are the best noise-canceling cans around. You must decide if you have room in your life for them. I made my decision; they are on my head as I type. www.bose.com.

> The bass response is a bit weak, so those tunes you play to mask the remaining roar of 4,000 horsepower of open flame right outside your window may be a bit thin.

CHIEF PLASMA HANGER

This is not a lesser-known Chief who Custer fought.

If you read my recent video columns, then you know that I am now the owner

of a 50-inch Pioneer plasma display. (Okay, maybe not just one anymore.) For six months, the first display sat on a nice desktop stand from Pioneer. For all that time, I thought it would be cool if it floated on the wall instead, so I searched for the right solution. I finally came across the answer at my local tweeze shop—an insane device from Chief Manufacturing.

This double-articulated, scissor-extending mounting system bolts to the studs in your wall and floats your 150-pound plasma with effortless grace. This is a must-buy for you plasma owners for two reasons: First, it allows you to pull the display away from the wall in any angle that you want. You can pull it straight out almost a meter, turn it left or right almost 90° from the wall, or any combination. It also lets you tilt it down and adjust it laterally.

With this mount, you can literally aim your plasma anywhere in the room, and when you push it back to the wall, it docks the display about an inch closer than most nonmovable wall mounts.

And the other reason you need this? The sheer terror, the adrenaline rush you get every damned time you pull $15k of

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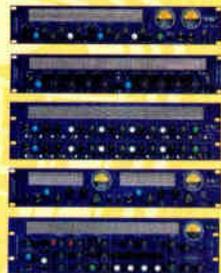
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AS PASSIONATE AS YOU.

BY PAUL D. LEHRMAN

We Don't Need No Steenking Ethics!

Keeping Things Honest in Our Own Back Yard

ILLUSTRATION: MICHAEL MORGENSTERN

One of the things I like the most about the pro audio business is that almost everybody I know is in it because they *want* to be in it. No one gets into pro audio—whether it's designing and building tools, running a studio, mixing concerts or even working 90 hours a week on original music—because they think it's going to make them filthy rich. Sure, it's possible (although not so easy these days) to make a good living, but the material rewards at even the highest levels in our industry pale compared to the fortunes to be made in sectors like financial services, energy or telecommunications. Well, at least there *were* fortunes to be made in those sectors.

But because our sphere lacks the lure of obscene amounts of lucre, we are not a particularly attractive target for the pirates and thieves who've been romping through much of the rest of the business world recently. Sure, we've got our screw-ups, our minor-league ripoff artists and our occasional cowboys who think the rules of business and commerce don't apply

to them, but they tend to get shut down pretty quickly before they can do too much damage. Even if they do manage to wreak some havoc, the scale of their efforts pales next to those captains of industry who have been making off with billions, while tossing the life savings and pension funds of thousands of stockholders and ex-employees into oblivion.

Which brings me to the issue of corporate ethics and the pro audio industry. Do we have any? Do we *need* any? What is "corporate ethics," anyway?

To many ears, the term itself is an oxymoron, like "military intelligence," "airline food" or "creation science." Corporations don't *have* ethics. Unlike people, who develop a complex set of morals based on factors like the welfare of the family and the group, the need for meaningful work and self-expression, and the need to eat, stay healthy, stay warm and reproduce, corporations are pretty simple entities. Because they do not have any moral imperatives, they cannot be immoral. Instead, they are amoral. They exist for

World Radio History

one purpose: to maximize return for their owners.

So, it's the owners who can be either ethical or unethical. But who are the owners of a company? Are they the board of directors, the venture capitalists, the managers of large mutual funds, the proverbial stock-owning widows and orphans, or the employees who have been paid off in stock options in lieu of realistic salaries? And should the owners' goal be to run a growing company with potential for healthy profits and dividends, or to drive the stock price up as high as possible, as quickly as possible? If everyone involved can get rich by doing the latter, is that unethical?

The implosion of the high-tech sector, and the energy, telecom and financial services industries that followed (and the others to come) can be attributed to a decline in the personal ethics of the major players, but only partly. After all, pirates and thieves have been running commercial enterprises since Biblical times and before. Even among otherwise honorable people, niceties like ethics tend to go by the wayside when millions of would-be entrepreneurs are chasing trillions in

seemingly unfettered venture capital, which is as good a definition as any of the past decade.

But this is nothing new. You may not remember the Roaring '20s or the Teapot

If we are going to remain a healthy industry, whose members genuinely like what they do, and like each other, then we too have to be on the lookout for scams, bad practices and bad products.

Dome scandal, but your grandfather might. Or think back to the Go-Go '80s. Michael Milken, anyone? In fact, let's go back to the '80s and see where at least part of our current troubles began. Over

the past 20 years, we have witnessed the steady erosion of meaningful business regulation. When powerful amoral forces are at work, the rule of law is all that we, as a society, have to keep ourselves from descending into chaos. The Roosevelts, Teddy and Franklin, recognized corporations' tendencies to consolidate and abuse their power, so they put into place measures—like antitrust laws and government-operated service agencies—to curb them. But since the 1980s, those efforts have been methodically undermined by the Congress and the presidents, both Republican and Democrat. In the name of the almighty free market, the U.S. government and several of its allies in Europe—who, given the right circumstances, could be bought and sold like any other commodity—abandoned their reponsibility to keep capitalism from going totally nuts.

Which is why hearing the present administration in Washington talk about corporate ethics (or "malfee-ance," as George II insists on calling it) is about as absurd as Bill Clinton preaching abstinence or Saddam Hussein extolling religious tolerance.

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REMIXING

DANCE MUSIC PRODUCERS SHARE THEIR SECRETS
By Erik Hawkins

HOTSHOTS

The act of taking a song's vocal tracks and putting them to a new arrangement that targets the dance music market is a serious craft. Remixing has come a long way over the past decade. This is due, in no small part, to advancements in music-making technology, especially computers and software. In the past, only songs that were at, or near, a dance tempo were good candidates for remixing. Today, the vocals from practically any song, regardless of its original tempo, can be massaged and manipulated.

Remixes have become a staple of today's music industry economy. They are now used regularly to promote artists, even when an artist's genre isn't dance. And, there is little doubt that remixes are fueling dance music's popularity. (Disco lives.) However, as with most disciplines, simply buying the latest remixing gear won't turn you into a hotshot remixer overnight. Remixing requires its own brand of production smarts and familiarity with the dance music movement. In order to uncover some of this know-how, *Mix* sought out several of the industry's top remix producers—Brian Transeau (aka BT), Dave Audé, and Chris Cox and Barry Harris of Thunderpuss—and asked them to share their insights.

FIRE STARTERS

All four remixers employ Macintosh G4 computers, a digital audio sequencing application, and software for time-correcting vocal and instrument tracks. And, while G4s are used in the studio, Apple's Titanium Powerbooks are popular for composing on the road. BT also uses a PC for additional sound-design duties, such as taking advantage of synthesis programs that are only available for that platform. Audé does all of his recording and editing in Digidesign's Pro Tools, Cox and Harris depend on MOTU's Digital Performer, and BT uses both Pro Tools and Emagic's Logic Audio.

"I work in Pro Tools, especially when I'm scoring film, in order to deliver stems in that format," BT says. "But for my next album, I have actually written several songs completely in Pro Tools. It's weird, because I don't usually do that; I mostly compose in Logic Audio."

REMIXING HOTSHOTS

Software synths are slowly making their way into everyone's arsenals. Cox and Harris have even used Propellerhead's Reason on a few recent projects. But at the same time, the consensus still seems to be that hardware-based synths sound the best. A cursory look around each of the remixers' studios shows that they are well-stocked with Waldorf, Access (like the Virus), Clavia (specifically, the Nord Lead) and Roland equipment. As Audé explains, "In terms of turning something on right now, twisting a few knobs and getting a nice big, warm sound, keyboards and sound modules are still the way to go."

Effects plug-ins get the thumbs up all around. Audé and BT are heavily invested in TDM plug-ins, and the Bomb Factory and TC Works products are big favorites. Cox and Harris also like the Bomb Factory plug-ins, but they use the MAS versions for compatibility with Digital Performer. "Bomb Factory plug-ins are a must; the compressors and other effects are wonderful," Cox says, adding, "The built-in Digital Performer plug-ins are really great. We haven't had to get into VST wrappers because the plug-ins that come

Dave Audé: "In terms of turning something on right now, twisting a few knobs and getting a nice big, warm sound, keyboards and sound modules are still the way to go."

PHOTO: ERIK HAWKINS
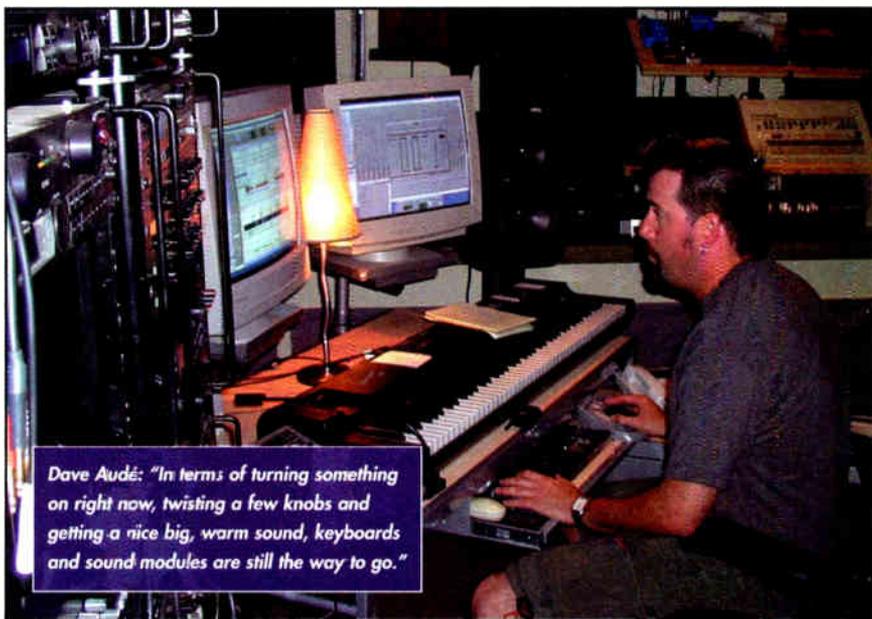
with Digital Performer are so strong. Audio Ease plug-ins, like the Nautilis bundle, are also cool."

Mixing consoles are an interesting case study with this group. Audé owns a Mackie Digital 8•Bus but doesn't use it much. BT has a console-less setup, using Digidesign's Pro Control to interface with Pro Tools. Both Audé and BT record directly to Pro Tools through stand-alone mic pre's and Digidesign's 888|24 inter-

faces. They even mix down directly to hard disk, right off of the stereo bus of their digital audio sequencer's virtual mixer. In contrast, Cox and Harris own three Mackie analog 8-bus boards. They keep mixes going in each room, zeroing a board only after the mix has been approved and "signed off on," Cox says. "We use the Mackie 8•Bus consoles because they sound great, we're very happy with the results and we're fast on them. People like the way our records sound, but then they see how we're doing it and are horrified. It's pretty ghetto, sort of a bedroom studio moved into a bigger room. However, a lot of the character of dance music is a little rough around the edges; we're not trying to make a jazz or classical record here."

REMIX KINDLING

These remixers are adamant that before they accept a job, they must like the material to be remixed. BT explains, "I will only do a remix for a band whose work I love, and I have to love the song and feel that I can add something to it." Harris adds, "Some songs just weren't written to be at a dance tempo. Like the Nelly Furtado song, 'Turn Off the Light'—that's a hook that's meant to be performed at that tempo. Don't ruin it by changing its tempo [sings the hook slowly to demonstrate his point]—that sounds horrid to me. Changing a hook like that messes with the integrity of the original song. Yes, anything can be made to fit to any tempo, but we're artists and song-

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THE REMIXERS

Dave Audé
Cutting-edge recording artists like Paul Oakenfold, Christopher Lawrence, Cirrus, Superstar DJ Keoki, DJ Feelgood, DJ Micro, DJ Dan, Doc Martin and Tall Paul have all done some of their best work with the help of this multitalented producer/DJ/remixer. His remixing credits to date include superstar acts like the Barenaked Ladies, Faith No More, Love & Rockets, Orgy, A Tribe Called Quest, LeAnn Rimes and Madonna. He has also released several successful DJ mix compilations and artist singles himself (for example, "Push That Thing," available on Ministry of Sound's *Millennium* CD set).

BT (Brian Transeau)
BT has produced tracks for top recording artists like N'Sync, Britney Spears, Madonna and Sarah McLachlan, and his music can be heard in the hit movies *Driven, The Fast and the Furious, Tomb Raider* and *Blade II*. He has also released several critically acclaimed albums of his own: *ECSM* (1997), *Movement in Still Life* (2000) and two best-selling sample CDs on East-West. A brand-new artist release is due out in spring 2003.

Thunderpuss (Chris Cox & Barry Harris)
Some of the biggest superstars in the world have had their tracks remixed by Thunderpuss. Cher, Madonna, Celine Dion, Whitney Houston, Eurythmics, Pet Shop Boys, J-Lo, Christina Aguilera, Enrique Iglesias, Shakira, Donna Summer, Jennifer Holliday, Mary J. Blige and Amber are just a handful of the acts whose tracks have been touched by this duo's artistry. This year, they also released a blistering CD called *Barry Harris+Chris Cox Present: Thunderpuss* that is packed full of their most memorable dance floor hits.

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REMIXING HOTSHOTS

writers, as well, and we don't want to rip apart the foundation of original songs just for the sake of putting something out at 128 bpm."

Remix parts can arrive in a variety of formats—DAT, 2-inch tape, audio CD—but these remixers prefer a CD-R with neatly trimmed and labeled audio files. "I got a CD-R yesterday with nothing written on it," Audé explains, "just a bunch of audio files that weren't labeled or even trimmed. That means it's going to take time to figure things out, to line up all of the tracks and determine where the vocals are supposed to go before I can get to work doing my thing. I want to hear the original tracks exactly how they were intended. That's the best place to start remixing from: right where the artist left off." He and BT particularly like getting complete Pro Tools session files. "This way, it's just set, I don't have to convert anything," BT says. "Everything is right there. I can go through the parts and use some guitars or maybe the room mics from the drums. It's fun because there are a lot more elements available."

CHANGING TEMPOS

After auditioning the original parts, the song's tempo must be determined in order to have a starting point from which to derive the remix's tempo. Popular styles, like house and trance, range from 120 to 140 bpm, though some genres, such as drum 'n' bass, can be as high as 170 bpm. If a song is 112 bpm, a house remix is an easy stretch, but if the song is 92 bpm, reaching these tempos is more difficult. Audé describes his thought process behind choosing a remix tempo: "I did this song last week for Interscope that was 90 bpm. With this tempo, I had two options: either go up to 130 or down to 65 [because 65 is half of 130]. Since 90 to 130 is a difference of 40, and 90 to 65 is a difference of 25, I chose 65. The less you have to time-compress or expand a track, the better your final tracks will sound. Now at 65 bpm, I have the vocals doing half-time to the 130 bpm beat. That tempo is pretty much middle of the road right now—most DJs will play it."

VOCAL ACROBATICS

For time-correcting vocals, Audé swears by Serato's Pitch 'n Time, which he calls "the best time-compression/expansion plug available." BT prefers a vintage Steinberg Jones application called Time-Bandit: "TimeBandit is an essential tool for me when I'm doing a remix. Its algorithm is exceptional for time-compressing and stretching vocals—and instruments, too—up to tempo, which is something that you will inevitably need to do when you are remixing." Cox and Harris use a combination of hardware and software. "We use Akai samplers for time-compression/expansion of vocals," Cox explains. "Digital Performer's Pure DSP algorithm is good for solo female voices; that's what it was designed to do, but on a whole group and on male voices, it gets a little shaky. The Akai sounds much cleaner."

"I can't stand billy-goat vocals [an artifact that occurs with held vibrato notes when they are highly time-compressed]," Harris says. "So we try to make the processed vocals sound like they are the original performance as best as we can." To do this, BT, Cox and Harris spend numerous hours editing the vocals to fit the remix. Cox says, "Very seldom do we actually get a vocal, throw it in time-compression/expansion and then that's the one we use. Sometimes, there will be days of editing. Sometimes, it's not just the processing but also a timing issue, like they [the artists] sang it in a certain meter or a with a particular feel and we need it to be different. So, we'll cut it up syllable by

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syllable to get it in our groove. It's the longest, most painstaking process of the whole thing, and it's so important."

In order to get rid of "billy goat" vocal effects, BT, Cox and Harris comp together the processed and unprocessed vocal tracks. This allows them to create a seamless take that is free from time-compression (or expansion) artifacts. "A really good trick on anything that is legato is to drop in the actual phrase from the original vocal," BT explains. "What happens to legato and vibrato phrases when they are time-stretched is what makes the performance sound fake. If you pair up the original vocal with the time-stretched version, whenever there is a held note—not a succession of notes, but a flourish, a legato phrase that has vibrato on it—take it from the original and crossfade into it. That's how you make a really natural-sounding vocal comp."

DANCE FLOOR DRAMA

Slick production tricks are an important part to craft a happening remix. Tantalizing effects, dramatic breaks and interesting segues help make a remix exciting to hear and even more fun on the dance floor. For example, Audé describes one of his favorite tricks: "I use a lot of filters, like the Bomb Factory's MoogerFooger Lowpass plug is really nice. Insert it right on a track like a drum loop. Start with the stock setting and turn the mix up to 10 so you're just hearing the effect, none of the original sound. What you get is a really cool sound of just the envelope of the filter. Mess with the envelope a little bit, turn the resonance until you hear just the peak-resonance envelopes. It's a really cool effect to put behind the drums. A couple of projects coming up that you can hear it on are the Matt Gauss record out of England called 'Saved.' I'm also using it on a Laura Derby song called 'Carry Me.'"

Cox and Harris are masters at creating arrangements with dramatic builds. On their remix of the Mary J. Blige tune "No More Drama," Cox notes, "We gave that song a lot of drama. We actually did tempo changes in 'No More Drama' and 'Rainy Days' [also by Blige]. Like Ja Rule's rap on 'Rainy Dayz,' we tried putting it at
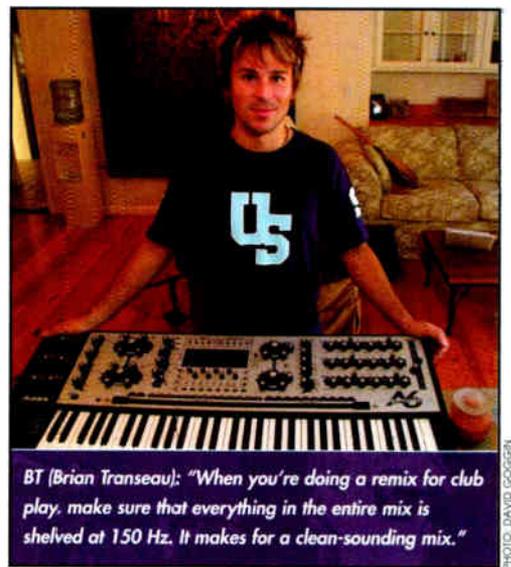
BT (Brian Transeau): "When you're doing a remix for club play, make sure that everything in the entire mix is shelved at 150 Hz. It makes for a clean-sounding mix."

PHOTO: DAVID GOGGIN

130 and it sounded ridiculous, so instead, we put it around 115 and it still had a groove. Then we bookended that with the 130 tribal-house anthem stuff. And I really love where 'No More Drama' went. There were actually three tempo changes. It starts off as a tribal thing, breaks down to a total hip hop record, then goes to this big dramatic instrumental, Pink Floyd-esque middle section, then back into the big tribal-house anthem. Not everything has

REMIXING HOTSHOTS

things: Either you'll get a weird clash melodically, or you get DJs who are riding their turntable's pitch slider to adjust a record's tempo. So, if you have a string line, its pitch is going to start sliding around, which may not sound pretty. By having mainly percussion, with just a little vocal hook or effect, on a tune's beginning and end, you're giving the DJ what they need to mix records, to beat-mix."

What goes in between intro and outro beats is more open to interpretation. "It's like classical music where you have a theme, variation on the theme and a recapitulation of the theme," BT says. "House music follows a similar structure: Start with a beat, then introduce the vocal, go off somewhere new, then usually in the middle of somewhere new you'll have a breakdown, then you come back with something that's the hook. Generally, you'll have a rise, fall, rise further and level out sort of structure. That's typically the pattern my compositions follow."

Because club mixes can be quite long—often averaging about eight minutes—some type of guide that maps out the direction of your remix can be helpful. BT says, "Paul Van Dyk got me started on something he'd been doing for years. He draws a map of how he wants the track to feel in terms of a build. It's drawn as if you were looking at the side of a mountain that's been cut away; you can see it rise in some parts and fall away in other parts. For example, you can see

Thunderpuss is Chris Cox and Barry Harris: "A lot of the character of dance music is a little rough around the edges; we're not trying to make a jazz or classical record here."

right on your map that bar 16 to 32 is building, the line is going up, and then at 33 we drop, but we only drop this far. At bar 33, you only want to take the intensity down a little bit, meaning leave the kick drum in but drop a bunch of the elements out. It's such a handy thing, a visual way of thinking."

MIXDOWN

When mixing a tune down that's meant for vinyl and club play, there are frequency ranges that require kid gloves. "For vinyl, it's mainly in the high end, around the 6 to 8kHz range," Cox explains. "If a turntable has old cartridges, you can get a lot of sibilance in this range. We try to be really careful in this frequency range and even boost the mids up a bit more to compensate. We're also careful on the bass; we don't put a lot of subs in there. I'll roll some stuff off at 40 or 45 Hz; vinyl can take it, but when you play it in the club, it's going to sound like total mud." BT elaborates on this point: "If there's one thing I can't stress enough, when you're doing a remix for club play, make sure that everything in the entire mix, with the exception of the kick drum and the bass line, is shelved at 150 Hz. It makes for a clean-sounding mix. If you're not doing this, your mix is going to sound muddy."

To premaster the mixdown, BT will "use a combination of Digidesign's Maxim and TC Works MasterX. I like the 3-band over the 5-band for house music. I'll play around with the compression and limiting setting a bit, but don't compress it too much because you want to leave the mastering engineer room to fidget about with it."

"Leave the mastering engineer some room to work," Audé says. "Bounce down to 16- and 24-bit files to give the engineer options. I submit my final mixes on a Mac file data CD-R but also provide an audio CD for quick reference."

BEST REMIXER

The general public may think that remixes just sort of happen, but this is obviously not the case. A good remix takes talent and a lot of time, as these four top remixers have attested. To hear MP3 audio clips of remixes done by this fearsome foursome, and to check out a remixing tutorial created by yours truly, visit www.mixonline.com. ∎

Visit Erik Hawkins' fledgling record label at www.muzicali.com, and check out his new virtual studio recording book, Studio-in-a-Box *(Artist Pro/Hal Leonard).*

Survival of the Fittest

L.A. Music Studios Adapt to Change

By Maureen Droney

N ever an industry for the faint-hearted, music record-
ing has been the recipient of multiple whammies
lately, such as general record company dysfunction,
competition from home studios and an overall trend among
the listening public to accept inferior sound as normal. For
music-recording facilities, it's just not business as usual any-
more. Only the strong and the smart can survive.

Although the past year has been undeniably difficult, there
have not been any major L.A. studio closings. In fact, a couple
of brand-new, ground-up facilities debuted in 2002, and two
classic studios of the '70s and '80s have recently reopened.

In 2000, Alan Kubicka, owner of numerous music and pro-
duction facilities under the Chicago Recording Company um-
brella, took over and reunited the original Kent Duncan/Carl
Yanchar/Tom Hidley-designed Kendun Recorders. Renamed
Glenwood Place, and with an acoustical update by Yanchar's
Wave:Space Inc. that's garnered a 2002 TEC Award nomina-
tion, the new venture is aimed at the upper-echelon market.
After an extensive cosmetic renovation, the rooms were out-
fitted with an adventurous choice of new consoles: a Euphonix
System 5 and a "Rupert Neve" Amek 9098. In mid-2002, vet-
eran studio manager Kit Rebhun, who previously helmed
NRG, moved to take over Glenwood's reins. Shortly after,
Mitch Berger, formerly with The Village, came onboard as
chief technical engineer.

Studio 3, Kendun's large live tracking room, sports an SSL 9000
J Series console. And, as of September 1, a 64-input Neve 8068,
formerly at New York's Unique Recording, will replace Studio 2's
9098. The System 5 remains in Studio 1, a 5.1 surround suite that
has hosted projects for The Cartoon Network and music clients.

"Right now, the market wants tried-and-true," Rebhun says of
the 9000 J addition. "People aren't comfortable with new con-
soles, even if they're absolutely incredible. They don't want to
sit down with a learning curve; there just isn't time for it."

Plenty of live bands are still recording, and a lot of them are at
Hollywood's Cello Studios, open since 1999. With seven studios
housed in the "Western" part of what was Bill Putnam's legendary
United Western Studios, the facility has become a haven for such
producers and engineers as Rick Rubin, Jim Scott, Bill Bottrell, Jer-
ry Finn, Joe McGrath, Pat Leonard and George Drakoulias.

Western was the site of such historic recordings as the Beach
Boys' *Pet Sounds* and Frank Sinatra's "It Was a Very Good Year,"
so there was a lot to live up to. "Our first year was a battle," ad-
mits studio manager Candace Stewart. "People were skeptical,
thinking that we'd alter the studios. But it was always our inten-
tion to keep the live rooms unchanged."

Cello's centerpiece is Studio 1, which can accommodate a 70-

Above: Craig Huxley in The
Cabin at The Enterprise.
Right: Producer/engineer
Warren Riker (left), mixing at
Chalice Recording Studios'
Neve 88R, and owner Ben Tao

piece orchestra and is
fitted with a double
Neve 8078. Studio 2
houses a heavily mod-
ified Neve 8028, and
Studio 3, the "*Pet Sounds* room," recently replaced its vintage
Neve 8078 with an Amek 9098, an experiment that's proven more
successful at Cello than it was at Glenwood Place. "With the 56-
in Amek, we get 112 automated faders and the Rupert Neve
sound," Stewart says.

It seems like every available space in Cello's large complex is
being turned into a studio. Private rooms have been revamped,
creating an SSL 9000 J mix suite, as well as smaller API and Neve
overdub rooms. "I think people come to Cello for a number of
reasons," Stewart says. "One of them is the sound of the rooms;
many of our clients are into the concept of 'the room as instru-
ment.' They also like our plates and live chambers, and we pro-
vide a large support staff. And we've got a chief engineer who
understands how to maintain vintage equipment and also has an
eye to the future."

"This building—what Bill Putnam created here—is an in-
credible statement, with a heart and soul of its own," adds chief
engineer and director of technical operations Gary Myerberg.

Above: Glenwood Place's studio manager Kit Rebhun. Right: At the Rupert Neve Amek 9098 console in Studio 3 at Cello Studios are chief engineer Gary Myerberg and studio manager Candace Stewart.

PHOTO: MAUREEN DRONEY

"Our clients tend to be people who understand and appreciate traditional recording. For example, Jim Scott, on John Frusciante's [of the Red Hot Chili Peppers] record, brought in a Scully 2-track. They're recording directly to that for some songs, as well as to an old Scully 8-track that I rescued. And, ultimately it will go to Pro Tools|HD."

Skip Saylor is also a proponent of the multiroom solution; his Skip Saylor Recording made a bold move this year, reopening the three-room Devonshire complex that in the '70s and '80s hosted bands from Nirvana and Ozzy Osbourne to Whitney Houston and Roger Waters. Saylor, in business for 22 years with a successful two-room Hollywood facility, caught many by surprise with his decision to expand during the current business climate. Now, in addition to his original Larchmont Village location with its 80-input SSL 9000 J mix room and SSL 4000 G-Plus/Pro Tools|HD multipurpose studio, Saylor Recording includes a large tracking and mix room with an 80-in SSL G-Plus, a Pro Tools suite with attached recording space, and a third record and mix room that houses a 96-input SSL MT.

"The recording business has definitely changed," Saylor states. "I wouldn't want to try to make a living from a one-room facility. It's more efficient when you have multiple rooms and can spread equipment and costs among them—if you can keep them booked, of course.

"The clients coming to me have lots of different needs, and it helps to be flexible. For example, our vintage Neve sidecar, which is often used in the big tracking room, was used in the MT room the other day when they were cutting drums. The fact that I've got five distinctive rooms with different equipment is working for me. Pro Tools is great, but a 1073 into Pro Tools is even better. Hip hop projects with real

drums, rock projects using real strings—recording is actually fun again."

It seems like there's always something new happening at The Enterprise and The Enterprise-2, Craig Huxley's sprawling Burbank

complex. In business since 1984, it now comprises 12 rooms with a number of consoles, including three 101-input SSL 9000 J Series, two Neve Capricorns and two Sony DMX-R100s. The Enterprise has increased its number of Pro Tools suites to four, combining the systems with Focusrite controllers. Busy mixer Dave Pensado keeps the 9k in Studio C. "The Cabin," occupied by artists such as Christina Aguilera, Destiny's Child and Pink.

Recently, Huxley has noted an upswing in live recording, with major artists choosing to use E-2's large 9k-fitted orchestra stage. "We've done projects for U2 and for Paul McCartney," he says, "where they did extensive recording with the band and a string session playing at the same time. Also, Britney Spears shot her live video on Stage J. We built that room three years ago, but it's only been recently that I see this kind of recording growing in popularity." Huxley also confides plans to add yet another large SSL room.

In Hollywood, Chalice Recording Studios, the much-talked-about, ground-up facility in the works for the past three-and-a-half years, definitely deserves the phrase "spared no expense." Stocked with a vast collection of outboard equipment and housing both an 84-input Neve 88R and a 96-input SSL 9000 J Series, Chalice was designed by Gary Starr, studio bau:ton, Studio 440 and George Augspurger under the auspices of owner Ben Tao.

According to Tao, a self-described "cosmopolitan entrepre-

neur" who has an engineering background and whose family has been in the hotel business, the goal is to provide studio clients with the kind of service that guests expect in a luxury hotel. Chalice's individually decorated lounges are equipped with Dolby Digital and DTS 5.1 surround sound and a DVD/VHS movie library along with PlayStation 2 and Xbox games. A third editing room houses a Yamaha DM2000 desk, Pro Tools HD3 and super hi-fi Bowers & Wilkins Nautilus 802 speakers with Aragon amps.

Today, few studios share the philosophy of treating their clients as if they were guests at a fine hotel; the idea actually originated with Record Plant back in 1968. The Hollywood facility remains in L.A.'s upper strata, with four SSL rooms and a recent cosmetic renovation

Record Plant president Rose Mann expresses confidence in the future of commercial studios. "Over the past 20 years, we've learned to work with, not against, home studios," she comments. "Many of our clients just don't want to work at someone's home, no matter how good that home studio may be. They appreciate not only our equipment but our environment and the level of service that we offer. We have a large staff, with very little turnover, so there's a familiarity factor that helps make people comfortable. Although, of course, we provide complete privacy if someone wants it, many of our clients appreciate the kind of networking that can happen in a creative community like Record Plant."

Record Plant is now equipped with four SSL consoles: two 9000 J Series and two G Series. "I'm very happy with the combination of boards that we have now," Mann continues. "Producers and engineers seem split about 50/50 between 9ks and Gs, so it's working well to have both." ∎

PHOTO: LYNN CAREY SAYLOR

Skip Saylor

High Tide at Ocean Way

Celebrating 25 Years

By Blair Jackson

"In 1974," remembers Allen Sides, "I leased a garage on Ocean Way in Santa Monica Canyon, essentially as a hifi demo room to show off the tri-amplified theater speakers that I was building. I did limited live-to-2-track recordings as demo material for my speakers and sold a lot of systems to musicians and industry types using my demo tapes. By early 1977, I branched out and launched Ocean Way Recording Studios there. I installed the original Western Recorders Studio 1 tube console, an Ampex MM-1000 16-track recorder and began serious studio operations. This came about primarily because, during my speaker demos, people were often more interested in the recordings I was playing than the speakers. Before long, I had lots of clients wanting me to make their recordings sound like my demo tapes. So, in some ways, Ocean Way became a real recording studio by accident."

Since those carefree days 25 years ago, Ocean Way Studios has grown intelligently and expansively; it is one of L.A.'s great recording success stories, thanks in large part to the vision and persistence of Sides. During the studio's humble beginnings, he parlayed his fascination with, and knowledge of, old recording gear to equip his burgeoning studios—first buying equipment from Bill Putnam's United Western Studios (Sides had been a runner at Western Recorders in '69) and then going into business with Putnam, helping him sell his UREI equipment. The two of them then went on a buying spree, plucking equipment from some 30 bankrupt and closed-down studios, "which gave me an amazing opportunity to cherry-pick great stuff for my studios," Sides says. He amassed his legendary mic collection in much the same way: Dan Alexander went mic-foraging all over Europe for Sides.

As Sides' client list and equipment stock grew, he eventually moved his operation from Santa Monica to Hollywood, leasing and renovating Studio B in the United building on Sunset Boulevard and later taking on Studio A, as well. In his new digs, Sides attracted such diverse acts as Bette Midler, Kenny Loggins, Frank Zappa, and a host of jazzers, from Count Basie to Chick Corea to Sarah Vaughan. Studio A became one of the most popular string rooms in town. Within a couple of years, Ocean Way had taken over both the United and Western buildings, giving Sides the biggest recording complex in town. And he wasn't done yet: In 1988, Sides bought and remodeled Record One in Sherman Oaks. Bonnie Raitt, Don Henley and Wilson Phillips were early clients there, and Quincy Jones and Michael Jackson kept Studio B busy for several *years*. These days, Studio A has an SSL 8000 G Series console; B has an SSL 9000 J.

Today, Ocean Way and Record One continue to draw top acts from every part of the music industry, from established titans such as U2, Elvis Costello, Tom Petty, Whitney Houston and the Rolling Stones, to young turks like Green Day, the Goo Goo Dolls, Beck, Alanis Morrisette, Eminem and No Doubt. Certainly, having the hot engineer/mixer Jack Joseph Puig ensconced for the past few years in Ocean Way Studio A—with its unique 72-input Focusrite board—has increased that room's profile somewhat. But Sides, too, has continued to be an in-demand engineer and producer—where he finds the time to do that *and* keep his operation (which also includes a studio consulting business, equipment rentals and more) in smooth working order and technologically up to date is anybody's guess.

"I can't seem to help myself," he says. "It's a passion, and I've got it bad." ∎

Upper right: Quincy Jones leads an all-star choir at Ocean Way's Studio A. Above: Bill Putnam and Bing Crosby Right: Ry Cooder and Allen Sides circa 1996

PHOTO: DAVID GORSKI

P recious few studios in L.A. (or anywhere else, for that matter) can boast that they've been around 40 years and are under the same family ownership. Yet that is the remarkable achievement of Hollywood's beloved Sunset Sound—founded in 1962 by Walt Disney's director of recording, Tutti Camarata, and owned today by his son Paul. Factor in that this year also marks the 20th anniversary of Camarata's ownership of Sunset's "sister" studio, Sound Factory, and you've got a strong case for dubbing the Camaratas the First Family of L.A. Recording.

In the early days of Sunset Sound, which was built on the site of a one-time automotive repair shop, everything was recorded in mono, and much of Camarata's business came from his former employer, Disney. Soundtrack work for such classic films as *Bambi, Mary Poppins* and *101 Dalmations* kept Camarata and his small staff busy. But just as the rest of the recording world embraced rock 'n' roll in the post-Beatles age, Sunset found itself increasingly catering to that market, too, while

Sunset Sound and Sound Factory

Family-Owned for 40 Years

By Blair Jackson

continually modernizing the studio to accommodate the rapid changes in technology in the late '60s and early '70s.

During most of the '70s, the studio was usually buzzing 24 hours a day, as L.A.'s emerging rock demi-gods churned out smash album after smash album there, and Sunset remained a magnet for film music work, as well. But truly, there's never been a period when Sunset hasn't been one of the busiest studios in town. The list of artists who have used the studio for tracking and/or mixing through the years is staggering: Van Halen, Led Zeppelin, Paul McCartney, the Bee Gees, Prince, Whitney Houston, the Beach Boys, Miles Davis, the Rolling Stones, Sam Cooke, Janis Joplin, Elton John, Alanis Morissette, The Doors, Neil Young, Bob Dylan, Tom Petty, Smashing Pumpkins, Sheryl Crow, The Wallflowers, Beck, Lauryn Hill—the list goes on and covers every

Upper right: A custom 48-in/48-monitor Neve 8080 console with Flying Faders is the centerpiece of Sunset Sound's Studio 2.

Above: Van Halen in Studio 2, December 1978, working on Women and Children First.

style of music imaginable.

Sunset Sound is justifiably famous for being musician- and engineer-friendly—a comfortable place to work, with great-sounding rooms and top-notch, well-maintained equipment. Studio 1's control room has a custom discrete console with Flying Faders and API 550A EQ modules on every channel; Studio 2 houses a Neve 8088; Studio 3 is based around an API DeMideo custom console, also with the API modules. There are also plenty of top microphones and a fine selection of outboard gear to keep engineers coming back to Sunset. It's no wonder that so many musicians, producers and engineers sing the studio's praises.

Though the neighboring Sound Factory has been under Camarata control for the past two decades, its history actually goes back further. It was originally built as a studio for Moonglow Records in the '60s, but by 1969, it was bought by the famed engineer/producer David Hassinger (Rolling Stones, Jefferson Airplane, et al). With help from engineer Val Garay, Hassinger turned it into one of the most popular rooms in town during the '70s, when it hosted the likes of Linda Ronstadt, Jackson Browne, Warren Zevon, Little Feat and many others. By 1980, though, the studio was set to close when the Camaratas stepped in and reopened the facility—which is just a couple of minutes from Sunset Sound—in 1982. Here, some of the draw is the wonderful-sounding API consoles that grace the control rooms of A and B; they've helped attract such diverse artists as Elvis Costello, Suzanne Vega, The Pretenders, Weezer, Red Hot Chili Peppers, James Taylor, Los Lobos, Bonnie Raitt, X, The Bangles, Richard Thompson and scores of other greats.

There are flashier rooms in L.A. than Sunset Sound and Sound Factory, but few command the loyalty and respect of these venerable institutions. ∎

Let it Rock and Roll.
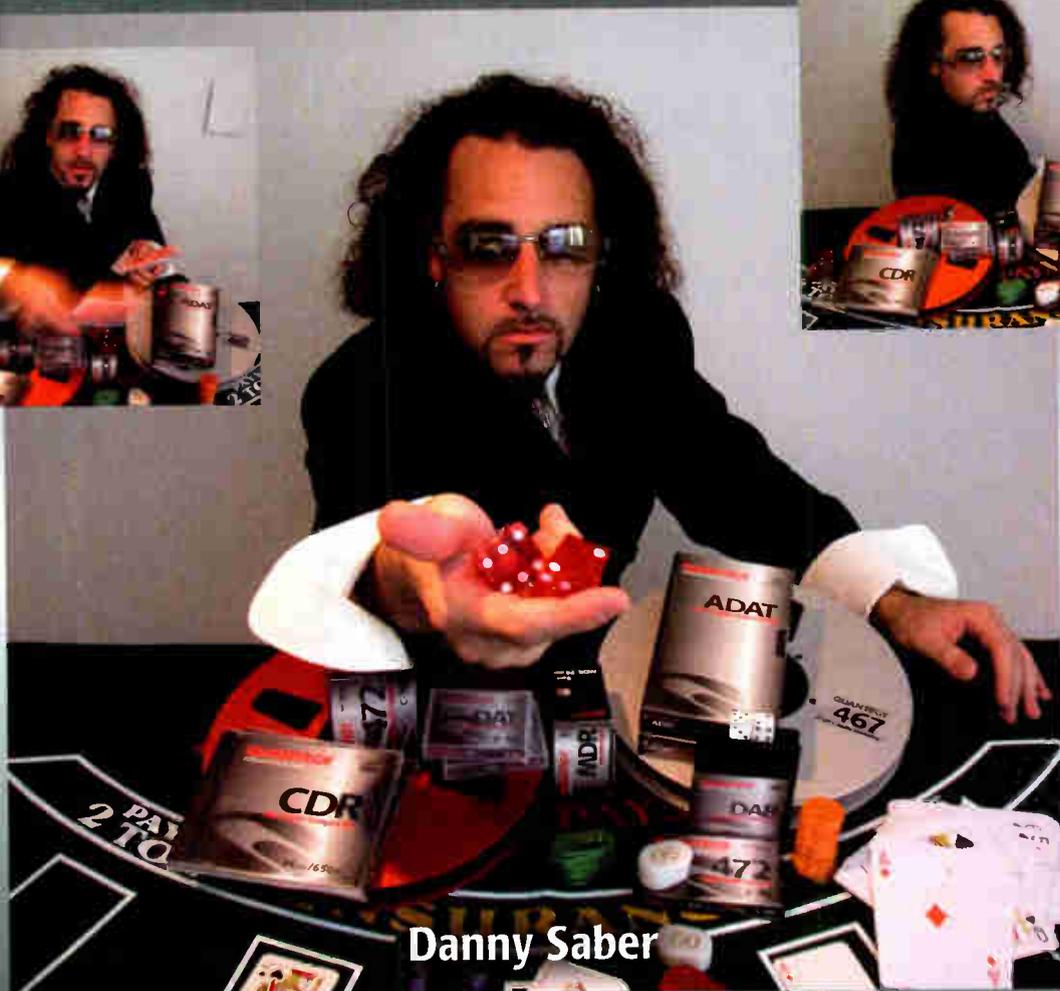
Danny Saber

Producer/composer/musician/engineer Danny Saber's credits include The Rolling Stones, Marilyn Manson, U2, David Bowie, Charlatans UK and music for the film Blade 2, among others.

Think Quantegy

When it comes to analog and digital mastering media, nobody offers a wider selection. So it's no wonder that more music around the world goes gold and platinum on Quantegy media than on all the other brands combined. While opinion may vary on what it takes to make a hit, there's no argument on what it takes to master one.

QUANTEGY
The Hit Maker's Media

Workstation File-Format Interchange

PART 1: OMFI IS DEAD AND DOING WELL

In the early days of digital audio workstations, the industry was captivated by the new-found power and flexibility of these digital wonders. We were so amazed by all of the cool things we could do that we didn't notice minor irritations, such as why my Studer Dyaxis system couldn't share a drive or swap files with someone else's NED Post Pro.

However, as DAWs became more ubiquitous, the problem of moving a project from one workstation or facility to another started to loom as a real barrier to effective workflow. Why not just patch my output to your input? Obviously, that could transfer the audio tracks, but in the process, edit data and source information would be lost—an unacceptable situation in editing-intensive areas such as audio post and music production.

Standards organizations such as AES and SMPTE were aware that the issue existed, but by nature, they moved slowly. Eventually, a workstation manufacturer made the first serious attempt to move us out of this tower of digital babble. Avid Technology introduced the concept called Open-Media Framework Interchange (OMFI) in 1992 to facilitate moving complex audio/video media and edit data between workstations. The very first public presentation of OMFI to the professional audio community came at the 1992 SPARS workstation "shoot-out" at Hollywood's Beverly Garland Hotel. The presentation by Avid's Mack Leathurby was met with a cautious and somewhat suspect reception. After all, sage audiophiles reasoned, what does a company that makes nonlinear video-editing systems know about audio?

As it turns out, the problem involved not so much audio, per se, but the matter of creating an extensible data model for digital files that would allow a complete representation of which media was used and how the media pieces related to each other in time, encoding various parameters associated with the media. Computer-based editing systems did not have the same concerns as analog—or even digital—tape machines. PCs don't care about settings such as nanoWebers per meter (the measure of tape fluxivity)—everything is simply data. With a linear medium (tape), the relationships among recorded elements are bound together by the linear medium itself. With the computer, the organization of elements is completely dependent on an internal database that describes the relationships. Every element that appears in the timeline of an Edit Decision List (EDL) must be meticulously tracked in the computer filing system, along with important parameters attached to those elements, such as fades, clip levels, timecode stamp, source origin of each element and many others.

BY RON FRANKLIN

"The rumors of my death have been greatly exaggerated."
—Mark Twain

To be truly future-proof, the model needed to be extensible so that new data types and parameters could be added over time without breaking previous implementations. Therefore, the types of classic EDLs used by linear video editors from CMX, Grass Valley, Sony and others were insufficient to deal with nonlinear computer-based editors. Rather than an ASCI text-based list that made each of the EDL parameters explicit, Avid's OMFI used an object-oriented approach with multiple levels of indirection and "nested" relationships. This makes it incredibly powerful and extensible, but also incredibly slippery and subject to multiple interpretations and implementations. Therein lie both the blessing and the curse of OMFI.

Now, 10 years into the life of OMFI, let's examine what works (and what doesn't) and try to gauge where this attempt at forging a file-system Esperanto is heading. To provide accurate accounts of some of the issues that exist with OMFI, I spoke directly to OMFI software engineers and users—folks in the trenches who grapple with these issues directly.

WHY ISN'T OMFI A "STANDARD"?

If OMFI provides a way to move material between workstations of different manufacturers, then why hasn't it been adopted as a standard by organizations like AES or SMPTE? This hasn't happened for several reasons, but a big one has to do with a key component of OMFI. The OMFI data structure uses a "container format" called Bento, which is the intellectual property of Apple Computer, a company that has never been keen on letting such intellectual property be placed in the public domain for use in a standard. This was a major stumbling block when OMFI was investigated as a candidate for the basis of an AES file-format interchange standard in the mid-1990s. Standards must be based on intellectual work that can be described completely in the standard and used by anyone. Apple would not allow Bento to be included in this way in a standard, thus eliminating OMFI as a candidate for the AES. The eventual evolution of the current AES31 standard for file-format interchange will be discussed in part two of this article, along with AAF and OpenTL.

FLAVORS OF OMFI

The import/export of OMFI projects requires a good deal of software development by the DAW manufacturer to translate the workstation's native format (every DAW has a unique native format) into an OMFI composition. Some systems only do this one way (e.g., import only), because a separate and serious software effort is required to implement either import or export.

The next issue that DAW manufacturers and users must contend with is determining what "flavor" of OMFI is supported: OMFI 1 or OMFI 2. The original OMFI was hammered out by Avid engineers and then refined through a number of annual conferences. These were sponsored by the OMF Developer's Desk and

> Standards must be based on intellectual work that can be described completely in the standard and used by anyone.

were open to interested parties from the video and audio communities they served. From these meetings, it became clear that certain aspects of the original approach needed improvement, so in 1996, OMFI went through a major change resulting in OMFI 2. The earlier work was then referred to as OMFI 1.

Brooks Harris, of Brooks Harris Film and Tape, has created software for OMFI translation in his own EDL Max program (www.edlmax.com) and OMFI Developers Toolkit, as well as for other workstation systems, including Sony's XPRI editor. "OMFI 1 and OMFI 2 are different enough to be considered separate formats from the developer's point of view," Harris explains. "Many of the data structures [classes] are similar, but there are important differences that make them incompatible. OMFI 2 introduced several data-type changes and additions, including an updated Bento container format. The most difficult difference between OMFI 1 and OMFI 2 is that the syntax with which the structures are linked together is different. This requires a program to select between two very differ-

ent logical flows to contend with both formats."

Of course, this can create real-world issues for users who are offered a choice of using OMFI 1 or OMFI 2 for import/export. It's important to know the capabilities of the target system before creating the OMFI file in order to be sure that file can be imported properly. David "Digby" Richards is principal engineer for AV Media, a company offering a file-translation utility called AV transfer (www.avtransfer online.com). "The early OMFI-enabled applications written to work with OMFI Version 1 cannot read or write OMFI Version 2," Richards notes. "And, as many manufacturers concentrate only on OMFI Version 2, they cannot read or write OMFI Version 1 files."

THE OMFI TOOLKIT BLUES

Most software engineers who spend time huddled over a hot computer implementing OMFI code for a DAW will give you an earful on toolkit issues. When Avid's OMFI group released OMFI to developers, they included a suite of software tools—the OMFI Toolkit—to facilitate implementing OMFI support in workstations. However, even the most recent revisions of the Toolkit have some issues and gotchas. Additionally, some DAWs implement certain functions in ways that conflict with how other workstations have approached the same issues, leaving a minefield for the unwary engineer trying to produce a robust OMFI implementation.

"As supplied by Avid, the OMFI Toolkit is both a blessing and a curse for developers. In many respects, it is brilliant and ambitious, but it succumbs to its own complexity," says Harris. "It is intended to provide a cross-platform development environment to simplify OMFI development, and in some respects, it accomplishes this. But nobody expects code of this complexity to be bug-free, and it is not. With so many target development environments and platforms, together with the complexity of edit projects, expressed as OMFI, bugs can, and do, appear unexpectedly. These include memory leaks, memory damage, run-away recursion, stack overflows, incorrect calculations—you name it."

Ultan Henry of Dark Matter Digital (www.darkmatterdigital.com) is an engineer with wide experience implementing OMFI utilities for Akai and for Dark Matter's own Media Magic program. "I've found the problem with the toolkit is not due so much to 'bugs,' but the fact that many of the higher-level routines cannot be used to read or write 'real-world' OMFI

World Radio History

files," he says. "Although these high-level routines do actually conform to the OMFI specification, they are not sufficient to handle the way in which OMFI has evolved and the manner in which the individual elements of OMFI are now being used. This is why I believe that the expandability of OMFI has been one of its weaknesses."

The result? Most engineers use the Toolkit as a starting point but add considerable work on their own to create import/export routines used in their programs. This can lead to variations in the ability of a given implementation to work with files made by another system.

Another engineer with considerable OMFI experience is Bill Claghorn of Diaquest (www.diaquest.com), who created the OMFI import/export routines for the WaveFrame DAW. "The real problem is that OMFI importers expect a very restricted and specific OMFI implementation. An export must be targeted to the expectations of the destination system. Conversely, every new version of every system exports OMFI differently," Claghorn explains. "Because OMFI is like a Tinker toy™ connection between software objects, there are many combinations of ways to assemble something. For example, some systems attach gain to a clip. Other systems attach gain to a sound. Some systems even have many layers between a clip and a sound file with effects in between. Handling all of this is rather complicated."

Claghorn goes on to say that "a proper OMFI implementation will handle the flexibility of various interpretations on import and also handle the specific requirements for those particular targets on export. It's impossible to put a programmer in a closed room with the OMFI Toolkit and expect an import/export to work with other systems. There are just too many undefined relationships in the Toolkit."

The great variability of OMFI files has even produced the ultimate absurdity in a few isolated cases, with certain workstations seemingly incapable of importing some of their own exported OMFI files! Occasionally, even a manufacturer's own software quality-assurance department has a hard time with OMFI.

USING OMFI IN THE REAL WORLD

Lest I be accused of inventing bogeymen where none exist, OMFI is used successfully every day in many facilities. The key seems to be identifying the particular details of how the export file should be created so that it will match the capabilities of the system that will be used to import the file. To avoid some of the potential problems, experienced sound supervisors at facilities that use OMFI on a regular basis have come up with detailed procedures for engineers and editors to follow.

One rule of thumb: Find a method that seems to work and don't deviate from it—in fact, make it into an exact formula and put it in writing. A casual Internet search at www.google.com turned up examples of this from various facilities. Here's how some facilities formalize their OMFI procedures:

• Media City Sound (Studio City, Calif.)—click on the item labeled "OMFI Info": www.mcsound.com.

• Audio Post and Picture (Burbank, Calif.)—visit their OMFI page: www.audiopostpicture.com/omf.html.

• Los Angeles Final Cut Pro Users Group—check out instructions on getting from FCP to Pro Tools using OMFI: www.lafcpug.org/basic_omf_export.html.

> ## One rule of thumb: Find a method that seems to work and don't deviate from it.

I received some enlightening comments on using OMFI in the real world of feature film sound editorial from a sound supervisor at a major Hollywood film studio (who asked to remain anonymous to avoid the attention of the megaconglomerate's nervous corporate lawyers). "OMFI has met with mixed success in feature editorial. The degree of success usually depends on coordinating the process with picture editorial in advance of turnover to sound editorial."

One practical decision to be made when creating OMFI export files is the choice of using encapsulated media and composition, or a composition referencing separate external media files. With encapsulated OMFI, one large file is generated that contains all of the OMFI media files (the "ingredients") together, as well as the OMFI composition (the "recipe"). Here, a composition referencing external media is a collection of files with all of their attendant path names and file or-

ganization. Each has its advantages and disadvantages, but they are mutually exclusive in implementation—if you make an encapsulated export and bring it to a workstation that only supports OMFI compositions with externally referenced media, it won't work.

The Hollywood sound supervisor noted how this issue comes into play: "If we plan to go with OMFI during post, and we are confident that original dailies have been loaded, there are definite procedures that must be followed to ensure success. We have a procedure written out that we give to the picture assistant for exporting the OMFI list. Its highlights include exporting with media and making the handles as long as possible. We definitely do not use the export option of consolidating media, as that gives just one long audio file containing all of the takes. It's impossible to retrieve anything specific from that option."

One of the issues of real concern to working editors is the fact that the names of audio media files at the system level use a unique file ID scheme that can be confusing when trying to locate a sound. The Hollywood sound supervisor points out that "even with proper loading of dailies and a successful export, there are still pitfalls in the process. One of the main ones is that the OMFI process changes all of the file names to a computer-literate, user-irritant, hexadecimal scheme. Want to get an alternate take for scene 21, take 5? While the original file-naming procedure might show this file as '21/5,' the OMFI export process might call this 'Audio_01 8903658FHJKLIOUYDDN' or some such nonsense that a human can't possibly interpret as '21/5.' So, we go back to the dailies for that alt take. Even if it might already be loaded, you'd never find it unless it appeared in the region names list. To make matters worse, when—not if—there are picture changes, an additional OMFI export will name the same takes completely differently, so the dialog editor would not be able to reference the original files and would be back to square one with the edit. For us, this makes OMFI useful only for the first export from picture. All changes after that must be done from change notes. Or, more commonly from the tried-and-true cut-and-drag-'em-till-the-waveforms-line-up method."

HOW MANY BITS DO WE NEED?

Another issue mentioned by sound editors and software engineers alike is the fact that the standard OMFI Toolkit only

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deals with 16-bit audio files. In the early '90s, when OMFI was formulated, that certainly was not a problem, but these days, most every device in the signal chain is capable of dealing with 24-bit audio, so this seems a bit of a limitation. Again, from our Hollywood sound supervisor: "Another common OMFI problem is the bit depth of the audio files. Avid is only capable of using 16-bit files, so if the sessions are to be 24-bit—desirable if the dailies are quality analog or high-definition digital—then OMFI is out of the question."

AV Media's David "Digby" Richards points this out, as well: "The biggest item missing from the OMFI Toolkit [as far as audio is concerned] is the inability to read and write 24-bit. There is no reason OMFI files cannot contain 24-bit audio, and about two lines of code added to the OMFI Toolkit fixes this up pretty quick. Our AV Transfer software can read and write 24-bit OMFI files."

DEGREE OF INDUSTRY SUPPORT

Though OMFI support is by no means universal in the DAW industry, most of the significant players, especially those with a market share in audio post, support some form of OMFI interchange. Market leader Digidesign intends to offer continued OMFI support. According to Digi's product manager Gordon Lyon, "OMFI is currently our main avenue for file and session interchange with Avid and third-party systems. It is realistic to assume that with OMFI being the established standard for interchange between Pro Tools, Avid, SoftImage and third-party products, Digidesign will continue to broaden support for OMFI going forward, including with our OS X migration. However, we anticipate that the most enhanced functionality in the future will come with integration and further development of AAF interchange."

THE FUTURE OF OMFI

Do we still need a means for exchanging digital files between different proprietary systems? The obvious answer is that as long as there are indeed different proprietary DAW systems in use at production facilities around the world, we will always need a way to do file-format interchange. Even though the workstation market has fewer players these days, there are still enough differ-

ent systems to make this a necessity.

The follow-up question is, are there better ways to do this than OMFI? Given some of the problems and issues mentioned in this article, this is a very legitimate question. Until *all* workstations are made by the same company (not going to happen), the need will be there, and it isn't going away.

Based on interviews with OMFI engineers and users, OMFI—despite its complexities and dangers—still provides a useful means to move complex edited material between DAWs. The watchwords seem to be *verify* and *codify*—that is, for most reliable results, find an exact method that allows material to be reliably moved between specific systems for a specific purpose, and then write it up as a set of procedures to be followed precisely. Don't expect OMFI to just automatically work between two different systems the first time. Test it first to find the gotchas and work-arounds ahead of time, and you will minimize the risk of failing to interchange when the deadline (and the client) are looming.

What's next for OMFI? In a nutshell, it's here to stay, but it has no future. As one indication of how far off the plate OMFI has fallen at Avid is the fact that the formerly working link to the OMFI Website at www.omfi.org now goes to a "404 error—not found" page on the Avid Website. The fact is, OMFI has no future as an ongoing, living project. There will be no further development of OMFI—no bug fixes, no extensions, no OMFI Version 3. This hardly means that the effort to have a working interchange technology for digital media is dead—it has simply grown beyond OMFI.

In the past few years, a new effort to expand the scope of what can be accomplished with complex, object-oriented file interchange has been taken up by a consortium of companies (including Avid, Microsoft and others) through an initiative called the Advanced Authoring Format. So there is a way forward, and that is part of the story for an upcoming issue. OMFI is dead—long live file-format interchange! ∎

Ron Franklin, the president of Ron Franklin Associates (a digital media and marketing consulting company), has worked for more DAW manufacturers than he cares to admit and did a stint as a Hollywood sound editor in the early years of DAWs. His real passion these days is guitar, songwriting and performing. His home on the Web is at www.ron franklin.net.

BY MAUREEN DRONEY

Geoff Emerick

The Beatles, the '60s Sound Revolution, the Hall of Fame

The most revered pop music of all time is, indisputably, that made by The Beatles. Almost 40 years after they were recorded, their words and melodies are still heard all over the world. Even today, producers and musicians speak of Beatles recordings with awe as they strive for some modicum of the artistic and commercial success achieved by those records. While many recent albums have quickly become dated, The Beatles' records still sound fresh, current and desirable—as shown recently by the chart-topping success of *Beatles 1*, the 2000 Apple/Capitol Records compilation.

Now, think of The Beatles' greatest later works: "Strawberry Fields Forever," "Penny Lane," *Revolver, Sgt. Pepper, Abbey Road.* Behind the console for all of these milestones was this year's TEC Hall of Fame inductee, Geoff Emerick, an engineer who truly has never been accorded his due respect. The superb songwriting of Lennon and McCartney and the brilliant polish of producer George Martin were, of course, essential elements. But without Emerick's courage, vision and determination, these recordings would have been lesser accomplishments. He pushed the boundaries of recording, doing things that other engineers had either never thought of or never dared to try. He challenged hidebound traditions and rigid administrators, and created perfect sounds, along the way developing groundbreaking techniques that today's engineers invariably take for granted. Simply put, Geoff Emerick brought record engineering into the modern era.

Since those long-ago Beatle days, Emerick has amassed a lengthy roster of credits as both a producer and an engineer. He's worked with The Zombies, Badfinger, Supertramp, Tim Hardin, America, Robin Trower, Jeff Beck and Split Enz, as well as on seminal albums for Elvis Costello (the 1982 release *Imperial Bedroom* and *All This Useless Beauty* in 1996). He has also continued to work with Paul McCartney and with Wings on records including *Band on the Run, Tug of War* and *Flaming Pie.*

But in an interview the summer before Emerick's TEC Hall of Fame induction, the talk was mostly about The Beatles. Obviously, questions for Emerick
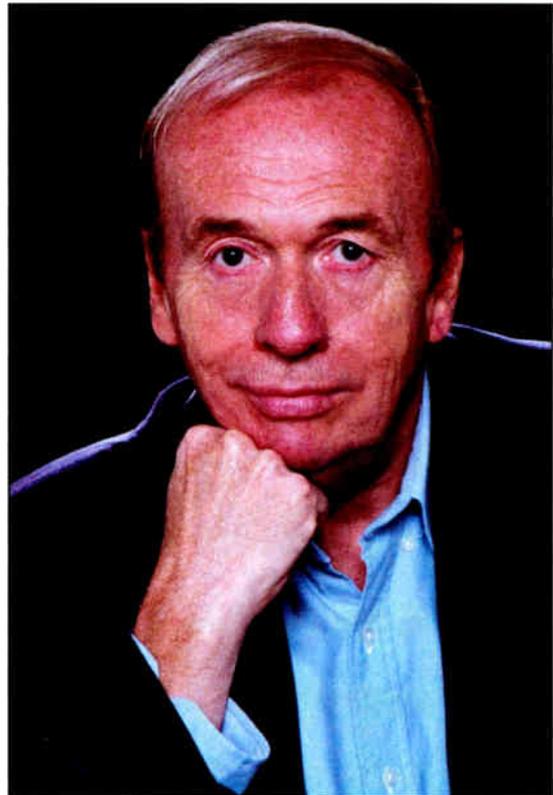
could be endless. For more, you'll have to wait for his book.

I guess my first question has to be, "Why you?" How did it happen that you became The Beatles' engineer?
Well, I'd started at EMI as a second engineer when I was 16, right out of school. It was, actually, the same month that The Beatles went in for their artist test. I used to get on well with George Martin, so when I was an assistant, I used to do most of his sessions. Norman Smith, who was The Beatles' original engineer, used to like working with me as well, and we had a great relationship. He taught me some priceless fundamentals that I've never forgotten.

From assisting, I was promoted to mastering—disc cutting. The reason for that was, in those days, to know mastering was to know what you could get on the tape that could actually be transferred to the master. Because, of course, if you overdid the bass end or didn't get the phasing right when you were recording, there were problems.

When The Beatles started, of course, things began to move at a different pace. And then Norman, their engineer, wanted to become a producer. He also

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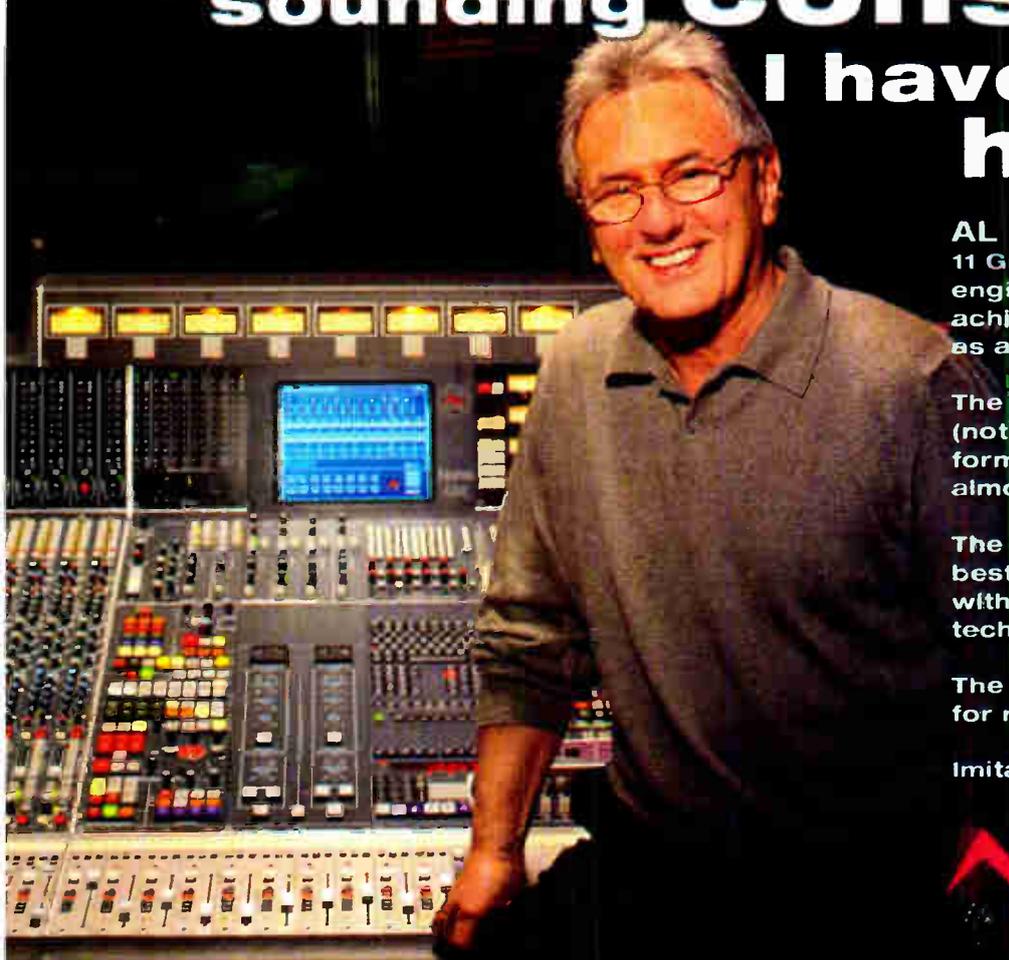
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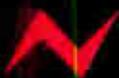
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wanted to carry on engineering The Beatles, but EMI said, "No way." As I'd been second engineer on some of The Beatles' sessions and got on well with George Martin, it was decided to promote me to engineer. I was not quite 20, so everyone was aghast at this.

How did it go at first?

Well, I was terrified. For one thing, multitrack wasn't on every session at that time. You had to record straight to stereo—huge orchestras and a singer, the whole bit. And the mixing console had only eight ins and four outs so you had to know what you were doing, because no one's going to spend a fortune putting an orchestra in the studio with you if you don't. The responsibility was absolutely enormous. I was doing Matt Munro, Cilla Black, Manfred Mann—all EMI artists. My first hit was Manfred Mann's "Pretty Flamingo." And then George Martin approached The Beatles and said, "Here's the situation: Norman's going to leave, and I'm going to suggest that Geoff take over." And I was called up to the manager's office.

At the time you got the position with The Beatles, were there already signs of you being a bit of a maverick?

Really, it all started when I was mastering. We used to get American records in and wonder how they got the sounds they did. We, of course, were limited to EMI equipment. There was no outside equipment allowed in, apart from a few Altec compressors. If they did bring a piece of equipment in, they took it apart and rebuilt it…just to find out how it worked, I guess.

So we were listening to these records, like the ones from Tamla [Motown], and there was all that extra bass end. And we were always talking about how did they get that sound? Now a lot of it was the musicianship, of course. But there was no one to tell us these things; we had to find out by our own methods.

It was the amount of bass and also the level—the loudness that fascinated us. You see, there were certain things that we weren't allowed to do. There were limitations on how much bass we were allowed to have on, because, in the early days, there had been one particular Beatles single that was mastered and it jumped [skipped]. They'd pressed about a quarter of a million of them and they had to redo them all. After that, for any Beatles single that was cut in England, everyone was instructed to cut all bass below 50 cycles. *You just had to roll it all off.*

Yes, and it also had to be two to two-and-a-half dB quieter than any other records. It was ridiculous, but they were selling in those huge quantities, which, of course, had never been done before, and they were afraid the records would jump. Later on, when I was The Beatles' engineer, we had a discussion—which became quite heated—with the manager, myself, The Beatles and George Martin, and it was decided that we would be allowed to cut them louder.

The first album you did with The Beatles was Revolver.

Yes, and "Tomorrow Never Knows" was the first track.

Of course. They would start with what was to become the most complicated track. Can you describe a bit of what the equipment was like?

> I hear certain sounds in different colors. It's really an art form to me. If you start asking me technical stuff, I'm not really that interested.

The 4-track was remote; in those days, it was never in the control room. We had two 4-track rooms where the tape machines were, and there were three studios, so they had to patch them through. But because of the difficulties of recording "Tomorrow Never Knows," with the backward things and so forth, where you had to communicate with an intercom to tell the tape op to drop in—which was ridiculous—we requested that the 4-track machines be brought into the control room.

Well, that was just a "no go" area, but eventually they relented. And they sent out six technical staff from the main EMI technical department to supervise the moving of the 4-track machine up the corridor.

There goes the azimuth!

Yes, they were sure the azimuth would go out, it wasn't going to work, all sorts of things…really, it was unbelievable. And the sheer look of horror on their faces as it was lifted over the door threshold!

How would management know if you put too much bass on something?

The mastering engineers would complain to the manager of the mastering department: "Geoff's put too much bass on his tape, and we can't transfer it." And I used to get reprimanded.

At that time, the producer and engineer weren't allowed in the mastering room.

No. In fact, when I did *Sgt. Pepper*, I put on the box, "Please transfer flat," and it just caused chaos. Now I knew, having gone through the mastering stage, what could be done and what couldn't. There was no need to touch the tape, and I wanted just to transfer flat. And also, I wanted to go in there while it was being done. Eventually, I did get special permission to sit in on the mastering. Over time, of course, things gradually changed, and it became the norm to go in with the mastering engineer.

But you really did have to do battle over certain things.

Yes. For example, on Ringo's drum sound, I wanted to move the mic closer to the bass drum. Well, we weren't allowed. I was caught putting the mic about three inches from the bass drum, and I was reprimanded. I said, "Look, this is the bass drum sound we've got, and we don't want to touch it." And so I was sent a letter, from one of the guys in the office down the corridor, giving permission—only on Beatles sessions—to put the microphone three inches from the drum. They were worried, you see, about the air pressure, that it would damage the mic. There were a lot of things like that.

But what made you think to break the rules?

It was the fact that I was looking for something new and different all the time. The only way that I could do that was to change the way things were done. In fact, one of the first sessions I ever did, with Force West, we did in Number 2 studio, where the strings always went on the hardwood end and the rhythm and brass up on the carpeted end. But I was after a more live rhythm sound, and a different string sound, so I put the strings up on the carpeted end and the rhythm and brass on the hardwood. And it caused all manner of problems. When the next day some of the older engineers found out what I'd done, they said, "You can't do that; we've been doing it this way for all these years." Other people would set the session up, you see, and they used to just walk in and know where to put everything. Then the engineer would just sit down and away they went. So it was, "If someone else wants to do this, we'll have to do such

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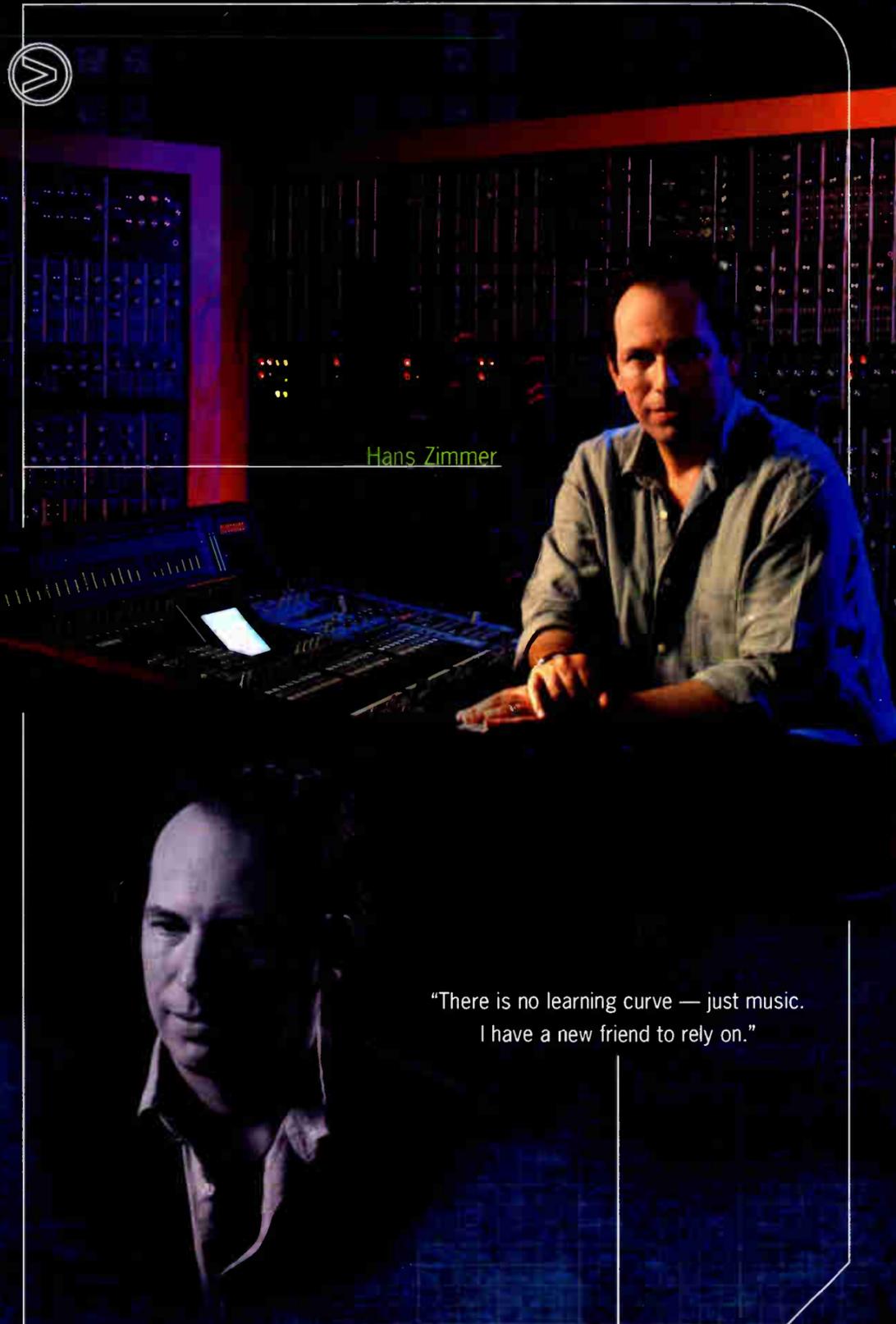
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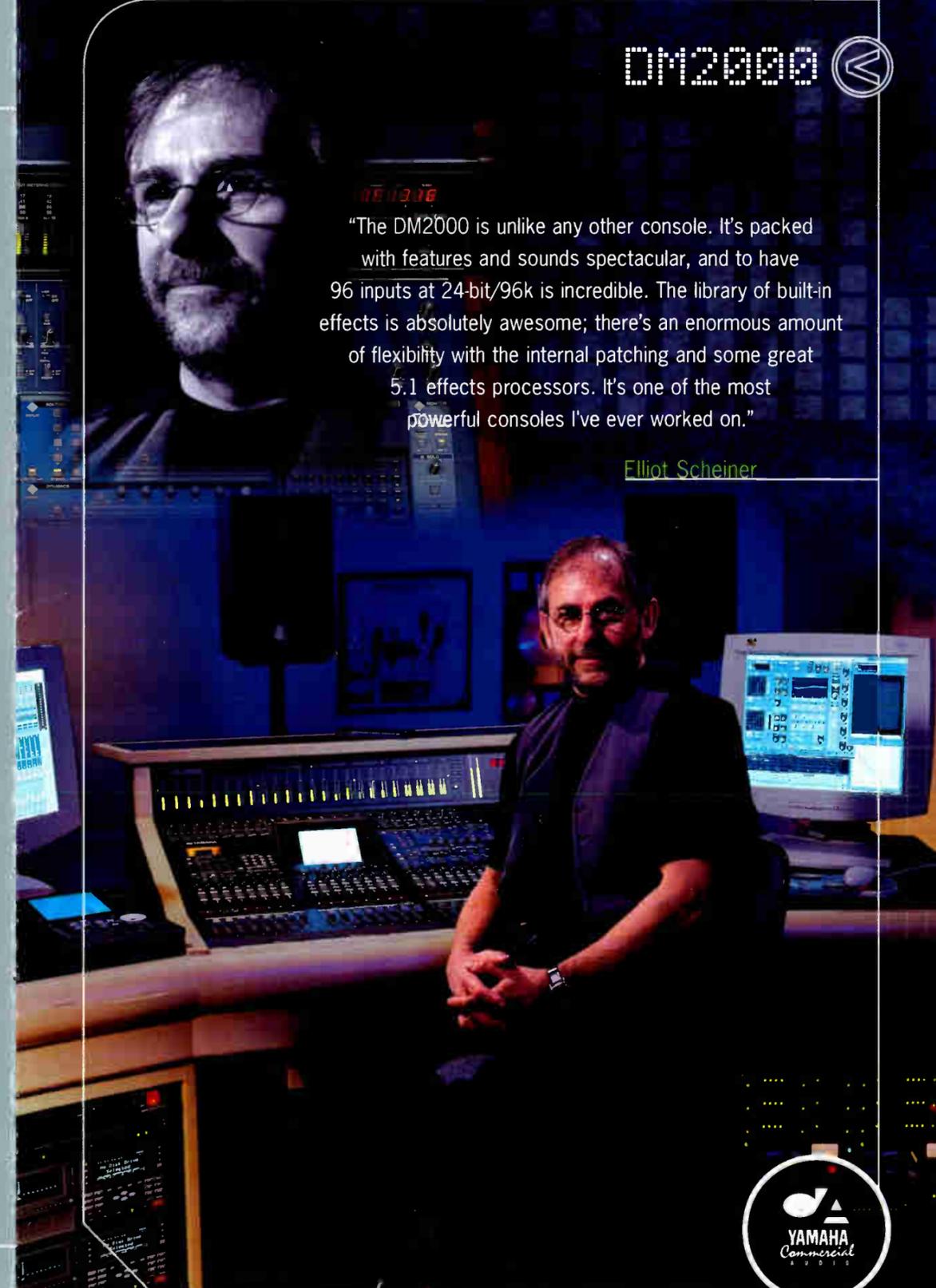
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Elliot Scheiner

BY ROBERT HANSON

Morningwood Studios

Third Eye Blind Marry the Past With the Future

Third Eye Blind lead singer Stephan Jenkins is not an ordinary guy, and as such, he's grown weary of ordinary recording studios. When it came time to work on their latest album, *Crystal Baller*, Jenkins, his band and their longtime engineer/producer Jason Carmer felt that the mood was right to strike out on their own. Enlisting the guidance of studio designer Chris Pelonis, the band capitalized on a commercial-space surplus and set up shop in San Francisco's media-friendly SO-MA (South of Market) district. Nestled between the vacant confines of once-bustling Internet start-ups and the historic cafes and boutiques of South Beach, the band's new home, Morningwood Studios, mirrors its surroundings by mixing cutting-edge technology with a healthy dose of classic character and charm.

Inside the main tracking room at Morningwood Studios (L-R): Stephan Jenkins, Arion Salazar, producer/engineer Jason Carmer and engineer Sean Beresford.

"In most recording studios, you can smell the dread on the wall," says Jenkins. "You can feel the clock. You feel the balding, late-40s, coke-addicted studio owner walking in on your session to impress his friends. [We wanted] to create an environment that really speaks to those kinds of issues. Also, Jason and I have a very particular and methodic concept about sound. We like some period in the early to mid-'70s when Rupert Neve's ears were at their peak. This is a housing project for those little toys."

"During the course of the last record, we started to say, 'Wouldn't it be nice if we had our own studio?'" adds Carmer. "We were giving all of these other people so much money. Then we started talking about this record, and we were doing pre-production at this studio called Tiny Telephone in San Francisco, and still talking about building a studio. One day, Stephan was riding his motorcycle around and saw [a sign that read] 'recording studio for lease.' He had actually recorded in this studio the day of the ['89] quake. And we came and checked it out and leased it last year."

After talking to a number of studio designers, the band brought Pelonis in to help rework the space. Jenkins and Carmer were both proponents of his designs, having worked in various Pelonis-built mastering suites and recording studios. The main worry that Jenkins and Carmer wanted addressed had to do with the overall accuracy of the control room. After years of working in large multimillion-dollar studios, the band simply wanted an uncolored listening environment.

All of the vocals for Crystal Baller *were tracked inside the live room.*

"They had a shell to start with," explains Pelonis. "We designed a control room specific to the band's requirements: accuracy and musicality without compromise. The reverb time is plus or minus 15 to 20 milliseconds from 20 to 20k Hz. The room is really punchy, accurate and very revealing. The bottom end is very present and tight without being exaggerated. The reports I've gotten is that they're happier with their own control room than anything they've ever worked in."

"We wanted to have a really accurate control room, and we do," Jenkins explains. "It's physics. Our control room is excellent. If you make a sound in there and listen through those speakers and then take it somewhere else, you will never be surprised.

"The control rooms [that Chris builds] are really even-sounding. A lot of control rooms, especially in bigger studios, seem to have a sheen or a glossy sound. And that just makes me nervous. I don't want to hear the room. I just want to have a nice flat room that really has accurate low end. One thing about Chris' designs is that the low end is very tight and very even across the whole room."

The space includes the main control room, a live room with a small iso booth, a secondary Pro Tools editing suite, a lounge, and a number of isolated tape rooms and storage spaces. "In the live room, we didn't really change tha[t] much," Carmer adds. "We put up som[e] different surfaces and got some bass trap[s] and diffusers."

Outfitting the studio wasn't terribly di[...]

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sound. We had the luxury; we weren't holding up the session. Most of the tracks were started in the studio, and they would go on for many hours working on the basic rhythm track, which gave us time to work on the sounds.

Of course, we were recording and mixing at the same time because we were still 4-track. So, we were putting the real sounds on the instruments. They weren't going on separate tracks, they were all mixed on to one. That was the finished sound. It wasn't a question of doing it in the mix; that was it, and the rest of the track was built around that sound.

Is it true that the kind of slap you used on John Lennon's voice couldn't be duplicated anywhere else because the EMI tape machines had a different kind of head gap?
You could work it out now, I'm sure. But the head gap between play and record isn't the same on EMI's machines.

I'm confused about how you were doing ADT—Automatic Double-Tracking—back then.
It's funny you should say that, because not long ago, when I saw Jack Douglas, who had worked with John, he said to me, in a humorous kind of way, "How did you do that ADT? I could never get the copy tape to go fast enough to actually lie on top of the original voice like it was double-tracked."

From his question, I got the feeling the tape was going so fast it was about to go up in smoke; John must have told him you could do it while you were recording, but actually you could only do it when you were remixing. You have to take the signal of the vocal from the sync head. So, you're mixing off the replay head. The sync is in advance, and you put it into another ¼-inch tape machine, then you put that on frequency control and you slow it down. You're not trying to advance it; it's already advanced. You're just slowing it down. The trick is taking it off the sync head.

You were having to devise all of this crazy stuff on the spot: backward bits, phasing with tape machines, loops. Were you having fun?
Looking back, it was great fun, for the most part. There were some moments that weren't, of course—there was a sort of bad period during the *White Album.* I actually walked out halfway through. It was something like the eighth attempt at "Ob-La-Di, Ob-La-Da." They were arguing, and I could see the whole thing disintegrating. I just couldn't handle it anymore. I said to George Martin, "Can I

have a word?" And I told him I wanted to leave the sessions. We went to the manager of the studio; it was a Tuesday, and he said, "Well, can you stay till Friday?" And I said, "No." We went back to the studio and had a discussion with the band, who tried to make me stay. But I said, "No, I've had enough."

You stayed on at EMI for a while after that. Then what happened? How was it that you came back to make Abbey Road*?*
Being so young, I felt I couldn't further myself at EMI; I'd gone as far as I could, and was desperate, really, to leave. Apple [Records] had formed, and Paul asked, "Will you join Apple and do the studio?" I did and built the studio, and during that time, Paul phoned up and said, "We're going to go in and do a new album, would you like to do it?" So I said, "Of course."

Considering that you were using loops as far back as 1966 (on Revolver*), it must amuse you that they are now so prevalent.*
A lot of it was that Paul had a couple of Brenell tape recorders at home. You could disconnect the erase head on them, and he used them to make tape loops, putting new recordings over the first. He'd come in with a bag full of them—some long, some very small—all labeled with a grease pencil. We'd lace them up on our tape machine, and people would have to hold them out with pencils. I recall that on "Tomorrow Never Knows," there weren't enough people in the control room to handle holding them, so we got some of the maintenance department down to help. I think we put five loops up on faders and then just played it as an instrument.

Of course, now you can do anything; it's endless. But often all that doesn't mean anything. If you just press a button and it's there, you haven't really created anything, have you? Anyone can apply this technology. But there's that certain something that you can't put your finger on, something that you give to that piece of recording that the equipment can't. It's something that's in your heart that doesn't come from any equipment whatever. It comes from what you hear.

Being pushed to come up with all sorts of new sounds, to try all sorts of things, did you ever think, "Oh, this will never work."
Oh, no. Never. Everything was always possible. Nothing is impossible. That was always my theory. ∎

Maureen Droney is Mix's Los Angeles editor.

impact of the bass drum. We always used to keep the front skin off of the bass drum and put in cushions and a big weight. That sounds better to me than with the head on and a hole cut in it.

What other mics do you recall using on drums?

There were D19s, which were AKGs, I think; just a cheap talkback mic. AKG always said they were the "throwout" capsules for D20s. Then they came out with the D19C, which had a little vent in the back to help the bass end or something, which never sounded the same, of course. Like Neumanns—the way they progressed up the chain from the 47s and 48s to the 67, which never sounded as good as the 47; and the 87, which didn't sound as good as the 67. They were always trying to prove to you that it did, but it didn't.

Many drummers have said they were inspired by the way the drums you recorded sounded on Beatles records.

It was the presence, I think. No one had heard a bass drum up in your face, sounding as solid as it did. Maybe my approach to recording was magnifying them; I don't know. Getting back to this visual aspect, it was a question of putting into focus various instruments. Whereas before, everything had been sort of a blur. We just pulled everything back into focus.

There'd been very little close-miking done before.

I used to put my ears near things to hear what the makeup of the particular tone was. I would go out and have a good listen and see if there were any places where things sounded slightly different. It's like miking a cymbal on the edge. Have you done that? I put a little condenser on the very edge, and it vibrates and you get this enormous big bottom end—things like that.

Overall, your favorite microphone for vocals was a 47.

Yes, and also for guitars.

And you liked using a microphone in figure-8 pattern on bass.

I used to try to pull the bass out of the track to get its own space and hear it more defined. And one way I tried to do it was to put a tiny bit of chamber echo—well, actually I should say reverberation—on it. I started to do that on *Revolver*, but Paul could always detect even the slightest amount, and he wouldn't accept it. So I had to be careful.

But when we were doing *Pepper*, Paul would often overdub his bass after everyone had gone home. It would be just Paul

and I and Richard Lush, the second engineer. We'd spend a couple or three hours doing bass parts, and I started using a C12 on figure of 8 about eight or 10 feet away from his cabinet, which I would bring into the middle of Number 2 studio. I'd bring it out into the open from the corner area where it was baffled off because I wanted a bit of the room sound.

For a while, you were monitoring in mono, even for stereo releases.

Stereo was late being introduced in England; we were quite behind the times. Up until *Abbey Road*, everything was monitored in mono through one loudspeaker, which was hard, but it also helped, because it's easy to get distinctive sounds between guitars if you've got them left and right. But if they're coming from one sound speaker, they merge together and it's a fight to find a place and a tone and an echo for each guitar. And then, of course, when you got it and you switched to stereo, it was wonderful. It's still a good way of putting sounds together.

You have to work harder on it.

Yes, it would take, on the average, two-and-a-half to three hours to work on each

and such, and we can't have that." Because, really, they'd had it easy for 10 or 15 years, and if things were changed, people might expect more from them.

I've heard that there was, at that time, a sort of adversarial relationship between engineers and artists.

Well, there were certain rules and regulations. It was very regimented. You weren't allowed to get too close to the artist; you were only supposed to speak to them if they spoke to you. That was very hard. We had to wear collars and ties and make sure our shoes were polished, and we had to get permission to take our jackets off on a session. And to be seen without a tie—forget it. Of course, you were working with classical people, remember, who expected a certain amount of respect.

You have said that you bear in "colors."

Oh, I do, definitely. The way I approach it is I use what I'm given by the studio like a palette of paints. It's very hard to explain, but I hear visually. I hear certain sounds in different colors. It's really an art form to me. If you start asking me technical stuff, I'm not really that interested; it's like an artist not really wanting to know how the paint was made.

Yet you're quite a technical engineer, especially in the techniques that you developed—close-miking, preamp distortion, backward sounds, automatic double-tracking, tape loops...

It was only out of frustration because The Beatles were quite demanding on the sessions. That's what gave me the fuel to do what I was doing. I couldn't just sit there and leave it; you had to do something different every track—like, "Geoff, we're going to use the piano, but we don't want it to sound like a piano; we're blending the guitar, but we don't want it to sound like a guitar."

Did you usually have a sound in your head that you were going for?

No, I just built the picture from the textures and colors of what the other instruments were doing—what Ringo was playing on the drums, or the way the other guitar or keyboard sounded, trying to get something from that. Obviously, it was still going to sound like a guitar. But I knew what they were saying; they just wanted that extra little bit of magic to make it sound like a *different* guitar.

I was given the equipment and used it. Basically, that's what happened. Like triple-compressing a bass or going from one compressor into another compressor and out of that compressor into a limiter,

and out of that limiter into another limiter and seeing what happens.

Speaking of compressors, in other interviews you've mentioned Fairchilds quite a bit. What is it about them you like so much?

The Fairchild 660s—it's just a sound they've got that I loved. It's good for specific drum sounds. It's great on electric guitars, and it's great on vocals. That's about it, really.

Do you think there's something to the notion that bigger is better in terms of recording equipment?

[Laughs] Well, that's because it was all tube equipment. All the albums up until *Abbey Road* were recorded through a tube desk. *Abbey Road* was the first album that was recorded through an EMI transistorized desk, and I couldn't get the same sounds at all. There was presence and depth that the transistors just wouldn't give me that the tubes did.

That must have been frustrating.

Oh, it was. But, of course, it gave a texture to the *Abbey Road* album after all, which is quite pleasant. But at first, being used to the tube desk and being confronted with the transistorized desk, it was like chalk and cheese. It was hard. And there was nothing I could do about it except craft the music around it; it was a much softer sort of texture.

When Studer came out with its transistorized multitrack tape machines, we were A/B'ing with an MCI 8-track and the same thing happened. The tape machine just wouldn't produce the same snare or bass drum sound. And, of course, they could never give you an answer—you could only hear it and say to the people from Studer, "Why does it sound this way?"

And they'd run test tones through it and say it was all to spec.

Exactly.

You say you're not technical, but you did have a lot of technical training at EMI.

Yes, and it was superb technical training; it really was. Referring to what I said earlier, to be able to record in straight stereo, with no multitrack backup...

And the quality of EMI's equipment, even to the tape, was excellent.

Oh yes, it was extremely high. When I went to do The Beatles' *Anthology*, I took some of the tapes out of boxes that hadn't been out for 30 years, and they didn't shed or show much sign of wear at all. Even the tones went straight to zero. It was quite unbelievable. But then, we never had a problem with the tape. Of

course, we were never allowed to go back over it.

You used fresh tape for every take?

Yes. That was another one of the rules; we always had to record on virgin tape, because the technical people at the research department said—due to the flux or something—we shouldn't record over. *"Paperback Writer" had a rather unprecedented amount of bass on it.*

Yes, and the bass drum also. It was one of the younger mastering guys—Tony Clark, who was a pal of mine—so there was some rapport between us. Whereas before, it would have been, "No." I also remember the buzz that quickly went around Abbey Road when it became apparent what we had achieved with the sound of a record. People were standing outside the door and listening...It was so different; really it was like seeing the first screening of *2001*.

Do you recall the setup for those sessions?

We did it ["Paperback Writer" and "Tomorrow Never Knows"] in Number 3 at Abbey Road, although most of The Beatles' songs were done in Number 2. I think I was miking the toms from underneath as well as on top. And I think I was experimenting with 4038s—which were originally a BBC design and are now made by Coles—on overheads. They're big ribbons; you have to boost the high end. But there was a certain relationship, for some reason on the 4038s, between mixing them in with the close mics that really worked—something to do with the phasing I suppose. When you reversed the phase on the snare mic, it always came as a much bigger, fatter snare sound when you used the 4038s; it had to do with the bottom end on them. And they were also figure of eight, of course, so it was kicking back.

What mic would have been on the bass drum?

I think D20s. But whatever can take the

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ficult for the band because they had already amassed an excellent collection of gear that they used to lug from studio to studio. "When we go into another recording studio, we bring all of our own shit," Jenkins adds. "We don't actually use their room. We monitor off their board, but we use all of our own mic pre's, compressors and mics."

The main console is a Sony DMX-R100 that interfaces through Apogee AD-8000 and PSX-100 converters with a full-blown Mac-based Pro Tools|HD system. However, the real stars are a refurbished Helios board and a hot-rodded Ampex MM1200 outfitted with an 11-track head stack. The basic premise is simple: Everything is recorded through the Helios board or pre's onto the Ampex and then flown into Pro Tools for editing. All of the monitoring is done though the Pelonis Signature Series Mains (which are the first professional mains to boast a frequency response of 21 to 45k Hz) and a set of Yamaha NS-10s. In addition to the vintage Helios board, pre's and some Neve 1081/1073 modules, Carmer also uses some more-modern preamps and outboard processors including selections from Sony, Focusrite and Universal Audio.

"[The word] 'hybrid' always sounds like somebody's car or something like that," Jenkins states. "Anything that's lime-green is a hybrid. But [here], it's a very

Salazar takes a quick nap inside the lounge.

simple concept. Classic analog gear creates the sound we covet. It's the sound of Bob Marley and Led Zeppelin and sort of the classics of recording. And modern technology and digital-information management improves the sound by allowing you all kinds of ways of manipulating it that analog doesn't [allow]. So the philosophy of the studio is to get pristine, classic analog signal path and be able to manipulate it in the most up-to-date fashion. That's what it's about."

Following the completion of their new record, Morningwood Studios will actually transition from a project studio into a commercial facility. And, rather than cater to strictly high-end users, Jenkins and Carmer are hoping to attract younger upstart musicians who might find the facility's affordability and "hands-off" attitude a plus.

"I think that we have put a lot of thought into this place that is going to make sense to people," Jenkins concludes. "And that is what we've really wanted in a studio—a home-like environment and no one bothering you, and a focus on tone and flexibility and ways of manipulation. And most studios you go to don't have that as their concept." ∎

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Chris Fogel

From Albums With Alanis Morissette and Seal to Film Soundtracks

In our sometimes over-inflated, over-hyped technological world, where audio addicts frenzy over the latest, the greatest, the oldest and the coolest, Chris Fogel is a refreshing breath of fresh air. The emperor better not try wearing any new clothes around this guy: A brisk engineer who works with streamlined gear, Fogel espouses a totally no-nonsense approach to his art.

The results of his engineering style are the proof; it was Fogel's mixes that scorched the airwaves during the summer of '95 on Alanis Morissette's *Jagged Little Pill.* He's continued to work with Morissette on almost all of her music, including her current smash, *Under Rug Swept,* as well as with U2, Seal, the late Aaliyah, Sheryl Crow, John Hiatt and Robbie Robertson, among others, garnering a Grammy™ nomination in 1998 for Best Engineered Album for his mixes on Robertson's *Contact From the Underworld of Redboy.* Since 1998, he's also been mixing for film and 5.1 surround, working with composer Edward Shearmur on the scores for such features as *Charlie's Angels, Cruel Intentions, K-Pax* and *Miss Congeniality.*

Reno, Nev.,-born and currently bi-coastal, Fogel recently constructed a studio from the ground up for himself at his Glendale, Calif., home, where we sat down for this interview.

You got your start as a DJ, commuting from the Reno area to San Francisco to work weekends at clubs. What kind of music were you spinning?
Industrial, mostly—Ministry and Wax Trax bands and everything around them. Also Depeche Mode, New Order, that kind of '80s Euro dance music. Song-based stuff with guitars and melodies and a good driving beat—that's what got me into it. DJs weren't the sort of rock stars they are now, making $10,000 an appearance. I couldn't afford to get a place in San Francisco, so I'd commute for two nights, staying with friends and sleeping on the floor. I also ran my own clubs in Reno—Underground and Red Square—when I was only 19. I leased space, promoted them myself and got over a 1,000 kids a night.

So, recording school came after you were already a DJ.
In fact, it was a total accident. I was at a party up in Tahoe, and I saw a brochure for Full Sail on the back of a toilet.

It was a sign.
Yeah. Why the hell was there a Full Sail brochure on the back of a toilet in that house in Tahoe? I went, graduated Number One in my class, and got a job at Westlake [Studios in Los Angeles] right after that.

I remember hearing that Westlake only hired people if they'd graduated from a recording school.
Actually, for a time they were against it. There were areas of knowledge students were definitely lacking in, but they came out kind of cocky like they knew everything. And I'm here to tell ya, nobody knows everything. I'm nowhere near the engineer I potentially could be. I'm learning every day. I go through periods; like now, I'm in one of my "Van Gogh" dark periods. That's where everything that I listen to that I've done I don't really like; I think I could have done it better. I'll come out of it, but the point is that you don't come out of school knowing anything, except how to wipe your nose.

You started as an intern?
I started as the night runner at Westlake's Beverly location. I remember what got Steve Burdick, the man-
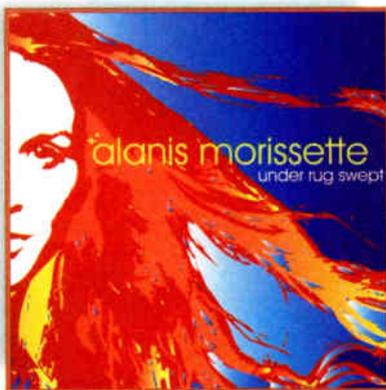
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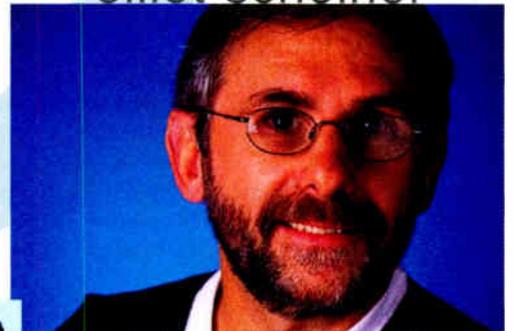
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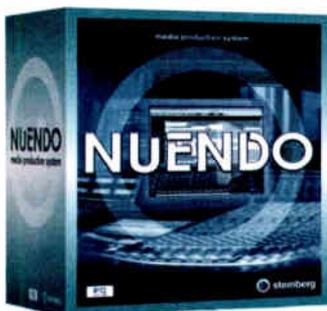
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ager, to give me a shot at assisting: It was Christmas, and all of the regular assistants were out of town. Because I was the night guy and he was the first one in every morning, he'd see what kind of cleanup job I'd done. And he noticed that I would line up all of the coffee mugs on the shelf so that the handles were facing the same way.

Very impressive. Like when you open the fridge in a studio kitchen and all the labels on the drinks are facing the same way.

That's what got me moved up. Now when I see someone who's doing the same thing, I think, "An ambitious runner we've got here—just like I was." But back then, I didn't know. I was just doing it. But Steve gave me a shot, and my first gig was a Pontiac commercial.

That's a speedy start.

Yeah. With a hardcore jingle engineer whose license plate said "Mix4Bux." I remember I was terrified.

Was it at Westlake where you hooked up with producer Glen Ballard?

I actually hooked up with Francis Buckley, his engineer at the time, on a project he was doing with someone else. And then we did a Curtis Stigers record—a great singer and sax player from New York—with Glen. And when they did the second Wilson Phillips record at Westlake, I was the technical director.

Technical director?

That was Francis Buckley's neat way of giving me more credit. We did that record on a Mitsubishi X880 and I was in charge of everything—come in on Sundays, you know. After we finished that record, Glen

From left, Chris Fogel, Alanis Morissette and mastering engineer Chris Bellman at Bernie Grundman Mastering.

decided to build a studio at home. He bought a Euphonix and he took me from Westlake to run his show. I learned the Euphonix, and we did a lot of demos together. If there were albums, Francis would come in. But Francis happened to get hired by Quincy Jones to do *Q's Jook Joint* right at the time when Alanis showed up at Glen's door saying, "Let's work together." And that was it.

So you've been working on Euphonix since 1992.

Euphonix may correct me, but I think Glen's was the second install. It was a CS2, a tiny little frame. It was Francis' idea. They didn't want to do a big battleship console because the studio was upstairs above the garage. They wanted some-

thing fairly light that didn't give off a lot of heat, had a small footprint and still sounded really good.

I learned from Francis not to fear new technology. He sat me in front of the Euphonix, and for one whole day, I went, "What is this?" I didn't get it. Midway through the second day, I got one little section and the light went on for the whole console. I understood it, and now—if I don't have to—I won't work on anything else.

You like a more transparent sound?

I prefer a much less colored sound. A lot of other engineers don't like the EQs. Well, I love them. I like having the visual "Q" curve, like in Pro Tools. I like Euphonix's tactile and visual interface that allows you to see what you're doing, in addition to hearing it. Plus the instant recall [laughs]; that's really important, because we recall everything. I don't think there's been a single song—on any of the three records that I've done with Alanis—that I didn't have to recall at least twice. Because of the way she's worked, she understands that a recall is not that big a deal. Of course, when we're getting toward crunch time, it is.

With recalls so easy, how do you know when a mix is finished?

I'm satisfied much earlier than a lot of people. I think if you've gotten the point of a song across, you've done your job. Alanis, I don't know what her process is. We'd do recalls, I'd send her home with them, she'd drive around in her car, and call me and say, "Yeah, this one's done." What's strange to me is that on the more important songs, she's usually willing to

SELECTED CREDITS

Brendan Lynch: *Brendan Lynch* (1997)

Message in a Bottle soundtrack (1999)

Michael McDonald: *Very Best of Michael McDonald, Voice of Michael McDonald* (both 2001)

Nine Inch Nails: "March of the Pigs" remix (1996)

Playing By Heart soundtrack (1999)

Plumb: *Best of Plumb* (2000), *Candycoated-waterdrops* (1999)

Seal: "Togetherland" on forthcoming album

Sheryl Crow: "If It Makes You Happy" (1996)

Sneaker Pimps: "Post Modern Sleaze" remix (1997)

Super Deluxe: "Farrah Fawcett" (1997)

U2: "If God Will Send His Angels" remix (1998)

The Urge: *Too Much Stereo*, "My Time to Fly" from *Titan A.E.* soundtrack (both 2000)

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let go earlier. Like the first single from this [new] album, "Hands Clean," was the mix we finished earliest. It was finished and she never revisited it. But everything else, right up until nine hours before mastering, we're doing recalls.

This time around, Rob Jacobs did most of the recording.

I recorded almost everything in her rock genre up to this; that's because I worked with Glen. He and I had a falling out, I think Alanis and Glen also had a falling out, and she started with Rob. And there couldn't have been a better choice. He's

perfect for her; an organic-based engineer. Frankly, I wouldn't have revisited much of what he did. But to her ears, something was missing, and I think it was just that she was used to the process that I give her. She wasn't looking for just mixing, she was looking for what we could do to make the songs better. So she said, "Why don't you try mixing a few songs?" We had to do it in New York because she was doing videos and photo shoots, and because there are no other commercial Euphonix studios in New York, except for System 5s. We ended up in a tiny overdub

room at Battery Studios.

A programmer, Carmen Rizzo, and I tag-teamed, he in one room and I in the next. I flew tracks around and kind of re-arranged with some of the additional elements Carmen added. She loved it and wanted to do the whole album, so we did it in chunks. We did the first four in New York and the rest here at [Glendale's] Front Page Studios. The only song we didn't look at was "Flinch." I listened and didn't want to touch it. Actually, I felt that way about a lot of the mixes that Rob did. But that goes back to my point: I'm willing to let things go a lot earlier than other people are. If I'm getting the song and the point of what she's trying to say and the emotion she's trying to convey, then, to me, it's done. I don't have to get a perfect kick drum or bass sound, or the perfect overall texture.

I think people can spend way too much time trying for perfection and get perilously close to sterilizing a song. I'm more into the immediacy of it. I think that's what Alanis is into also—getting your gut reaction and maintaining it without going too far—but her process is different.

Not many mixers do both CDs and film work.

I love being able to have my hand in both. I like having five speakers set up and digging into the technology and the art. On the other hand, I think mixing for stereo is more of an art than mixing for surround. Mixing for surround is more of a science—more color by numbers. When you're mixing for stereo, you take the speakers out of the equation and create the image. For 5.1, the speakers are every bit a part of the equation. I actually think it's more limiting to mix in 5.1 than in stereo.

Seal brought it up; he said mixing in 5.1, he tends to lose the emotion because he's thinking about the technology too much. He's thinking about how cool it is that something's coming from behind rather than what the point of the piece of music is.

That's a problem that plagues a lot of surround projects.

Most titles sound sterile—due to no fault of anybody; it's just the technology. "Yeah, that's cool, but do I want to listen to it again?" No.

What about for film?

If I had my choice for film, I'd do it in stereo stems. When I'm given a mandate by the stage that I have to deliver in 5.1, I have to think about placement rather

than the entire picture. When the stage doesn't have a preference, I'm happier. I can create a stereo mix that totally kicks butt, then break out stems for them. If they need to extract surround or the center, they can do it.

Mixing film for 5.1 is, of course, totally different than mixing albums for 5.1, because you have to clear the center for dialog. For 5.1 albums, that center is discrete; it's got its own life, and you can put whatever you want in there.

How do you work with composer Edward Sheamur?

He'll write at home and I've got mirror equipment for his writing setup, which is mostly GigaStudio, so he can just come in with his files. I start building mixes early in the process and we overdub where needed. Keeping cues in a near-mixed state, we always know what they

> I think if you've gotten the point of a song across, you've done your job.

are and when they're done, I just print. Also, it's important to have cues in good shape for that day when the director decides to pop in for a listen. Sequencing is on Digital Performer, and I have a Pro Tools rig, as well. I'm not a huge fan of Pro Tools; I use it because I have to. You can do most of what you do with Pro Tools in a Euphonix R1, and it sounds so much better!

Do you generally do a lot of rearranging in mixes?

Not usually. If an artist has gotten to the point where they're ready for me to mix, I'm assuming that they've already put thought into having what they want on tape. If there's something that's really bugging me, I'll call them up and say, "Hey, can I do a little rearranging?" I'm not into the school of replacing every kick and snare just for the sake of retriggering. If they were getting a vibe off of what they had on tape, there's a reason why they put it there. Unless they tell me to go through and do whatever I need to, I'll mix what I'm given.

I just mixed two singles for a band called Custom. They brought in some mixes that had been done, then played the original track and said, "We never gave the guy the right to do this. He never asked us, he just did it and it really

sonal monitors?

I use them for leveling vocals and checking overall balances at really quiet levels. And if we're doing a film and Ed is sitting here writing, I flip one around and give him dialog in it so he can set his own levels.

I don't see much vintage equipment; I guess you're not one of those collectors of Eastern European broadcast gear.

I went through that stage, but now my main question is "why?" The Lexicon 960, for example, my main axe reverb, has all the sounds that the 480 had and I get a ton more DSP. The only things that I've kept since the beginning are my Yamaha SPX-990s. I have to have a pair of those. There are a couple of drum rooms that I really like. And without fail, when I mix Alanis' vocals, they're processed through the wood room for the reverb and the vocal doubler for a little bit of spread. Except on the current record, where I strayed away from that, and now I kind of regret it.

Overall, I'm into tried-and-true stuff. I'm not into collecting. The bottom line is, [the older gear] doesn't sound any better to me. To me, it's a waste of money from a maintenance standpoint. I work all of the time; I can't afford to be in the middle of a mix and have a problem. I had two vintage, black-face 1176s and I got rid of them. Either the barrier strip would fall off or the resistance would get funny. I bought one of the reissues and it sounds, I won't say better, but it doesn't sound worse. And I know it's going to remain stable. It's got XLR outputs, a discrete transformer...

For me, I like a transparent mic pre, and then let me go after the sound I want via filtering or whatever. I am into microphones. The Coles ribbon mics are cool, and there are times to use weird, vintage mics.

Who built your studio?

I built the room myself, including acoustics, which I designed along with Ty Moyer at ASC—Acoustic Sciences Corp.—in Connecticut. I just e-mailed them out of the blue and said, "Hey, I'm building a room in my backyard." I gave him dimensions and he came up with the coefficients of where the [treatments] should be placed. ASC also has a wall construction that I used; they recommend multiple layers of drywall.

Charlie Bolois and Kevin Kaiser of Vertigo did the wiring. They had wired the console for Tesh also, so they were familiar with the system.

I patterned it after Seal's room; I used matching specifications. He has a CS3000, and he built his studio in his gym without really doing any acoustic treatment to it. I got some of my best mixes out of there, and it made me realize that I could build my own room. I'm very happy with the results.

What's next for you?

I just finished recording and mixing the score for Cameron Diaz' *The Sweetest Thing*, and I'm currently remixing *Under Rug Swept* in 5.1, with Alanis' previous two albums to follow. I'm also recording and mixing the score for Spyglass' *Reign of Fire*, with Matthew McConaughey and Christian Bale. After that, I'm dong the score for *A View From the Top*, composed by Theodore Shapiro, starring Gwyneth Paltrow and Mike Meyers. And, I've got a bunch of unsigned bands in development that I'm working with on and off, until winter, when we should be starting the *Charlie's Angels* sequel. I guess you could say it's a multichannel year for me! ∎

Maureen Droney is Mix's Los Angeles editor.

DIGITAL AUDIO ROUTERS

IN THE PROFESSIONAL STUDIO

By Gary Hall

I n today's studio, "resource utilization" is the watchword. Studio managers must efficiently reconfigure rooms quickly and put any given piece of gear to work where it's needed. Gone are the days when a room could operate with a more or less fixed configuration of gear, supplemented by rentals paid for by the client.

Digital signals are a godsend in this regard by allowing for lossless signal runs over long distances. But the sheer number of signals and lines involved can be overwhelming, and nonterminated patchbays can be dangerous to signal integrity. Centralized and automated routing of digital audio provides flexibility for rapid configuration changes, while making sure that transmission lines are handled properly at all times and eliminating wear and tear on cables and connectors.

DIGITAL AUDIO TRANSMISSION FORMATS

Resolving the alphabet soup of digital audio transmission formats is an important benefit of centralized signal routing. AES3,

AES3-id (single-ended AES), S/PDIF and TDIF vary in electrical characteristics and connectors. Conversion between 2-channel and multichannel multiplexed formats such as ADAT Lightpipe and MADI is more complex, and is better handled by dedicated converter units.

Most routing systems on the market are focused on the AES3 family. Larger routers may use TDIF or Sony-style multi-pin connectors for cost and panel space reasons. Signal routers for ADAT Light-pipe are on the market as well, handling eight to 15 Lightpipe inputs and outputs. Conversion units to translate between Lightpipe and multiple AES3 signals are also available.

At present, dedicated routing systems for MADI are thin on the ground. Manufacturers such as Euphonix that are committed to MADI usually provide routing facilities within their own systems, but options for intersystem routing are limited because of reduced demand and the difficulty of handling the higher bandwidth and run-length limitations of MADI signal lines.

ROUTER DESIGN

For the studio, there are three factors to consider when designing a routing system to handle digital audio: signal integrity, number of inputs and outputs, and control features.

A centralized routing signal will carry a large number of signal lines, many with long runs. It is imperative that the system preserves the integrity of data and clocks in every signal, with careful termination and buffering, and low signal leakage or crosstalk.

The "eye pattern" is the key tool to evaluate signal integrity in digital signals. This pattern is formed by triggering an oscilloscope or digital measurement system with the signal word or bit clock. The result is a composite of millions of individual state changes, immediately showing noise, impaired rise and fall times, or other forms of signal degradation.

Figure 1 shows a progression of eye patterns, taken from real life, that illustrate how an AES3 signal can be degraded by poor signal handling. As the
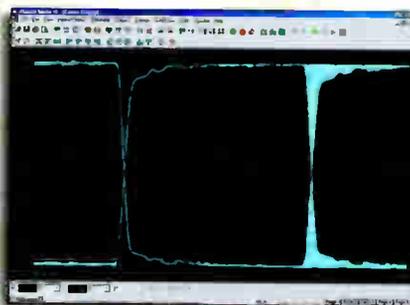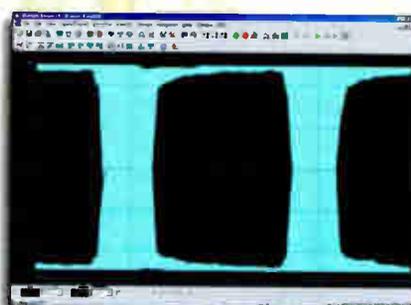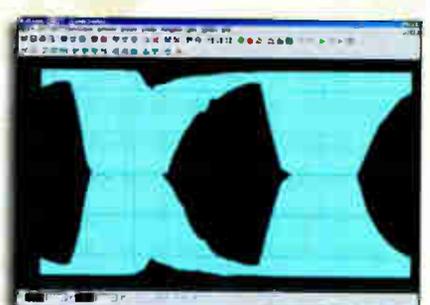
(a) (b) (c)

Figure 1: A series of "eye patterns" that show the progressive degradation of an AES3 signal. The pattern itself is a composite of millions of transitions, showing variations from cycle to cycle and expanded blue areas. In (a), an original clean signal is shown, with consistent rise and fall times. In (b), 30 ns of jitter has been added by a poorly terminated signal run. In (c), a second bad termination has degraded the signal sufficiently to endanger the ability of a receiving device to recover clock and data.

rising and falling edges lose integrity, the "eye" becomes smaller. The actual timing of signal transitions becomes uncertain, adding jitter to the embedded clock and increasing the risk of data error. With seriously degraded signals, a receiving device may be unable to latch onto the clock or recover data successfully.

Centralizing the routing for a multiroom studio complex calls for larger numbers of signal inputs and outputs, with stiff requirements for termination. Design difficulties rise quickly as routing systems scale up. Whereas an 8x8 matrix for a small room has only 64 different paths, a 256 in/out router has more than 65,000.

Routers for multiroom studios also must provide for remote control and monitoring from any location, whereas single-room systems can operate from the front panel. In both cases, the essential control function is the ability to preset memories for routing configurations. Larger systems naturally need to store a greater number of setups and provide better means to label and organize setups so that multiple operators can use them.

PATCH POINT MATRIX VS. SYNCHRONOUS ROUTING

In asynchronous routers for the production studio, appropriately terminated input buffers feed a matrix that routes selected signals to the drivers for the designated outputs. In a well-designed router, a careful design of input and output circuits, coupled with proper layout and grounding practices, ensures that signals pass from input to output without a significant increase in jitter. This type of router is completely agnostic with regard to the format or data content. As long as the design isolates and buffers a signal appropriately, there will not be any interaction, and signals of different sample rates and bit resolutions can be mixed freely.

The other digital audio router design type is synchronous, where digital audio signals are completely or partially decoded and routed using time-domain multiplexing. This is a more costly and complex method to route signals. Apart from cost, a disadvantage to this method, as far as the recording studio is concerned, is that all input signals must be synchronous, and therefore of the same

Frontier Designs' Apache: simple Lightpipe or optical S/PDIF routing.

sample rate. Any incoming "wild" feeds not already synched to a common clock must be sample rate-converted.

In a broadcast environment, synchronous TDM-based routing allows any signal or combination of signals to be switched instantly, allowing for seamless switching. However, if the signals in question are already clock-synchronous, then they can be switched within an asynchronous matrix without any issues. Synchronous routers ensure that this is the case under all circumstances and provide assurance in critical broadcast environments.

Synchronous routing also makes it easier to implement signal-handling functions, such as channel splitting, status bit flipping or sample-rate conversion. In most studios, these functions are not often used and are typically assigned to dedicated units or handled directly within recording, editing and mixing systems. For recording studios, the additional costs of synchronous signal routing are usually not justified.

PRODUCTS: MEDIUM-SCALE ROUTERS

Several companies have made digital routing systems a specialty for the project studio and larger installations. Here are a few.

A company focused on signal routing
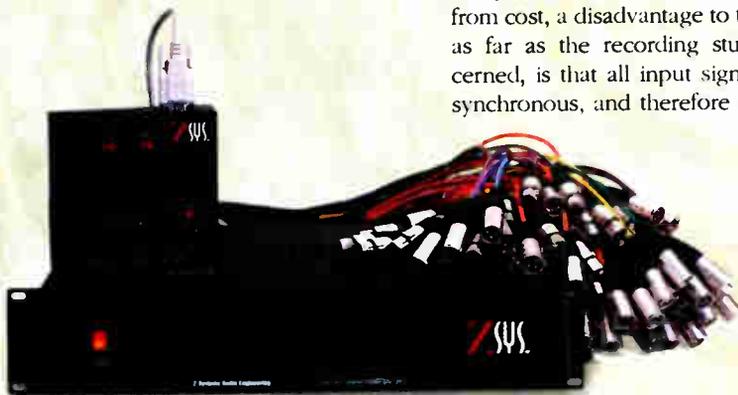
z-Systems' Digital Detangler: The name says it all.

and monitoring control, z-Systems offers a rapidly expanding line of digital audio routers that it refers to as Digital Detanglers. The z8.8 and z16.16 models offer 8x8 or 16x6 matrices with a choice of AES, S/PDIF or optical connectors, all controlled exclusively from the front panel.

The z8.8r and z16.16r "professional" models eschew optical connectors, but offer control via the z-rrc remote panel or by computer. These models also combine multiple AES3 connections onto multipin connectors to expand to the larger z32.32r, z64.64r, z128.128r and, most recently, the z256.256r.

z-Systems recently introduced the OptiPatch and Optipatch+ Lightpipe Routers. The basic OptiPatch offers eight Lightpipe inputs and eight outputs; OptiPatch+ expands that to 15 ins and outs in the same-

FUTURE DIRECTIONS

To date, digital audio routing in the studio has followed the point-to-point paradigm of analog signals. Digital audio transmission standards carry two, eight or up to 56 channels on a single line, but it's still a fixed number.

Meanwhile, technologies such as Ethernet and FireWire/IEEE1394 have evolved to the point where they are capable of carrying substantial numbers of digital audio signals. Applying these technologies to signal routing is a tempting prospect, potentially offering same advantages as computer networking, where many users can share resources in a very flexible way using a single connection.

Several manufacturers now offer systems that use networking technologies. Most of these focus on fixed installations, touring sound and remote recording, rather than generalized studio production.

Current network technologies are limited by bandwidth. Studio applications also require low latency, which can be difficult to achieve when large numbers of arbitrary signals are handled over a network. As Gigabit Ethernet, FireWire-2 and other higher data-rate technologies emerge, we can expect to see more and more application of these to professional production.

The most prominent technology to route digital audio over networks is CobraNet. Developed and supported by Peak Audio, CobraNet is currently incorporated into products and systems from Peavey/MediaMatrix, QSC Audio, Rane Corporation, Crown Audio and others. Numerous other companies have CobraNet products at various development stages.

At its current level of development,

CobraNet carries up to 64 channels of 20-bit audio on a single conductor. Major installations for the Sydney Olympic Stadium and the Experience Music Project in Seattle, among others, have proven that CobraNet is robust and scalable. This is clearly a technology to watch.

Otari offers the Network Audio Distribution System, which uses IEEE1394 connections to handle up to 96 channels of 24-bit audio at 48kHz sample rate or 48 channels at 96kHz. Individual model ND-20 "head" units are equipped with mic or line inputs, D/A outputs, AES or TDIF I/O as required, with up to 32 channels available in each unit. As many as 63 ND-20s can be connected to the network.

For the studio, the most ambitious of the systems that multiplex audio data onto external serial buses is the Nexus system from StageTec of Germany. The system uses modular head units to acquire digital or analog signals in various formats, determined by system configuration, and multiplexes them onto one or more fiber-optic cables to be picked off by corresponding decoding heads. The maximally expanded system is claimed to be able to handle a crosspoint matrix of 4,096x4,096 (though we didn't have a chance to test that). The system provides options for DSP functions, format conversion, and transmission of nonaudio data such as machine control and MIDI. Among others intallations, Nexus systems are in use at Skywalker Sound and Fox Networks.

Yamaha has the MLan family of products that is based on IEEE1394. The company manufactures MLan adapter cards for many of its popular synths, samples, as well as the 02R and 03D digital mixers. Yamaha also offers an 8-channel audio and MIDI interface to link standard devices into the network. Yamaha is actively soliciting licensees to expand the range of products and applications for MLan. ∎
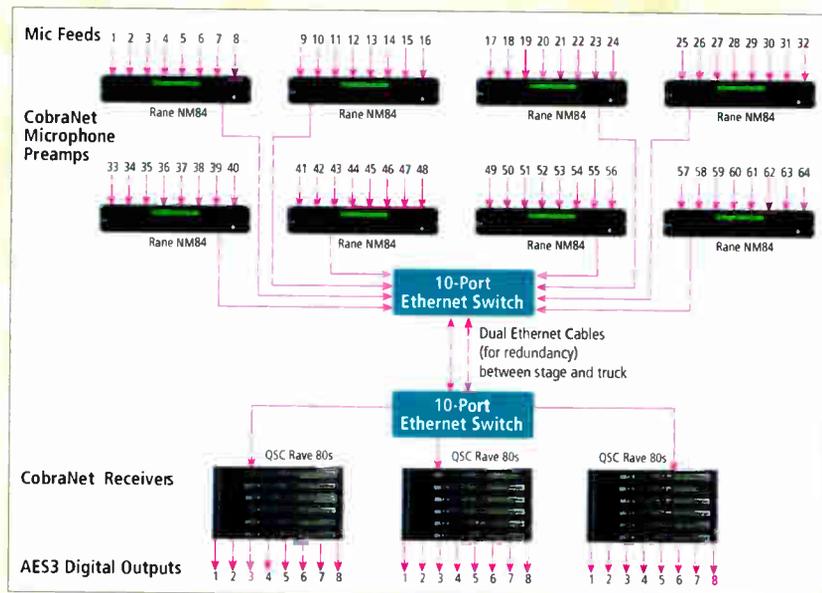
Signal flow of a CobraNet application in remote recording, as implemented by Floating Earth in London. Eight Rane 8-channel mic preamps route 64 microphone feeds across a single redundant Ethernet connection. CobraNet receivers from QSC decode the audio into eight AES3 pairs per unit to feed monitoring and recording.

DIGITAL AUDIO ROUTERS

less cost-effective for recording studio applications.

NVision manufacturers a range of audio-routing products from 32x32 to 1,024x1,024 or larger, with options for both asynchronous and synchronous routing. Control is via serial port, with a choice of control protocols. The smallest member of the family, the NV3064, is available with

and can be installed in the same rack-frame.

Sierra Video Systems manufactures several dedicated AES3 routers in its Shasta and Yosemite products groups. The Shasta products are mostly combined switchers for video and audio, but 8x8, 16x16 and 32x32 digital audio-only configurations are offered. The Yosemite product includes audio configurations up to 128x128, in various combinations of synchronous and asynchronous patching.

Snell & Wilcox offers the IQBRT, an
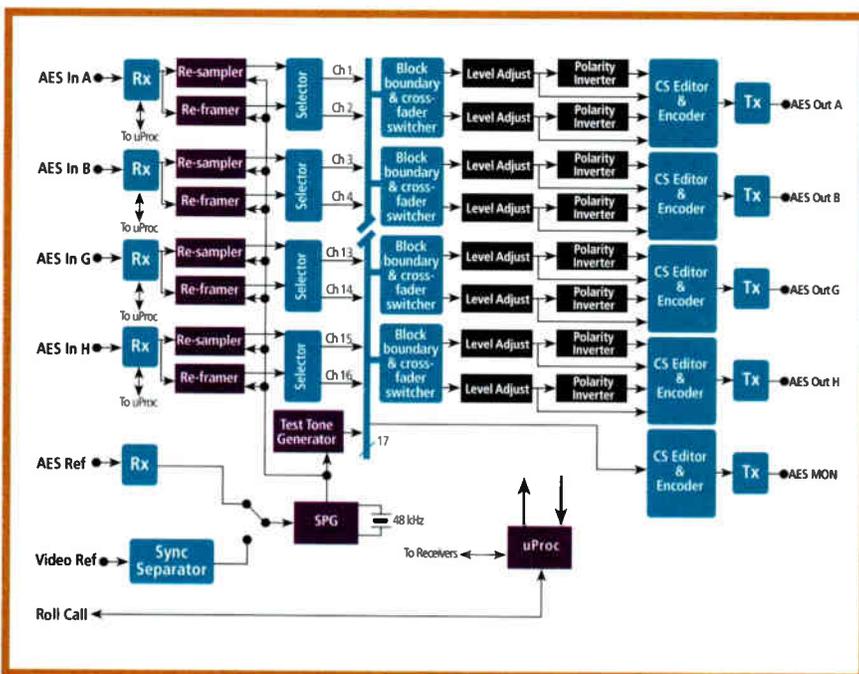
Operational flow of a broadcast router (in this case, a Snell & Wilcox IQBRT AES3 synchronous 8x8 switcher), which provides for conversion of sample rate, frame alignment, crossfading, level matching and polarity inversion in the digital domain. These utilities can be lifesavers in live broadcast, but may not be required for general signal routing in the studio.

32x32 or 64x64 AES3 pairs, in synchronous or asynchronous configurations. The NV3256 offers 256 AES input and outputs in different combinations of synchronous and asynchronous signals in the same frame. NV3512 is a fully modular system occupying one or more full-sized racks. Designed as the ultimate in flexibility, each rack unit provides up to 512x512 matrix switching for any combination of digital audio signal connectors, in any combination of synchronous and asynchronous.

PESA offers the TDM3000, a large-scale modular system using TDM technology and engineered with the demands of broadcast in mind. The TDM3000 can be configured using four-rackspace units, from a 32x32 matrix up to 1,024 inputs and 1,024 outputs in any desired combination. Modules for timecode and machine control routing are also available

8x8 synchronous digital audio switcher with sample-rate conversion on all inputs and gain adjustment to correct differences in reference level, as well. Twenty-four-bit audio is handled at standard sample rates up to 48 kHz.

TESI offers the DR48, a two-rackspace, asynchronous, crosspoint matrix configurable from 16x16 up to 48x48. Front panel control is unavailable, but the company supplies control software that runs under Windows.

As the digitalization of production continues, we can expect that the needs for dedicated routing products will only increase, with more entries at both the top and bottom ends of the market, and more devices to handle MADI signals. ■

Gary S. Hall operates the world's only solar-powered piano lounge.

THE GREAT DAW CHALLENGE

The old debate was simple: digital vs. analog. But today, we have PC vs. Mac, native vs. host-based, digital consoles vs. audio interfaces, hardware samplers vs. GigaStudio, EXS24 and Halion, FireWire vs. PCI; take your pick, and someone can build a case for the best way to work. As the format war's intensity increases, it has become imperative to carefully weigh not only the monetary considerations but also the investment of one's time and energy. With the pace of today's work, there simply isn't time to head down any blind alleys.

In my work as the Digital Doctor (a consulting business serving the New York area), I consult with a diverse group of clients with very different needs and goals: studio owners, musicians, producers, composers working in film and television. The common thread is that they all want to use their CPUs to track, edit, mix, post, send MP3s and browse the Web—all while doing it faster, cheaper and easier than they did yesterday.

In the past month alone, my studio clients have sequenced running Logic and VST instruments and printed to Pro Tools; dumped files from Logic running on one CPU into Pro Tools|HD for mixing; played songs straight out of Digital Performer 3 into analog gear and then into Pro Tools for mastering; tracked through Pro Tools hardware into Cubase on a PC; transferred files from Nuendo to Logic; and brought 24-bit Tascam tapes to be transferred to Pro Tools for editing and mixing. The point to all this? The lack of compatibility among formats is costing people a lot of time and money. There is a great deal of pent-up demand to be able to move freely between studios.

These issues lead to the two questions I'm constantly asked: One, what is the best choice for a user setting up a high-end DAW on a single CPU? And two, how does one incorporate multiple CPUs into a powerful and dependable system? This article will focus on the first question of setting up the killer computer-based studio, providing two case studies that are pretty typical of what I see daily. I will tackle the issue of compatibility more fully in my next article.

Even though a single CPU is capable of power that was simply unimaginable a few short years ago (in 1985, I was able to awe my friends with Professional Composer's eight tracks of MIDI running on a PC that sported 64K on the motherboard), users' expectations have increased at an even faster rate. The goal, therefore, is to design a combination of software and hardware that meets users' needs and desires without sacrificing reliability/stability. The first decision is possibly the most important: whether to use "native" (referred to as host-based processing) or invest four times as much in a TDM system.

Let's look at native systems first. With the increased CPU power available today, mixing a project entirely with native plug-ins has come closer to being a reality. But soft synths, video playback, and applications such as Reason and GigaStudio all compete for the same processor cycles that plug-ins do. As more demands are placed on the system, even the fastest CPU will eventually buckle.

BY NED MANN

HOW WILL IT ALL FIT ON A SINGLE CPU?

NATIVE SYSTEMS AND LATENCY

The biggest drawback to host-based systems is latency. Software companies seem to have conveniently missed this point. Every manufacturer I speak with tells me that latency is not a big issue, yet it is the Number One concern of musicians and producers. Even the lowest buffer settings yield 1.5ms to 3ms delays and are more of a fantasy than a reality when it comes to large files. The song that starts out with 16 tracks and a somewhat livable 3ms delay setting will die an ugly death when it reaches 64 tracks of audio, 128 plug-ins and 16 virtual instruments. In order to record a session with this file, all of the tracks would have to be bounced to disk. This is not the DAW dream. Although many interfaces feature "no latency" inputs, these are generally limited to a stereo pair, with the live inputs combined with the stereo mix from the sequencer and fed directly to the interface's output. When combined with an outboard mixer and reverbs, this setup can salvage a small overdub session, but this is definitely not an alternative for pro applications.

Bluntly stated, the current level of latency in host-based systems is simply unacceptable for most of my clients, large or small. Therefore, a combination of card-based and native processing power is still necessary for the pro user. For the moment, at least, Digidesign dominates this approach. In addition to zero latency on input, Digi hardware also provides confidence monitoring, extensive DSP power, high track counts and extended sample rates. It also offers compatibility with most major studios, in addition to the highest reliability.

These issues would seem to make Digidesign hardware and Pro Tools an obvious choice. For many users, it is. In terms of composing and arranging via MIDI, however, pro users need sequencing tools that are simply not yet available in Pro Tools. (Real-time quantize, looping, notation, VST support, to name just a few— these desires are not news to developers of Digidesign, and I'm sure they are hard at work on them.) The other important con-

sideration is that most musicians and producers typically have logged years on their chosen sequencer and are loath to sacrifice that experience. This leads many users to seek to improve their work environment with Digi hardware, as opposed to completely starting over with Pro Tools.
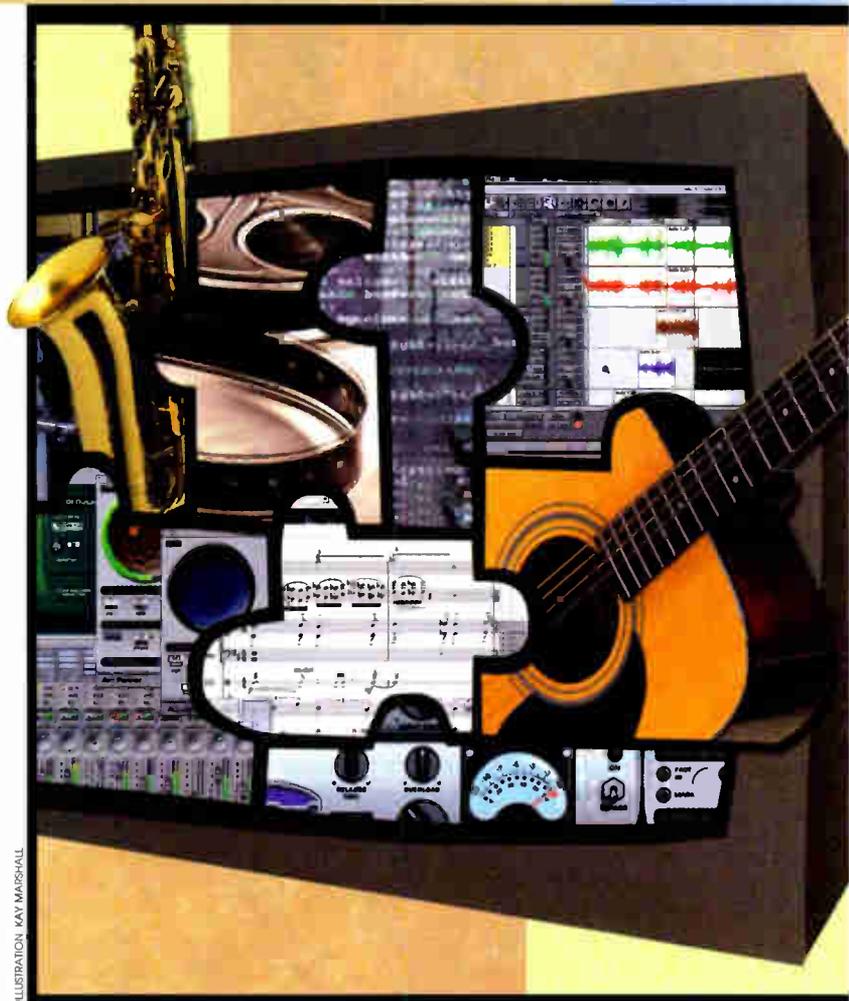
INTEGRATING THE BEST OF BOTH WORLDS

For many, then, the discussion boils down to a two-part question: which sequencing program to use in conjunction with Digidesign hardware, and how to control the hardware via the chosen program. Logic, DP3, Cubase/Nuendo, Sonar, etc., all have their devotees. Of these, Cubase/Nuendo and Sonar, although excellent native applications, do not support Digidesign hardware at all.

Logic and DP3 are both sophisticated and mature programs, though Logic offers much tighter integration. HD support for Logic is shipping, while MOTU's HD support is promised with its long anticipated 3.1 update. DP3 and Logic can both be run with the sequencer "taking over" the Digidesign hardware and under DAE. This allows for the no-latency monitoring and DAE plug-ins (a huge plus). Until now, it has also ruled out using the host's native plug-ins. Emagic's release of the groundbreaking ESB-TDM Bridge (which allows users to run DAE on one track and Logic/VST on another)

was a pivotal moment, allowing users to have their proverbial cake and eat it, too.

However, many longtime Pro Tools users do not want to abandon the program. For some, the elegant automation and ease of use are irreplaceable, while for others, it is the need to interface with other Pro Tools studios on a daily basis. One answer is to run both applications at the same time (Logic or DP3 handling the sequencer chores and Pro Tools handling the audio), synchronized over the IAC bus (an internal bus of the Mac OS). I have many clients who do this, and it has proven to be quite stable. The drawback is that only one program can be the master (i.e., start and stop the other). This can be solved by configuring Pro Tools hardware as the digital clock master, while using a synchronizer (for example, the MOTU DTP, Digi's USD or the new Sync I/O) as the time-address master. Each application sends MMC to the synchronizer and receives MTC back from the synchronizer. In this way, the fronted application always has control of the system. It's fast and accurate, and it works.

In order to explore today's realities, I want to examine two real-life scenarios where users have dealt with single-CPU issues and have come up with configurations that work.

DP3 AND PRO TOOLS

Joel Goodman, of Hifiproductions, is a composer and DP3 user who works primarily for film and TV.

"My current MIDI/recording setup is entirely computer-based, with Digital Performer fronting my Digidesign hardware. There is no physical mixing console and no outboard effects [other than an occasional PCM 80], and all mixing and DSP are done in the computer via TDM plug-ins. The way I typically work is to compose in DP, do some 'premixing,' and then transfer everything into Pro Tools for additional recording and final mixdown. For me, DP and Pro Tools each have major features to offer that the other doesn't. One of the most important Pro Tools features is that it is now in almost every studio. So when I need to go to a larger facility, I can just bring my drive and I'm ready to go. But when it comes to composing, and especially composing to pic-
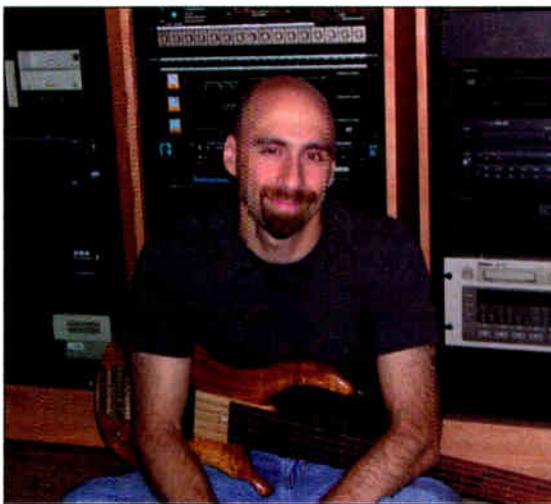
Film/TV composer Joel Goodman

ture, Digital Performer is indispensable.

"One of those 'indispensable' features is the way that DP handles separate cues as 'chunks,' allowing me to work with one file per reel of film. So instead of having 35 files and the need to open a new file with each cue, I usually only have six files. Chunks also help keep setups and tracks to a minimum while promoting more consistency. Perhaps most importantly, when a director comes over to hear my work, everything is right there. Another important aspect of Performer is the conductor track, which allows you to view tempo and meter changes in the main Arrange window. Logic handles this in a separate window, which prevents editing the tempo and MIDI tracks in parallel. While I'm sure there are workarounds, these are important features for film work.

"I decided to run Digital Performer under DAE instead of using MAS [MOTU Audio Engine], for several reasons. The first is to access TDM plug-ins, which are truly top-shelf, and to ensure that what I work on in my studio will transfer exactly to what we use in the final recording and mixing. An important problem with this scenario is the inability to automate effect parameters, which both Pro Tools and Logic can do. Another important limitation has to do with using soft synths [such as Absynth, Virus, etc.], which 'connect' to Digital Performer via Digidesign's Direct Connect. Digital Performer only allows one instance of each as opposed to using the soft synths in Pro Tools, where I could have up to eight instances. Also, VST is not sup-

ported directly and requires the use of a 'wrapper,' which is buggy. The lack of full support for soft synths and VST is especially frustrating when considering the direction sound developers are taking. A perfect example is ILIO's amazing new plug-in, Stylus, which has been creating a huge buzz. Even though Stylus has an MAS version (as well as an RTAS and VST), DP3 still leaves any user running under DAE out in the cold.

"The second and most important reason I turned the Digi hardware over to DAE is that under MAS, it is not possible to monitor your input without latency. This became a deal breaker because, for me, zero latency is critical. The trade-off here is that DP can't punch in on-the-fly when running under DAE as it does under MAS. The work-around in this case is to use Digital Performer's auto-record feature and set the punch-in/out points before recording. This is something I hope will be addressed by DP soon. While I have considered sequencing in Pro Tools, there are far too many limitations, especially the absence of notation editing and printing.

"When all is said and done, one of the most important reasons that I compose with Performer is that I have been using it since Version 1.22, about 15 years! In that time, Digital Performer has grown into a stable and elegant composing tool. For now, the ease and speed of composing in DP, combined with the ability to edit and mix in Pro Tools, are a great combination."

Musician/producer Andy Snitzer

GREAT DAW CHALLENGE

LOGIC AND PRO TOOLS

Andy Snitzer, a New York City-based musician and producer, has composed with Logic Audio and Pro Tools for years. The advent of soft synths and samplers has created a new set of problems and solutions, as the next example will illustrate.

"Until recently, I ran Pro Tools and Logic together on the same computer. Pro Tools served as my virtual mixer, accepting synth audio via my Digidesign 1622s, while I sequenced on those synths in Logic. Pro Tools controlled the audio via DAE, and Logic served only as a MIDI sequencer. When I finished an arrangement, I'd lock the programs together and record all of the MIDI parts as audio files in Pro Tools. From that point on, Pro Tools would be my working environment for overdubs, audio editing, mixing, etc. I had the best of both worlds as I saw it: MIDI tasks in Logic and audio tasks in Pro Tools.

"The advent of virtual synthesis blew this setup out of the water. In order to continue to work this way, and take advantage of both TDM and VST synths, things got too complicated. I'd load the Virus TDM, for instance, on a Pro Tools aux track and control it from Logic via OMS. Every time I wanted to change a patch, I had to switch programs! In order to use VST synths, I'd load the ESB on a Pro Tools aux track, and then load a VST synth on a DTDM track in Logic, linking them through Direct Connect. If I then wanted to print VST audio to tracks within Pro Tools, I'd often have to start Pro Tools in record with five or six bars of pre-roll, switch to Logic to re-establish the DC connection, switch back to Pro Tools to monitor recording, levels, etc. Switching between programs while running the Virus TDM would often cause Virus to freeze, meaning that I'd have to remove and re-instance the plug before audio output from the plug-in would stop!

"The solution to all of this was to turn the Digidesign hardware over to Logic, and to run only Logic during the composing/arranging/sequencing stage. I built my virtual mixer in Logic, accepting input from the 1622s as before, yet I've also augmented my mixer to take advantage of the soft-synth world. Even on my

GREAT DAW CHALLENGE

old 9600/XLR8 G4 450, the amount of virtual synth/sampler power I'm getting is amazing and a joy to work with. My default setup loads with four stereo instances of Virus, four EXS24 stereo instances, four EXS24 mono instances and four stereo VST synths [B4, Absynth, EVP88, Cheese Machine] running through the ESB. I've loaded additional Virus and EXS24 instances without any problems. The only practical limitation I have is that at a certain level, the density of VST/ESB data can cause clicks and pops, I believe due to the bus speed on my trusty ol' Mac. Nevertheless, I've lately been doing full MIDI arrangements that are 80 percent based in virtual synthesis. In terms of plug-ins, I've got access to all of my TDM stuff, and on the VST instruments, I've got VST plugs on the DTDM track that hosts the VSTi, and TDM plugs on the ESB track that routes the sound to my audio interface! Making sampler banks in the EXS24 is a dream: Point it at a bank of .WAV files, tell it to map chromatically…done. Working with ReCycle this way is also amazing: Recycle the loop, export the slices and a MIDI file, make an EXS24 instrument, drag the MIDI file in and off you go.

"In addition to functioning as my audio mixer, MIDI sequencer and virtual sound palette, my setup also handles simple audio recording, naturally! Since I still prefer to work with audio in Pro Tools, I generally bus all of my MIDI-generated output to audio tracks when I've completed an arrangement. Usually, I'll just record all tracks from bar one and import them into a Pro Tools session, compacting the files where there are tons of blank audio. Before that, though, when I'm still in Logic, if I need to record a vocal or a couple of guitar parts to arrange MIDI against, I can. If any of that ends up being final, I do the same thing I do with the synth output: bus to an audio track and import into Pro Tools.

"Once the session exists as audio only in Pro Tools, my good friend and frequent partner Kevin Killen can take a copy and

start to do his thing on it, via our Titanium/Magma-based mobile rig. He prefers to work in Pro Tools. If at some point I need to do any additional MIDI work, I can either do it in Pro Tools, which is fine for an extra MIDI part or so, or if it's a bigger task, I can go back into the original Logic document. The flexibility is wonderful.

"While I do have a couple of practical limitations (which might well be reme-

Ned Mann, aka the Digital Doctor

died by a new G4!), I'm generally doing substantial work using host- and TDM-based virtual synthesis, MIDI, audio recording and audio mixing all on one computer. It's an amazing time."

WRAP-UP

Because of the factors mentioned by both Goodman and Snitzer, many users decide to go with a combination of Logic and TDM. The tight integration with Digi hardware, as well as the extensive support for VST and soft synths, seems to make a compelling case. For established users, however, the decision to change programs is not to be taken lightly. The first tight deadline will often send my clients fleeing back to the safety of their original sequencer.

This fall will be a turbulent time. Apple's acquisition of Emagic is a perfect example of how fast things change. Soon, when Emagic, MOTU and Digi release versions that support OS X, the playing field may change yet again. VST is not supported in OS X (or it will have to be completely rewritten), so we will have to wait and see how that shakes out. Stay tuned. ∎

Ned Mann, a bassist and recording engineer/producer for 25 years, runs Interactive Sound, a recording studio in Ringwood, N.J., and Digital Doctor, a studio consultation business.

Specifications

	AD-16		DA-16
Inputs:	16 analog inputs, balanced; Word Clock	Inputs:	16 channels of AES/EBU, TDIF and ADAT (inc S/MUX) Word Clock
Outputs:	Four TosLink interfaces, 2 x 8 ch channels in ADAT mode and 4 x 4 for S/MUX; Optional AES/EBU & TDIF cards; Word Clock	Outputs:	16 analog outputs, balanced, –10 dBV to +28dBu
Resolution:	24-bit	Resolution:	24-bit, Delta-Sigma conversion
Sample Rates:	44.1, 48, 88.2, 96 kHz ±10%	Sample Rates:	32–106 kHz
Relative THD+N (S/(N+D):	–105 dB @ 1kHz, –0.5 dBFS output	Relative THD+N (S/(N+D):	–104 dB @ 1kHz, –0.5 dBFS input
Dynamic Range, –60 dB:	–117 dB A-weighted	Dynamic Range, –60 dB:	–116dB A-weighted
Passband Ripple:	0.001 dB	Passband Ripple:	0.0002 dB
Stopband Attenuation:	110 dB	Stopband Attenuation:	115 dB
Interchannel Crosstalk:	≤ –120 dB	Interchannel Crosstalk:	≤ –125 dB
Frequency Response:	10 Hz–20 kHz, ±0.025 dB	Frequency Response, 10 Hz–20 kHz:	Gain: ±0.15 dB; Phase: << 1.0°
Input Levels, maximum:	24 dBu, 18 dBu and 4 dBV	Functionality:	Wide and Narrow Lock indicators, sample rate indicators.
Clock Jitter:	<22 pSec (ext WC input)		Signal present indicator per channel
Functionality:	Lock and sample rate indicators. Signal present and "over" indicators per channel. Internal clock (four sample rates) and External (word clock) input. Soft Limit and UV22HR buttons. Power switch & indicator. Rear panel reference level indicators - from a multi-turn trimpots (one per channel).		Clock source selection, WC, Bank 1 or Bank 2 Input selector (2x) Power switch & indicator Digital gain control with auto-storage
Connectors:	1 IEC power connector chassis male 4 Toslink optical transmitters for ADAT-S/MUX output 2 BNC for Word Clock input & output 2 DB25-B for analog input, Tascam standard pinout Option cards: 1 DB25-B for AES/EBU, 2 DB25-B for TDIF digital outputs	Connectors:	1 IEC power connector chassis male 1 DB25-B for AES-EBU input. 2 DB25-B for TDIF input 4 Toslink optical receivers for ADAT-S/MUX input 1 BNC for Wordclock input 2 DB25-B for analog output, Tascam standard pinout
		Case:	1U (1.75 in) high, 19 in rack-mount
Case:	1U (1.75 in) high, 19 in rack-mount	Power Supply:	Linear power supply, Toroidal transformer
Power Supply:	Switch-mode	Input Voltage Range:	100–240 Volt AC (switched) 50–60 Hz
Input Voltage Range:	100–240 Volt AC 50–60 Hz		
Power consumption:	~25W	Power consumption:	~25W
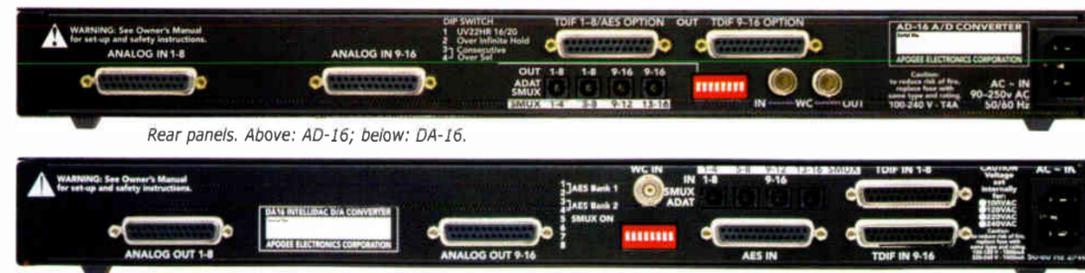
Rear panels. Above: AD-16; below: DA-16.

Nuendo

	Computer Hardware, PC:			**Computer Hardware, Mac:**	
	Minimum requirement:	Pentium II 233 MHz, 128 MB RAM Parallel port required		Minimum requirement:	PowerMac G3, 128 MB RAM USB port required
	Recommended System:	Dual PIII / Athlon 1 GHz or faster, 256 MB RAM		Recommended System:	PowerMac G4, 256 MB RAM
	Operating System, PC:	Windows 98 SE, 2000, XP		**Operating System, Mac:**	MacOS 9.1 or higher; MacOS X 10.1.4 or higher
	Audio Hardware, PC:	Supports ASIO 2 spec for high-end multi-channel audio cards Supports Windows MME spec for standard sound cards		**Audio Hardware, Mac:**	Supports ASIO 2 spec for high-end multi-channel audio cards Supports Sound Manager

The Sound of Apogee.

Apogee's AD-16 is a 16-channel, 24-bit A/D converter, operating at sample rates up to 96 kHz. Its powerful multi-channel configuration integrates perfectly with the Nuendo DAW, and it is ideal for surround applications. The system offers ADAT optical outputs and optional AES/EBU or TDIF, for compatibility with many digital audio systems. The unit syncs to word clock or its own internal high-stability clock. Word Clock output is also provided.

Optical outputs on the AD-16 support the Sonorus S/MUX specification for sample-splitting of high sample-rate audio data into multiple ADAT-style optical interfaces. Additional light-pipe outputs are provided to deliver up to 96 kHz digital audio from all 16 channels in this mode: ideal for the 96/52 PCI card supplied with NativeTools.

An expansion port allows the addition of optional TDIF or AES/EBU daughter cards. LEDs indicate signal status on each channel, with the intensity modulated by the signal level to give an "analog-like" display. A second LED per channel indicates "overs", and may be user-configured. The balanced analog inputs are organized into two groups of eight channels on 25-pin D connectors.

Apogee's industry-standard word-length reduction system, UV22HR, is included for reducing the word length from the converter's native 24 bits to 16-bit for CD mastering, Internet audio, etc, or 20-bit for DVD-Video and other applications. UV22HR retains virtually all the

AD-16 & DA-16: 16 channels of Apogee at 24/96.

high-resolution detail without creating artifacts.

Apogee's unique SoftLimit system maximizes digital output level without overs. These features are easily activated with a pair of buttons, and may be optionally applied to channels 1–8, 9–16 or all.

An elegant and effective user interface characterizes the AD-16, including a power switch, sample rate/sync selector, clear "overs" button, and two buttons for Soft Limit and UV22HR respectively. Rear panel DIP switches select regular ADAT versus S/MUX mode, "over" settings, UV22HR output resolution, infinite hold for the over indicators, and set the sample rate to 1x or 2x Word Clock.

The AD-16 closely matches its companion, the DA-16 16-channel D/A, in appearance.

Without compromise, these products make superior conversion more accessible, and more available for a wider range of creative applications. Both are ideal companions for the Nuendo DAW software that forms a vital part of the NativeTools system.

AD-16 Features
- 16 channels of Apogee A/D in a compact 1U package – perfect for tracking, surround or multitrack transfer
- ADAT+S/MUX and optional TDIF or AES interfaces to connect to Nuendo and other DAWs and MDMs
- Full 24-bit A/D conversion for maximum quality
- UV22HR retains detail at 16- & 20-bit resolutions
- Sample rates up to 96 kHz – ideal for DVD-Audio and other high-density formats
- Soft Limit minimizes the chance of overs and maximizes digital output for the hottest recordings
- Adjustable "over" definition: 1–4 successive FS samples
- Locks to 1x or 2x the external Word Clock sample rate
- Multi-turn pots for level calibration

Nuendo: The Premier Audio Production System.

Before the advent of today's super-computer-power PCs, early digital audio workstations (DAWs) relied on expensive, proprietary hardware with dedicated DSP chips. But today, computers are much more powerful – and much more affordable, making them ideal platforms for a high-power DAW solution.

For more than a decade, Steinberg Media Technologies has been the leader in native, host-based DAW systems. Building on that experience, Steinberg has created **Nuendo**: the ultimate audio production tool.

Instead of requiring dedicated DSP hardware and locking you into an expensive proprietary environment, Nuendo uses the power of your computer's CPU to deliver awesome performance, scalability, and above all, flexibility. With simple, expandable hardware interfacing that uses industry standard interfaces, not expensive proprietary ones.

Flexible by Design
Flexibility is the key to Nuendo's superiority for digital audio recording, editing and mixing. Configure Nuendo to work the way you want with user-definable Key Commands and Views. Import almost any audio file. Choose the operating system that best suits your needs: Macintosh® OS 9 or X, Windows® 98, 2000 or XP. And Nuendo benefits from the added power and flexibility of multiple processors – allowing configurations far in advance of current hardware-based DAWs. Enhance Nuendo almost indefinitely with an enormous range of VST plug-ins: even connect multiple machines and platforms together with sample-accurate VST SystemLink.

What Is Nuendo?
Nuendo offers a 200+ track recording facility, complete with a 200+ channel audio mixer including everything you need for fully professional recording, editing and automated mixing – and that's just the beginning. In film scoring, post-production, music recording, TV and radio, or video games, Nuendo has the tools to get the job done easier, faster, and for a fraction of the cost you'd expect. Nuendo won't limit your creative output, delivering support for mono, stereo, or any surround format up to eight discrete

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DA16
24/96 INTELLIDAC

Designed to interface seamlessly with the Nuendo DAW part of the NativeTools package, Apogee's DA-16 "IntelliDAC" offers 16 channels of Apogee quality in a compact, convenient 1U package, handling 24-bit D/A conversion at sample rates up to 96 kHz.

Digital inputs to the DA-16 may be derived from AES/EBU, ADAT optical or TDIF sources, and the unit can sync to word clock or a specified input. ADAT and TDIF inputs are organized into two groups of eight, and channels 1-8 and 9-16 can have different sources. In addition, the light-pipe inputs accept the Sonorus S/MUX protocol for sample-splitting high-resolution signals into optical interfaces – the protocol used by the 96/52 PCI card supplied with NativeTools – allowing access to all 16 channels. Input sample rates are detected automatically, and a two-level "Lock" indicator shows "wide" (up to ±150 degrees) and "narrow" (±5 degrees) lock. LEDs indicate signal status on each channel, whose intensity is modulated by the signal level to give an "analog-like" display. The balanced analog outputs are supplied in groups of eight channels on 25-pin D connectors.

"IntelliDAC", the DA-16's subtitle, relates to the converter's unique "intelligent" two-stage re-clocking system. A fast-responding "read" clock, with a wide locking range, fills a dedicated FIFO buffer, while an ultra-low-jitter "write" clock writes the data out of the buffer, and clocks the converters.

A significant advantage of this configuration is that both incoming clock and data are de-jittered. As a result, the system is more insensitive to phase errors between synchronous digital sources. Errors up to ±150 degrees can be corrected, substantially reducing the chances of glitching, and enabling the D/A converter to offer superior performance even with extremely unstable input signals.

A calibration mode is also included, allowing quick and easy adjustment of the reference level for each channel.

The DA-16 is a powerful and audibly superior solution for both multichannel/surround monitoring and analog mixing in the NativeTools environment, completing the record/replay chain with the ultimate in conversion quality.

DA-16 Features
- Unique dual-clocking system locks to almost anything, removing jitter from both clock and data
- Two-level panel indicator gives instant lock status
- ADAT with S/MUX, plus TDIF & AES/EBU interfaces for interconnection with the NativeTools Nuendo 96/52 card and the vast majority of other systems
- 16 channels in a 1U form-factor – ideal for accurate surround monitoring or analog mixing
- Sample rates up to 96 kHz meet the high-resolution needs of the modern studio
- Simple level calibration for perfect interfacing with other studio equipment
- Superior Apogee audio performance where it counts

Because Nuendo is a host-based, native system, it is able to grow with your needs, adapting itself to the latest computer technology. Unlike proprietary hardware solutions, that limit future possibilities, Nuendo delivers the tools you need to keep pace with innovation and with your own requirements.

Nuendo 96/52 PCI Audio Interface Card

The Nuendo 96/52 card, included in the NativeTools package, plugs into your computer to provide extensive digital I/O capability. It features three ADAT I/O ports with S/MUX capability for high sample rates, S/PDIF or AES/EBU, Word Clock I/O and ADAT Sync In.

All I/O is available simultaneously, and the ADAT input features a powerful PLL for perfect audio synchronization.
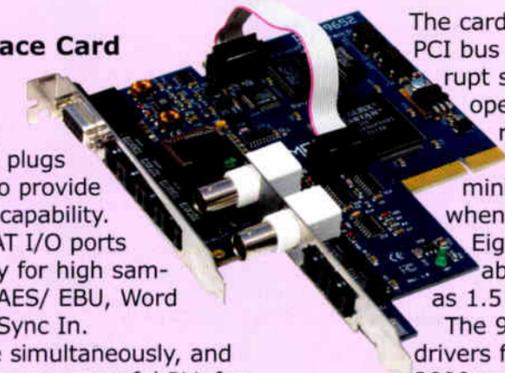
The card features a zero wait-state PCI bus master design with interrupt sharing, and burst FIFO operation allows a transfer rate of 130 MB/s in both directions – resulting in minimal CPU loading, even when using all 52 channels. Eight buffer sizes are available, offering latencies as low as 1.5 ms.

The 96/52 comes with ASIO 2.0 drivers for Windows 98, Windows 2000 and Mac OS, and supports sample rates from 32 to 96 kHz.

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BY RICK CLARK

Gus Dudgeon, 1942-2002

The Last Interview with Elton John's Legendary Producer

On July 21, 2002, the music world lost one of its finest production talents when Gus Dudgeon and his wife Sheila died in a road accident in England. Best known for producing many of Elton John's most critically and commercially successful albums, Dudgeon had also produced David Bowie, XTC, Ten Years After, Joan Armatrading, Audience and the Bonzo Dog Band, among many others.

Dudgeon came up through the ranks, starting out at the renowned Olympic Studios on Baker Street in London in the early '60s, and later joining Decca Studios in West Hampstead as a staff engineer. While at Decca, Dudgeon engineered The Zombies "She's Not There," worked with the Moody Blues and Marianne Faithfull, and recorded the legendary John Mayall's *Blues Breakers* album with Eric Clapton. At the urging of producers Denny Cordell and Andrew Loog Oldham, Dudgeon decided to get into production, and by 1968, he had become an independent producer for his own Tuesday Productions company.

From that point on, Dudgeon produced a number of distinctive and now classic recordings. With David Bowie's first major hit, "Space Oddity," Dudgeon took what could've been a rather noveltyish tune and turned it into a transcendent pop moment. His extensive work with Elton John covered everything from the larger-than-life orchestral sweep of "Tiny Dancer" and "Levon," to hard-as-nails, hook-filled rockers like "Saturday Night's Alright for Fighting" and "The Bitch Is Back," to more reflective numbers like "Daniel" and "Country Comfort."

Elton John trusted Dudgeon's production instincts to the point that the artist basically left the studio after the piano and vocal tracks were laid down, leaving Dudgeon to create that unique synthesis of orchestral pop and Americana that defined many of John's best recordings.

Although Dudgeon was always a fan of organic recordings with real players, the *Guinness Book of World Records* lists him as having produced the first commercial recording that utilized a drum loop, John Kongo's "He's Gonna Step on You Again." It was an acknowledgement that Dudgeon was proud of and also amused by.

During the '70s, Dudgeon joined Elton John in forming Rocket Records, which put out successful releases for Neil Sedaka and Kiki Dee. In the '80s, Dudgeon built SOL Studios and reunited with Elton for several more successful albums: *Ice on Fire, Leather Jackets* and *Live in Australia*. With XTC, Dudgeon produced *Nonsuch* (1992), one of the band's finest albums; during the '90s, he produced Menswear and committed himself to remastering all of Elton John's CDs for Universal.
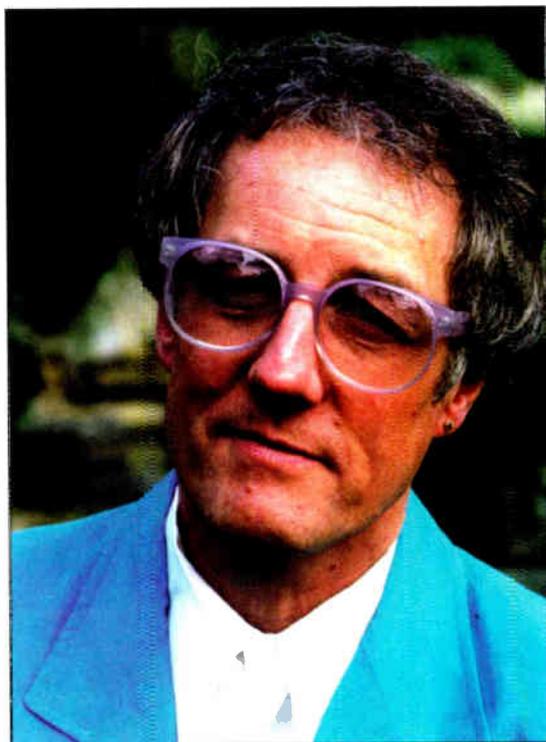
My involvement with Gus began last year, when I received an e-mail requesting a replacement copy of a CD I produce every year for *The Oxford American Magazine*. Gus had loaned it to a friend who lost it. When Gus found out that the CD was one of a series I produced, he got me to send him the rest. From that point on, he sent me numerous and lengthy e-mails about every track on each disc; we wound up spending hours on the phone yakking about music and whatever else was on our minds. I was continually struck by how much he truly loved music, especially Americana and roots-type music. At one point, I asked him if he had ever considered, due to his love of American music, moving to the States. He replied that there had been a time when many of his English friends moved Stateside and had tried to get him to come over. Upon reflection, he'd realized that as much as he loved artists like Doug Sahm, Fats Domino, and

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newer artists like Nickel Creek and The Yahoos, his heart and soul were rooted in England and he knew that he would always stay there.

After one of our conversations, I casually mentioned to Gus that it might be cool to do an interview for *Mix*. He agreed and we did several lengthy interviews shortly before the tragic accident. This is very likely the last interview Gus Dudgeon ever gave, and I hope it conveys some of this legendary producer's enthusiasm for his work and his real love for great music.

How did you come upon the realization that you wanted to work in music?
Well, basically when I left school, I ran through 11 jobs in four years. I got fired from every single one 'cause I used to get bored and would leave without telling them. I worked in a toy store. I sold purple hearts on the streets of London—a

pound for 100. I worked for a clip joint, an advertising agency. Just ridiculous jobs. I had no idea what I wanted to do.

My mother was doing PR for a company that was just opening, which found jobs for people, called ManPower. My mum came home and said, "Listen, we found you a job at a recording studio." And I said, "Doing what? What do I know about recording?" She said, "Well, I don't know, but this guy got sent to a studio last week and I don't think he was that qualified either." So I thought, "Okay, I'll go and do an interview." I was 17 or 18 years old.

So I went to interview for this job at Olympic Studios, which at that point was just off of Baker Street in an alleyway that is now sadly not there any more. I walked into the reception area, and there was a series of Lonnie Donegan EPs on the wall, of which I had two and actually still have to this day. And, in true kind of cheap EP style, they had the same photographs on

the front of each different jacket, only slightly tinted differently. One was tinted orange, one was tinted green, but exactly the same picture of him on the front with a microphone but behind him were these acoustic tiles. Right then, I noticed behind the receptionist were these same acoustic tiles. All of a sudden, I got this rush. I thought, "Wait a minute, people make records in here. I can't believe it!" By the time I had gotten up to the boss' office for the interview, I was already working in this place in my mind. He asked me certain questions, like did I know how a tape machine worked and so forth. By a weird quirk of fate, I actually did have a tape machine made by a company called Baritone. I was able to record little things at home and make a bounce on it, which is kind of nifty and it impressed my friends. I was the only person I knew who had a tape machine.

So, obviously, I was headed in that direction, albeit inadvertently. So he asked me questions and I waffled on a lot of crap. He asked, "Could you take a tape machine to bits and put it back together again?" I'm going, "Yes, of course I can." [Laughs] It was completely untrue. A week later, he rung up and offered me the job.

On the very first day, I made a decision: "Gus, this is it! This is your job. This is your life, and it is what you have to do." When I sat in on that very first session and the engineer pushed the monitors up, I was like, "God, I can hear bass, I can hear things I've never heard on my Baritone machine at home." It was just a thrill, and I was completely blown away with the power of it. I was hooked, and there was no going back from that point on. This was about 1961 or '62. I remember Del Shannon came in and did a session—I was wetting myself.

How did you transition into production from being a staff engineer?
What happened is, I was doing a 4-track Moody Blues session that Denny Cordell was producing, and I was really pleased with the sound we had achieved. It was difficult in those days to get a great sound on every single track. If you put a rhythm track together, you might have as many as five different people on one track. When you got a great sound and a really good balance, it was really not worth changing—I would fight for it. The Moodys got to the session first, and they wanted me to change the EQ and add echo all over the place. I was getting more and more pissed off. And then Denny came in about an hour-and-a-half into the session and

REMEMBERING GUS DUDGEON

The loss of Gus Dudgeon affected an entire industry, but most certainly those who worked with him. On hearing the news, independent Website Elton John World (www.eltonjohnworld.com) assembled a Gus Dudgeon tribute, with comments from people who knew him best. Here are some excerpts, courtesy of EJW:

"I am devastated by the tragic news about Gus Dudgeon. He was an incredibly talented producer and a very dear friend for many years. I will miss him terribly."
—Elton John

"Gus was a legend—and will live on as one—to all of us. As most of you know, Gus and I had always planned to work together again at some stage, and it had been suggested as recently as two months ago that we were going to work together in the very near future. I am lost for words and will miss him desperately."
—Nigel Olsson

"I worked as Gus' engineer for three years but knew him as a friend since 1968, when he met Elton. Gus was a perfectionist, whether mowing the lawn or mixing Joan Armatrading. I'd been at Dick James Music studios for two years and was an Elton John convert. I became Steve Brown's assistant. Steve decided the production wasn't good enough. Then Gus arrived. Bloody hell! Gus made the production amazing! From *Empty Sky* to *Elton John* [Elton's first album with Gus] is a great leap, like chalk and cheese, thanks to Gus moving in." —Stuart Epps

"I had the privilege of working with Gus on several projects over the years, either as a studio engineer, live engineer or as co-producer, and learned a great deal from him. He loved all kinds of music and had an amazing ability to extract the best performances from singers, musicians and technicians alike, and thought nothing of working for hours through the night until he captured that perfect sound. The Nigel Olsson drum sound and Dee Murray's bass sound were classic examples of Gus' brilliance and were such a major feature of Elton's earlier albums."
—Clive Franks

said, "Play me what you've got." Before I played it to him, I said, "Listen Denny, before you hear this, I've got to tell you that since you've heard it last week, the guys had me stick all kinds of shit all over it." And he went, "Well that's probably what they want. Let's have a listen to it." So I played it, and he said, "Well, it sounds all right to me." And I said, "Well Denny, can I just play it to you without any of the effects on it?" He said, "No." I said, "Why not?" He said, "That's what the boys want." I went, "I think that's pretty stupid. A week ago when we did the session, you loved it." And he said, "Well I think it sounds fine now." So he got pissed off and rang the head office. They called me back and said, "Listen, you can't talk to Denny like that. We've just given him his own label. He's an important producer." I said, "Yeah, but I have an opinion. Surely my opinion isn't valueless." They said, "Well, you've got to go back into the control room and apologize to Denny." So I put the phone down with my tail between my legs and went back into the control room, and he said, "Gus, do me a favor. Just let me hear what it is you're talking about." So I took all of the EQ and all of

the effects off and just played it flat. And he said, "You're absolutely right. That's 10 times better. The guys in the band are full of shit. Run it off the way you want to do it." And I went, "Oh, great. Okay."

As he was leaving the control room, after the end of the mix, he said, "You're bored with this aren't you?" I said, "Well,

> The challenge we made for ourselves was to try and marry a big orchestra with a rock 'n' roll section and make it work.

I've been doing it almost six years, and the challenge has gone out of it now. I'd like to move on to something else and I don't know what." He said, "I reckon you should get into production." I was amazed. He said, "I think you'd be good at it."

About two weeks later, I did a session

with Andrew Oldham [producer/manager for the Rolling Stones]. I used to always do his sessions at Decca. At the end of the session, Andrew said, "It's about time you went into production, isn't it?" And I thought, "Christ, you're the second producer in two weeks to say something to me about that." I said, "Well, I'm kind of thinking about it." And he said, "Well, good luck, mate. If you want any help, give me a call." As he walked out the door, he stuck his head back in and said, "Oh, by the way, make sure you get a royalty." This was like '65 or '66. I thought, "What a good idea." But it was between Denny and Andrew pushing me that I kind of took the bull by the horns and went into production.

One of your most well-known production credits is David Bowie's first big hit, "Space Oddity."

The only reason "Space Oddity" was done was because the label was looking for some kind of gimmick. At that point in his career, Bowie's manager couldn't give him away. So Mercury picked it up very cheaply and got in touch with Tony Visconti. Tony said he would do the album, but he hated this "Space Oddity" song. So he said,

"Gus is in the next office. Pop in and see if he wants to do that. He can do it on the B-side, and I'll do the album." And that's how it came about. I spent more time planning ahead of the recording more than any other I'd done. The demos I did for "Space Oddity" were bloody good demos. I also spent a lot of time planning the first Elton album, but it came out of habit from "Space Oddity," and that approach proved to be so successful.

How did your work with Elton John come about?

The fellow who had produced the first Elton album [*Empty Sky*], Steve Brown, said to Elton, "It was great to produce your first album, but I'm not really a producer. I think if we're going to move this thing on, we really ought to be looking for a professional producer to take on the next album." I think it was admirable that he had the balls to say that.

So they started looking around, and one of the songs they kept talking about was "Space Oddity." Steve, Elton and Bernie thought the orchestral arrangements on it were really good. So they rang Paul Buckmaster and said they'd be really interested in me working with Elton John. So, Bucker rang me and said, "Do you know of Elton John?" I said, "Yes. He's got this great record out called 'Lady Samantha.' It's not a hit, but it's getting a lot of play." He said, "Well, if he offers you a job, I suggest you take it. I think it would be well worth doing. He's obviously a good writer."

At the same time, they decided they wanted George Martin to produce their record. Everyone wanted him to produce their records in those days. So they went to George and apparently turned him down, because he wanted to do too much and he wanted to do the arrangements, as well. They said, "Well, we've already hired Paul Buckmaster to do that. He's working on three charts now." Now, this was incredible—no one turned George Martin down. So they went back to the office and rang Bucker up and said, "Well, disappointing news, Paul, you're not going to be working with George Martin." Of course, Paul was very touched that they would stick with him because he was relatively untried as an arranger. So they were talking to him about who they should approach, and he said, "Well, seeing as you like 'Space Oddity' that much, why don't you approach Gus." They seemed to like that idea. Dick James' office was a five-minute walk from my office, so they came over and played me 12

songs off of a demo, and I just couldn't believe it. All of them floored me. Basically, my prayers were answered. Although I'd had four hits prior to this, it was with four different artists. What I really wanted was an artist that I could work with on a consistent basis. So I was like, "Yeah. I'm going to do this."

In fact, that first album [*Elton John*] wasn't really made to launch Elton as an artist; it was really made as a very glamorous series of demos for other people to record his songs. It was kind of like Jimmy Webb making an album and everyone rushes in and covers all of the songs on it. That was kind of the plan behind it.

Is it true that Elton's live album [11-17-70], which quickly followed Elton John, *was a form of damage control from bootleggers?*

That was done as a radio broadcast up at Phil Ramone's studio in New York to an audience of maybe 100 people. It was being bootlegged like mad, so Dick James rang me up and said, "Look, if I send you a tape of this broadcast, do you think there is an album in there?" So I managed to find about 20 minutes to fill each side and he said, "Go ahead and mix it and we'll put it out as an album." We did and it was ultimately one of four albums that were put out in one year, which was ridiculous. We also had the soundtrack to *Friends* and *Tumbleweed Connection*, which was the official follow-up to the debut album.

One of the most distinctive elements of your work with Elton had to do with Paul Buckmaster's huge orchestral arrangements.

GUS DUDGEON SELECTED DISCOGRAPHY

(P, producer; E, engineer)

Joan Armatrading: *The 20th Century Masters* (P, 2000); *Love and Affection* (P, 1997); *Greatest Hits* (P, 1996); *Classics, Vol. 21* (P, 1989); *Whatever's For Us* (P, 1972)

Audience: *Lunch* (P, 1972); *House on the Hill* (P, 1971)

Bonzo Dog Band: *Beast of the Bonzos* (P, 1970); *Tadpoles, Urban Spaceman* (P, both 1969); *Doughnuts in Granny's Greenhouse* (P, 1968)

David Bowie: "Space" Oddity" (P, 1969); *David Bowie* (E, 1967)

Michael Chapman: *Fully Qualified Survivor, Window* (P, both 1970); *Rainmaker* (P, 1968)

Kiki Dee: *I Got the Music in Me* (P, 1974)

Marianne Faithfull: "What Have I Done Wrong," "What Have They Done to the Rain," "As Tears Go By," "Greensleeves," "Come and Stay With Me" (E, all 1964)

Elton John: *Live in Australia* (P, 1987); *Leather Jackets* (P, 1986); *Ice on Fire* (P, 1985); *Blue Moves, Here and There* (P, both 1976); *Captain Fantastic and the Brown Dirt Cowboy, Rock of the Westies* (P, both 1975); *Caribou* (P, 1974); *Don't Shoot Me I'm Only the Piano Player, Goodbye Yellow Brick Road* (P, both 1973); *Honky Chateau* (P, 1972); *11-17-70, Friends* [soundtrack], *Madman Across the Water* (P, all 1971); *Elton John, Tumbleweed Connection* (P, both 1970)

John Kongos: *John Kongos* (P, 1971)

Magna Carta: *Seasons* (P, 1970)

John Mayall: *Crusade, The Blues Alone* (E, both 1967); *John Mayall & The Blues Breakers With Eric Clapton* (E, 1966)

Ralph McTell: *You Well-Meaning Brought Me Here* (P, 1971); *8 Frames a Second* (P, 1968)

The Moody Blues: *Caught Live + 5* (E, 1977); "Fly Me High," "Love and Beauty," "Cities," "Leave This Man Alone" (E, all 1967)

Gilbert O'Sullivan: *Off Centre* (P, 1980)

Chris Rea: *Deltics* (P, 1979); *Whatever Happened to Benny Santini?* (P, 1978)

The Rolling Stones: "Poison Ivy," "Fortune Teller" (E, both 1963)

Sounds Nice: *Love at First Sight* (P, 1969)

Steeleye Span: *Sails of Silver* (P, 1980)

The Strawbs: "Oh How She Changed" (E, 1968)

Tea & Symphony: *An Asylum for the Musically Insane* (P, 1969)

Ten Years After: *Ten Years After* (P, 1967)

XTC: *Nonsuch* (P, 1992)

The Zombies: "She's Not There" (E, 1964)

Paul and I would lie on the floor of his flat for hours going over little sections of songs and talking about lines. We would take turns coming up with different lines, and he would be writing things down. When you finally got into the studio and all of a sudden you are hearing this orchestra running through the parts, and you actually hear it being played by 20 or 30 people, you think, "Wow, this is just magic," because that would be the first time anybody actually heard it. Then you finally marry the string parts up with the orchestra, and it was such a buzz. It was such a white-knuckle ride. There's nothing like hearing an orchestra play a great arrangement. The bottom line was that Paul was an absolutely terrific arranger.

I would almost always book two or four Arco basses as well as the cello to add the real weight to the bottom end. I knew the kind of beef that came from basses from being a tape jockey for quite a few classical sessions.

The challenge we made for ourselves was to try and marry a big orchestra with a rock 'n' roll section and make it work, and not have one of them lose out to another. We also had to make sure the piano, which is a difficult instrument to get through sometimes, still stood out on top.

I was always trying to get Paul to write more cello parts, and he was always saying, "Gus, they'll get lost." And I was saying, "No they won't, because if we pitch them in the right register, they are going to be perfectly audible. I can promise you that."

I would almost always book two or four Arco basses as well as the cello to add the real weight to the bottom end. I knew the kind of beef that came from basses from being a tape jockey for quite a few classical sessions. I was confident I could make it work. I think "Levon" is one of Paul's best arrangements of all time. It's such a fabulous arrangement. That or-

chestra riff on the outro is fantastic.

There's also a great example of a really magical moment at the outro of "Levon." It was when Barry Morgan, the drummer, played the drum fill in the wrong place when he misread the chart. He jumped down a complete line on the chart and played a written drum fill in the wrong place. He carried on playing, even though he realized what he'd done. When he came up to the control room to listen to the playback, I was grinning my head off. He said, "Oh man, I'm really sorry—I screwed up." I said, "Barry, that was a brilliant drum fill. What on Earth made you put it there? It was a moment of genius." He said, "No, no. We'll have to do another take." I said, "No way, you've got to hear it." So we played it back and everybody thought it was brilliant. That kind of stuff doesn't happen if you're programming—there usually are no happy accidents.

Madman Across the Water *was the zenith of that larger-than-life sound. The follow-up album,* Honky Chateau, *was an earthy, folky, funky kind of effort.*

That started a whole different thing, really. That's when we went to France for the first time because Elton was being advised by accountants to record abroad, but more importantly, to write the songs abroad, he wouldn't be paying English tax. I asked to see if I could find something in France and I'd almost given up when somebody tipped me off to Chateau d'Herouville where the Grateful Dead just did an album. As soon as I saw it, I went, "Yeah, this has to be the place." And it turned out to be, as luck would have it, a very successful choice.

Wasn't* Goodbye Yellow Brick Road *also cut there?

Yeah. Well, I must admit, the only reason that it became a double album was because we'd been to Dynamic Sounds in Jamaica anticipating to possibly record there, and I just couldn't get a sound together at all. It was weird. The Stones had just recorded there and they were checking out as we checked in. They told us a few slightly scary stories like don't open the piano lid too fast or you'll upset the cockroaches that live in there—things like that. It took me three days to get a decent drum sound, and eventually we said, "This isn't going to work." So we said, "Let's go back to the Chateau. We know we can work there and it will be fine."

Now at this stage, Elton would write all of the songs for each album in the studio during the five days beforehand. He

Gus and Sheila Dudgeon

already had an album's worth of songs together that he wrote right before we started recording in Jamaica. But when he arrived at the Chateau, he felt like writing some more songs. It was like starting another album project. So he wrote some more songs, and all of a sudden, we had more than a double-album's worth of material. It was only because he wrote two albums—one after the other—because we cancelled the first one. So if we had gone to Jamaica and the sessions had been successful, it would have been a single album. I'm pleased to say that it still is his most successful album.

On Elton's* Tumbleweed Connection *and* Madman Across the Water, *I loved the way you integrated orchestral elements with country Americana instrumentation like banjo and pedal steel.

If the record had been made in America with American musicians, it would have turned out very, very different. The difference was that we were using English guys who loved American playing as I did. I loved bands like Little Feat and The Band, who were one of the finest collections of players ever put together in one group in my opinion.

Elton was always a pleasure to work with. He always left us alone to do whatever we wanted, once he'd done his bit; he never came to mixes, which was a blessing. He only asked me to remix one track out of the many I did with him. As it happens, I'd already decided to do it again anyway! Oh, and there was one other occasion when he didn't care for the banjo we'd added to a track.

One quality that was notable in many of your mixes concerned how totally dynamic they were. "Burn Down the Mission" from* Tumbleweed Connection *or

"*Indian Summer*"*from Audience's* House on the Hill *come to mind.*

First off, I love that Audience album, and that singer is still one of my greatest friends. Audience is one of my favorite bands and I loved working with them. Concerning my mixing technique, I was trying to make CD-dynamic records before they had been invented. I used to do these ridiculous dynamics. To be honest, I did much bigger dynamics on the mixing than was actually apparent on the final vinyl on any of Elton's stuff. I hated the whole vinyl-cutting thing, which was one compromise from beginning to end. You have no idea how many times I had to cut albums like *Tumbleweed Connection, Madman Across the Water* or *Goodbye Yellow Brick Road* to get anywhere near the kind of dynamics I had originally planned. I knew I would have a problem when it came to mastering, but I would just deal with it then.

You got to remaster the Elton catalog. That must have been nice to address that.
Well, I enjoyed doing it. The whole series is now called *The Classic Years.* The first few CDs of Elton that came out were dreadful. They were just terrible, be-

cause they basically didn't understand what they were doing. They looked for the loudest peak and set it up, and go have another cup of tea and watch a TV program while it ran off, and come back and do the other five albums. I spent hours on each of them.

When you think about all of the things you've done and seen, it must sometimes feel like it has been quite a ride.
In the '60s, there were really only three things you should be in England. It was either music, fashion or film. And I just happened to get in the music business at the time when it was absolutely the place to be. Obviously, I didn't realize that is what had happened till halfway through the '70s.

[Laughs] I suddenly realized that I was actually in the best thing you could possibly be doing. I mean, how good is that?

You know, I remember after I had started engineering, The Zombies basically won a contest, which was a record deal with Decca. So having won the contest, at that time, they didn't have much original material—like so many English bands, they were basically doing mostly all of the American R&B stuff. I remember the band came into the session with this really odd off-the-wall song called "She's Not There," and shortly after we recorded it, it went to Number One on the charts. I remember that session really well. A guy shows up from *Cashbox* magazine to present them with their award, and I remember seeing them being given the award and thinking, "God, I would like one of those one day." But you know, it never was an ambition for me. I never got into this business to make money. I got into it 'cause all I ever did as a kid was spend all of my money on records. To be suddenly given the opportunity to actually work in that industry and be a part of making music was like heaven to me. I couldn't believe my luck." ∎

Paramount Scoring Stage M
Storied History of a Legendary Studio

By Chris J. Walker

Despite an increasing number of productions going out of state and abroad, Southern California is still a filmmaking hub. When it comes to scoring, producers have a multitude of facilities to choose from, from the massive Todd-AO to small independent stages. Paramount's Scoring Stage M is neither the largest nor the smallest facility in Hollywood. It can hold orchestras in the 75 to 100-person range, while retaining a special quality that music-scoring artisans find very appealing, what many call "a sweet sound."

"Technically, all of the places basically have the same equipment," notes independent contractor John Rosenberg. Initially a player for 15 years, he's had a 30-year association with Scoring Stage M. "Personally, I like the sound of this room a lot better than some of the bigger stages. Different composers like different stages, but most of the guys I work with like this place."

"Scoring is the icing on the post-production cake," states Stephanie Murray, executive director of Scoring Stage M. "It's the music, and everyone gets excited about it. Also, it's the last element before going to dubbing, and finally, everyone knows how important it is."

Murray is the point person for the facility and has been there since 1986. She says her mission, first and foremost, revolves around accommodating clients' needs. The myriad top-flight composers and production companies who have worked there rolls off her tongue effortlessly, like remembering old college friends. Essentially, most of the projects that come through Stage M are feature scores, but have included sessions for studio logos, CD recording dates and even served as a rehearsal hall for the Oscars. "I think *101 Dalmatians,* the remake, was one of the bigger jobs that came through here," Murray recalls. "We also had *The Horse Whisperer,* and not too along ago *Zoolander.* Just about every *Star Trek* film with the exception of one has been done here." Additionally, the facility donates time for student orchestrators to obtain experience on a real scoring stage.

PHOTO: ANDREA CIMINI

TURNING BACK TIME

In 1932, the facility was transported from what is now the Sunset-Gower Studios on a flatbed pulled by mules. From then until 1968, Paramount's own orchestra primarily used it. Glen-Glenn Sound then leased the stage until the Record Plant took over the lease in 1982. The Record Plant stayed on the lot until 1989, but gutted the area upon departure. Basically inoperable, the stage remained dormant until 1992, when a major revamping was undertaken to make the stage competitive again.

David Schwind, from the San Francisco-based design firm Charles Salter & Associates, was the consultant for the acoustical enhancements, while Paramount's engineering department handled equipment and wiring details. Together, they constructed a facility that was state-of-the-art but maintained the essence of the renowned "sweet sound." However, the room had to be altered, which affected its often-touted multifaceted aspects: During the Record Plant era, the stage featured tunable louvers that enabled it to transition easily from recording small rock acts and jazz combos to large classical orchestras.

Danny Wallin, a recording engineer/mixer since the late '40s with more than 500 films to his credit, was a staff mixer at the facility during the Record Plant years and has seen lots of technology changes

over time—from recording direct-to-disk to recording to hard disk. Elmer Bernstein and Bill Conti are his two favorite conductors, while Sony and Paramount rank as his top picks for scoring stages. "I just like the sound of the room," Wallin says of the Paramount stage. "I like the string sound a lot, and the room just has a lot of definition in it. Overall, it's very pleasant and clean, with a nice singing quality."

Wallin describes the louver system that was installed and used by the Record Plant: "They were 14-foot-long panels that were soft on one side and hard on the other. So, you bring them down a track and you could tune them up if it was live, spin them to make it deader, or go in between and diffuse them. You could do whatever you wanted. For example, I did *48 Hours* here with two drummers, a steel drummer, strings and a brass section tuned down. It sounded great, and the next day we tuned them up and did a classical score."

Paramount's management decided against retaining the tunable walls and opted to dedicate the room to classical scoring. "This [room] is kind of locked into one sound now," Wallin notes, "but it's a good sound, with the original acoustics updated. The only thing that's different now is that we were able to do more before. But I remember when I came here to visit someone in 1946. It looked like the

Howard Schwartz

By Gary Eskow

The year was 1975…

- Communist forces capture Saigon, ending the Vietnam War.
- *Jaws, The Godfather Part II, The Towering Inferno.*
- Carlton "Pudge" Fisk's home run delays the inevitable: Reds win World Series in seven.
- "The Hustle," "At Seventeen," "Lyin' Eyes."

Those days seem so far away. So much has changed. But there are constants, and Howard Schwartz is one of them. While the country was preparing to slip into a post-war party phase that would last for a decade, Schwartz was making his way up the chain as a recording engineer in New York City.

A native of Buffalo, N.Y., who started out as a musician, gravitated to law and spun discs as a service jock during his Army days, Schwartz thought he

Howard Schwartz, after 27 years in business, still feels most at home in the studio.

Move Over FM!
XM Radio Goes Satellite Live

By Mark R. Smith

Music aficionados who fancy "MTV Unplugged," "VH1 Storytellers" and the like would be drooling if they saw—or, to be more precise, heard—the sounds emanating from XM Radio, a high-tech radio studio that was recently unveiled in the nation's capital.

On a scorching June day, in the satellite radio service's new $2 million, 1,500-square-foot performance studio at Washington, D.C.,'s Eckington Place, former Genesis guitarist Steve Hackett is telling war stories between strums of his acoustic guitar during a taping of a segment for XM's Fine Tuning channel. He's one of a growing list of notables, including celloist Zuil Bailey, keyboardist Ben Folds and trumpeter Wynton Marsalis, who have already performed at the state-of-the-art space.
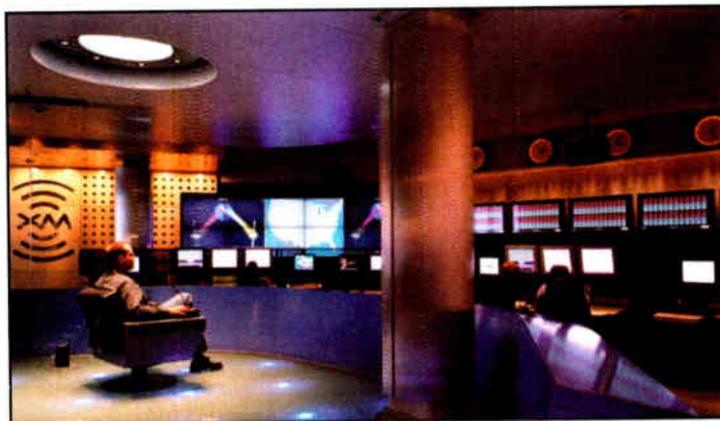
Mission control at XM Radio

The studio can accommodate an audience of 50 or a 40-piece orchestra, and is designed to simulate a chamber concert hall. XM VP of operations Tony Masiello, who helped design the per-formance suite and oversaw construction, says the room easily doubles as a premier recording studio. "It has its own acoustic signature," he explains. "It's not a flat room. It has some reverb."

THE BIG IDEA

The performance space was constructed with diverse surfaces, most notably a floor-to-ceiling glass diffuser that allows passers-by to observe the goings on while ribbon mics, the limited-edition and custom-made DPA 4004 transistor mics (only 100 of which exist worldwide) and a handmade vintage Neumann/Telefunken U47 "vocalist" condenser mic.

The live performance space can hold an audience of 50 or a 40-piece orchestra. Control room with Sony Oxford, at right.

it eliminates reflections that ordinarily bar the use of large expanses of glass in studios. The back wall is canted, angled and contains diffusers, as well. Masiello calls it the "sweet spot" of the studio.

Building from scratch proved a critical advantage for Masiello and a team that included Northeastern Communication Concepts (NCC) and the Francis Daniel Consulting Alliance, allowing them to employ some old and new design concepts.

For instance, the studio and the control room are fully floating, with a steel floor sitting on rubber isolators that Masiello says are akin to "big hockey pucks." Maple and mahogany form the surface. There are also silencers for the air conditioning, an extensive theatrical lighting system by Barbizon, and wall and ceiling Diffusors built by Upper Marlboro, Md.-based RPG, including the OptiCurve and FlutterFree models.

The control room is what's called a "zero-environment" room, lined from floor to ceiling with louvers around high-density plywood so that unwanted reflections are quashed. A 96-channel Sony Oxford digital mixing console with full automation is the centerpiece. Recording is to Pro Tools|HD. In the studio are Coles 4038

WHAT YOU DON'T HEAR...
AND WHAT YOU DO

According to Masiello, NCC was brought in to keep the sound out, and Francis Daniel Consulting Alliance was onboard to keep sound in. "What was unique about it for us," observes NCC design associate Philip Altenburg, "is that it's the largest studio we've ever built using Acoustic Systems pre-engineered enclosures. For that reason, there were some unique structural challenges, like creating the floating 6.25-inch-thick steel floor that's topped by wood, which is glued to itself, not the steel underneath it. It's strong enough to drive the forklift around on top of it.

"It's definitely the quietest room I've ever been in. You can't hear any noise from the loading docks, any of the diesel generators or—and this is key—music from the adjacent control room."

The walls sit on the floor and the roof sits on the walls, without any connections to the surrounding structure. "If condos were built this way, neighbors wouldn't complain so much," Altenburg says with a grin.

Francis Daniel, principal of his West Palm Beach, Fla.-based company, says, "I want to point out that the concept underlying the design of the control room is very unusual in this country. It's used all over Europe, but it's rare here," adding that all such studios built domestically were, until now, designed by Tom Hidley.

Producing an average environment today is meaningless, Daniel stresses, because music is listened to in such an incredibly wide range of acoustic environments, from headphones to multichannel sound systems. What to do? "Get as direct a pipeline from your ear to the source material as possible. That's what this 'zero-environment' concept is about."

"There's an amp for every transducer," states Russell Sherwood, general manager of Eagle EKSC in Olathe, Kan., parent company of XM Radio. "In that system, there are 80 amps and 80 loudspeakers, so they're designed to work together for greater control and very low distortion."

For P.A., XM has installed Studio Live arrays employing 25 mid/bass drivers and four high-frequency drivers, with bass supplemented by 10 drivers in five On Stage subwoofer cabinets, powered by 7,550 watts. "Our goal is to produce a loudspeaker that has less distortion than the ear," Sherwood says. "Our speakers in that room at XM produce the lowest frequency and time distortion you're likely to hear."

As for the studio, the live room is designed to maximize diffusion, which is "a key element in any performance space," Daniel says. "Even walking around the column (by the door), you still basically hear the same balance. It doesn't get any better than that, if I do say so myself. And I do."

For his part, Hackett seems impressed. "Acoustically, it's lovely. That means there's nowhere to hide, of course," he muses, adding a thought that seems to harken back to playing with his old bandmate, the skins-pounding Phil Collins. "Sound carries very well. You'd go deaf very quickly in here with a rock drummer." ∎

Mark Smith is a freelance writer based near Washington, D.C.

air-conditioning noise

reverberation

wind noise

traffic rumble

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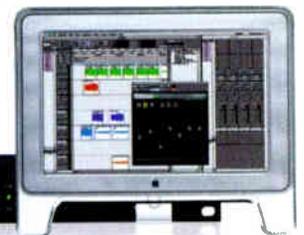
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Paramount

inside of an old barn—sounded good, though. Then Glen-Glenn got ahold of it and thoroughly modernized the room, but it didn't work very well. Then we [Record Plant] got it and revamped it again. We were busy then; sometimes, we'd do three different sessions a day."

THE REDESIGN

Consultant Schwind's memories of the old scoring stage are less romantic. His firm did a feasibility study for Paramount in 1989 when the room was first shut down. After a detailed analysis, it was determined that modifications were necessary to produce a consistently desirable sonic output for orchestras. "We didn't use any of the original sound-absorbing materials, except on the ceiling," states Schwind. "We created a pattern of pyramids and sound-absorbing panels between them. They did have these large wood door things [louvers] that were adjustable. We found that we could put them together and make a V-shaped diffuser out of them. So they were attached together and fixed in place.

"The variability was actually kind of a problem. It was always thought that if you had something that varied, you'd never know if someone had moved one of the variable devices or something else changed, especially when you went out in the middle of a session. So they were

eager to get rid of that variability. For music, there are genre-specific reverberation times that are good. Yet if a scoring stage doesn't have variable acoustics like Skywalker [Sound], you have to make a compromise. Those are between the more modern amplified genres and orchestral, which can tolerate a long reverb time. The Todd stage has a reverb time of 1.8 seconds, but we decided with the Paramount people that the reverb should be 1.2 seconds."

Schwind also conferred with some of the mixers who worked at the facility. He

The crew of Scoring Stage M, Paramount Pictures. L-R: Norm Dlugatch, maintenance engineer; Stephanie Murray, executive director; Dominic Gonzales, floorperson; and Paul Wertheimer, recordist.

says they were pretty much in accord with him and Paramount's management, and especially helpful when it came to construct the new control room. "We wound up basically demolishing the old control booth and building one with much better sound isolation," Schwind recalls. "The booth is on the same floor as the stage, and we didn't want structure-bearing noise transmission between the

two. We put in a concrete floating floor to better isolate the control booth. With that in mind, we changed the design of the control area significantly. It used to be wide and not very deep. We turned that around and made it deeper than it is wide. That allowed us to get the machine room alongside it."

For Robert Spano, the chief engineer of post-production facilities at Paramount—a responsibility that includes picture editorial, sound editorial (not for scoring), ADR/Foley and transfers—Scoring Stage M's refabrication was a work in progress during his initial days on the lot 10 years ago. "It was all rewired, everything was new, all new cables with mic panels in six places throughout the room," he recalls. "The podium can be set up anywhere in the room, and for scoring, we have an editor's table that has a computer going through it for video wipes, which can either be onstage or in the control room.

"We didn't know where anyone wanted anything, so I said just make it so that anyone can put anything anywhere. Five years ago, we moved the [projection] screen back [about 10 feet]. That involved a tremendous amount of work because there were concrete film vaults there. It took weeks to move those vaults because they were bombproof. That gave us another 30,000 cubic feet and opened up the room a lot. The reason we did that was so that we could put more musicians in the room, but it made it sound better, too."

THE STAGE TODAY

From a technical standpoint, Spano likes to keep things simple and makes upgrades as customer and performance demands call for them. For example, there's no routing system employed in the machine room or control room area. Instead, there are three sets of patchbays running on +4 voltage, which are connected by 4-inch conduit running underneath the floorboards. The mixing console is a Neve VR with Flying Faders, which has been expanded from 72 to 96 input/outputs. "It's a huge console now," Spano remarks. "The demand for more inputs was tremendous. Not just for recording, but also to mix. We have three 24-tracks coming in soon, and we're using two 48-track decks sometimes. So we needed to be able to accommodate all of

Stage M control room, with 96-in Neve VR

that stuff, along with external mic pre-amps."

DMT Rentals of Burbank has built a Maserati Pro Tools HD-3 system that will live on Stage M. It's configured with 48 channels each of digital and analog I/O, with, among other innovations, the ability to record 192kHz and 96kHz simultaneously.

For viewing purposes, there's a series of monitors in the control room and out on the stage. Also, a Sharp XG2000 video projector is available for full theater-like viewing. Other equipment that a client might want or need can be rented. Like most operations in Hollywood, the facility is client-driven, which translates to "whatever you want; From premier chefs to cutting-edge file-based systems, we'll get it for you."

Summing up the facility, Spano says, "It feels down-home; you walk in there and feel completely different from the rest of the lot." Schwind adds, "I think it fits very well for the market that they are interested in pursuing. I think it's been a great success. Frankly, it's always a good thing when you're called back and the client likes your work, and it stands the test of time." ∎

Howard Schwartz

deserved a raise from his employer and walked into his boss' office at 12 East Recording one day in 1975 to ask for it. When his request was denied, Schwartz decided to implement a plan he'd already been considering. On August 21, 1975, Howard Schwartz Recording (now HSR Studios) opened its doors with one studio, one engineer (Schwartz) and a receptionist. Within a year, he added a second engineer and embarked on a new construction phase that has yet to end.

Today, HSR Studios has 45 employees, a worldwide list of clients and a reputation as one of the best audio facilities anywhere, period. Affable as ever, Schwartz sat down and spoke with *Mix* about his background, 25-plus years as a studio owner and the future.

What were your business goals back in 1975?
I wanted to make $300 a week and not have to worry about being fired! That's why I opened my own place. I had no business plan, I was a true entrepreneur.
Entrepreneurs don't have business plans?

I didn't! We didn't do business plans in those days. I begged, borrowed and stole $125,000 to build the first studio.
And then you just waited for work to show up?
We were busy the first day. In fact, we opened the day before we opened, before the glass was installed! I was the new restaurant in town, people wanted to try my cuisine.

People liked my mixing, and I had some loyal friends. I'd only been in New York for three-and-a-half years, but I had a solid following. But it was tough going.

The J. Walter Thompson Agency had been one of my main clients at my previous employers, and I expected them to become my biggest client here. But Stan Turner, who was the head of the music department at JWT, didn't give me the work I thought I'd get; I became his Number 2 guy, not his Number 1. That's okay, his son now works for me! By the way, figuring that I'd get the JWT account was the reason we opened in the Graybar building [located in midtown Manhattan, directly over Grand Central Station]. But we did get a lot of out-of-town work

quickly, especially in the jingle area of the business.

Why?

No one was used to having rock 'n' roll technology being applied to jingle work. Remember, after I got out of the Army, I went to Hollywood looking for fame and fortune. I worked at Wally Heider's place and got to work with lots of great rock acts—Crosby, Stills, Nash & Young, Jefferson Airplane, Leon Russell. That reminds me of a funny Leon Russell story. When you worked for Wally, you did anything and everything, including break-

ing gear down, driving it all over the place in trucks, setting up wherever you had to, it didn't matter. You'd get a call at three in the morning and the next thing you know you're on the road! Wally's motto was, "Just get it done!"

Leon Russell used to have a home on Sky Hill Drive, just a big split-level, wacky house. He used to rent Ampex 16-track machines that we had to schlep up the stairs. Leon would have us set the stuff up in a room on the main floor. The drums were in the den, the keyboard sat in the living room and we used the bathroom as

a reverb chamber. The rule was, whoever took the gear was the engineer for the day! Anyone might drop in. Tom Scott became a friend during those days. You might work all day at Leon's and then head over to Santa Monica to record Steve Miller, maybe the James Gang would be opening or Elton John would show up. It was a great time.

Where was I? Oh, the point that I was making was that no one in New York was using this kind of engineering experience in the jingle business, and the fact that I had it made me attractive. I put in all MCI consoles designed for rock 'n' roll, whereas a lot of the consoles used for jingles were clunky old Neves. There was no SSL back then, just Neve, Autotronics, MCI and API. My board was brand new!

Who were some of your early jingle clients?

Ed Labunski came in here to track. So did Kevin Gavin—he did a lot of work on the McDonald's account. A drummer named Jimmy Young told Ed Friedner about our place. Ed mixed for Labunski. When Ed started coming in regularly, I stopped mixing to build our second studio. When Labunski Music was working in Studio 1, I sat outside and took care of everybody. This was less than six months after we opened. In 1976, I built Studio B and hired Roy Latham, who's still with me.

How long did it take for people to realize your formula was having some success and begin to go after your business.

By 1979, Ed Labunski's business had grown quite a bit. I was competing with Sound Mixers. They were on the second floor of the Brill Building and are now part of Sound One. Their place was similar to my facility, but it was much bigger, and I lost business to them. Automated cut into my business, as well.

To stay in business, I built two more studios, which we called Park Ave. East and Park Ave. West, because the 60 or so windows looked down on the park—you can see all the way up to 96th Street. I almost went out of business during that expansion. But my philosophy has always been the same: Do whatever it takes to stay in business. I took no salary for a while and borrowed more money.

When did you begin augmenting the traditional services offered by HSR Studios?

Around 1980, I bought a 1-inch videotape machine, hired George Meyer from ABC and went into the television business. Fred Collins was a voice-over talent who was coming in here regularly. He recom-

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mended George, right after George had won an Emmy for his work on the miracle hockey game at Lake Placid. You remember, the game where the U.S. beat Russia.

We started doing audio post work on *Lifestyles of the Rich and Famous*. All of the audio. Other music studios hadn't made the shift to audio post work, so we had a clear advantage. I started out in radio and some TV, then went into jingles, then went back to radio and TV. That's my history!

We stopped doing jingles around 1985 to focus on post work, but we were still recording a lot of albums in the off-hours. The Rolling Stones mixed *Tattoo You* here. That was a compilation of the previous eight or 10 albums the Stones had done, plus some extra stuff.

Besides the attraction of working with a major personality, what brought the Stones to HSR Studios?

Like I said, *Tattoo You* was primarily a compilation album. They'd tracked in studios all over the world, and the material was in every format you could imagine— 4-track, 8-track, 16-track, dbx, Dolby IEC, just about every format that existed at that time. The stuff would be delivered in a big, red, coffin-like thing that had the tongue on it.

Word got to the Stones that we could handle multiple formats, in addition to having an excellent mix room. We'd do our regular work during the day, and the Stones would come in at around 10 or 11 at night. Bob Clearmountain did most of the album.

We did other records, as well. I remember when Roy Halee came in to produce and engineer a Dan Hill record. We had just bought a set of brand-new chairs the day he came in, and he burned a hole in one of them! That was around Thanksgiving. I brought him Thanksgiving dinner; my mother cooked for everybody!

What kind of learning curve did you have when you got into tape laybacks and other areas of the video industry?

From an ego standpoint, it was very hard. I wanted to learn all about that stuff, but I realized that I didn't know anything at all! So I hired people, and I empowered them to be as successful as they wanted to be.

Is that philosophy the essence of your formula for success?

Absolutely. We hire attitude, not skills. It's all about the human condition; providing an opportunity and letting people

---

sound for picture

run with it. The video area is a good example.

Bob Liftin was the owner of Regent Sound. He invented layback and was the godfather of timecode. Whatever Bob Liftin did, I copied! When I bought my first million-dollar console, I met Mack Emmerman, the owner of Criteria in Florida. Joe Tarsia owned Sigma Sound in Philadelphia, Chris Stone owned the Record Plant in L.A. We all became buddies. Eleven of us started SPARS back in '79. That's where I learned everything. I watched what they did, copied the good stuff and avoided the bad. Back then, I was 33, my company was four years old. I was a baby in the business, hobnobbing with these big guys. They'd worked with the Bee Gees, KC & The Sunshine Band, people like that, and had been recording for more than 20 years already.

Video-wise, Bob Liftin was the expert. We'd have dinners every five or six weeks, our own inner circle. Liftin was always late; he'd regale us with stories about some crisis at NBC that had to be fixed. This was the time when *Saturday Night Live* was just getting going. Bob worked with the live bands, applying our stuff to TV. I listened to his stories all of the time. They were great! House sync—those two words changed my life! Every machine has to run at the same speed; what did I know about that concept before then? That was SPARS for me. Unfortunately, Bob passed away about 10 years ago.

Anyway, the point about HSR Studios is that we hire people who have the right attitude, who are eager to learn and pleasant to be around, and teach them what they need to know to be successful.

In some cases, maybe too successful? How do you feel when talent you've developed leaves HSR Studios and goes into competition with you?

Proud. Of course, no one's put me out of business yet, or affected my business in a way that's affected my lifestyle. I love it when they go out to California and become successful! Seriously, we probably have about 600 graduates of Howie Schwartz University working in the business, from the owners of Broadway Sound, to the chief mixer at Fox in L.A., a mixer at Margarita Mix, one owns his own audio business in San Francisco, another is an English teacher in Japan!

The funniest moments are when I hear stories like, "Twenty years ago, you

sound for picture

What lasting lessons have you learned over the 27 years you've been in business?
I guess there are two: If you tell the truth, you never have to remember what you said, and no matter what it costs, just do it! Some day you'll get it back!

It makes me a little teary eyed, just saying those things. I stand behind both statements. I tell the truth, I've always been fair, and I've given people the opportunity to be whatever they wanted to be and make themselves whole. For example, in this business, you run into people who owe you money. I don't want

> My philosophy is to
> have the best people on
> staff and work at creating
> relationships, not jobs.
> —Howard Schwartz

to sue anyone. I always say, give me $5 a week, make us both whole! I want to be treated the way I treat other people.

I take pride in being an entrepreneur. An entrepreneur will do anything to make sure the company stays open and thrives. I've lost money plenty of times in the last 27 years, but here I am. If you walk through this place, you wouldn't think it's 27 years old. It's new, fresh and young. Every day I love coming to work. Everyone needs a safe place, and my office is my safe place.

Do you consider yourself an icon in the industry?
I'm proud of myself, but I don't think of myself as an icon. I still have to get over thinking of myself as a chubby Jewish boy from Buffalo!

Still, we've had three presidents—Ford, Reagan and Clinton—in here. Schwarzenegger, Schwarzkopf, John Belushi to Jim Belushi, so many characters have walked in these doors! You get to see major stars being themselves. Woody Allen, Sylvester Stallone and Christopher Walken did their voice-over work for the Dreamworks film *Ants* here. Walken loves to take his clothes off when he records. No shirt, no socks, belt off! That's what I love—working with people, seeing them for what they are and giving people a chance to succeed. ∎

Gary Eskow is a Mix *contributing editor.*

XTA Electronics

Celebrating a Successful Decade

reat companies are often born out of necessity. Ten years ago, corporate giant Mark IV (at the time, the parent company of Electro-Voice) was looking to expand its audio empire and completed negotiations to purchase Klark-Teknik, a British company that specializes in pro outboard equipment for the live sound market. The acquisition was a good fit for the Mark IV Audio Group, but the corporation wanted K-T to focus strictly on analog gear, preferring that another of its holdings (the German-based Dynacord) handle the group's DSP development.

The decision didn't sit well with some of K-T's engineers who were excited about the possibilities of digital—particularly, in speaker control—but saw little challenge in simply creating more analog equalizers and crossovers. One K-T hardware engineer, Andrew Grayson, set out to find his own company that would focus on high-end analog *and* digital solutions for live sound applications. He was soon joined by software design engineer John Austin and Terry Clark, the original co-founder of K-T. Another early partner in XTA was Jack Kelly, who had been the U.S. distributor for K-T and launched his new company, Group One Ltd., to distribute Celestion, Cadac, Milab, MC², Clay Paky—and XTA. Group One has since expanded into product development with its acclaimed Blue Sky studio monitors and Elektralite lighting controllers.

Every company needs a name, and for a while, the new team joked about calling their new venture XK-T. Wanting to establish its own identity, the new company was named XTA Electronics, with the acronym referring to the "crossroads of Technology and Audio Applications." Eventually, the company outgrew its humble beginnings in a spare bedroom in Grayson's house in England's west Midlands, and moved to far more spacious quarters in a riverfront facility in Stourport-on-Severn.

XTA's initial products included the RT1 (a unique unit combining a third-octave RTA, SPL meter, RT60 analysis and a swept

XTA principals (from left): Terry Clark, John Austin, Andrew Grayson and Jack Kelly

frequency analyzer), the DS400 mic/line distribution system and the GQ600 graphic equalizer. Today, the DS400 lives on as the expanded/enhanced DS800 8x32 mic/line splitter; 10 years later, the high-performance dual 32-band GQ600 is still in production—an impressive testament to any product; and the RT1 laid the foundation for what was to come. Besides the GQ600 and DS800, XTA's current product line includes the popular DP224 and DP226 speaker-management systems; the DP100, DP200, DP202 audio processors; and the SiDD (Seriously Intelligent Digital Dynamics) dynamics processor. The newest XTA creations are the C2 comp/limiter, D2 dynamic EQ, E2 parametric and G2 noise gate.

The company did well with its initial products, but the debut of its DP226 five years ago set XTA apart from the rest. The 226 offers two inputs, each with eight bands of parametric EQ and delay. Also standard are six outputs (or four in the similar model, DP224), each with HP and LP filters, five bands of parametric EQ, limiting and delay. An optional Audiocore™ software package for Windows can control up to 32 units via any PC.

Two years ago, XTA scored again with the 2-channel DP324 SiDD dynamics processor. Also featuring remote PC control, SiDD offers far more than dynamics, with comp/limiting/gating/expanding, dynamic EQ, parametric input EQ, ADT, harmonics generators, sidechain EQs, delay, and push-button recall of factory or user presets. Designed for FOH or monitoring duties (especially with in-ear systems), SiDD has also found a home with users in broadcast, recording and mastering applications.

Products such as these reflect the "XTA approach," says company founder Grayson. "Our development process is driven by looking at systems, determining their weakest points and looking at ways to improve them." The company has a definite practical streak: The principals are all former engineers or musicians, and they share years of real-world road experience with an affinity for soliciting input from their customers. For example, major tour supplier dB Sound worked with XTA to develop a new Array Control function in the Audiocore software that allows global parameter control. This co-development allows dB Sound—and other SiDD users—to make a simultaneous EQ change over many SiDD DP224 or DP226 units feeding a large array.

In live tours and theater, failure is unacceptable. XTA's rigorous QC process tests all units at four stages, a detail not lost on XTA's customers: At last count, 42 of 52 Broadway shows had XTA-powered racks. XTA processors have also been out with major tours such as Bob Dylan, Slipknot, Roxy Music and the Rolling Stones, who are currently using 32 DP226s to handle digital crossover chores.

To keep up with all of this activity, XTA has expanded to a custom-built, 16,000-square-foot facility just a few hundred meters from its first riverfront home. "The new location is fairly quiet where we won't disturb the neighbors," notes Grayson, whose R&D staff regularly tests XTA gear on large touring rigs at the plant. "Best of all," he jokes, "it's between the river and the pub!" But knowing the work habits of the XTA team, they probably spend more pub time drawing schematics than drawing pints. ■

Audio-Technica

Forty Years of Innovation

I n 1952, Hideo Matsushita, a 32-year-old art and music lover, came from the province of Fukui on Japan's west coast to work at the Bridgestone Museum of Art in Tokyo. During the 1950s, money and resources were scarce in Japan—even in the capital city—and Matsushita began to organize "record concerts" at the museum, where people would gather to sit and enjoy LP playbacks of great performances—a sort of symphony without the symphony. These concerts were quite popular in Japan, especially with the introduction of the first stereo records in the late '50s.

Matsushita saw the coming mono-to-stereo revolution as an opportunity and left to found Audio-Technica in 1962. "We began with three employees in a single-

story barracks in Shinjuku [now a major financial district in Tokyo]. I was interested in producing audio equipment, and at the time, there were few companies making phono cartridges in Japan. I believed that manufacturing phono cartridges was ideal, as it required less start-up capital than other components," explains Matsushita, who, as the chairman of the board, is still active at A-T. However, there were also some learning and growing pains to endure. "Sales of our first product—the AT-1 stereo cartridge—were abysmal." By expanding its line with higher-end products—such as the AT-3/AT-5MM carts and precision

tonearms—and focusing on consumer sales, as well as supplying OEM cartridges directly to phonograph manufacturers, orders took off. Over the next few years, A-T's continued success led to outgrowing several other facilities, eventually settling in the Tokyo suburb of Machida, where the main factory remains today.

Audio-Technica's familiar logo debuted in 1964. Its exact look has changed slightly over the years, but it still comprises a circle surrounding two inner triangles, signifying a round vinyl record, its "V"-shaped groove and a stylus in the groove. True to its roots, Audio-Technica enjoyed years of global success as a leading producer of phono cartridges, with its MM (moving magnet), patented and proprietary VM (dual-magnet) and MC (moving coil) models.

In 1977, Audio-Technica celebrated its 15th anniversary (as well as the 100th anniversary of the invention of the phonograph)

Audio-Technica's in-house facility, AstroStudio, offers a real-world test site.

with the opening of Technica Gallery, a museum exhibiting an impressive collection of more than 100 phonographs. In addition to showcasing historically significant machines, such as early Berliner disc and Edison cylinder machines, the collection also includes more obscure models such as my personal favorite, a 1924 UltraPhon, which features two tonearms that could be placed any number of grooves apart to create a delay effect in the home.

But even as the 15-year festivities went on, A-T was watching distant changes in the market. Early discussions about new digital disc formats were under way. The company launched a plan for diversification, which began with advanced designs for headphones—such as the 1977 ATH-7/-8 condenser headphones and the AT-800 Series of microphones for contracting and broadcast applications. For the time being, vinyl (and phono cartridges) was still king. "However, the commercial debut of the compact disc in 1982 triggered a rapid shift from analog to digital," says current A-T president Kazuo Matsushita, son of founder Hideo Matsushita.

The rise of the CD brought a difficult period to Audio-Technica, but the company endured through new enterprises, such as an OEM division that created optical products, which ranged from bar code readers to laser readers for LD and CD players. Ironically, the same CD players that spelled the demise of phonograph brought new opportunities for A-T via its optical division, and today, A-T is one of the world's leading suppliers in this area. Meanwhile, coinciding with the growing world popularity of Japanese cuisine, Autec—a 1984 A-T spin-off—began to develop commercial sushi-making machines for restaurant use. Expertise in working with thin film technology in microphone and headphone diaphragms led to A-T's TechniClean industrial products for electrostatically cleaning printing films. Other products followed, including home hi-fi speakers, disco mixers, karaoke systems, AC line conditioners, car stereo components, more consumer headphones and high-tech laser measurement systems used in the construction industry.

Perhaps A-T's most significant change—at least to the pro audio community—came in 1991, with the introduction of

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~Steve Greco/Dreamhire

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BY OLIVER MASCIAROTTE

The Sheep Are Still Asleep

Slow Steps Toward File Interchange

Although there have been weak efforts in the past and a good deal of lip service addressing file and session interchange, little actual help for the average practitioner is afforded by old-school methods, unless you are a single-vendor house. What began a decade ago as a proprietary solution, the OMF standard and its spawn, AAF, are, in large part, controlled by Avid and have not made life much easier for end-users and have made pure hell for other audio manufacturers. (For an in-depth look at the history of OMF, see "File-Format Interchange" on page 50.)

Back in 1998, the Audio Engineering Society, identifying a need in the industry for an open approach to session interchange, made a first attempt to bring some order to the chaos. So began the AES31 standard: open, international and designed to simply address interchange of audio content and metadata. Mel Lambert covered AES31 in detail in the October 2001 issue of *Mix*, so I won't dig into the gory details. The standards committee has now ratified two parts, AES31-1-2001, or Part 1, which describes "a common platform so that files may be interchanged among hardware of different manufacturers of audio and video equipment," and AES31-3-1999, Part 3 of the spec, which provides a "simple but extensible system for passing audio material between systems."

The essence of Part 1 is straightforward and succinct. In a word, *fat*. Whether it be 12-bit for floppies or 16- or 32-bit for rigid media, Microsoft's antique de facto disk file system is the foundation for AES31FT, the standard's file-allocation table disk format. Because this is a lowest-common-denominator standard, the more widespread FAT won out over the much-improved NTFS, because universality is paramount. NTFS, the file system developed for Microsoft's professional NT operating system, is a more robust approach than FAT32, a 32-bit version of the file-allocation table first developed for its original operating system, MS-DOS. NTFS has better user access control and handling of modern volume sizes and file counts, along with improved reliability. We all like reliability.

ILLUSTRATION DAVE EMBER

On we go to Part 3, which outlines a "...convention for expressing edit data in text form in a manner that enables simple and accurate computer parsing while retaining human readability." In other words, it's sample-accurate session data expressed as ASCII text. ASCII text is the simplest data format for "human readability," consisting of the upper and lowercase alphabet and common metacharacters like # and $, along with the numbers 0 through 9. So, like the CMX EDL (edit decision list) format for videotape editing that started it all, AES31 Audio Decision Lists (ADL) can be read by any engineer who has learned to parse or understands his or her grammar. As an example, the following fictitious entry would identify a source file used in a project:

```
(F) "URL:file:08/26/01/localhost/Kingston03/AUD001 .WAV"
030A2C68010101010202000230531M80-119F4-28b2-DPDC-
00T06703K9TC040603
09:11:03.03/1101 00:00:07.00/1101
"NAME: MOS RoomTone2"
N
```

The first line identifies a (F)ile entry, and then states the location of that file, as expressed in a URL as you'd see on the Web. That's followed on the second line by the unique identifier, a pseudorandom string that is unique to that file. The fourth line provides the starting timecode address from the source

reel, followed by the file's starting time-code address. The fifth line gives the source reel name, and the sixth line completes or closes the entry. Not too scary, huh? AES31 ADL files can be identified by their—you guessed it—".ADL" extension.

Part 3 also describes the Edit Decision Markup Language (EDML), a very simple "language designed to accommodate the requirements of edit data exchange. A primary design objective is to maximize platform and transmission compatibility and to provide simple and explicit parsing." Notice how many times the word "simple" is used in the descriptions. Simplicity is a key feature of AES31, as most creatures—including software engineers and their project managers—are pain-adverse. In the world of computer-based products, one basic equation rules: Complexity equals pain. Remember, though, that "simple" is a relative term, and although AES31 is simplified relative to prior exchange methods in many regards, it's no walk in the park. Because there are so many proprietary session formats from products old and new, any solution can't help but be fairly complex.

By this time, you may wonder what happened to Part 2. This portion of the spec identifies a preferred audio file format—the EBU's Broadcast Wave Format (BWF) has been fingered as "suitable for this purpose." BWAV files, a professional version of the ubiquitous .WAV sound file format used on Win systems, contains additional time stamp and sync info. Multichannel audio is represented as monaural rather than interleaved files. So, a 6-channel mix would be stored as six monaural files. At the time of this writing, the AES hadn't posted this part of the spec, so I assume that there are some last-minute details to work out.

By the way, interleaved files are a holdover from the days when all audio on computers was derived from studies in "computer music." Those were the days when computers were *big*, the size of a 'fridge or two, and disk drives were slow and stupid. Anyway, interleaved files take all of the channels and time-domain multiplexes them into one chubby file by slicing each channel up into discrete chunks of time, then assembling the pieces, each in turn, into a serial string. Interleaved files, universally frowned upon these days, make disk transfer easier, but processing individual channels is a pain in the butt.

Much more complicated is Part 4, the effort to "...identify a system, capable of working cross-platform, using object-oriented computer techniques, because they offer much greater flexibility than is possible in a simple list." Ouch! Though this process began in 1997, it isn't scheduled for completion until 2005, and my guess is even that date is optimistic. A liaison with the rich media-oriented AAF Association was started awhile back to promote audio interchange within the AAF framework to provide some cross-compatibility with AES31. Not surprisingly, recent activity in this area has languished because vested interests are usually stronger than any desire for improved interoperability.

Let's talk about vendor support. Since I last visited this topic, the list has grown considerably. The pioneers at SADiE have long been the champions of AES31, and now the list of participants includes Euphonix, Fairlight, WaveFrame, iZ, Nuendo, Zaxcom, Genex and Akai. AES31 implementation is in process at DAR, Merging Technologies, Studer, Mackie and Tascam.

In all of this, one cannot help but wonder how our little world of pro audio will fit into the much larger context of digital teleproduction and rich-media production as a whole. The AES is working with SMPTE to make AES31 part of a larger production infrastructure, and I applaud both organizations for taking the initiative to make all of our lives easier. Maybe someday, the AES, EBU, ITU, NAB and SMPTE will become one unified body creating harmonious pan-industry standards, but I'm not holding my breath. Until then, go with what works, and AES31 works.

This discussion of AES31 and other tools is all well and good, but the one important onlooker that's invisible—but essential—to these proceedings is Avid and its Digidesign division. Personally, I think AES31 is strong medicine for the session-interchange malaise, and, with vocal support from users like you, it can become an everyday success. I've said it once and I'll say it again: Demand support for AES31 in the products you purchase and use. You may not need it today, but you most likely will tomorrow. AES31 has reached a surprising state of maturity. So, don't stay asleep, wake up and participate! ∎

OMas provides professional services to content creators and manufacturers large and small. For links to his previous installment of the AES31 soap opera and other useful arcana relating to this column, visit www.seneschal.net.

log 2-track returns are balanced TRS jacks. Two-track analog I/Os are also provided on unbalanced -10dBV phono jacks.

MIDI In/Out/Thru ports support chores such as recalling scenes (automation snapshots), controlling real-time console parameters, Bulk Dumping automation and other data, controlling external machines (including transport functions and track arming) via MMC, and controlling DAWs via the DM2000's predefined remote layers. USB and serial ports handle multiport (supplying eight ports) communication between the DM2000 and a host Mac or PC. Alternatively, installing an optional mLAN I/O card in slot 1 supports 8-port communication over Yamaha's proprietary network. MTC and SMPTE inputs (the latter on a balanced XLR connector) allow synchronizing automixes (dynamic automation moves).

A 15-pin D-sub connects to the optional MB2000 Peak Meter Bridge ($1,100). The MB2000 shows levels for all of the console's I/O and four remote layers, and allows users to globally set pre-EQ, pre-fader or post-fader meter source points for inputs and outputs. A large timecode readout and connections for two lamps (with a dimmer) add the finishing touches to this outstanding meter bridge. Users who decline to purchase the MB2000 can access meters (and a wealth of other data) on the backlit, 320x240-dot LCD screen near the center of the DM2000's control surface.

Besides the dead-quiet cooling fan, the rear panel also features a port to connect a PS/2-compatible keyboard (for quick titling of scenes, automixes, libraries and so on), a GPI Control port (used to control external gear with the

The console's center section offers quick parameter access.

DM2000's faders or 16 user-defined keys) and a 9-pin D-sub remote port (for remote control of machines that support the Sony P2 protocol, such as the head amps on the optional Yamaha AD824 A/D converter). Anyone who needs *lots* of inputs should note that up to four DM2000s can be linked using the console's Cascade In/Out ports.

A/D INPUT AND CHANNEL STRIP CONTROLS

On the DM2000 control surface, each of the 24 A/B input channels features a -26dB

pad, detented (+44dB range) gain pot, analog insert on/off switch, and separate signal presence (-20 dB below nominal) and peak (3 dB below clipping) LEDs. There are 24 48VDC phantom power switches for each of the "A" (XLR) inputs.

The DM2000's 24 100mm channel faders (as well as the stereo master fader) are touch-sensitive and motorized. The channel faders set I/O levels or remote-control parameters in nine different console layers and can be used to punch in automix moves on a channel-by-channel basis. The faders are joined by On, Solo, Channel Select and Auto buttons in each of the console's 24 channel strips. The Auto buttons can be used to set automix playback and recording status —including on-the-fly punch ins/outs—independently for each channel.

The rotary encoder in each channel strip can be used to control channel-input panning and matrix-send balance (Pan Encoder mode), or aux and matrix-send levels (Aux/Mtrx Encoder mode). In each of the four additional assignable encoder modes, one of the 44 available parameters can be mapped to the encoders. For example, the encoders could adjust surround LFE levels in Assignable Encoder mode 1, and the head amp gain on Yamaha's AD824 external A/D converter in Assignable Encoder mode 2. Awesome!

As mentioned earlier, faders and other

CURRENTLY AVAILABLE MINI YGDAI I/O CARDS FOR THE DM2000

Card	Format	Ins	Outs	Resolution/Fs	Connectors	U.S. List
MY4-AD	Analog in	4	NA	24-bit, 44.1/48 kHz	XLR x4	$319
MY8-AD24	Analog in	8	NA	24-bit, 44.1/48 kHz	TRS x8	$369
MY8-AD96	Analog in	8	NA	24-bit, 44.1/48/88.2/96 kHz	25-pin D-sub	$449
MY4-DA	Analog out	NA	4	20-bit, 44.1/48 kHz	XLR x4	$269
MY8-DA96	Analog out	NA	8	24-bit, 44.1/48/88.2/96 kHz	25-pin D-sub	$399
MY8-AE	AES/EBU I/O	8	8	24-bit, 44.1/48 kHz	25-pin D-sub	$319
MY8-AE96	AES/EBU I/O	8	8	24-bit, 44.1/48/88.2/96 kHz	25-pin D-sub	$449
MY8-AE96S*	AES/EBU I/O	8	8	24-bit, 44.1/48/88.2/96 kHz	25-pin D-sub	$599
MY8-mLAN	IEEE1394	8	8	24-bit, 44.1/48 kHz	6-pin 1394 connector x2	$599
MY8-AT**	ADAT I/O	8	8	24-bit, 44.1/48 kHz	Optical x2	$319
MY8-TD**	Tascam TDIF-1	8	8	24-bit, 44.1/48 kHz	25-pin D-sub/wordclock out	$319
AP8DA	Analog out	NA	8	Apogee 24-bit, 44.1/48/88.2/96 kHz	25-pin D-sub	$1,195
AP8AD	Analog in	8	NA	Apogee 24-bit, 44.1/48/88.2/96 kHz	25-pin D-sub	$1,495
Y56K	ADAT I/O	8	8	Waves 24-bit, 44.1/48 kHz	Optical x2	$1,049

* The MY8-AE96S is the same as the MY8-AE96 but adds onboard sample-rate converters and can't be used in more than four slots due to heavy power consumption.
** Can handle 24-bit/96kHz operation in double-channel mode.

controls in the DM2000's 24 channel strips can access nine different console layers: four input-channel layers (serving input channels 1 through 24, 25 through 48, 49 through 72, and 73 through 96, respectively); one master/output layer (controlling the eight buses, 12 aux sends and four stereo matrix-send masters); and four remote layers (using the channel strip's faders, encoders and on buttons to control external MIDI gear and DAWs). The DM2000 includes preprogrammed, remote-layer setup templates for Nuendo and Pro Tools; additionally, users can store custom controller-to-MIDI parameter setups within scenes for their own particular DAWs.

The DM2000 offers eight fader groups and eight mute groups, and input channels can be paired (both horizontally and vertically) across layers. Bus outs, aux sends and surround pans can also be paired horizontally.

Above the DM2000's faders is a gorgeous fluorescent assignment strip that graphically displays each channel's bus routing, encoder value and on/off status of the channel's EQ/insert/delay/compressor/gate functions. It also displays custom user names (e.g., "kick," "vox") for each channel; unfortunately, these names are not stored in scenes. [*This is possible in the latest Version 1.1 software.—Ed.*]

I/O ROUTING

The DM2000's routing capabilities are nothing short of astounding. Input channels, bus outs, aux sends, matrix sends and the master stereo out all feature digital inserts that can be independently placed pre-EQ (post-gate), pre-fader (post-EQ) or post-fader. Any available input port (e.g., from a card slot, A/D, etc.) can be routed to any of the console's digital insert ins, as well as to any of the 96 input channels or eight internal effects inputs. Insert outs, direct outs, bus outs, aux sends, matrix sends and the master stereo out can be routed to any card slot, omni or digital 2-track output port. Inserts can also be patched to internal effects. Users can also store their most used I/O-routing setups in 64 libraries that are dedicated to this purpose.

Adding to the console's flexibility, the master stereo output and all input channels, bus outs, aux sends and matrix sends have independent compressors. The DM2000 also offers six (total) 31-band graphic EQs that can be inserted into the bus outs, aux sends, or the left or right channels of the matrix sends or master stereo output.

SELECTED CHANNEL CONTROLS

All 96 input channels feature a gate, 4-band parametric EQ, delay and—as noted before—a compressor. All 30 output channels (buses, aux sends, stereo matrix sends and master stereo output) offer a 4-band parametric EQ, delay and compressor, as well as provide access to the aforementioned pool of six graphic EQs. Separate libraries are provided to store/recall your custom graphic equalizer, 4-band parametric EQ, gate, compressor, effects and channel settings.

Five rotary controls handle dynamics processing. A button toggles the rotary-control assignments between gate and compressor functions so that they serve either as dedicated threshold, range, attack, decay and hold controls for the gate, or as dedicated threshold, ratio, attack, release and gain controls for the compressor. Separate gate and compressor on/off buttons are also provided.

The parametric EQ section provides two control knobs (one for gain, the other toggles between frequency and Q) for each of the four bands. This arrangement lets users simultaneously adjust two EQ parameters in one or more bands at once. Shelving and low/highpass filters are alternatively provided in bands 1 and 4.

Four other knobs serve three banks of aux sends (12 aux sends total) for input channels or, alternately, one bank of four stereo matrix sends for the console's eight buses, 12 aux sends and master stereo out (forming a 22x8 matrix). The console's 12 aux sends can feed external effects processors—via omni outputs, for example—and/or the eight independent internal effects processors. The internal effects can also be fed by insert outs on the input/output channels or chained together to create multi-effects. The internal effect returns can route to input channels or to insert ins on the input/output channels.

The DM2000's onboard effects include stereo reverbs, delays, phaser, flange, distortion, autopan and chorus, as well as *multichannel* reverbs, autopan, compression, multiband dynamics and modulation effects for 5.1 surround sound. An optional Waves 56k effects plug-in card ($1,049 retail) is also available. You can also define your own plug-ins to control external effects via MIDI.

Other selected channel controls include channel delay (on/off, time, mix and feedback), channel insert on/off, normal/reverse phase and pan controls, including a joystick for surround panning!

MONITORING

A dedicated button switches control room monitoring between your mains and nearfields, with a companion-level attenuator knob for the latter. Possible CR-monitoring sources include three digital 2-track, two analog 2-track, master stereo bus output and two assignable output channels.

NOT JUST FOR RECORDING!

On the Road With the DM2000
By Mark Frink

Yamaha's DM2000 has created quite a buzz within the recording community, but what about its live sound capabilities? To check it out first-hand, I brought a DM2000 to the Britt Festival in Jacksonville, Ore., and hooked it up to a second split on the stage box, running it backstage next to George Relle's PM4000M monitor desk. The Beach Boys brought their own monitor engineer, freeing me to make my own mix on nearfields, headphones and IEMs.

Like Yamaha's PM-1D, there are eight onboard effects units and they sound pretty good, but like many features on this console, quickly programming them takes some getting used to. Presenting this desk to an artist's live sound engineer for the first time requires having a competent technician preprogram it before soundcheck. Pre-production can be done offline using the (Mac/PC) Studio Manager software, which is easier than doing it directly on the desk.

The DM2000's 96 channels are addressed via 24 motorized faders paged in four banks, plus a fifth page to control the output levels of its eight groups, 12 auxes and four stereo matrices. Beyond its 24 XLR analog mic inputs and XLR analog stereo mix outputs, there are eight "omni" TRS jacks that can be assigned as any output. To accommodate additional inputs or outputs, optional mini YGDAI cards must be added to the six slots on the back. (See the table for all of the cards' specs.)

Of the dozen optional Yamaha I/O cards, the 24/96's are the likely choices for live sound. The MY8-AD96 adds eight analog inputs on a 25-pin D-sub connector, and the MY8-DA96 does the same for eight analog outputs. Adding eight channel inputs to all six slots yields an additional 48 line-input channels, bringing the total to 72. The last 24 channels can be used for internal effects returns and for double assignment of inputs that require different EQ or dynamics treatment for foldback. An mLAN/IEEE1394 card is available for networked system applications.

Apogee Electronics also offers high-performance, 8-channel, 24/96 I/O cards (the $1,495 list AP8AD) and the $1,195 AP8DA. It's beneficial to perform A/D conversion outside of a digital machine, so while its A/D input card made a negligible difference, using the AP8DA for console outputs provided a fuller, smoother sound on my Meyer HD-1s. Every DM2000 should be equipped with at least one Apogee D/A card.

Making the DM2000 a 48 mic-input desk would require an additional 24 channels of preamps and converters. The DM2000 sounds as good as a PM4000, and the need for additional pre's may be a blessing if your rider or installation specifies high-end preamps.

Installations where events are regularly repeated (such as houses of worship, theatrical performances, theme parks and industrials) will reap rewards from the DM2000's programmability, snapshot recall and SMPTE-based dynamic automation. Additionally, the ability to store scenes, copy settings from one channel to another and archive EQ, dynamics and effects in libraries give the DM-2000 an advantage for single-user, multi-act productions.

With six 27-band graphic equalizers that can be patched to any output, Yamaha has created a digital recording console with far more live sound appeal than the 02R. Though designed primarily for recording and post-production applications, the DM2000's large number of inputs, compact footprint and comprehensive recall capabilities should also appeal to the live sound and installation markets. ∎

Studio monitor sources include the master stereo bus, CR output, and aux 11 and 12 (for cue mix feeds). Levels for the control room, studio monitor, talkback (from a built-in mic), phones, a solo and surround monitoring are controlled by separate knobs. Slate, Mono and Dimmer (attenuator) switches are standard.

The console's surround monitoring facilities are comprehensive. Both LCRS and 5.1 modes are supported; they use buses patched to slot or omni outputs to monitor surround channel sources. Included are five preset bass-management modes for 5.1 setups and down-mix matrices in LCRS and 5.1 setups. The built-in pink-noise generator is used with individual attenuator and delay parameters to align each speaker in your surround setup; one dedicated console knob can control all speaker levels simultaneously. You can quickly switch between monitoring a surround mix in progress (e.g., the bus outputs) and playback of surround mixes from as many as six multitrack recorders (sourced from slot inputs). As with routing presets, your multichannel listening setups can be saved/recalled in the DM2000's surround monitor library.

AUTOMATION AND REMOTE CONTROL

The DM2000's 99 scene and 16 automix memories dynamically control virtually all mix parameters to $\frac{1}{4}$-frame accuracy. A plethora of automix function buttons on the control surface minimize the need to navigate virtual buttons on the LCD screen. For example, seven "hard" buttons let you choose the exact combination of parameters (fader/mute/pan/surround/EQ/aux/aux switching) to be overwritten on the next pass. Fast!

The DM2000's dynamic automation is similar to 02R operations—02R users will be up and running in no time at all. Relative-Fader mode dynamically trims fader moves that were made in a previous pass with new fader moves. Fader Return mode makes the fader return at the punch-out point to the value it was at on the previous pass, and at the speed you specify for ultrasmooth overwrite drop-ins. To control the fader's return manually, a Fader Takeover mode continues the recording until your current fader position intersects the previous pass' fader data.

Scenes and libraries can be recalled offline. Offline editing is also available for fader/mute/pan/aux/aux switching and surround parameters. A defeatable selected-channel filter thins the data display for manageable event lists. Timecode loca-

tions can be captured on-the-fly and used as in/outs to erase and trim automix events, copy/move events to other channels and timecode locations, and more. Once you're finished mixing, your automixes, scenes, libraries and setups can be saved to a SmartMedia card using the DM2000's built-in card slot.

Dozens of buttons on the DM2000's right side can be used to control the transport, locate, chase and track-arming functions of up to eight external recorders via MMC or Sony P2 serial protocol. The board also includes Studio Manager software to control/display any DM2000 parameters using your Mac or PC.

SOUND QUALITY

The DM2000's A/D converters sound much smoother and more revealing than those in the 02RV2; in A/B tests, they sounded very similar to those in the Apogee AD-16 in terms of spectral balance, depth and channel separation. The DM2000's head amps sound far more robust than the 02RV2's, capturing plenty of low end and high-frequency detail. I produced superior tracks using a Millennia HV-3 mic pre and Apogee Rosetta A/D as my front end, but few—if any—consoles at any price can stand up to the quality afforded by such highly specialized outboard gear.

The DM2000's EQ sounds excellent. The console's compressors are a huge improvement over those in the 02RV2; at moderate settings, they sound quite transparent, both dynamically and spectrally. The onboard plate-reverb algorithm—and to a much lesser extent, the room reverbs—exhibited fluttery tails. However, most of the DM2000's internal effects sound great, with early reflections, delays, modulation effects and even the hall reverb program winning particularly high marks.

CONCLUSIONS

The DM2000's phenomenal routing capabilities and jam-packed feature set will astound you. The generous allotment of controls and their logical layout make working with this console a joy. Add the console's impressive sound quality to the mix and you've got a truly incredible value. Anyone who is looking to buy a serious digital production console should check out this amazing console. The DM2000 rocks!

Yamaha, 6600 Orangethorpe Ave., Buena Park, CA 90620; 714/522-9011; www.yamaha.com. ∎

Mix contributing editor Michael Cooper owns Michael Cooper Recording in beautiful Sisters, Ore.

World Radio History

Emagic Logic Platinum 5.1 and Logic Control

Workstation and Hardware Controller

Emagic's Logic Platinum Version 5.1 picks up where Version 4.8.1 left off and adds a whole slew of enhancements to the program's already impressive engine. Highlights include new proprietary effects and instrument plug-ins, comprehensive automation features, improved audio file-format handling, graphical user-interface enhancements and integration with Logic Control surfaces.

The 5.1 upgrade is available for all Logic versions. The stock soft synths are included in every version, although only Platinum features all of the effects plug-ins. Emagic offers competitive upgrade prices for those who would like to trade in their current digital audio sequencer for Logic. Or, you can just purchase a complete version of Logic, independent of any manufacturer incentive.

Before upgrading your version of Logic, there are some important things you need to know. On a Mac, Version 5.1 requires OS 9.1 or later, though Logic is not yet OS X-compatible. If your system is not up to date, then you will need to fix this before you can perform the install. Since Version 4.7, Logic has supported Apple dual-processor computers, though for this field test, I ran it mostly on a 500MHz G4 Titanium Powerbook (which it ran wonderfully on). If you're using the program on a PC, it still runs with Windows 98, as well as 2000, ME and XP. You've probably heard by now that with Apple's recent purchase of Emagic, the company is discontinuing its PC products; however, the official word from Emagic is that it will continue to support existing PC products. Time will tell how that support is maintained.

NEW-SCHOOL COPY PROTECTION

Version 5.x comes with a brand-new copy-protection dongle called the XSKey. It's USB and is meant to replace all previous forms of copy protection for all of Emagic's software (including virtual instruments like the EXS24 and EVP88). The good news is that you are no longer prompted, intermittently, to insert your installation CD-ROMs for ownership authentication. The bad news is that Emag-
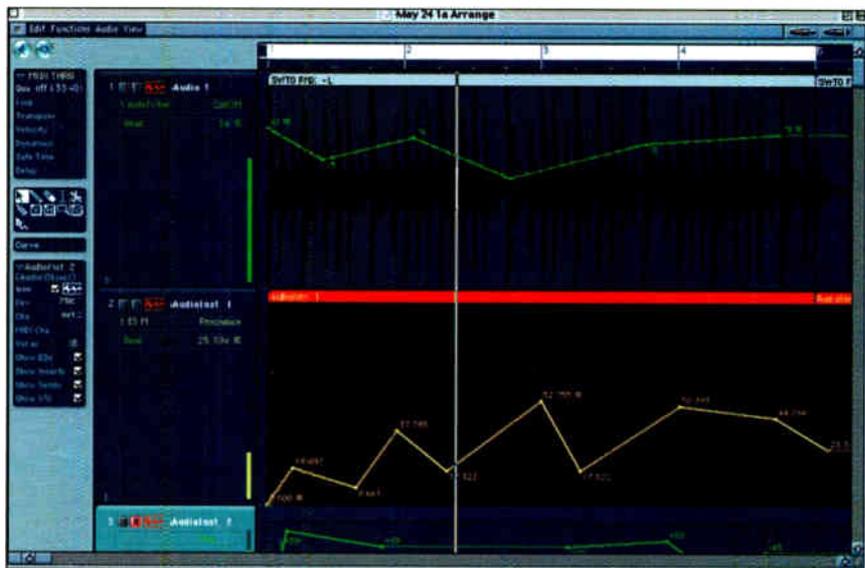
Logic features new automation features, as seen here in the Arrange window.

ic wants all of the original installer CD-ROMs and your old dongle returned.

When you upgrade, the XSKey will let you use the software for 12 weeks before requiring the proper codes to officially unlock everything. You get an envelope (with Emagic's address, but not postage paid) to return all of the requested paraphernalia. When Emagic receives your bundle, it will mail or e-mail you the official codes (hopefully within the 12 weeks). A special system menu that is associated with Logic lets you publish the codes to your XSKey.

If returning old dongles and CD-ROMs sounds like a pain, it is, especially if you own a bunch of Emagic software. For example, I had to stuff seven items—the installer discs for Logic Audio 4, ES1, EXS24, EVP88, ESB TDM, registration paperwork and the dongle—into the provided envelope. (No wonder insuring the envelope is recommended.) I understand the need for a good copy-protection scheme, but this is a bit ridiculous. How about employing a copy-protection system that is more convenient for honest end-users? One-time authentication during the program's initial installation, using its original CD-ROM and a S/N, is my preference. Emagic feels that this system is the best alternative for both domestic and international users; alternatives such as purchasing a new package and recieving credit for sending in a key were more cumbersome.

LOGICAL CHANGES

For the most part, V. 5.1 looks the same as previous incarnations. The program's default predominantly gray color themes still reign supreme. However, there are a few noteworthy improvements that add a touch of zest to the interface. All of the buttons have been given better coloring and backlighting, greatly improving their visibility and 3-D appearance. The background of the Matrix Edit window now features alternating light and dark gray bands to delineate every other note of the keyboard. This is much easier to look at and work with than the old white background and black grid.

The Track Mixer can now display specific types of tracks, such as MIDI, audio or virtual instruments. The buttons to switch between track types are conveniently located to the left of the channels. This is a big improvement and makes the Track Mixer far more user-friendly. Whereas before I spent most of my time tweaking sounds (like adjusting levels and EQ) in the Audio Mixer, the Track Mixer is now my window of choice for such operations.

Zoom functionality has been greatly enhanced. Several key commands are now included to save and recall zoom settings, as well as zoom to fit a selection horizontally and vertically, or just horizontally. The ability to strike a key and

zoom all the way in to a selection, without repeatedly pressing arrow keys or touching those crazy telescoping tools, is really appreciated.

AUTOMATION ARRAY

It's been a long time coming, but I'm happy to report that full-fledged automation has finally arrived. Even plug-ins (effects and virtual instruments) that support automation can now be controlled—yippee! The automation modes are available directly from the channel strips: Read, Touch, Latch and Write. The old MIDI Automation mode is still available. The only mode that is noticeably missing is Trim. Though it's possible to hold down Option and trim multiple break points of an automation curve using the mouse just as before in Hyper Draw, this isn't the same as using a fader to trim a level.

Viewing automation in the Arrange window is handled nicely. Automation curves appear in standard breakpoint form and can be treated just like MIDI data in Hyper Draw. Multiple curves can be viewed at once, and when zoomed in, the automation data you want to see can be selected directly from the track (see screenshot). The only thing I missed was a way to constrain breakpoint creation to the tempo grid. This would make it easier to draw in automation moves locked to the beat and cook up effects like periodic (as in a sine or square wave) volume changes.

HARDWARE CONTROL

Emagic teamed up with Mackie (the folks who designed and built the HUI control surface) to build the Logic Control ($1,299) and Control XT ($1,199) units. Logic Control is the 8-fader master control surface with buttons to access almost every facet of Logic, and Control XT is an 8-fader expansion module. Both units are MIDI and require their own input and output MIDI ports to communicate with Logic. You can hook up as many Control XTs along with Logic Control as you have MIDI ports available.

With the Logic Control and XT units properly connected, they are automatically recognized when the program is booted. Open a project and the control surfaces will update to reflect the session's settings. Out of the box, the control surfaces work with Logic's internal MIDI routing. To have them operate with OMS, you will need to download an update from Emagic's Website (www.emagic

.de). If you use Digidesign's Pro Tools and would like to use Logic Control to control this program, a HUI software emulation is also available from Emagic's site. The emulation software runs in the background and allows Logic Control to communicate with Pro Tools via the OMS IAC buses. Though Logic Control under HUI Emulation mode is missing the specific function buttons found on a dedicated Pro Tools controller, the unit's communication with Pro Tools is amazingly well-conceived.

The control surfaces feel good with touch-sensitive, 100mm Penny & Giles faders and solid knobs and buttons. Logic Control is about half of the size and weight of the HUI, but feels just as well built. There are some nice refinements over the HUI, like the smooth detent action of the jog/shuttle wheel and V-pots, and the slightly raised Transport bar with its inset buttons. Most of Logic's functions can be accessed directly from Logic Control, from basic panning and levels to environments, channel inserts (effects and instruments) and markers. A Flip mode enables swapping the V-pots with the faders to let you control a plug-in's parameters with faders instead of knobs—a very cool trick.

However, despite all of Logic Control's power, I was not able to lose my mouse and keyboard entirely. I continued to return to these controls to edit and perform custom key commands. A dedicated Edit Key section (with at least Cut, Copy, Paste and Repeat keys) and a user-assignable 10-key pad would be nice additions in the future. And, call me old-school, but it makes a world of difference to have a couple of monitor feeds right on your mixing surface. To mix properly, you need to be constantly comparing your mix between a few different speaker sets. Sure, you can set up a separate monitor mixer on the side, but that eats up desk (or rack) space and can be an inconvenient reach when you're trying to keep your ears focused on the sweet spot. A monitoring system like the HUI's would also be appreciated on the Logic Control. Emagic says it left the feature off to maintain the low $999 street price.

PLUG-INS FOR EVERYONE

There are a bunch of new effects plug-ins that range from utilitarian to wacky. On the essential studio-tools side, there is a de-esser and an exciter, two invaluable limiters and a multiband compressor. For

more creative processing, there are a couple of interesting distortion plug-ins and a phat SubBass harmonic generator. All of the plug-ins sound good and can be fully automated—they're worth the price of the upgrade alone.

For those of you who use Logic in TDM mode, the Tape Delay and Auto-Filter TDM versions of these plug-ins have been discontinued at this time. I know a few producers who regularly depend on these plug-ins and will be unhappy to find them missing from their effects arsenal. Emagic promises that they will be updated to work with an upcoming version, in DAE mode, soon. The native versions of these two plug-ins are still available and function as usual.

The great new plug-ins don't stop with effects either. Three soft synths (Logic-proprietary instruments, like the ES2 and the brand-new EVO1—a vocoder-type plug-in with a soft-synth component that sounds very cool) come standard with Version 5.x. The ES E is an eight-voice polyphonic instrument designed as a pad synth; a mono bass synth is dubbed the ES M; and another more powerful poly synth is called the ES P. The instruments all look like lunar space stations, gray and with landing pads for dials, but together they make an impressive set. The ES P is the most flexible of the bunch in terms of sound design, but a variety of useful sounds can be culled from all of them. I found the ES M particularly useful because it had presets that were quite close to the bass synth sounds that you get from a vintage analog synth.

GOOD LOGIC

Several enhancements to Logic's file handling and formatting have been introduced. All versions of the program now support 24-bit recording and sample rates up to 96 kHz. (Previously, this was only available with Platinum, Version 4.7 and higher.) A Psycho-acoustically Optimized Wordlength Reduction (POW-r) dithering algorithm can be applied during bounce-down. There are three variations of the algorithm to select in the bounce-down menu.

OMF files can be imported and exported for complete file interchange between Pro Tools (to make the file conversions between Pro Tools, you'll need the OMF Tool application, which is available as freeware from Digidesign's Website, www.digidesign.com), Avid, MOTU's Digital Performer and other such appli-

cations supporting this format. Previously, in order to transfer tracks from Logic to Pro Tools for the final mixdown, each track had to be bounced down as a contiguous SDII file to import into Pro Tools. This entire step can now be skipped because all of your audio regions and their start times can be imported directly through OMF. Logic Version 5.x session files are not backward-compatible, but there is an option to save out a session to Version 4.x (sans the new automation data).

Drag-and-drop support of REX files has been implemented, which lets Logic users take full advantage of the many REX libraries available. Loops converted to REX files have been beat-mapped, sliced up and saved, along with a playback directory as a single integrated file. From your digital audio sequencer, you have complete tempo control of these loops without changing their pitch or using time compression/expansion. The format was developed by Propellerhead Software and initially supported by Steinberg's Cubase VST. The EXS 24 (Logic's proprietary sampler) has also been updated to import REX files and will automatically keymap a REX file's beats and load its associated MIDI playback file to your selected track—very cool.

There are many other improvements in Version 5.1, including enhancements to the Score feature (such as multipage views that follow zoom levels in real time, and the notation of aliases and loops) and 999 levels of undo. Unfortunately, it's impossible to cover everything in a single article. Logic was a powerful program before its revisions, and is even more impressive now. The added effects plug-ins are wonderful, the virtual instruments are awesome, and the new automation features combined with the Logic Control surface are smashing. Despite Emagic's annoying upgrade path and copy-protection system, Logic is well worth the hassle. Thanks to the changes, the program has even become easier to figure out. If you shied away from Logic before because of its reputation for a steep learning curve, then try out Version 5.x.

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Visit Erik Hawkins' fledgling record label at www.muzicali.com and check out his new virtual studio recording book, Studio-in-a-Box *(ArtistPro/Hal Leonard).*

Brauner VM1 KHE (Klaus Heyne Edition)

Tube Condenser Microphone

The Brauner VM1 tube condenser microphone garnered a lot of praise when it was introduced in 1994 because of its deft marriage of subtle tube sweetness, remarkably low self-noise, open/revealing sound and impeccable construction. The original VM1 didn't sound like a vintage tube mic; rather, it was a stunning example of the accuracy and nuance that can be achieved using an innovative, contemporary tube-based transducer design.

At AES 1999, Dirk Brauner met Klaus Heyne (of Corbett, Ore.-based German Masterworks). Heyne (who has modified and tuned innumerable vintage mics for top recording studios and Grammy Award-winning artists for more than 20 years) and Brauner forged an agreement to build a new high-performance "super mic." After a period of design, experimentation and extensive field trials, the VM1 KHE possessed a modified VM1 capsule design, modified VM1 circuitry, a different head grille, a different power supply, and a special cable between mic and power supply.

Hand-built in Brauner, Germany, and hand-tuned at German Masterworks in the U.S., the result is a phenomenal microphone that retains its precision pedigree and oozes with primal appeal. Find a sturdy door jamb to stand under, folks—the new VM1 KHE is going to rock your world!

FLIGHT TO QUALITY

The VM1 KHE ships in a lockable aluminum case. Also included are a shockmount, windscreen, and external power supply and connecting cable. (The windscreen may be discontinued in an effort to keep the price stable in the face of unfavorable exchange rates.) Every piece of the system showcases superb craftsmanship, and a five-year parts-and-labor warranty is included. The system lists at a whopping $8,700 (user price is $8,199.99), making the VM1 KHE the world's most expensive microphone.

The side-address mic body is roughly two inches in diameter and 8.7 inches long. It's quite heavy, weighing two ounces shy of two pounds. In fact, the mic—fitted with its weighty suspension and windscreen—proved to be too heavy for my workhorse AKG mic stands in some applications. For example, placing the mic at the end of a long boom arm (with the arm aligned parallel to the floor) caused the boom arm to slip. Vertical placement never caused any slippage, but this mic needs an extra heavy-duty mic stand for the most flexibility in positioning. The good news is that its heavy body won't resonate, adding unwanted coloration to the sound source you're recording.

The VM1 KHE is beautiful. The brass body is nickel-plated, and the head grille for the dual-diaphragm capsule is domed at the top to prevent internal standing waves from ruining the party. Its 27mm (about 1¼-inch) diaphragm is 6 microns thick. A single EF 86 tube sweetens the deal.

The mic connects to the supplied PS1 KHE external power supply via a special, RFI-rejecting, 7.5-meter cable fitted with Tuchel connectors. All polar-pattern adjustments are made from the power supply, and a switch is provided to select between two different directional modes. One mode disconnects the rear-capsule side to provide a fixed-cardioid pattern with 4dB improvement in signal-to-noise ratio. (Brauner maintains that this mode avoids a loss of clarity inherently caused by remote pattern control of a mic.) The cardioid-only mode was optimized for close-miked vocals, but it sounded superb on many instruments, as well.

The second directional mode allows for infinitely variable adjustment of the polar pattern—using a knurled rotary knob—from omnidirectional through wide-cardioid, cardioid, supercardioid, hypercardioid and figure-8 patterns, serving up intermediate patterns along the way. A front panel LED glows red in cardioid-only mode, and glows green when in multipattern mode. Lower your monitor feed before switching modes because moving the switch will produce an audible pop.

No mic roll-off or pad is provided for the VM1 KHE—in keeping with Heyne's goal to create a mic with "the most direct path and the least amount of componentry between capsule and output." You won't need to pad the VM1 KHE in most situations, anyway—the mic handles 138dB SPLs for a conservative 0.3% THD. (Most mics' max SPL specs are rated at 0.5% or 1.0% THD.)

In addition to the AC power switch, an 8-pin Tuchel mic connector and an XLR audio jack out on the rear panel of the power supply, you'll find a three-way ground-lift switch, which does not compromise the safety-earth connection. One switch position lifts the signal ground, another switches the XLR's pin 1 to earth ("hard" ground), and the third position couples the signal ground via a capacitor ("soft" ground).

The VM1 must be secured to the supplied suspension mount in order to place it on a mic stand. This shockmount is essentially a cylindrical tube that floats on an elastomer suspension inside a concentric ring. The VM1 KHE is secured by turning two integral rings that close around the mic. This arrangement takes some getting used to, and mic setup/take-down requires a little more time, but it dependably safeguards this delicate instrument. A lever angles the suspension mount through approximately 180° of rotation.

The VM1 KHE's custom windscreen attaches to the suspension mount with two screws. This, too, is more time-consuming than most "slip-on" designs. The wind-

Four New Angles From The Solution Factory.

Protea 4.24D D stribution System Processor

MX-406 Six Input Stereo Mic/Line Mixer

DPX-100 Graphic Equalizer & Compressor Limiter

DPX-200 Parametric Equalizer & Compressor Limiter

Ashly is known for unparalleled sound quality, rugged construction, and attention to detail. Our products are designed for every audio application you'll encounter and our four new solutions are no exception.

The latest addition to our award-winning Protea series, the 4.24D is a fully programmable 4-in 8-out, 24-bit digital system processor for managing distributed or conventional sound systems. With no front panel controls it's virtually tamper-proof, keeping the audio under total control.

Expanding our line of mixers, the MX-406 provides six balanced-input stereo mic line inputs, making it perfect for use in fixed installations as well as for portable applications. Up to 84dB of gain is available, making it extremely flexible. And with channel inserts and built-in 48V phantom power, it's ready for just about anything.

Make the most of your valuable rack space with Ashly's new dual audio processors. Combining EQ with compression or limiting is a natural solution for dynamics control in any environment. Our DPX-100 gives you a 15-band graphic EQ with short throw faders (from our popular MX Series). The DPX-200 provides a mic/line input and parametric EQ with 4-bands of filtering – two full bandwidth, and one each hi and low shelving. Both are paired with one channel from our famous CLX series.

Give us a call or drop by our web site to learn more about how Ashly's solutions can remedy your audio needs.

Tascam DM-24

24/96 Digital Mixing Console

T ascam's DM-24 digital mixing console represents a large step toward providing home and project studio owners with pro capabilities in an affordable ($2,995 list) package. Sporting 24-bit/96kHz AD/DA converters, 32-bit floating-point processing, 100mm touch-sensitive motorized faders, internal automation, dynamics processing, extensive routing capabilities and the ability to cascade two consoles, the DM-24 provides numerous compelling reasons for digital studio owners to consider it as command central.

The DM-24 is optimized for use with Tascam's family of DTRS machines, yet it's flexible enough to work in several digital audio environments. I tracked and mixed with the DM-24 using ADAT XT-20s and Logic Audio Platinum 4.81 running on my Mac G4.

PHYSICAL LAYOUT

The DM-24 is a 32-channel/8-bus desk with six aux sends. While there are 17 actual faders (16 channel faders plus a stereo master), the DM-24 organizes channels into three layers of fader control, with backlit buttons to toggle between the layers. Each channel has common Mute, Select and Record Arm functions, plus an overload status LED that can double as an automation activity indicator. The top of the stereo master fader includes All Safe and Solo functions that are configurable in software. When the master Solo key is pressed, all channel mute keys become solo keys.

The DM-24 has 16 mic preamps and balanced line inputs on XLR and TRS jacks, and 16 insert jacks for outboard processors. The 48VDC phantom power is switched in groups of four channels. There's no switch to select between mic and line inputs—users must be careful not to connect both inputs at the same time. Gain can be adjusted between 0 dB and 56 dB. The analog I/O section also includes balanced ¼-inch control room and unbalanced RCA studio monitor outputs, 2-track RCA inputs, XLR main stereo outs (with TRS insert jacks) and dual headphone outs. Four balanced ¼-inch sends and returns are software-assignable to act

as inserts on any channel.

All ports for digital audio and control I/O are on the rear panel, including MIDI I/O/Thru ports, an RCA SMPTE/EBU timecode input, word sync I/O/Thru connectors, three TDIF connectors, ADAT optical I/O ports, a DTRS remote connector, RS-422, GPI, ¼-inch footswitch jack and two stereo digital I/O ports supporting AES/EBU and S/PDIF. Two expansion slots accept optional cards for cascade or additional AES/EBU, ADAT optical, TDIF or analog I/Os. The mixer uses passive heat-sink cooling, so there's no fan noise—this is a *very* quiet mixer.

The DM-24 control surface includes sections to control the 4-band parametric EQ, channel assignments, library access (for recalling and storing dynamics/effects/EQ presets and mixer snapshots), transport and automation, and monitoring. Checking status and configuring each section are handled in its corresponding control screen.

INTO THE CONTROL SCREEN

Maneuvering the DM-24 is pretty straightforward. Rotary encoders (with ring LEDs), pods, soft keys, cursor buttons and a jog/data wheel navigate to and configure each channel's settings using a decent-sized 320x240 LCD screen. The DM-24 has three main control screens: System Control (for overall settings), Global Control (adjusting groups of specific parameters) and Module screens (detailed control of each channel, which covers effects, dy-

namics, aux sends/returns, machine control, automation, surround, metering and monitoring, libraries, as well as analog and digital I/O assignments). Each screen can be accessed quickly via 12 buttons that double as a numeric keypad.

The hierarchy of pages is friendly, with only one sub-page associated with any given screen. And no matter where I was, one button jumped me back to the Module screen of the currently selected channel.

The Module screen contains the basic settings for each channel with soft-key menus to access the main setup, dynamics, EQ and aux send sub-pages for channels 1 through 32. (Bus and aux channels don't use these menus.) The top of the Setup screen always has a graphic representation showing EQ settings, with a block diagram of your signal path directly below. The right-hand column shows stereo and dynamics metering, compressor, gate and phase-control switches, EQ/bus status, compressor insert-point indicators, as well as a grouping indicator for fader and mute groups. Along the bottom are the selected channel's trim and pan controls. The central area of the screen is devoted to the following information.

SETUP

The Setup section resembles a channel patchbay, with switches for the channel source, the Aux 1-2 source, gates (channels 1 through 16 only), compressors and assignable inserts. Here, the compressor

and assignable inserts can be placed pre- or post-fader, channel phase reverse is provided and channels 1 to 24 can be delayed up to 371.5 ms (@ 44.1 kHz).
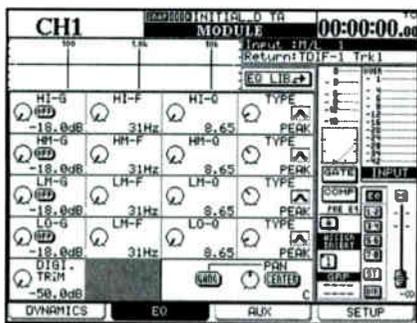
Figure 1: One of the strong suits of the DM-24 is its subtle and musical 4-band parametric EQ. EQ can be navigated and controlled on this screen, as well as via assignable rotary encoders.

AUX

The Aux Send page shows the levels, pre/post-fader selections and returns for all six auxes. Aux 1-2 also allows setting the source to mic/line or return. In the latter, Aux 1-2 can function as a tape return path, while channels 1 to 16 are used to send input channels direct-to-tape. While tracking, a recording snapshot in the library is available with these settings. During mixdown, Aux 1-2 can have the mic/line inputs routed to them instead. When routed to the stereo bus, the Aux 1-2 path essentially provides 16 extra channels at mixdown with pan and level control. The auxes default to fader control, but can be adjusted via the PODs below the LCD screen or using rotary encoders. Additionally, three global screens display all of the aux sends to configure their settings at once.

DYNAMICS

The Dynamics page provides a compressor for all 32 channels and a gate/expander on the first 16 channels. The controls are straightforward, and a library of presets for common applications is available. These are good, not great, dynamics processors that are quite clean, easy to control and—dare I say—almost warm. Special mention: The Hysteresis feature is excellent to tailor the gate's response.

PARAMETRIC EQ

Hands down, one of the best aspects of the DM-24 is its 4-band parametric EQ (see Fig. 1). Settings can be adjusted via the four PODs below the screen. Alternatively, four rotary encoders can function as independent EQ controls for gain, frequency and Q. (In the latter case, HF, high-mid, cy and Q. (In the latter case, HF, high-mid,

low-mid and LF frequency bands can be selected via backlit equalizer buttons. This flexibility lets you adjust EQ for a given module, while tweaking aux sends or dynamics settings with POD controls.)

The HF and LF bands offer peak, shelf or lowpass operation; the two mid bands can act as notch or peak filters. Gain is ±18 dB, and the 24 Q settings range from 8.65 to 0.27. As with the dynamics processors, user- and factory-EQ presets are stored/recalled in the DM-24 library. With a limited 31 to 19k Hz frequency range, detailed applications may require dedicated outboard EQs, but the smooth, musical quality of the EQ and amount of control afforded are outstanding.

THE INS AND OUTS

The DM-24's digital I/O functions like a digital patchbay, routing inputs and "returns" via virtual patch cables (see Fig. 2). Inputs include all mic/line inputs, digital inputs 1 and 2, internal effects returns and assignable returns. These inputs can be routed to any of 32 channels, so mic/line number 12 can be assigned to channel 4, effect return 2 can be assigned to channel 5, etc. The use of "return," as in tape return, is a tricky bit of nomenclature. The DM-24 treats all TDIF, ADAT and option card-slot inputs as returns; these can only be assigned to channels 1 to 24. Channels 25 through 32 are input-only, so you can't route any TDIF or ADAT channels to them. However, these channels can be used as effects returns, and the DM-24's library section includes this routing within its many mixdown snapshots. [Note: The upcoming Version 2.0 software is said to allow channels 25 through 32 to access the return signals. Under V. 2.0, channels 1 to 16 can be used for input signals, while 17 to 32 can be used as tape returns. This negates the need for using Aux 1-2 as tape returns.]

While there is a limit of three return interfaces that can be used for tape returns, all outputs (TDIF, ADAT, AES/EBU, S/PDIF and option cards) are always active, which frees you up to assign and bus 8-channel mixes to different formats, like to ADAT or DTRS multitracks.

MONITORING

The console has an excellent monitoring setup. The Control Room section has selector buttons to monitor the hard-wired stereo outputs and three soft outputs that default to Aux 1-2, Digital In and 2TR In. Different sources can be selected via the Monitor screen. Also provided is a headphone-level control, talkback mic, main control room outs, mono switching, solo

monitoring and two "smart" keys. The latter re-route the main control room out to the studio feeds or slated to the eight mix buses, the six aux buses and the stereo bus.
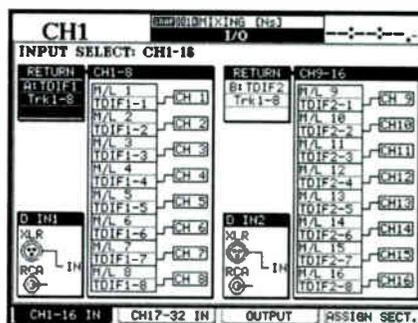
Figure 2: The I/O module of the DM-24 functions like a digital patchbay. Assignments can be easily modified with the data wheel. Here, channels 1 through 16 are hooked up as returns to TDIF parts 1 and 2.

HIGH-SPEED/HIGH-RES

Switching the DM-24 to 88.2/96kHz operation increases fidelity for high-resolution work but reduces features. Rebooting the console set for this mode yields 16 tracks with four aux sends, one effect and one digital out. Basically, you lose half of the desk's power, although all eight buses are available for surround mixing. Also note that the ADAT card doesn't support 88.2 or 96kHz Lightpipe, but Tascam is working with third-party developers to address this issue.

IN SURROUND

In surround applications, DM-24 uses six of its eight buses to send the 5.1 mix. Output can be sent via TDIF, Lightpipe or the option card. Surround modes can also be configured as 2+2 and 3.1. Two side-by-side XY matrices in the Surround screen show two channels at a time, and the PODs manipulate the image.

A Global Boom screen allows users to uniformly edit the bass level for groups of channels. Like other project studio-priced mixers, the DM-24 lacks the ability to monitor surround mixes. Tascam is aware of this in its design and offers its standalone DS-M7.1 ($1,895) as a solution. It also lacks support for a joystick controller, and this won't change. However, software V. 2.0 of the DM-24 will include various refinements for surround operations that add innovative surround panning via the data wheel.

INTERNAL EFFECTS

In addition to its dynamics algorithms, the DM-24 includes internal effects that can be patched as loop/inserts or in series (Ef-

fect1-Effect2). These include Tascam-designed algorithms for delay, distortion, chorus, flanging, phasing, de-essing and pitch shifting. Stored in 127 locations in the Effects section of the library, these can be customized and stored as user presets.

I found these effects fairly basic and decent—most users may prefer routing to dedicated external effects. Perhaps anticipating that users would need an extra enticement, Tascam struck a deal with TC Works to include reverb algorithms. Anyone who is familiar with TC Works' MegaVerb will also be familiar with the sound. They're serviceable but not on par with a good outboard TC or Lexicon box. Achieving proper imaging can be a challenge, so it's best used for subtle jobs within the mix.

Tascam does include some cool mic and speaker-modeling emulation technology from Antares. The former applies characteristics of various high-end mics to your own microphone. This won't turn a C3000 into a U87, but it may improve the sound. More importantly, I achieved sounds that I couldn't possibly arrive at via EQ and compression alone. A poorly miked recording won't be saved, but it may offer a wonderful weirdness that cuts through the mix. It's highly recommended to users who are open to random discoveries and who like to experiment with textures. Antares' speaker modeling simply lets you change your nice monitors into the boombox or computer speaker variety. Inserting this into the main stereo outs provides a reasonable idea of how your mixes will sound on tiny speakers.

All digital audio and control I/Os are on the rear, leaving the top panel for analog-style patching.

MIDI AND MACHINE CONTROL

The DM-24's MIDI implementation serves to send/receive controller data and program changes, sends MMC and locks to incoming MTC, backs up automation and library data, as well as updates the system software. You can program MIDI channel and controller numbers for the fader, mute keys and pan knobs for channels 1 through 32, allowing the DM-24 to control other devices, or vice versa. Another MIDI layer offers DAW control over faders, mutes and pans, acting as a control surface for programs such as Emagic's Logic Audio or Steinberg's Cubase.

The DM-24 can also control many devices via the R-422 port, MMC or the DTRS remote jack. The DM-24 can scan and detect connected devices, as well as map the transport of those devices. ADAT owners note: The DM-24's software has not yet implemented the sync port on the optional ADAT I/O card. For now, you'll need a BRC, MOTU MTP-AV or JL-Cooper dataSync2 and use MMC in lieu of ADAT sync. Each of these devices converts ABS timecode to MTC or SMPTE that the DM-24 can read. All timecode/sync settings are found in an Option screen for selecting SMPTE or MTC as the sync source. Common timecode frame rates of 24, 25, 29.97ND, 29.97D, 30D and 30ND are supported.

AUTOMATION

If flexible signal routing and great EQ make this board a good value, then the automation makes it a great one. The DM-24 lets you automate fader levels, mutes, EQ setting, aux send level, bus master levels, dynamics settings and library recall, as well as surround panning.

The DM-24 designers have reduced the number of steps required to begin automating a mix. Once a mix is set up and sync settings are established, automation is armed within the Automation menu. I started playing my MDM/DAW tracks, and as soon as the mixer read timecode,

I pressed the Write button in the console's Automation section and began mixing.

While automating my mixes, the faders were very responsive, easily punching in and out of automation and providing just the right amount of resistance when moved. The rotary encoder and POD moves can also be automated, but the knobs are not touch-sensitive. However, the software lets me adjust the punch-out time following a knob's release, so I could customize their response. The DM-24 includes common Safe, Trim, Write to End, Rehearse and Undo features. And a useful Multi-Pass mode lets you continue writing

automation once timecode has stopped.

Eight memory banks each store up to 8,000 events, and you are limited to 32,000 events per mix. Complex mixes will quickly swallow up memory, but I always had enough headroom to complete a mix. You don't need a computer to run the automation, but you'll probably use one to back up your automation data and library files. I'd prefer an onboard drive for backups, but Tascam wanted to keep the DM-24 costs down and figured most owners would have access to MIDI devices.

SOUNDING OFF

Monitoring in a quiet room on a pair of HD-1s with excellent cable, the DM-24 provided a very clean and transparent sound without any noticeable artifacts. The converters on this board are simply outstanding. This was particularly useful to evaluate the 16 mic pre's, which are very good—much better than Mackie analog 8-bus in the same price range. However, the uneven gain distribution of the trim pots could be annoying to some engineers who discover the dramatic gain boost around 3 to 4 o'clock. For $200, Tascam offers an upgrade to improved taper trims.

While the manuals for the DM-24 are okay, they don't ease the console's learning curve. Thankfully, Tascam's online DM-24 forum is one of the best I've seen, with respectful and responsive participants, saving hours of grief for anyone who is dedicated to learning this desk. Tascam representatives actively moderate and contribute to discussions, accepting suggestions from its user base and integrating them directly into software revisions. Speaking of software, DM-24 Version 2.0 was being released as we went to press. Some key features include an internal MIDI timecode generator, effects returns routing to stereo bus, pre-aux muting, new MIDI fader layers, direct surround panning, HUI emulation (Pro Tools, Digital Performer and Nuendo DAW control) and more.

Overall, the DM-24 offers an incredible value. Its excellent converters, flexible routing, good dynamics/EQ and automation more than compensate for any concerns regarding the onboard effects or the strange linear-trim pots. If you're in the market for a powerful digital mixer at a rock-bottom price, then check this one out.

Tascam America, 7733 Telegraph Rd., Montebello, CA 90640; 323/726-0303; www.tascam.com. ■

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World Radio History

Mackie UAD-1 Powered Plug-Ins

An Extra Boost of DSP Horsepower for Native DAWs

The UAD 1176LN includes the famed all-buttons British mode.

L et's face it, most native worksta-
tions could use a little help. No sin-
gle- or dual-processor CPU on the
market right now can handle the real-life
demands of high-end, professional-level
audio production. When you move be-
yond a 40-plus track count, with any num-
ber of real-time effects, it doesn't matter
what platform you're using; things quick-
ly begin to get shaky.

Recognizing the issue at hand, Univer-
sal Audio has stepped up to the plate to
offer a solution: Universal Audio's UAD-
1 (now marketed and distributed by
Mackie) includes a proprietary PCI ex-
pansion card and a host of purpose-engi-
neered plug-ins that are designed to run
off of the expansion card and leave the
host CPU largely untouched.

The focus of this article, the UAD-1, is
a cross-platform plug-in package that will
work with a number of industry-standard
platforms (VST and MAS), including Log-
ic Audio/Waveburner Pro, MOTU DP3/
Audio Desk and Steinberg Cubase/Nuen-
do/Wavelab. The included plug-ins are
designed to integrate seamlessly into any
of these environments, presenting users
with no significant learning curve or any
hardware conflicts.

When assembling the UAD-1 plug-
in suite, Universal Audio looked no
further than its own R&D department
and ported numerous emulations of its
own outboard processors over to the
UAD-1, as well as some formerly Pro
Tools-only items. The package current-
ly includes Kind of Loud RealVerb Pro,
emulations of the UA 1176, Teletronix
LA-2A and Pultec EQ, the CS-1 Chan-
nel Strip and the Nigel guitar proces-
sor (both of which comprise multiple
components that can be auditioned
separately). The rumored specs for the
UAD-1 and the company's own press
material suggest a top processing
speed of 1,000 MHz and the capabili-
ty to simultaneously run 32 EQs, 16
compressors and two instances of Real-
Verb Pro. On paper, this all adds up to
a pretty powerful package, consider-
ing the list price of $995.

CRACKING THE LID

Installing the UAD-1 is a relatively pain-
less procedure. Simply drop the 7-inch
PCI card into an open slot on your Mac
or PC and install the drivers and plug-ins
from the supplied CD-ROM (or download
the latest update). The UAD-1 card dou-
bles as the world's most expensive soft-
ware dongle, thus eliminating the need
for any type of copy protection or chal-
lenge/response prompt. I tested the UAD-
1 on a Mac G4 450 with 768 MB of sys-
tem RAM, running Cubase 5.0r2 with Mac
OS 9.2.1. Running software Version 2.2.2,
the UAD-1 plug-ins immediately showed
up inside of the plug-ins folder in Cubase.
I found the UAD-1 does add a bit of start-
up time both when the user is turning on
the machine or loading a file. On particu-
larly large sessions that require near the
maximum numbers of native and UAD-1
plugs, the delay became rather long, but
the system never crashed.

The plug-ins are organized in a very
logical manner: The elements within the
CS-1 and Nigel (EQ, compression, delay,
chorus, etc.) are broken down into indi-
vidual stereo and mono plug-ins that can
be arranged in any manner you like. Oth-
er items that are included are the UA De-
lay Compensator plug-in and the UAD-1
DSP Performance Meter. The Delay Com-
pensator is a utility item that only needs to
be used with DAWs that don't automati-
cally account for plug-in delay latency. In-
side Cubase, users need to check the
"Plug-In Delay Compensation" box that is
found under Options/Audio System Setup.
(Logic and Performer also include this
item.) The Performance meter is a separate
application that users can launch and quit
at any time, and which displays the amount
of available DSP power on the UAD-1 card.

VINTAGE COMPRESSION
AND GLISTENING EQ

The first plug-ins that most users will want
to audition right away are the emulations
of the LA-2A, 1176 and the Pultec EQ. All
three plugs are exact digital copies of their
real-world counterparts. Thus, there are
no additional knobs, menus or anything
except what the original units included;
this also means that you have to rely on
your ears when working with these plug-
ins, as opposed to, for example, typing in
attack and release values. And, although
these produce some of the most impres-
sive results of any of the Powered Plug-
Ins, they are also the some of the most
CPU-intensive.

Like the original units, both the LA-2A
and 1176 plug-ins deliver excellent com-
pression and limiting without seriously
augmenting the noise floor or introducing
that squashed, artificial sound that many
native compressors are famous for. Each,
however, has its own distinctive sonic
touch. The LA-2A, with its two knobs and
one switch, proved to be a huge help with
some troublesome vocal and bass tracks.
It was an exercise in simplicity to set the
input and peak levels and be done. The
sound of whatever I ran through the LA-
2A took on a richer, punchier quality,
without sounding effected in any way. It
seems strange to say that this plug-in adds
character while also sounding transpar-
ent, but that's the best way to describe it.
I also found the LA-2A especially helpful
on both full mixes and as a way of nor-
malizing sampled material before export-
ing it to a hardware device.

The 1176, also the picture of simplici-
ty, really shines on drums and guitars. If
a drum loop is sounding tired or the lev-
els on a guitar track are just a mess, the

1176, which includes the all-buttons British mode (click on the ratio buttons while holding the Shift key), will do wonders. On a guitar track I recorded a while back, the player was all over the place—soft-muting the strings in places and then tearing into screeching leads. At the time it was recorded, it was a very difficult track to mix with the included Dynamics section in Cubase, requiring multiple automation tweaks to get the levels right. The 1176 took a lot of the pain and misery out of trying to make this track work: It brought the muted bits into the mix without overdoing it, and the lead lines finally sounded like they were part of the same song. None of the expression nor any nuances of the original performance were lost; the 1176 simply introduced a more controlled, polished sound.

The Pultec EQ is the last of UA's hardware emulations and possibly the best of the three to add that extra punch to a mix. The Pultec allows you to augment or cut relatively narrow bands of audio without introducing any discernable noise, while, at the same time, improving the overall sound of the source material. Also sporting a scant number of knobs and switches, the Pultec made an immediate and noticeable difference to any piece of audio I ran through it. Without doing anything beyond clicking the On switch, everything took on a brighter,

The elements of CS-1 sound almost as good as the UAD vintage emulatioos.

clearer sound. It is very easy to overdo it with this plug-in, but just a touch of bass and a little bit of extra high end made a world of difference on all of the mixes I ran through it.

A PROFESSIONAL-SOUNDING REVERB...REALLY!

Kind of Loud's RealVerb Pro is about as full-featured a reverb as anyone could expect from a plug-in. Although it's not a Lexicon, the RealVerb Pro worked wonders as both a send effect within Cubase and as a sound-design tool. The included presets are a great jumping-off point for users who need to sweeten up a vocal or a drum track. But high-end users will want to dive right into the morphing capabilities.

RealVerb allows you to blend and morph, in real time, between different room sizes and shapes as well as blended materials. For example, it is possible to begin with a reverb sound that emulates a small square room made of concrete and morph it into a large arena with a 60/40 blend of seats and people. You can blend one room with another and dress each one up with a variety of materials ranging from brick and plywood to velvet curtains and linoleum. (Keep in mind that the Morphing function only works when morphing between user/factory presets.)

RealVerb includes controls for room shape/size, surface material/thickness, resonance, timing, input/output gain, wet/dry mix, distance, reflection panning and morphing.

LEVELING THE PLAYING FIELD

When shopping for plug-ins, most users are lured by big-ticket items and flashy names, often overlooking some fabulous alternatives. The CS-1 channel strip is one of those options. The CS-1 includes a 5-band EQ, compressor/limiter, modulation/delay effects and a reflection generator (short reverb). The EQ/compressor section, known as the EX-1 when auditioned separately, is the real workhorse of the UAD-1: A small 20 to 30 track session, for instance, can have one on every channel, depending on the sample rate and the number of active EQ bands. The components of CS-1 sound almost as good as the UA vintage plug-ins. For general-purpose tasks like boosting the highs on an acoustic guitar or touching up a backing vocal, the CS-1 is perfect. Each of the components can be switched on and off, and each one includes its own output knob.

I only have a few gripes with the CS-1. I would have preferred a more modern EQ interface. The ability to draw in EQ curves is something that many of us have grown fond of, and its absence from a package of this quality is a little annoying. Also, it would nice to be able to re-order the components without having to audition them separately.

DON'T CALL IT A POD

Unlike the more conventional, utilitarian UAD-1 plug-ins, the Nigel guitar processor is meant to provide users with a little fun. It includes a dizzying collection of guitar amps, cabinets, effects and a compressor/gate. Guitar aficionados will have little trouble figuring out which amps and cabinets are being

The LA-2A plug-in, while one of the best-sounding in the UAD-1 suite, is DSP-intensive.

modeled after a quick skim through the presets. One of the extra features included with the Nigel is the ability to blend between different guitar amps and create some truly unique sounds.

The Nigel guitar processor is heavy on sounds and flexibility.

Personally, I had much more fun running some Reason tracks through the Nigel and adding a very brutal, lo-fi quality to their sound.

THE OUTER MARKER

For test purposes, I wanted to see what the real-world limits of the UAD-1 are. I conducted an exercise where, inside of a fresh session in Cubase, I loaded in eight tracks of 16-bit files and auditioned a UAD-1 plug-in on each of the four channel inserts, beginning with the CS-1. Unfortunately, the current Mac version of the UAD-1 does not include any sort of memory-overload warning. (The Windows version does include this function.) Thus, I was able to blindly load an obscene number of plug-ins, thinking all the while that they were actually working. After exchanging some e-mails with the people at Universal Audio, they informed me of the issue and provided a detailed breakdown of what the card can realistically do. At 44.1, the maximum number of each plug is 10 CS-1s, 50 EX-1s (depending on the number of active EQ bands), 10 1176s, 16 LA-2As, 10 RealVerb Pros, three Nigels or 12 mono/nine stereo Pultec EQs.

CHECKING OUT

The UAD-1 is well worth the $995 list price. By taking the load off of the central CPU, the UAD-1 really takes many of the headaches out of native workstations. Also, with the ability to use a realistic number of higher-end plug-ins, users will breathe a big sigh of relief. The UAD-1 (especially when multicard support becomes available this year) gives native users a real option and creates a middle ground between hobbyists who run Micrologic on an iMac and professional studios. The UAD-1 is also a much more cost-effective option than upgrading your CPU. Overall, the UAD-1 is an excellent product whose time was well-overdue. ∎

Robert Hanson is an assistant editor at Mix. *Check out what he does after dark at www.blacksnakemoan.com.*

Z-Systems Audio Engineering z-K6

Stereo-to-Surround Audio Processor

One of the most requested items on DVD authoring lists is the "magic black box that will take my stereo program and make it into surround." Those of us who work on projects that require "upmixing" (extracting and extrapolating surround sound from 2-channel material) will often post that "one box won't do it" and "you need years and years of honing audio engineering skills" to make an acceptable upmix. Although this may be true in the strictest sense, the z-K6 Surround Processor ($12,500 retail) comes very close to being the magic black box for many 2-channel audio examples.

A collaboration between Glenn Zelniker (the "Z" in Z-Systems Audio Engineering) and Bob Katz (the "K" in K-Surround), the z-K6 embodies years and years of mastering experience, psychoacoustic research and empirical tweaking.

THE BASICS

The logic flow behind the z-K6 is based on two functional blocks: The first one extracts the three front channels (left front, center and right front) from the stereo input. The second one extracts the two back channels (left surround and right surround), as well as the LFE (Low-Frequency Effects) channel. These correspond to the typical 5.1 surround home theater speaker setup of LCR in the front and Ls, Rs in the back. The LFE channel is sometimes labeled "sub" in the z-K6. Without going into a discussion on bass management and its relationship to large theater vs. home theater setups, it's safe to say that this is the area where those "years and years of honing audio engineering skills" will come in handy. There's one output for LFE (sub), and it's up to the engineer to decide how to handle it in the monitors and in the final layback.

Using the z-K6 requires a professional digital setup. The I/O is all-digital: It has three AES/EBU ports for input and three for output. An AES/EBU distribution amplifier, or switcher, that is capable of handling 96kHz audio is necessary, because you must generate three copies of the stereo material (with perfectly synchro-

nous timing) for those three input ports. We used our Lighthouse Digital 96-point AES/EBU switcher, but you could also use a Z-Systems Digital Detangler.

In the current revision, the z-K6 does *not* auto-detect sample rate. The user must select the sample rate manually, and it's a good idea to check often to make sure you have done this. A couple of times when we thought we had lost the center channel to a patchbay malfunction, the cause turned out to be an apparent sampling-rate mismatch.

OPERATION

The z-K6 front panel is straightforward with clean organization. There's a large alphanumeric FIP display for adjustable parameters, with six multifunction buttons underneath. Three *big* knobs reside under the display and its accompanying buttons, flanked on the left by System, Master Bypass and Dither/Sample Rate buttons and on the right by a Load/Save/MIDI button, as well as an EQ, Master Level and Offsets (toggle) button. In the upper-right area are three LED indicators for AES/EBU lock for the three channel pairs.

Toggling the EQ/Master Level/Offsets button to the Level functions screen assigns the left knob to channel volume offset control and the right knob to master level control. A small button under a channel label first selects the channel; pressing the button mutes the channel, and a third press unmutes the channel and resets it to the value prior to muting. You can also solo a channel by pressing and holding its assigned button.

Pressing the System button reveals the

Front Ambience screen and assigns K-front level control to the left knob and algorithm selection to the right knob. K-level is the amount of ambience extraction. It spreads uncorrelated ambience to the front soundstage and enhances depth and imaging of instruments and vocals. Its range varies from "off" to +6.0 dB.

There are eight ambience-enhancement algorithms: four 2-channel combinations of small or wide and deep, and four 2-channel combinations with the same parameters. If you select a 3-channel algorithm, a center channel is derived and controlled via the center knob, with a focus parameter varying from 0° to 90°. If the focus is set to 0°, then the center channel receives all of the mono component; at 90°, it is split equally between left and right, so L and R output is the same as L and R input (with a phantom center). We found the focus control to be invaluable when constructing a director's commentary for a DVD-Video. The director wanted the soundtrack on the commentary track, with 5.1 channels but without the original dialog. It was easy to set the focus control to 0 and replace the center channel with the director's spoken-word track.

Pressing the left-most small button under the display navigates the user from the "LRC" page to the "LRS" page, moving from the front soundstage channels to the rear surround ambience and the LFE cut controls. Again, the left knob controls K-level for the rear channels, while the right knob controls the cut-off frequency for the LFE lowpass filter.

In a similar fashion, both front and rear

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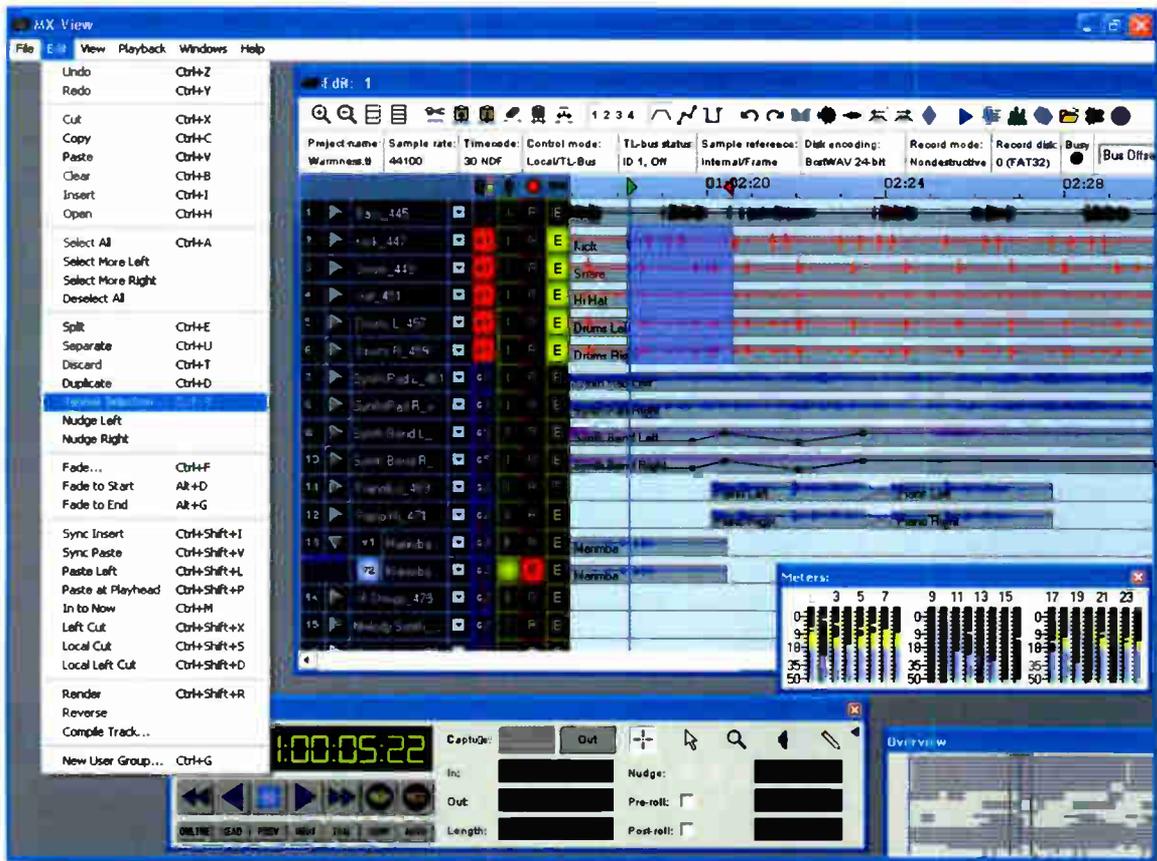
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blocks may be shaped by input and ambience filters. Input high- and low-shelving filters have variable corner frequencies and shelf gains. The ambience filter consists of high- and lowpass, as well as a fully parametric bell filter with controls for gain, bandwidth and center frequency.

In the Wordwidth/Sample Rate screen, the user adjusts sample rate (32 to 96 kHz) and selects from 24, 20 or 16 bits dithered or 24 bits undithered. Dither is a variant of TPDF and includes POW-r noise shaping.

Users can save and recall the entire state of the z-K6 via MIDI presets. Our evaluation unit came with only one preset out of the available 50: preset 00. It recalls the z-K6's default settings and cannot be overwritten. The unit also supports limited automation via MIDI commands, including program changes and system exclusive.

TESTING, TESTING...

We began with a client's modern country pop tune, which was overly bright, overly compressed, and thick with artificial instruments and several different reverbs. Although the z-K6 brought some nice air and wideness to the soundstage, the center revealed the vocal processing's ugliness with even more clarity. The sur-rounds were brittle, and when the whole thing was sent through a Dolby Digital encode/decode loop, the surrounds frag-mented even more, which I expected. The z-K6 can work magic on many types of audio, but it cannot perform miracles.

An orchestral mix fared much better. This recording combined spot mics with two spaced-omnis that were too close to the orchestra and too far apart from each other. The z-K6 created a greatly improved center, while the front soundstage and sur-rounds gave the effect of sitting front and center in the recording space. We were wowed by the separation of the instru-ments and the clarity of the reproduction. My partner thought the surrounds were a bit bright. However, the z-K6 has rear ambience EQ, and it's easier to remove brightness than add it.

On a wonderful stereo recording of solo cello in a large, slightly reverberant space, I could clearly hear the rosin of the bow, the slap of the hand against the low-er body and the resonance of the body with long tones. Again, the z-K6 was true to the original recording's clarity and pro-vided delightfully natural surrounds. Oth-er methods of "extraction" with various techniques muddied the sound of the rosin and lacked the front depth of field that was captured by the original record-ing and revealed by the z-K6.

THE VERDICT

The Z-Systems z-K6 produced solid results on many types of stereo material. On most classical pieces, we liked it *a lot* better than other upmixing methods. The unit also re-lieved us of having to generate a center channel via Dolby Surround (Pro Logic) de-matrixing, with the added benefit of luscious surrounds. Because this box has active EQ, we'd like to see some overload indicators, and a few presets would help introduce users to the box. For many proj-ects, however, the z-K6 saved the day when other "magic black boxes" couldn't perform the trick. Move this one to the top of your shopping list.

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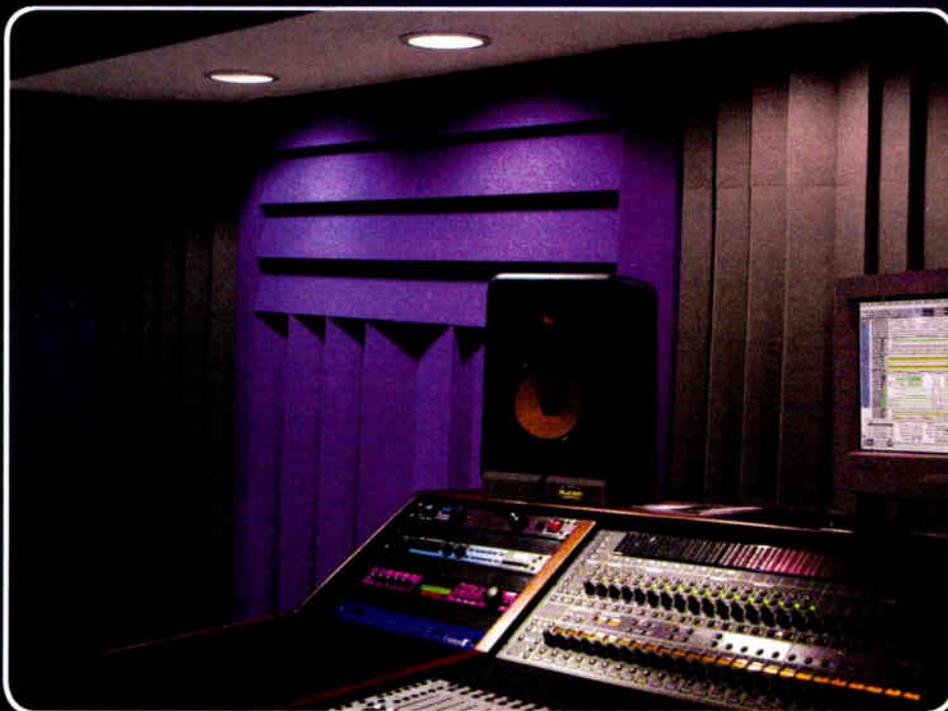
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Voyager Sound GraphiMix

Mixer Control Software

The GraphiMix interface represents mix elements with user-selected icons.

We all know the strengths and weaknesses of digital audio mixers and workstations. Mixers allow the user to recall virtually every console parameter, while providing traditional hands-on control with two—or more—hands on the board. Unfortunately, many digital mixers are menu-based, which forces users to scroll through small LCD pages that are ineffective at conveying console operations. In real-time applications such as sound reinforcement, delays caused by deep menu systems can be problematic.

The advantages of DAWs are many: dazzling visual renderings of session overviews, extensive editing capacities and abundant plug-ins; when combined, there is more creative control than any linear analog system. However, a DAW's keyboard/mouse interfacing is inadequate as a real-time controller for complex, multi-layered functions, and onscreen "glass consoles" don't provide the fast at-a-glance status of large multichannel mixers.

Recently, hardware controllers have remedied some of the DAWs' shortcomings, but a void still remains for an affordable, industry-standard interface for computer-based audio systems. Voyager Sound has come up with what may seem to be the beginning of a solution for this software/hardware disconnect. The company's Windows-based GraphiMix™ software is ostensibly an interface for Yamaha's first- and second-generation digital audio mixing systems—ProMix 01, 01V, 02R and DME-32. It's also available as a plug-in for Cakewalk's Sonar recorder/editor. But, because GraphiMix can be customized to control any MIDI device, its relevance extends well beyond the products for which it has been optimized.

In the GraphiMix interface, mix elements are represented by user-selected icons whose parameters change as they are moved up and down, or across, the screen. This icon system alone represents a significant improvement over both the scribble strips on high-end mixers and the virtual consoles in DAWs. To put it simply, it's easy to find the trumpet channel in a multichannel mix when you see a picture of a trumpet on the screen.

As cool as they are, the GraphiMix icons are more than just pretty pictures. In the most simple case, icons default to control volume and pan, depending on which way they are moved on the screen. Thus, dragging an icon up and down causes its volume to go up and down accordingly; similarly, moving an icon left to right changes its pan position in the stereo field. In a surround mix, the icon would be moved in a circular pattern.

For more complex operations, icons can be programmed to control virtually any console parameter. For example, if an engineer wants to fade out a background vocal, while panning it around the surround spectrum, raising its reverb and applying a transistor radio-type effect to it, the entire operation could be accomplished by assigning the volume, pan, reverb and EQ parameters to the icon—in a direct or inverse relationship—and then handle everything with a single mouse move.

GraphiMix is bidirectional, so it can control the console or simply reflect its status. Users who prefer a computer interface will want to use GraphiMix as the main control application. Those who like the feel of faders can continue to work on the console with the GraphiMix screen serving as a more complete and compelling visual interface than any mixer's LCD.

GraphiMix comes in three flavors: The $129 GraphiMix 01 is optimized for the ProMix 01 and 01V; GraphiMix 02 ($249)

adds support for the 02R and DME-32; and the $500 GraphiMix PRO includes the Sonar plug-in, adds improved links between icons and functions such as EQ, and a calibration system that dynamically shows dB settings (for other hardware) next to each icon.

I installed GraphiMix PRO in my 400MHz Windows laptop and connected it to my 02R via a Midiman Midisport 1x1 USB-MIDI interface. Without delving too deep into the manual, I could navigate GraphiMix's channel controls and set up a complex mix using icons from a menu of presets.

I was working on a 24-track live recording with drums, bass, electric and acoustic guitars, string and horn sections, piano, synthesizer, exotic instruments, background vocals and a different lead singer for each song. Using a stage plot from the event, I easily replicated the sound stage in the GraphiMix screen. You can also scan photos of all the vocalists to create bit-mapped icons for them.

I used the computer interface to set up the mix, the way one would create a "scene" in the 02R. Once my basic levels and pan positions were established—and ingrained in my visual memory thanks to the GraphiMix interface—I went to the console to perform the actual moves.

From that point on, the process was similar to any other console-based mix, with the added bonus of a visual counterpart to the audio program. Unlike a DAW mix screen, GraphiMix behaved more like

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Unlike most solid state electronics, tube-based devices strike the ear as having such a "warm" sound because the added mid-range harmonics have the same temporal relationship as natural mechanisms like strings, drumheads and vocal chords. This results in a sweet spot that makes vocals, guitars and other midrange-rich content sound especially pleasing. TAMPA's revolutionary new Temporal Harmonic Alignment technology produces that same phase relationship found in both tubes and nature. And unlike tubes, TAMPA's sweet spot spans the full spectrum of your sound from bass to cymbal.

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>> Built-in dual optical servo compressor/limiter

>> Variable impedance optimizes vintage mic performance

>> Available 66dB system gain

>> S/PDIF and AES/EBU output to digital recording gear

M-AUDIO
Revolutionize the Studio

a video game version of the concert than
a board snapshot. I decided to get more
adventurous. Because my studio is Mac-
based, I couldn't run GraphiMix in my
DAW computer, hence the Windows lap-
top. However, I wanted to see how far
GraphiMix would go to control both the
02R and my Mac-based Pro Tools MIXplus
system.

As a MIDI slacker, I was daunted by
the prospect of "trying this at home," so
I did what any self-respecting engineer
would do: scream "tech support!" The
GraphiMix team walked me through the
process. I connected the Midisport to my
Opcode Studio 64XTC, which I use as the
front end of my Pro Tools rig to syn-
chronize with the ADATs, 02R, and what-
ever synths, modules and drum machines
are around.

Soon after, Voyager's Kris Krug and
Doug DeVitt customized GraphiMix to
achieve rudimentary control of Pro Tools
via the 02R and/or the GraphiMix interface
by instructing it to speak to Pro Tools us-
ing the JLCooper CS-10 controller protocol.
To accomplish this, Krug used a text editor
to create a VSL file based on the MIDI codes
for the CS-10, which were documented in
the Pro Tools manual. Then it was loaded
into GraphiMix and selected within the
GraphiMix menus to complete the adapta-
tion and drive Pro Tools. This suggests that
anyone with a working knowledge of MIDI
(myself obviously *not* included) could have
done what they did. For now, GraphiMix
operates via MIDI, but the software can
be adapted by Voyager's developers to con-
form to any other protocol (Ethernet,
FireWire, etc.).

This is the essence of what makes
GraphiMix a powerful and potentially rev-
olutionary product. For all of its benefits
as a stand-alone program or a plug-in,
GraphiMix's greatest strength may be its
versatility. Offering an instantly compelling
interface, open architecture and adaptabil-
ity, the product brims with potential as a
multiplatform DAW plug-in, an interface
built into a large-format console, and a
controller for complex, multimedia envi-
ronments involving not only sound but
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As with any creativity-enhancing tool,
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Paul Verna is Mix's *New York editor.*

World Radio History

BY EDDIE CILETTI

Living in a 24-Bit World

Organic Tips for Recording and Playback

-40dBv

@ 5 cm

@ 1 meter

20Hz 50 100 200 500 1kHz 2kHz 5kHz 10kHz 20kHz

A Sennheiser e609 cardioid mic's response at 1 meter (3.3 feet) and 5 cm (1.96 inches), demonstrating proximity effect.
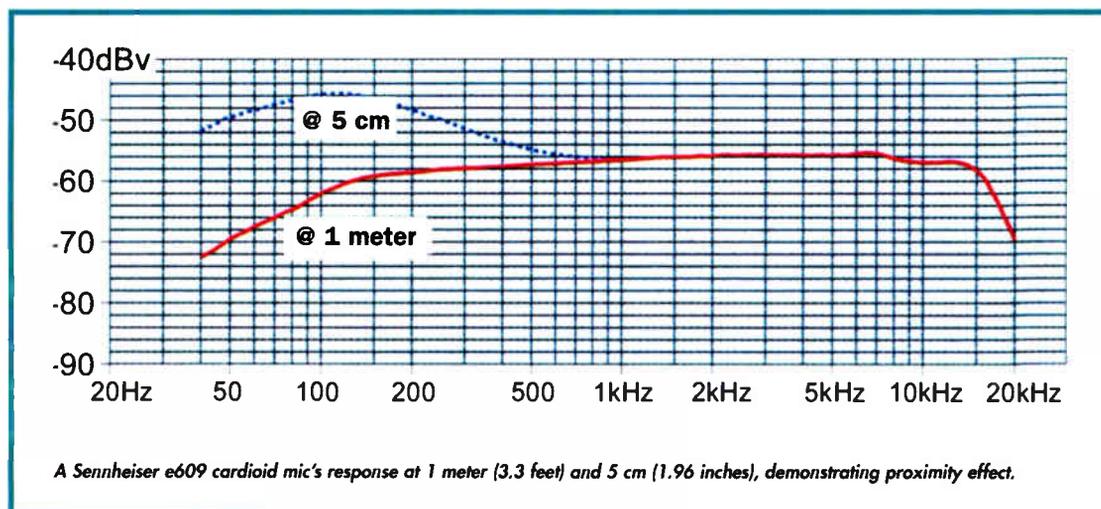
I 've made it a tradition to go easy in the AES issue and tone down the geek speak for more tangible concepts. It's always a good idea to zoom out once in a while, so whether you're fried from "the show" or just unable to focus on minutiae, this month, we'll explore "listening space clutter" and other audio obstacles in our organic quest for higher-resolution audio.

No matter where you are in the audio food chain, high-resolution audio has become the affordable rule rather than the expensive exception. To consume mass quantities of bits or not, that is the question, as well as your option. That no 24-bit converter actually delivers 24 bits of resolution is not an issue of quality but rather one of theoretical limitations. It applies to electronics and acoustic spaces, although we tend toward thinking that gear can solve all of our problems.

For example, Prism is but one company that makes premium converters. Check out www.prism sound.com, and you'll find an incredible array of impressive performance specs, but even they can "only" deliver about 21.5 bits of resolution. To deliver the extra 2.5 bits, the unit would have to be chilled to an icy -273.15° Centigrade, otherwise known as 0° Kelvin or Absolute Zero. That's as geek as this column will get.

No matter how many bits you choose, playing the numbers game is all for naught if the listening space is not up to the task. There are enough sonic obstacles in the typical control room to interfere with your pleasure of actually hearing the resolution we've paid for, even 16 bits' worth! Some of the fixes may be obvious and relatively easy. So, let's shift the focus from gear to space and see what happens.

FORK-U

At each step along the path—from basic tracks to mastering—you'll find a fork in the road, one that can make your life easier or miserable. For music recording, the rhythm tracks should fit together just by throwing up the faders. Reaching for EQ as the first fix is a detour on a bumpy road. Fixing the problem at the source will have a positive ripple effect.

Did you know, for example, that the position at which a cardioid mic delivers flat response is typically 1 meter (3.3 feet)? As the mic is moved closer to the sound source, the inherent proximity effect (bass bump) increases exponentially. (See the response curves for the Sennheiser e609 in the figure above.) This could be good for warmth when needed, but using all-cardioid mics on a session, up close and personal, could result in a massive muck buildup. Rather than boosting treble to compensate, it is much better to try these fixes in the following order: Increase the distance, roll off a little bottom or choose an omni mic (no proximity effect).

ÉCOUTER

In the quest for sonic nuance, two obvious issues are noise floor and early reflections. With their fans and hard drives, workstations are major noise contributors, and worse, their most offensive noises desensitize your ears to some of the most critical frequency ranges. The other obstacle is gear that's stacked too close to the

monitors, or poorly placed racks that reflect sound directly to your ears. This doesn't help imaging one bit (he-he!), let alone what it does to your perception of frequency response.

NOISE TAMER

My control room has three computer workstations; the noise from fans and drives was cacophonous until all of the noisemakers were relocated to a nearby closet. Sure, computers can be rackmounted, and applying acoustic treatment to the inside, front and rear panels can be effective, but unless you consider ventilation, the solution is only temporary—the heat will kill your gear. Other gear that is fairly quiet—for example, a Fostex DV-40, an Alesis Masterlink with external drive or a Tascam DA-45—can live behind the listening position.

With the computers in the closet, I found a clever way to share the same keyboard, mouse and monitor thanks to an Iogear MiniView USB 4-Port KVM Switch ($140 from www.tigerdirect.com). This box does not have a remote, but for users with geek inclinations, the front panel can be removed and extended to become the remote control. I am running dual monitors on the main workstation, the second monitor being on the Iogear switch. Only two long video cables link the closet with the control room, which is much easier than running expensive, long video cables from each computer. (Long cable runs using cheap cable can blur the image.)

WHAT'S RIGHT WITH THIS PICTURE?

Take a look at *Mix*'s back issues to see if you can pick out the mastering facilities from the front cover. When listening is "job one," the lack of clutter and ob-

SESSION EQUIPMENT

Seven microphones were recorded straight to Pro Tools | HD at 88.2kHz/24-bit, as detailed along with their respective preamps in the table. Seven tracks were mixed to stereo via Yamaha DM2000 (some live, some during playback from PT) to a pair of tracks on a Fostex DV-40 4-channel DVD recorder. (The other two channels captured an Audio-Technica stereo shotgun mic from the second-floor "balcony" using a Great River MP-2x transformerless preamp. These tracks were not used for the MP3.) Monitoring was via the Grace 901 D/A converter and headphone amp using Sennheiser HD600 headphones (sweet).

No signal processing was used during recording or mixing. The stereo files were digitally transferred to a modified Alesis MasterLink at 88.2 kHz/24-bit, then normalized, rendered to 44.1 kHz/16-bit and then burned to Red Book CD. Two versions of the same tune are provided, one flat with out compression and the other processed using the TC Dynamizer plug-in for Soundscape via a Mixtreme card. Cool Edit Pro Version 2 was used to convert to MP3.

Instrument	Mics	Preamp
Kawai grand piano	Josephson C602 stereo pair in omni	D.W. Fearn (stereo)
	Neumann U67 on the bottom	API 512
Sonor drum kit with Yamaha snare	Spieden (Royer) stereo ribbon for overhead	Neve 1064
	Neumann U67 omni kit mic	API 512
Room	AT815ST or AT835ST in MS mode	Great River MP-2x
Acoustic bass	Soundelux ELAM 251 in the f-hole	Manley Mono Tube

stacles will be immediately obvious. It's not just about visual aesthetics, but also about integrating form with the emphasis on function. A traditional recording console is a sonic obstacle. It should be as unobtrusive as possible, not flanked with racks of gear that can create more reflective space. (See sidebar: "Sonic Obstacles.") For all of us who have no choice but to work in a room with a low ceiling, try an absorber directly above

your head. A panel of Type-703 Fiberglas as small as 2x4 feet, covered with an acoustically transparent material (www.terratex.com), can improve the image by eliminating ceiling reflections.

A LIVE RECORDING IN EVERY SENSE

Back in June, I used a nearly finished audio facility to record a jazz trio consisting of Benny Weinbeck (piano), Gordon Johnson (bass) and Phil Hey (drums). (See the sidebar above for session details.) Located in a former carriage house, the control room and studio are integrated (no glass or walls). The second floor (over the control room area) takes up only half of the second story, leaving full height in the studio area.

Notice I said, "nearly finished," because the space was acoustically untreated. I am neither leakage-paranoid nor intimidated by very live spaces, having worked with sonic cowboys like Eddy Offard, Martin Bisi and Bill Laswell—all of whom chose wide open spaces over an isolated control room for several recording projects. One of the advantages of the open-spaces approach is a constant reference to the original sound.

SONIC OBSTACLES

The most obvious acoustic problem posed by a recording console is that short-path reflections off of its face can cause both additive and destructive phase problems. When recombined with the direct signal, the resulting "comb filter" gives a false impression of the loudspeaker's character. This is why you should not place speakers on the console (even though everyone does it). It is possible to limit (but never entirely eliminate) this reflection by tilting the monitors (or console) away from each other or by using ribbon tweeters that have a naturally wide but minimally vertical dispersion. Any of these solutions is a compromise that can be better solved by taking advantage of the smaller footprint of digital consoles.

—Terry Hazelrig, www.DIYacoustics.com

It's too easy to think of the control room as the place to make all fixes. Isolation can become a crutch.

Fearing the worst because the room seemed so out of control, everyone was surprised at how well the recordings sounded—on everything from computer monitors to car stereos. A rock band might have played to the threshold of pain, but the jazz musicians instinctively played *to* the room, not against it. I won't deny it was a challenge for all of us and the results may not have been perfect, but the ability to burn CDs is an invitation to *listen to the unprocessed sound first*, rather than reaching for that detour knob, virtual or otherwise.

You would think, for example, that bright monitors would yield a dull mix. Bright monitors alone, at high enough levels, can cause ear fatigue and sometimes have the opposite effect whether in a dead or live room. How does this apply to the carriage house recordings or any other sonic endeavor? First impressions are important, yet in unfamiliar territory, keep "The Force" in mind and listen *through* the monitors to inter-

pret what is being heard. In this case, the room made the drums seem overly bright during the session and on playback, so I knew it wasn't *just* the monitors. (It is good to think that all monitors lie—that way, they can't hurt you!) When in doubt, simply balancing the tracks to themselves is better than attempting to compensate with EQ.

THREE-DEE

In the June issue, I tackled a few acoustic basics, pointing out that the goal of treatment is to *evenly* tame the reverb time across the frequency spectrum. For example, simply covering all of the walls and ceiling with foam treats mostly high frequencies, leaving the bad stuff and sacrificing any life the space may have had.

Back in the '70s, control rooms were "tuned" using a graphic equalizer in conjunction with a spectrum analyzer. Many sonic tweakers from that era only made things worse by boosting and cutting with wild abandon in third-octave notches. Applying a curve to suit your tastes is one thing. Going beyond that is a 2-D

fix masked by the third dimension—reverb time. Near-field monitors were found to diminish the effects of a funky room, and they succeeded to a point, but they do not fix all of the problems.

BACK TO THE CONTROL ROOM

Of course, I have taken y'all on multiple detours, the purpose of which was to detail just a few of the typical sonic obstacles. It may seem an understatement to say that environment affects our perception of sound; it certainly affects how we judge a room, a recording or a pair of monitors. I hope this article inspires those who need to take a closer look at room acoustics. Like capturing jazz or classical music, ultimately the goal will be to not overtreat the space or the recording. And don't be afraid of leakage. It can be very cool—have fun with it!

Eddie would like to thank Terry Hazelrig at www.diyacoustics.com for his help with acoustic fundamentals, and David Ahl for his "Terratex" tip. Additional thanks to Jonathon Grove and Gonzalo Lasheras for the opportunity to record Phil, Gordon and Benny. ■

Recto Directo

A Recto Stack in a 2-Space Rack

We know you won't believe it...so **STOP READING!** Get your guitar, and go check out the new RECTO PRE direct through a console.

Still reading? Then here's the deal: There were several times we almost gave up. For three years we worked day and night to deliver the sound and feel of our legendary DUAL & TRIPLE RECTIFIER stacks ...direct to tape.

Rear Panel (not visible) Six 12AX7s and Rear Input Jack

WARNING: To reduce risk of fire or electric shock, replace fuse with same type and rating only. Do not expose this unit to rain or moisture.

CAUTION: To reduce risk of fire or electric shock, do not remove cover. No user-serviceable parts inside. Refer servicing to qualified personnel.

MESA ENGINEERING

RECTO™ PREAMP
ALL TUBE
RECORDING AMPLIFIER

EFFECTS   LOOP

RECORD OUT

NORMAL

SEND   RETURN · L   RETURN · R

TIP
GRID
SLEEVE
BALANCED
OR MONO

FX MIX
SET AT 10
IF NO FX IN LOOP

MODERN   CH1–CH2   SOLO

LEFT   RIGHT

LIVE OUT

POWER
117V~
60 Hz
1 A

UFT

GROUND

CE

EXT. TRIGGER
TO POWER AMP

EXTERNAL SWITCHES

TO PWR AMP

(ALT FX PATCH)

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MESA ENGINEERING

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P!nk

No overnight sensation, Pink has been performing professionally since the age of 13. She first broke out on radio and MTV in 2000 with the hit "There You Go," and in 2001, teamed up with Christina Aguilera, Lil' Kim and Mya for the Grammy-winning remake of "Lady Marmalade" for the *Moulin Rouge* soundtrack. Now 22, the singer-songwriter has been touring heavily to capitalize on the success of her first album for Arista Records, the triple-Platinum *M!ssundaztood* and its runaway hit singles "Get the Party Started" and "Don't Let Me Get Me." *Mix* caught her recent two-month headlining theater tour; Pink joins Lenny Kravitz for his summer tour and will then headline again in Europe, Japan and Australia.

Pink sings into a wireless Shure Beta 87 and wears Ultimate Ears in-ear monitors.

FOH engineer Dave Lester is using a Yamaha PM4000 at FOH. Dynamics are handled by a Summit DCL-200 tube compressor on Pink's vocal and backing vocals, with dbx 903 compressors on some instruments and Aphex gates on drums. For effects, Lester is using a TC Electronic M5000 dual-engine reverb, a TC 2290 delay, an Eventide H3500 and two SPX-990s for drum reverb.

"She's very versatile," says Lester of Pink. "She covers so many vocal styles in this show, from rock to R&B, a little bit of blues and some rap. She's great."

NK

PHOTOS AND
TEXT BY
STEVE JENNINGS
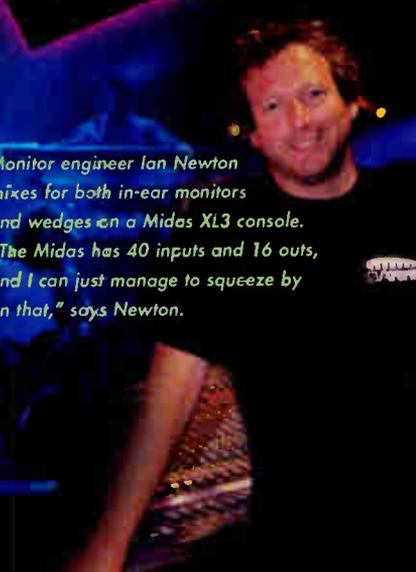
Monitor engineer Ian Newton
mixes for both in-ear monitors
and wedges on a Midas XL3 console.
"The Midas has 40 inputs and 16 outs,
and I can just manage to squeeze by
on that," says Newton.

P. A. for the tour is supplied by Showco; typically, FOH engineer Dave Lester arrays eight Prism Blue cabinets per side,
with four subwoofers a side. New in the drive racks is the Clair Bros. iO speaker-management system.

Mic choices for the drum kit include Shure SM57s on the snare top and bottom, both a Shure SM91 and a Beyer
M-88 on the kick drum, Shure SM98s on the toms, AKG 414s for overheads and an SM81 on hi-hat.

Guitar/bass/drum/keyboard tech Mike "Micro" Shaw takes care of
the entire back line. "Unlike some pop acts, this is not a 'track act'
with goofy dancers," says Shaw. "There are
a few songs where we use samples, but
basically what you hear at a Pink show
is a rock show."

Both keyboard players
use Mackie mixers for their
own in-ear mixes. "They
can pump up their own
mixes if they need to, which
is nice," notes Shaw. "We
don't have to spend a whole lot
of time at soundcheck with them
saying, 'We need more of this,
more of that.'"

Norah Jones

A Bright New Talent Works Her Way Up the Performance Ladder

BY CHRIS MICHIE

ALL PHOTOS BY STEVE JENNINGS

The extraordinary success of Norah Jones' *Come Away With Me*, her first full-length album for Blue Note, has taken many people by surprise, not least Norah Jones herself. Until early this year, the 22-year-old singer/ songwriter/pianist was accustomed to playing small jazz clubs in New York, and her typical audience numbered fewer than 100. Now, Jones' appearances at clubs and theaters sell out immediately, and by mid-summer, she had experienced the thrill and fear of playing to thousands of Dave Matthews Band fans in a football stadium.

"We got to England, and the album was Number 70," recalls production manager and FOH engineer Lee Moro, who has been touring with Jones and her bass/drums/guitar trio since last March. "By the time we left three weeks later, the record was at Number 7 and had sold 200,000 copies in Britain alone."

FROM JAZZ CLUBS TO FOOTBALL STADIUMS

As Moro describes it, his biggest challenge has been convincing Jones that the P.A. needs to be loud enough to carry to the back rows. "The Dave Matthews dates were pretty tough," says Moro. "You have to cover 25,000 people in a football stadium, which is a bit different from a little jazz club or a theater, where it's fairly controlled."

Moro is used to big gigs and large crowds; before getting hired for the Norah Jones tour, he was out on tour with Canadian band the Tea Party, who were supporting Ozzy Osbourne. But Jones, unlike Moro, does not have more than a dozen years of touring experience behind her. "It's all been happening extremely fast for her," says Moro. "In three months, she sold over a million records worldwide and went from playing to 50 people for brunch in a New York club to going to Europe and selling out 1,500-seaters."

Mix caught up with the Norah Jones phenomenon in early August at Bimbo's 365 Club in San Francisco, where both shows were sellouts. Moro brought in legendary lighting director Stan Crocker to make the most of Bimbo's intimate 600-seat supper club ambience. The Phil Edwards Recording truck was also on hand, recording both nights' performances, which gave Moro access to a pair of Neumann U87s for the piano.

"I always use three or four channels for the piano, and I generally use whatever the house has," explains Moro. "I just used the Shure VP88 stereo mic in Las Vegas, and that was great. I always have the lid all the way closed, so I had the VP88 taped across the bars about halfway up."

PIANO SOUND INCLUDES EVERYTHING

Whatever the piano mic, Moro has to cope with leakage. "I've tried everything—91s taped to the lid, C-ducer tapes, you name it," he says. "Norah plays really, really soft and has the monitors really, really loud, so any mic you put in there is going to pick up her vocal from the monitors. And no matter how big the stage, the setup is pretty tight and you get tons of drums through the piano. The bass is also

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the piano and bass, with dbx units on the kick, snare and Wurlitzer. Moro says he typically uses very little compression on the instruments, but he likes to have the protection.

Bimbo's has recently upgraded its main sound system to a compact Nexo Alpha rig, supplemented with Meyer Sound UPAs for the back of the two-section room. The FOH console is a Midas XL22—"Midas is my favorite," comments Moro—and monitors are mixed on a Ramsa 850. For reverbs, Moro is partial

to high-end TC Electronic or Lexicon models, but also speaks highly of the less-expensive TC M-One.

Though Jones relied on wedge monitors at Bimbo's, she has also used in-ear monitors when appearing on a larger stage, such as when she did five dates opening for the Indigo Girls earlier in the tour. "Part of my job is to help her get a feeling of what it's like to play really big places," says Moro. "Before March, she'd only done 100-seaters and little jazz clubs, and she would never

hear the P.A. because there was no P.A. to speak of. On this tour, on the bigger gigs, she would hear the room and wasn't used to it, so she felt the house system was way too loud." Moro now carries a Shure PSM 600 in-ear monitor system for Jones, though he admits that the standard E-1 rubber molds provide little isolation.

OPENING ACT BLUES
As well as unfamiliar surroundings, Jones has also had to cope with the perennial problem as an opening act: People who are finding their seats during the opening numbers. "For the Dave Matthews shows, the lawn was general admission, so that filled up right away," says Moro. "But the front 6,000 seats were all reserved, and a lot of those ticket-holders were still in the parking lot—they're Dave Matthews fans. So she played to this moat of empty seats for at least the first two songs while people were filtering in, which was quite a distraction for her. And at some of these outdoor shows, there's an amusement park right next door, so you can look out and see roller coasters and hear kids screaming. She was used to a pretty controlled environment. But her record sales spiked drastically after the Dave Matthews shows, so she did well."

Norah Jones also did well at Bimbo's, where the audience sat attentively throughout the 20-song set, which included some new songs and a few well-chosen covers: Kris Kristofferson's "Help Me Make It Through the Night," Mose Allison's "Everybody's Cryin' Mercy," and "Bessie Smith," another song from The Band's catalog. As Jones explained to the audience, she and her band have become habituated to watching The Band's *The Last Waltz* on the tour bus.

Quite a lot of Jones' life is spent on the bus these days. "We've been touring since May, and she could go on forever right now; there are so many territories that want her," says Moro. At present, tour dates are scheduled through next spring, when Jones will take a break to record her next album. If that record comes anywhere close to matching the runaway success of *Come Away With Me*, Jones is likely to be a fixture on the concert scene for many years to come. ∎

Chris Michie is a Mix *technical editor.*

PHOTO: STEVE JENNINGS

YES

Yes is out on a world tour with a classic lineup that includes original members Jon Anderson, Chris Squire and Steve Howe, plus longtime drummer Alan White. An added bonus is fan favorite Rick Wakeman, who returns on keyboards to help re-create more than three decades of Yes music and promote the band's five-CD box set retrospective, *In a Word: Yes (1969 -)*. *Mix* caught the third show of the tour at Shoreline Amphitheater, in Mountain View, Calif., during early July.

FOH engineer Jeffrey Gex mixes on a Yamaha PM4000. "The board is completely full," Gex says. "I have two stereo channels open, and I'm using all but one of the matrix outputs. That one is saved for a video feed." Gex uses a Summit DCL 200 for the two lead vocal channels, and dbx 160s and a Clark 904 4-channel compressor for dynamic control elsewhere. Gates are Drawmer models, and a TC Electronic M5000 and an Eventide H3000 Harmonizer are used for vocal effects, with a Lexicon PCM70 for keyboards and other reverbs. Clair Bros. supplied a traditional flown P.A. for the tour—20 S4 cabinets per side, supplemented with Clair P2s for frontfill. Clair crew chief is Bob Weibel, monitor engineer is Frank Lopes, and the "stage and input guy" is Wes Clair. —*Steve Jennings*

TOURING NOTES

LD Systems of Houston recently used four InnovaSON digital consoles at FOH and monitor positions for KSBJ's 20th Anniversary concert, staged at Houston's Reliant Astrodome. The show, one of the largest Christian music concerts of the year, attracted 45,000 fans and featured 28 Christian musical acts...Jewel, currently out on a North American tour, is using Sennheiser 3050 Series wireless in-ear monitors and listening to a mix created on the ATI Paragon II monitor console by MD Clair engineer and tour production manager Robert Bull. Three members of Jewel's five-piece band are also outfitted with Sennheiser 3050 Series in-ear monitors...Headline acts on the Glastonbury Festival acoustic stage, including Robert Plant and The Waterboys, were mixed on the new Midas Legend 3000 and heard via an Electro-Voice X-Array P.A. According to Rick Bailey of RMPA, who is responsible for sound on the acoustic stage (set up in a 5,000-capacity tent), none of the FOH engineers had seen a Legend 3000 before, but all were suitably impressed...Paragon Productions, based in Rock Hill, S.C., is the first U.S. audio equip-

ment rental and installation company to order the new GEO arrayable sound system from NEXO. The company has taken delivery of 20 S-8 Series cabinets, compact, high-output, full-range loudspeakers that can be combined in horizontal or curved vertical arrays. The order also includes Nexo CD-12 sub-bass cabinets, a full quota of flying hardware and Camco Vortex 6 digital amplifiers.

INSTALLATION NEWS

Pacific West Sound (PWS) of Bakersfield, Calif., has installed a 48-channel Soundcraft MH4 in the Canyon Hills Assembly of God Church, also in Bakersfield. The Soundcraft MH4 is being used to mix for both FOH and monitors, the latter consisting of six mono wedge mixes and four stereo in-ear mixes...Stonebriar Community Church in Frisco, Texas, has been steadily purchasing Neumann KM Series mics over the past two years. Chief audio engineer Chuck Swindoll Jr. says a broad range of Neumann mic models have helped simplify the church's multitude of complex live music and voice reproduction, amplification and post-production needs. ■

MEYER LINE ARRAY IN VIENNA

Austrian rental company Sound Art Service Vienna (SAS) supplied a Meyer Sound M3D Line Array system for the Vienna Festival opening, which was attended by 40,000 people and broadcast live on Austrian TV. Sound designer Adolf Toegel divided the sound system into five functional loudspeaker groups that could be addressed separately through a 6-in/10-out AKG DSP 610 matrix, allowing him to time-align each. The festival opening featured the Radio Symphonie Orchester Vienna conducted by Julius Rudel; guest stars included Bryan Ferry, Nancy Wilson and The Palastorchester with Max Raabe.

DESTINY'S CHILD ON SENNHEISER

Monitor engineer Blake Suib has been using Sennheiser's SR 3056-U dual-stereo transmitters and EK 3052-U miniature stereo beltpacks on a recent 10-week world tour with Destiny's Child. According to Suib, this was the first major tour with in-ear monitors for Destiny's Child, who had previously relied on wedges. Marty Garcia, president of Future Sonics Inc., packaged the Sennheiser system and Future Sonics Ear Monitors® with MG4 drivers.

ATI PARAGON II FOR PETTY TOUR

Robert Scovill, who has mixed every Tom Petty show since 1995, is relying on an ATI Paragon II Production console at FOH for Petty's current North American tour. "The Paragon II is the first live console to do a proper center bus for sound reinforcement use," notes Scovill, who has configured the P.A. for LCR speaker clusters. The console also provides dual sets of stereo and C-bus masters. "This allows me to do something I've always wanted to do: delay the backline microphones to the vocal microphone," Scovill explains. "I can now delay the entire band slightly so that they fall in time with Tom's vocal microphone."

SOLOMON BURKE
A NEW DAY FOR THE BISHOP OF SOUL

By David John Farinella

Solomon Burke drove to the Sound Factory in Hollywood with only one thing on his mind: "On this session, I did no changes, I did no producing. I just did the singing," the "Bishop of Soul" explains of his latest critically acclaimed CD, *Don't Give Up on Me* (Fat Possum/Anti). "It was a lot of pressure off of me to not be responsible for what the music sounds like or how it's going to go. 'This is the way you want it? Okay, here it comes.' You put the flour out there; I'm going to make the cake. Sorry guys, if you don't like upside-down cake," he adds with a laugh. "Next one's going to be chocolate. So we played bakery, and up popped the goodies."

Don't Give Up on Me is just the latest chapter in a long, distinguished career that began in the singer's hometown of Philadelphia in the early '60s. He had a number of big hits during that decade—"Cry to Me," "If You Need Me," "You're Good for Me," "Got to Get You Off My Mind," "Tonight's the Night," "Proud Mary"—but his influence was always greater than his popularity. Mick Jagger is just one of the singers who borrowed from Burke's powerful, gospel-influ-

enced style. He's continued to tour and make records through the years (and he owns a chain of mortuaries on the West Coast!), but none have created the stir that *Don't Give Up on Me* has in the few months since its release.

For this outing, Burke was assisted by producer Joe Henry and engineer Husky Hoskulds, who recorded the entire 11-song album in a mere four days. It made for brisk sessions, but Henry wouldn't have had it any other way. "I think time is like closet space—you fill up whatever you have," he says. "If we had more days, we would have used more days. Truth be told, we could have done it in three."

Before the recording team even hit the studio, there was already a buzz surrounding Burke's album: Fat Possum Records' A&R rep Andy Caulkin had managed to snag new tunes on Burke's behalf from such legendary songwriters as Bob Dylan, Brian Wilson, Nick Lowe, Elvis Costello, Tom Waits, Van Morrison and Dan Penn. Once in the studio, Burke was surrounded by a number of fine players, including drummer Jay Bellerose, pianist David Palmer, bassist David Piltch, guitarist Chris Bruce and Burke's longtime organist Rudy Copeland. The Grammy-winning gospel vocal group the Blind Boys of Alabama sang with Burke on the tune "None of Us Are Free," and Daniel Lanois added his ambient guitar to "Stepchild."

Though the songs partially dictated the album's feel, producer Henry—himself a gifted singer/songwriter—had some definite ideas of how the production would sound. "From the beginning, I said

PHILIP BAILEY
THE EARTH, WIND & FIRE SINGER SHOWS HIS JAZZ SIDE

By Chris J. Walker

For 31 years, Philip Bailey's soaring falsetto has been one of the hallmarks of Earth, Wind & Fire's dynamically charged R&B sound. Without question, his easily identifiable voice, along with the group's dazzling and innovative instrumentation, are major factors in the group's enduring success. Nonetheless, Bailey's crystal-shattering vocal parts don't display the full extent of his talents. He shines beautifully in the middle ranges as well, and even hits some low tones when necessary. But EWF fans rarely ever hear him sing extensively in those registers during shows or on recordings.
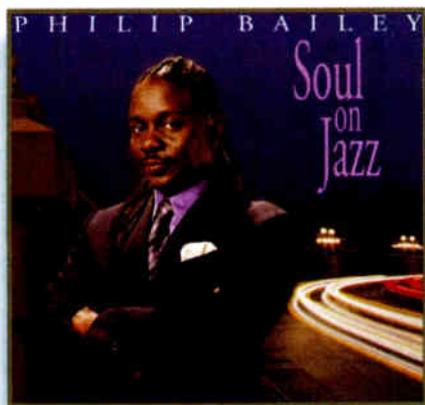
That could frustrate some singers, but Bailey says that he thoroughly understands his role, along with the group's format and boundaries. In order to satisfy his wider creative urges, Bailey has undertaken an array of side projects through the years. One of them even became a Platinum-selling and Grammy-winning CD, *China Wall*, made with Genesis drummer/vocalist Phil Collins in 1984 and highlighted by the mega-hit "Easy Lover."

Other solo endeavors for the EWF vocalist included gospel recordings and musically adventurous amalgamations such as the 1999 Head Up/Telarc album *Dreams,* which included numerous jazz luminaries, including Pat Metheney, keyboardist/vocalist George Duke, saxophonist Grover Washington Jr., saxophonist Kirk Whalum, trumpeter Randy Brecker, keyboardist Joe McBride, guitarist Peter White, bassist Ger-

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GRP RECORDS
CELEBRATING 20 YEARS OF SMOOTH (AND OTHER) HITS

By Chris J. Walker

Twenty years ago, composer/keyboardist Dave Grusin and producer Larry Rosen launched GRP Records as an independent outgrowth of the contemporary jazz projects that they had collaborated on and cut for GRP when it was an Arista Records imprint. Their label was one of the first to embrace the then-new digital recording technology, and the label quickly established itself as a major force in the jazz world, even though many mainstream and progressive jazz types decried the label's focus on "commercial" sounds—the age-old jazz debate.

Since its pioneering days in the early

GRP founders Dave Grusin (left) and Larry Rosen

'80s, when the label was synonymous with a particular type of easily digestible "smooth jazz," a lot has changed at GRP. MCA (now Universal Music) purchased the company from founders Grusin and Rosen in 1990. In 1994, renowned producer Tommy LiPuma became its president and streamlined the company roster, dropping a number of the label's less "contemporary" artists. (LiPuma is now CEO of GRP/Verve.) Many jazzers *still* don't like GRP, but it is regarded by most of the musicians who have recorded for the label as an "artist-friendly" company. Keyboardist David Benoit has been with the label since the mid-'80s and recorded more than a dozen different solo projects there. "Not only have I done all of my albums, but also their first big band records, a Beatles tribute and Christmas CDs," he comments.

To commemorate the company's 20th anniversary, GRP has compiled a double-CD chronicling its history. Though GRP's catalog is quite diverse, spanning new age

THE BAND'S "THE NIGHT THEY DROVE OLD DIXIE DOWN"

By Blair Jackson

Virgil Caine is my name and I served on the Danville train

'Til Stoneman's cavalry came and tore up the tracks again

In the winter of '65 we were hungry, just barely alive

By May the 10th, Richmond had fell, it's a time I remember, oh so well

The night they drove old Dixie down, and the bells were ringing...

In Sammy Davis Jr.'s pool house (L-R): Garth Hudson, Robbie Robertson, Rick Danko, Levon Helm and Richard Manuel.

More than three decades later, it's difficult to put into words just how bold and fresh and affecting those opening lines from "The Night They Drove Old Dixie Down"—sung with such plaintive authority by Levon Helm—sounded wafting from the ol' FM radio back in 1969. The Civil War? Huh? What's goin' on here? Rock was still in its indulgent, post-psychedelic haze. Long guitar solos (and bass solos, drum solos and everything-else solos!) were the order of the day. Wanking blues-rock was king. Yet here was the coolest American "pop" album of the year, by a group consisting of four mysterious Canadians and a guy from Arkansas, of all places. The 12 songs that make up The Band's eponymous second album—also known as "The Brown Album" because of its cover color scheme—seemed to have been forged in rural America sometime in the 19th century, yet they were also unquestionably at the vanguard of a new, modern rock 'n' roll sound, as well. Amidst the sawing fiddles, plunking mandolins and galloping pianos were electric guitars and basses and even a funky clavinet from time to time. For all of the musical allusions to old folk and country antecedents, there were other less definable nods to American R&B and early rock 'n' roll; sometimes, it was more of an attitude than anything else. But The Band mashed all of these influences together into a big ball and created a sound that was utterly unique and, as it turned out, quite influential.

The Brown Album wasn't a complete surprise, of course. A year earlier, in 1968, the group had released its critically acclaimed first album, *Music From Big Pink*, which demonstrated that *this* Band was quite unlike any other on the scene. By that point, they had already been together

on and off for eight years—first as the backup band for rockabilly/R&B singer Ronnie Hawkins; then for a spell as Levon & The Hawks; but most famously as the group that supported Bob Dylan on his controversial move to electric music in '65-'66, and recorded the famous 1967 "Basement Tapes" with Dylan in the cellar of a big pink house in the middle of the woods in rustic Woodstock, N.Y.

Despite the title, *Music From Big Pink* wasn't recorded in the basement there; it came from 4- and 8-track sessions at A&R Studios in Manhattan, and Capitol and Gold Star Studios in Hollywood. John Simon, a one-time staff producer for Columbia who'd gone independent, was brought in to help out—a good choice because he was an excellent musician and not shy about adding his own touches to The Band's rich stew. The album was an unexpected hit, and The Band quickly became critics' darlings and underground heroes.

It's easy to see why. The group boasted *three* highly distinctive lead singers—Helm, all backwoods charm and character; Rick Danko, so full of emotion and expression; and Richard Manuel, possessor of a quirky, unearthly falsetto—and everyone seemed to play a zillion instruments. Robbie Robertson was a guitarist of exquisite taste and imagination, not to mention a gifted songwriter, and keyboardist/reedsman Garth Hudson was like a one-man band—he could seemingly play *anything*. Every song on the album featured a different combination of sounds and textures; obviously great thought and care went into the arrangements. Yet there was also something very loose and spontaneous about it all; it didn't feel fussed over. There was something compelling but elusive, fragmentary but direct, about the lyrics—could anyone say for sure what was going on in songs like "Chest Fever" and *Big Pink*'s one bona fide FM smash, "The Weight"? Then there were the two powerhouse Dylan tunes on there: "Tears of Rage" (co-written by Richard Manuel) and "I Shall Be Released," which stand among his very best. The Band's own songs felt like they'd been cut from the same cloth as Dy-

of mostly dynamic mics, along with a few Neumann condensers. ("We must've had some 87s for vocals," says Simon, who, like Robertson, remembers few technical details of the pool house studio setup.) Capitol also helped work on soundproofing the studio, which turned out to be quite a task. "Instead of coming inside and soundproofing the place and making it smaller inside, we soundproofed it from the outside," Robertson says. "They had these big square frames that were chiprock or Fiberglas or something, and they put them on the side of the building.

It didn't look too good, but it was functional, and it did what it needed to do. Then on the inside, we hung blankets and things and made it so it was cool."

John Simon remembers being frustrated by the slow pace of getting the equipment from Capitol and setting up the studio, but the group's first couple of weeks in the house were well spent anyway, working on songs and scouring the area's music and pawn shops looking for interesting musical instruments: Levon Helm found a wood-rimmed, turn-of-the-century drum kit that became the foundation of many a

song, and Richard Manuel found a fine old upright piano. Once the equipment was all in place, in keeping with Robertson's vision, the group would set up in a close cluster, with minimal baffling, and in the same space as the console and recorder. Simon and Robertson were the principal engineers on the album, though Simon recalls that every morning, Capitol sent a maintenance man named Don Nelson up to the house to make sure everything was running properly.

Today, Simon notes that "I really wasn't trained as an engineer. I know enough to get by, I guess. I know when engineers are lying to me; that's the extent of my knowledge," he says with a laugh. Robertson concedes that he learned much of what he knows from Simon, who dryly notes, "Robbie wanted to learn everything I knew so in the future he wouldn't need me; that was clear. And that's what happened."

"John was great about saying, 'This kind of microphone works good in this kind of circumstance, because this might be too sensitive for that,' or 'You're going to get more leakage out of that,'" Robertson says. "He gave me a crash course on how to work the board and a lot of the basic stuff. But once I got into it, it didn't seem like there was much of a mystery here anyway.

"The way we worked, it was pretty basic. You would turn things on one at a time and listen to it. Then you'd turn *everything* on, and the idea was, if it doesn't now sound better, then something's wrong. If the leakage isn't working in your favor, then you're not set up right. So we really took time in setting up the room and getting a sound on everything. There were cases where we would move around baffles in the room—if the leakage was ruining the sound of the piano, for example. But the leakage is often a big part of the character of the song."

All of the songs for the Brown Album were all either written or co-written by Robertson—some were started in Woodstock; a couple emerged from a trip Robertson and Simon took to Hawaii just before the pool house sessions; and a few were written once the group was in Hollywood. This month's Classic Track was started in Woodstock and completed in Hollywood. "I remember Robbie writing 'The Night They Drove Old Dixie Down' piece by piece," Simon says. "He had a certain section, then another that wasn't finished, and he was sort of chipping away at it over a period of time. That was

World Radio History

one of the ones he really didn't have together when we arrived at Sammy Davis Jr.'s. We also had a piano in the house in which we lived, and I remember him playing that song on the piano in the house before we got to recording it."

As for the song's inspiration, Robertson told writer Rob Bowman, "I had the music in my head for 'The Night They Drove Old Dixie Down' and had no idea what the song was about. I was just humming it and playing these chords, and I liked the chord progression I'd come up with. At some point, [the concept] blurted out of me.

Then I went and I did some research and I wrote the lyrics to the song."

When I spoke to Robertson more recently, he added, "It just seemed to fit in with the combination of flavors in the music and the time period we were dealing with at that time. It was like that record was in sepia tone or something. To this day, people ask me, 'Whatever possessed you to write that song?' And the answer is, I don't really know; it's the only thing I could think of at the time." (Robertson says the group's resident Southerner, Levon Helm, nixed a verse about Abraham Lincoln. The song's Robert E. Lee reference—more appropriate to Virgil Caine's viewpoint—survived.)

Robertson's recollection is that "The Night They Drove Old Dixie Down" was cut completely live: He played acoustic guitar ("either a D-35 or this other acoustic I had made by this guy named Kalb"); Manuel played piano; Danko, bass; Helm, drums and, most likely, a live lead vocal; and Hudson laid down a Hohner melodica line that sounds uncannily like a harmonica. The backing vocals were most likely overdubbed, as were Hudson's Lowery organ, his little trumpet obbligato and, on some alternate takes, Rick Danko's fiddle. Robertson believes that the echo on Hudson's melodica was probably printed to tape at the time rather then added later during the mix. Besides the EMT plate Simon had requested, "our chamber was the bathroom, which had a speaker and a microphone in it," Robertson says.

According to Simon, the pool house sessions usually went this way: "We would work the songs over all day—fine-tuning the arrangement and getting the parts together. We'd work out the parts really carefully by trial and error, trying all sorts of different approaches. Even in choosing microphones, it was all trial and error. We tried every single mic on every single instrument to see what sounded best. We'd work on the song and then go to sleep at night not having really 'gotten it.' Then we'd get up the next morning and actually cut it fresh. So a song typically took two days to record. We would make rough mixes as we went along so we could play them for people, because *everyone* wanted to hear what we were doing. We always had lots of people coming through—especially musicians."

The Band left Sammy Davis' pad before they could complete the album—the last couple of songs were recorded back in New York at the Hit Factory, and the album was mixed there, as well. The mix is credited to New York engineers Joe Zagarino and Tony May, but in fact, all of the members of The Band and John Simon helped out as extra hands on the board when needed.

The Brown Album caused quite a sensation when it was released in the fall of '69. Propelled by the surprise hit "Up on Cripple Creek," and strong FM airplay for "The Night They Drove Old Dixie Down," "Rag Mama Rag" and "Across the Great Divide," the album rocketed into the Top 10 and established The Band as a real force in rock. They even landed on the

cover of *Time* magazine in January 1970 as "The New Sound of Country Rock."

There would be a few more good years and strong albums from The Band—*Stage Fright* in 1970, the underrated *Cahoots* in '71, the live *Rock of Ages* (with terrific horn arrangements by Allen Toussaint), *Northern Lights-Southern Cross* in '75—before their grand finale at the Last Waltz in 1976. All but Robertson would carry on with other incarnations of The Band in the '80s and '90s, but the deaths of, first, Richard Manuel, then Rick Danko, has now put The Band to rest permanently. ■

SOLOMON BURKE

pretty plainly, 'If I'm going to be involved, I have no interest in making a retro soul record. I don't want any horn sections, I don't want it to be something that's overly grand and ornate,'" he explains. "What I really wanted to do was something that was as stripped-down as it could be, so that every nuance, every trail-off of his voice was full-frame. The idea of having new songs from some very outrageous sources—songs that nobody has ever heard before—was very intriguing."

For his part, Burke says that he was very pleased with the choice of Henry as producer. "Anybody that eats biscuits and gravy is cool with me," the singer says with a laugh. "He sounded good and he talked good and he was willing to do it. That took a lot of guts, because there were a lot of different producers who would not produce me. Why would you produce someone who is 62 years old that's been in the business for 50 years? What happens if you fail? What if you don't come up with a record? Where do you go from there? So, it was a sure shot and a smart move for [Henry], because he knew just how to stay on the wire and to be there and get what he wanted.

"So, I'm hoping that this is it. All we can do is pray and believe. You believe, you receive. You doubt, you do without. So, I'm not doubting and having the faith. It's a little different for me, because I'm accustomed to hearing more music, more horns and more this and that. But sometimes, less is best."

That's also the approach that engineer Hoskulds took during the recording sessions. "For me, there's not really anything to do except just to make sure that the studio is set up in such a way that you can move quickly," he reports. "I try to set everything up so that everything is ready to go from the first song; then there's minimal changing around as we're going. It's not really a big setup or a big prep or anything; I just have a lot of coffee and dive in."

The album was recorded in Studio A at the Sound Factory, which has two medium-sized recording spaces that are in an L configuration, with the control room in the middle. There is a pair of isolation areas that were used but were not as important for an album like this, Hoskulds says. "On this record, it was not as much of an issue, because usually what you get when you're tracking stands on a record like this; there's not a lot of chasing your tail. You just don't have the time to do that. You get the guitar part that's the guitar part, unless there's something to fix. It's good in that sense because it's not huge by any means, but it's got a great vibe. And because of the proximity of everyone in the room, it has a vibe that, to me at least, is conducive to getting things done."

In the midst of the hubbub, Burke was learning the song, Henry was working with the Blind Boys' musical director on the arrangement, and the band was listening in to figure out what was happening with the music. "It was intense, and probably more than the Elvis song, I felt like I was in the hot seat to make sure that all these balls stayed up in the air," Henry recalls. "Then, when the song happened, it was chilling. At a certain moment, I leaned into Solomon's vocal mic and counted off the song as a joke to see where everybody was. I didn't know if

everybody had headphones on, I didn't know if everybody could hear me. I thought everybody was in their own world. I just called the room to order and counted off the song and everybody just fell in. It was really shocking. It kind of blew me back. I felt air leave my body because everybody was *there*. We did two takes of the song and that was it."

For any producer, there's not much better of a feeling. "It was remarkable. It was the end of the fourth day. Solomon was done working, he got up and thanked everybody, and he left. We sat

around, had a little bit of scotch and listened to some things back and said, 'Wow, there really *is* something.' It was a really intense four days; it's kind of a blur when it's happening, and then you kind of come out of it a day later and you go, 'I think it happened.'"

Not only did Burke have a chance to put his own producer's hat aside for this record, it was the first time in a number of albums that neither his daughter nor his son produced one of his sessions. "I kind of get away with things with them," Burke says with a chuckle. "There was nowhere to run here with this situation. There was a producer sitting there, and he was saying, 'Let's go.' I was waiting for him to come down and say, 'Hey, man, don't do this,' but that never happened."

In fact, Burke knew from the outset that Henry was the man for this project. "I think I took him out to breakfast and ordered him some gravy with his lox and eggs," Burke says laughing. "I think from that moment on he said, 'This is a soul brother; I've got to work with this guy. I've got to put more gravy in it.' He brought me a song called 'Flesh and Blood,' and I said, 'Does he want gravy with this?' So, I put a little gravy on it for him, and I'm sure it wasn't the way he originally thought it up. He was beautiful. He was a great guy. We had a lot of fun. It went very smoothly." ∎

PHILIP BAILEY

ald Veasley and others.

The title of Bailey's latest Heads Up release, *Soul on Jazz,* describes the project perfectly. It finds the singer delving into soulful, R&B-inflected mainstream jazz, crooning in a cooler, much more relaxed mode than his piercing EWF style. Accentuating the engaging arrangements are such players as Bob Belden (percussion/soprano saxophone; he also produced several tracks), Myron McKinley (keyboards, production), Scott Kinsey (keyboards, production), Billy Kilson (drums), Ira Coleman (acoustic bass), Allan Burroughs (acoustic guitar), Don Alias (percussion), Mike "Dino" Campbell (guitar), and a number of other top-notch musicians and backing singers.

Although he isn't normally associated with jazz, Bailey insists that he's been interested in the genre since his years growing up in Denver. "I grew up listening to

it as a kid and always loved it," Bailey says from a hotel room in Las Vegas while touring with EWF. "But this is not the first jazz project I've worked on. In terms of singing and doing backgrounds, I've done records with Fourplay and The Pride of Lions with the late, great Tony Williams, Billy Childs on piano and Roy Hargrove on trumpet. That kind of whet my appetite to actually do a full-out jazz project."

For this project, Bailey picked songs by such jazz greats as Joe Zawinul, Chick Corea, Herbie Hancock and Thelonious Monk, as well as the standard "Nature Boy," and a new original written by Myron McKinley with lyrics by Bailey's son (who also fashioned words for two other songs on the disc). There is also an intriguing re-working of the EWF hit "Head to the Sky, "which was done with regards to 9/11 and meant to be uplifting," Bailey says.

Unlike EWF's recordings, which can literally take years to complete, this album was cut in about a month—during October and November of 2001—at Bennett's Studio in Englewood, N.J. "The CD was really a testament to planning in terms of just knowing what we wanted to do," Bailey says. "EWF has been working on a new record it seems like forever now, and I don't know when we're ever going to get it out."

Much of the early work on the album was supervised by Bob Belden, who produced more than half of the tunes on Soul on Jazz. "Scott Kinsey and I did pre-production sketches on Digital Performer, and we e-mailed each other files and added stuff. Once Philip agreed on the tempo, form and other things, Scott recorded a lot of the parts into his laptop [G3 Powerbook]. Then, through my MOTU 828 [FireWire audio interface], we transferred the basic tracks, which were all done at home. So on the first day, we dumped all of the digital stuff in the computer to analog.

"On the second day, Myron worked on his things with the rhythm section [for live tracking with Bailey doing scratch vocals]. For the third day, I worked with Scott and the rhythm section for our tunes. Then, on the fourth and fifth day, we did overdubs with live horns. Plus, we had a second studio running at the same time for vocal overdubs. The whole thing was to keep everything running, and Philip just went from one room to the other."

Engineer Robert Friedrich concurs with the producer in regards to the efficient use of studio time. "It was quite intense, and we pretty much wrapped up the record in three or four weeks, from top to bottom," he says. "That was unique for a project of that magnitude. Originally, it was going to be just a jazz band backing up Philip [recorded analog], and then it kind of evolved into an R&B record with 48 tracks of analog and Pro Tools. We got involved with background vocals and other overdubs, and it kind of snowballed. While I was recording in one room, we were making stripes onto Pro Tools and doing submixes in the alternate one." Most of the tracks for the Soul on Jazz sessions were recorded on a pair of 24-track 2-inch Studer decks. Supplemental overdubs and backing vocals were recorded direct to Pro Tools.

Like all current Telarc/Heads Up CDs, this one was mixed in both stereo and surround, notes engineer Friedrich, who's also a classically trained violinist. "Basically, after I get my stereo mix going, we check out what we're going to do with surround. There's no real formula or anything, and the Genex recorder [used for the surround mix] has eight channels. We often do two channels stereo and six surround. In the case of Philip's record, we

recording notes

a regular pop/R&B production. The Winwood tune was the easier of the two, because everyone was in there just *blowing.*"

The entire process from recording to mixing was done in Pro Tools at various studios. Sykes has a full-blown system at his home studio in the Los Angeles suburb of Woodland Hills, where Braun and Harner literally live down the street from him. For the session done at Schnee's Studio in North Hollywood, the engineer brought in his "hot-swap" drive, which interfaced with the studio's Pro Tools system.

Formerly a hard-working session guitarist, engineer Sykes was able to use his musical knowledge to great effect on the session, reading the charts, and mapping out Lorber's CD-Rs to bars and beats with a click track. Additionally, he was able to line up the loops with the bar numbers on the charts, which greatly aided the session players.

Back at Sykes' home studio, the final prep and mixing of the tracks became more involved than originally anticipated. Before actually getting down to mixing, the engineer spent several days conforming Lorber's original "Uncle Darrow's" tracks with the ones done at Schnee's. "The feel that Jeff Lorber had on it was very different from the ones with added live musicians," Sykes explains. "All of his little parts didn't feel good against the rhythm section. When the band played, they brought their own magic to it. It's not a slam on Lorber; just a compatibility issue. Thank God I had Pro Tools to modify his parts so that they feel like he was with the players at Schnee's. His stuff was more laid back, while the band had a pushy feel."

During mixing, Harner, Braun and Sykes rewrote the horn arrangements. Due to the brevity of the tracking sessions, some of the desired emphasis was missed. All the notes were there, though; so in Pro Tools, they cut and pasted different notes in various places. "Basically, we work real well as a trio here," Sykes comments. "Bud comes up with different points of view on how things should come in rhythmically and especially what shouldn't play where. Rick is more hands-on, usually doing basic tracks and MIDI stuff." Final mixdown was also done on Pro Tools.

Unquestionably, GRP has evolved greatly since 1982 and plans to be around for many decades to come. One thing that hasn't changed for the label since its inception is the emphasis on quality, staying abreast of new technology and being alert to new styles of jazz. "We weren't just going in and whipping something out real

quick," Harner stresses. "I wanted to make sure the songs were good and worthy of the other acclaimed music that's on this project. It's hard to say what's going to come along, but we'll be keeping up with new sounds and recording styles." ∎

Cool Spins, FROM PAGE 190

monica cat. Yet, the music they make together (this is their third Blind Pig release) isn't flashy or pretentious in any way. These guys don't need to show off their virtuosity; it's apparent in the little details that give this mostly acoustic music so much depth and character. Stylistically, they are all over the map on these 13 original tunes—a little blues shuffle here, some countryish crooning by Buffalo there, a dash of rock 'n' roll—but it's unified by the remarkable communication between the two main players, who always seem to come up with the right instrumental coloration to match each song: 12-string slide on this tune, chromatic harp on this one, etc. Both are strong singers and songwriters—mostly they deal with romance (lost and longed for), but tunes like Rogers' "Trinity" and Buffalo's spooky "Seven Hearts" show them branching out into unusual areas, too. Fans of Rogers' incredible slide work will also want to check out his excellent recent Evidence solo album, *Slideways,* an entirely instrumental showcase for his prodigious talents. There's *plenty* of flash there.

Producers: Norton Buffalo and Roy Rogers. Engineers: Pete Carlson, Buffalo, Justin Phelps, Alan Sudduth, Joel Jaffe. Studios: Bayview (Richmond, CA), Moon Valley (Sonoma, CA), Studio D (Sausalito, CA), Prairie Sun (Cotati, CA). Mastering: Paul Stubblebine.

—*Blair Jackson*

Doro: *Fight* (Steamhammer)

It's true, I'll admit it: I want to be Doro. She's cool, she's tough, she's everything metal, and she'll run you over with her powerful, melodic hard rock. You may remember her as the frontwoman for the metal legend Warlock, but for the past 20 years, this emotive German rock chick has been flying solo, amassing 12 bonecrunching albums. This time around, Doro's newest release, *Fight,* relies more on her raw, earthy, female allure, rather than on a loopbased production of one guitar riff after another. Aside from Doro and her band (Joe Taylor on guitar, Nick Douglas working the bass, Johnny Dee hitting the skins, and Oliver Palotai tackling both guitar and keyboard duties), the release features tracks penned by Gene Simmons ("Legends Never Die"), Russ Ballard and Jean Beauvoir, as well as a surprise—and stellar—performance by Type O Negative bassist
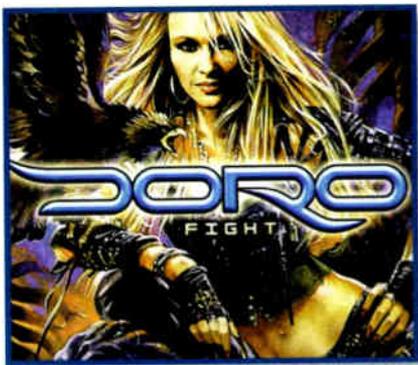
Pete Steele on "Descent." The album is as powerful as possible and as natural as necessary—she's still a metal chick's type of woman!

Producers: Doro Pesch, Chris Lietz and Dan Malsch. Mixers: Malsch and Lietz. Studio: Soundmine Recording Studios (East Stroudsburg, PA). Mastering: Pesch at Skyline Studios (Duesseldorf, Germany).   —Sarah Benzuly

Eleanor McEvoy: Yola
(Blue Dandelion/MOSCO)

Yola, the fourth album by this brilliant guitarist/singer/songwriter, may be McEvoy's best release to date. Although the album's title refers to an obscure dialect used in a remote part of her native Ireland, Yola is not "Irish" music, and other than a slight lilt to her voice, McEvoy's songs are universal in nature—typically about troubled relationships. Yola doesn't stray from this direction, with pithy tunes such as "The Rain Falls," depicting a day when everything goes wrong, ending in being dumped by a lover via e-mail. In her first self-produced project (co-produced with keyboardist Brian Connor), Yola offers tight, well-crafted performances by McEvoy and her band, with superb audio. As a historical footnote, two Yola tracks were re-

leased as the world's first SACD single (on Market Square Records), which further spotlights the warm 24-track/Dolby SR recording and sparkling ½-inch 2-track mix. Bravo!
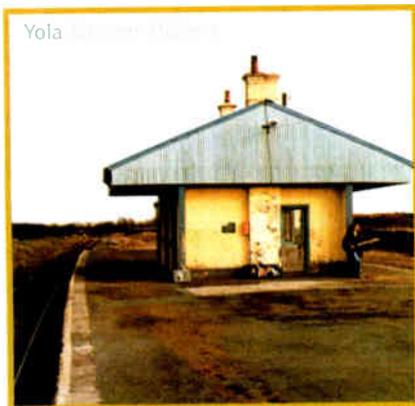
Producers: Eleanor McEvoy, Brian O'Connor. Engineers: Ruadhri Cushman, Ian Cooper (mastering). Studios: Tracked at The Works (Dublin), mixed/mastered at Metropolis (London).   —George Petersen ∎

SESSIONS & STUDIO NEWS

SOUTHERN CALIFORNIA

Out at Glenwood Place Studios (Burbank), Melissa Auf der Maur (Hole, Smashing Pumpkins) got to work on her first solo project. Chris Goss shared production duties with Auf der Maur, and Martin Schmelzle was tapped to engineer. Guest musicians included various members of Queens of the Stone Age, John Stanier (Helmet) and Paz Lenchantin (A Perfect Circle)...Inside Image Recording's (Los Angeles) Studio A, Chris Lord-Alge was mixing tracks for Vertical Horizon's upcoming LP with producer John Shanks. Assisting the session was second engineer Keith Armstrong. Lord-Alge also finished mixing the new LP for the Swedish rock band Blindside with producer Howard Benson and assistant engineer Dim-e...DMX checked into Enterprise Studios (Studio City) to work on some new material for his Bloodline imprint with producer Nas Collins. Also at Enterprise, Christina Aguilera has been working on her new album with a variety of producers, including Linda Perry,

From left: Chris Goss, Melissa Auf der Maur and Martin Schmelzle at Glenwood Place Studios.

The Headway Music Complex in Westminster, Calif., recently upgraded its Studio 2 with the installation of a 64-input, GML-automated Neve console.

Scott Storch and Glen Ballard. Aguilera has also teamed up with Alicia Keys for a song mixed by engineer Dave Pensado. Country star LeAnn Rimes tracked several songs for her new album, *Twisted Angel,* with engineer Rob Chiarelli. Peter Amato and Gregg Pagami produced the effort. Dave Mustaine was back at Enterprise to remix some live songs for an upcoming Megadeth box set; Bill Kennedy was in to engineer. And the Red Hot Chili Peppers and engineer Ethan Mates remixed some live material from shows in Madrid and Hamburg.

NORTHEAST

Matchbox Twenty and producer Matt Serletic worked on their next album for Atlantic Records at Bearsville Studios (Woodstock, NY). Greg Collins, who last worked with System of a Down, engineered the project. Island/Def Jam artists Saliva were also in to record some new material with producer Bob Marlette and engineer Michael "Elvis" Baskette...RCA artists Eve 6 stopped in at Avatar (NYC) to begin recording their new album with producer Gregg Wattenberg, engineer Chris Shaw and second engineer Ross Petersen.

NORTHWEST

Nettleingham Audio (Vancouver, WA) engineer Kevin Nettleingham mastered releases for a number of artists: Big Hank and the Blues Boys, Life After Lift-Off, Andi Camp, Trophy Wife and Sicc Mob Clicc.

SOUTHEAST

Production team The Neptunes (Pharrell Williams and Chad Hugo) stepped into Stonehenge (Atlanta) with Chili and T-Boz to work on an upcoming TLC release. Brian Garten (N.E.R.D., Nelly, Usher) engineered and Morgan Garcia assisted.

STUDIO NEWS

Studio B at Skip Saylor's (Los Angeles) Larchmont location recently received a facelift. In addition to some new lounges and a game room, the facility now features a 64-input SSL G Plus desk along with an 8-channel Neve sidecar with 1073 modules. ∎

Please submit your sessions and studio news for "Coast to Coast" to Robert Hanson. Submissions can be sent via e-mail to RHanson@primediabusiness .com. Photo submissions (JPEG at 300 dpi) are always encouraged, and please include the name(s) of the artists, producers and engineers on the project, and the location of the studio.

World Radio History

of the way we do that is by helping them write singles that are classic and, hopefully, will stand the test of time."

Writing brought the three together; producing came about when their demos, including Lavigne's "Complicated," ended up as final releases. Their general production M.O. is to get to know an artist in casual surroundings before diving into the writing. "Scott comes from the urban side, I'm more rock and Lauren ties us all to-gether," comments Edwards. "We come from different directions, and we all bring something to the music that mixes well."

"When we work with an artist, we tend to bond, have fun and become friends," adds Christy. "Sometimes that happens in just one day. We bring in all of our history and our past, but our most important aim is figuring out what they want to get across. We want to keep their vision, not to make it sound like a 'Matrix record.'"

John Kellogg and Dolby's "Surround in Motion" BMW X5

Among them, the three have four recording systems. The main studio in the house is based around Pro Tools and banks of synths, with portable rolling racks. "We can pack it all up in two hours and re-set it up in two-and-a-half," Spock asserts. "That's what we did in Miami for Ricky Martin, both at his house and at Hit Factory."

"Complicated" was recorded in one day in a house in L.A.'s Valley Village, and also mixed there, "in the box." The album features a Tom Lord-Alge mix, but both TLA's and Matrix's mixes are getting radio play. "We're able to put a track together really quickly," says Spock. "Everything goes into Pro Tools and we've gotten the signal-to-noise ratio really low. We use Apogee AD8000SE converters for live recording—they're the bomb—and we interface our 72 outputs of synths with Digidesign 1622s. Most of the time, for vocals we use Avalon mic preamps or a Neve 1272 preamp through a Distressor. As far as I'm concerned, Pro Tools is great. Hopefully in the near future, we'll have software versions of all of this in a laptop, with just a one-rack interface and a guitar, instead of all these boxes."

In keeping with low signal-to-noise, Spock is excited about his recently installed Isobox, a portable ATA-approved version of their studio model, which he's using on one of his racks. "It's great," he says. "Until I closed the door, I didn't realize how much noise the rack was generating."

All mixing isn't done at home; not long ago, The Matrix had three rooms booked at Burbank's The Enterprise, with mixers Dave Pensado, Paul Lani and Rick Travali all working on Matrix-written-and-produced songs for different artists on different labels. With so many projects going on, Spock jokingly says, "Retrospect [archiving software] is getting a real workout."

"Next week, we'll be going from hip hop to rock," says Christy. "Sandy Roberton, our manager, doesn't let us work on any one thing for too long, which, actually, I think is very good for you mentally.

PHOTO: MAUREEN DRONEY

We never get bored. The joy is coming into a room and going, 'Okay, what are we doing today?'"

Some days, this job is really fun. Say, for example, the afternoon Dolby Labs' John Kellogg took me for a spin in Dolby's "Surround in Motion" tricked-out BMW X5. Built to demonstrate how Dolby's technologies can be used in a vehicle—from 24/96 DVD-Audio and DVD-Video to Dolby Digital, Pro Logic 2 for CDs, Dolby surround headphones and Playstation 2— the car has been making the rounds of auto manufacturers, licensees, record labels and audiophiles. Outfitted with gear from Panasonic, Alpine, Tag McLaren and others, and featuring subs in both the rear and side rears, the car is Dolby's evangelical demonstration of what's currently possible to install in your roadster. "It helps people—and car companies—imagine the possibilities," explains Kellogg. "Auto systems providers don't just think of it as car audio anymore; it's really mobile multimedia, with navigation, XM [satellite radio], DVD, in-car Web-based communication—all sorts of things."

The goal was to use available "stock" ingredients, but Dolby engineers, led by Martin Lindsay, had to do some creative routing. All of the components run on 12-volt DC, but a Tag McLaren home unit had to be converted for use as a switcher. "We're heading toward a digital solution with 1394 connectors," notes Kellogg, "and it all works pretty well."

Think about it: Kids in the back lis-

At the new SSL XL 9000 K, (from left) studio designer Carl Yanchar, Pacifique owner Joe Deranteriasian and SSL representative Phil Wagner.

tening with Dolby Headphones to a 5.1 DVD-V of *Lion King*, while the front seat's occupants enjoy Mozart in surround on DVD-A. Cool features include settings to optimize for different seating arrangements and a lockout on the front screen to prevent the driver from becoming more interested in *Die Hard 2* than the road.

Kellogg, having lived through the DVD-Video marketing curve, is confident that DVD-Audio is finally on track. "There's no doubt that in the next couple of years, you will see American high-end auto manufacturers including DVD-Audio and other Dolby technologies," he comments. "But it takes time. There's a long design curve in a smokestack industry like auto manufacturing.

"DVD-Audio is following the same trajectory that DVD-Video did," he insists. "There are always companies that hold out until the last minute and then come in strong. Now, the tools are cheaper, everybody's stable and they've figured out production flow. We recently did a seminar with 10 hardware manufacturers and four record labels joining in together. It was passionate and it rocked. The industry is finally getting on the same page, figuring out how to do this, and DVD-Audio is moving full speed ahead."

Pacifique Recording threw a party to celebrate the installation of their 96-input SSL XL 9000 K Series console—only the second in Los Angeles—into West Studio. The well-attended bash brought a crowd of engineer and press types to the facility, situated on Magnolia Boulevard's "Studio Row," for a look at the new desk and a listen to an M&K surround speaker system. To date, according to SSL's Phil Wag-

COAST TO COAST

ner, 16 XLs have been purchased and eight installed; Pacifique's, at 96-in, is the largest among them.

A major console purchase is a brave step in the currently struggling studio business, but according to Pacifique co-owner Joe Deranteriasian, "You have to keep moving forward or people will forget about you. We love working in the music business, and we want to stay in it, so we have to upgrade."

Deranteriasian cites the improved sound of the second-generation 9000 Series desk as its main selling point. "Sonically, it was impressive, with more headroom," he says. "We had clients and their engineers listen to it; they told us that they'd love to work on it. We also liked that it's dedicated to 5.1. Another big feature is that it's integrated with Pro Tools."

The two-room Pacifique has always kept moving forward. The studios, which opened in 1984, are owned by three Deranteriasian brothers—Joe, Ken and Vic—all of whom come from musical backgrounds. Built from the ground up with the help of Wave:Space's Carl Yanchar, Pacifique was originally known as a well-equipped, economical overdub studio. Equipped for the past several years with two SSL 9000 J Series boards and a huge collection of outboard, it's evolved into a high-end mix facility that, thanks to hits by Christina Aguilera and Destiny's Child, was listed as one of *Billboard* magazine's top mix studios in 2000.

Wave:Space and Yanchar returned for West's redo that accompanied the XL. New wall treatments, including dark-wood speaker soffits and super-bright plasma screens, give the suite a new look, while a re-routing of the air conditioning gives the room a new feel. "Now it's not blowing on the necks of the mixers," says the genial Joe D., who has always seemed to take the studio business in stride.

East Studio, which was closed for the party while regular client Dexter Simmons jammed on finishing a mix for new J Records artist Monica, remains fitted with its 96-input SSL 9000 J with SL959J 8-channel monitoring system. Other recent projects have included mixes by Simmons for Will Smith and Beyonce, Brad Gilderman mixing the British girl group Atomic Kitten and a Wyclef Jean-produced project for Tom Jones, as well as projects with mixers Dave Way and Rob Chiarelli.

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love with his style of mixing. He understood how to get the low end right, and how to get the background vocals and the lead vocal positioned correctly."

For "Get It Together," Shippen mixed through an SSL 4064 G Plus console with Ultimation. The monitors were Dynaudio M3s with Avalon crossovers, bi-amped, with Bryston 7B-STs on the highs, 6Bs on the lows. There were also Yamaha NS-10s with an NHT sub. Pro Tools 5.1.1 was the recording/playback medium.

The lead vocals went through Fairchild 660, UREI LA-3A and Pultec EQP-1A3 to the console, while an EMT 250 helped with the ambience. The background vocals went to Neve 81069 pre's, VacRac tube EQ and SPL de-essers. Shippen ran the bass and electric guitar through Neve 2252 compressors, and acoustics went through vintage 117s.

The mix bus from the SSL went through an Avalon 2055 and Focusrite Red 3 into Apogee PSX-100, printed to Alesis Masterlink at 24-bit, 96k and Ampex ATR-102 ½-inch (BASF 900 at +5/250). Other gear utilized by Shippen included the Empirical Labs Fatso, two Lexicon PCM 60s, Lexicon 480L, a TC M5000 and Korg SDD-2000 delays.

For a number of the other tracks on the album, Alvin Speights (TLC's *Waterfalls*) handled the mixing in Atlanta and New York.

"We have learned so much from being in a town like Nashville," states Sanders, who also functions as Arie's music director on the road. "There are so many great songwriters and musicians and studios. And you pick up on so much that you don't even realize it until you go to other cities to work." ■

Sent your Nashville news to MrBlurge @aol.com.

a full-fledged album production in 20 years, camped out in Looking Glass' flagship Studio A in the fall of 2001, tracking, overdubbing and mixing the material that would become *Heathen*. Equipped with a Solid State Logic 4048 G Series console with E Series EQ, Studio A offers plenty of space in the control room (27x20 feet) and tracking area (31x15 feet). Other highlights include a 10-channel Neve BCM mixer with 1073 mic preamps; an Otari MTR90 II 24-track; a Pro Tools TDM rig featuring six Apogee AD-8000 converters; ADAT, DA-88 and Sony 3324 digital tape machines; and a full complement of state-of-the-art reverbs, compressors, effects,

equalizers, preamps and microphones.

In short, Studio A has everything that Bowie and Visconti might need. There was only one problem: Studio A became unavailable to them before they could wrap up the project. Glass had taken over the "A" room to record his score to the upcoming Godfrey Reggio film *Naqoyqatsi,* the last installment in the Reggio/Glass trilogy that also includes *Koyaanisqatsi* and *Powaqqatsi.* (Check out *Mix*'s April 2002 issue for more on Glass' work for this film.)

Although Visconti could have booked any number of other New York studios with a G Series SSL and state-of-the-art processing, he and Bowie were determined to finish *Heathen* at Looking Glass. The vibe was right, it was in the neighborhood, and all the hard drives were in-house.

Coincidentally, Looking Glass' Studio B had just opened up following the departure of its longtime tenant, engineer Pete Keppler. Visconti, who had been looking for studio space near his East Village apartment, promptly signed a lease for the room, effective March 1, 2002.

A 21x19-foot control room with a vintage MCI JH-600 36-input board, a Neve Kelso 10x2 mixer and a good-sized isolation booth, Studio B might not have been the most lavish room in the city, but it offered a viable alternative to its big brother down the hall. Visconti was sure that, with a little conversion, he could make it work.

"I knew that with my Logic Audio setup and the MCI console, we could mix tracks for the album in Studio B," he says. "We were in full-scale production mode here, so we wanted to keep going. Plus, every bit of equipment in Studio A was made available to us. If I needed a Fairchild compressor, it would appear as if by magic." Running 24 analog channels of Logic through three Digidesign 888|24 interfaces into the MCI console, Bowie and Visconti remixed the tracks "Slow Burn," "Afraid" and "I Took a Trip on a Gemini Spaceship," and, presto, *Heathen* was finished.

Visconti says that he was pleasantly surprised by how easy it was to work in Studio B, noting how consistent it was, acoustically and otherwise, with the flagship room. "We found that this MCI board had a lovely transparent sound, and that the room had nice acoustics, with a very honest low end," he says. "Also, it helped to have a lot of my old gear there—some nice vintage stuff like dbx compressors, a Saturator, a Shure Level Loc, an old Audio & Design Scamp processing system, and all the synths and modules we could possibly need, between the ones I brought and the stuff Philip has in his keyboard storage room."

Visconti also brought his vintage Neu-

mann U87 mics, as well as a handful of Audio-Technicas; he monitored through his KRK 6000s and Genelec 1034s, which he has been using in tandem for several years.

Since completing Bowie's album, Visconti has worked on material by rock band the Dandy Warhols and up-and-coming New York singer/songwriter Kristeen Young. He is now looking forward to continue ongoing writing/production projects with Annie Haslam and Richard Barone. "I thought this would be a demo studio, but it's turned out to be a professional facility for me," says Visconti.

"There's a tranquil, family-like atmosphere here and a sensitive vibe."

Bilof, for her part, is glad to have found a long-term tenant to fill the void left by Keppler's absence. "We wanted someone who had equipment to complement what was already in Studio B, and a strong base of clients to maximize the room," says Bilof. "Tony was the perfect fit. We love having him here. We all share resources and collaborate on projects. It's a win-win." ■

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plasma off the wall into the middle of the room and let go. And those rushes you get when you walk back into the room and see this thing floating four feet off the floor, over your cat and your Gold Top Les Paul.

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SONY 707 DIGITAL STILL CAMERA
I'll keep this simple: This is the sleeper of all "prosumer" digital cameras. Half point-and-shoot, half total control freak settable, this 5-megapixel alien artifact produces filmlike images that were simply not possible at any price a couple of short years ago. I searched and studied for months before a recent Harley trip through Sedona and finally found a most informative site: www.dpreview.com. After reading what this guy had to say, I chose the 707 over competitive cameras like the Minolta DiMage and Nikon CoolPix.

I was not disappointed. The 707 sells for $1k, but I read in the dpreview forums that Sears (!) matches even the most crazed Internet quotes, so I ended up getting one for $609.

If you are shopping for a 5-megapixel camera, don't rush out and get the 707, but read everything you can in the review section of dpreview.com. It may still be the best bet, but it may not be—digital cameras are the fastest-growing and fastest-changing consumer technology on Earth.

Meanwhile, I'll be printing giant posters of red mountains under black clouds.

11 SECONDS IN NASDAQ
I think this is about the right amount of time to be in the tech market to drop $999. Twelve seconds would put you out of range for this column.

NADY MRC-11 SUPERLOUD MOTORCYCLE RADIO COMMUNICATOR
Being a Harley rider who enjoys the virtues of a straight-pipe, high-compres-sion stroker V-twin under the tank, I have always wondered what it would be like to actually be able to talk to the other guys I ride with. Well, Nady must have thought of that as well when it designed this little FRS radio.

It has everything you need to tell your buddy half a mile behind you to watch out for the horse droppings just around

Superfast-forward through every episode of *The Osbournes* and only stop when Ozzy is actually trying to speak. Be the first on your block to decode what he is saying and tell your friends. I think there is a cash reward.

the bend at the Pennsylvania border, and to hear him when he finds out that you weren't kidding.

Its voice-activated transmit feature is, of course, totally useless on an alcohol-burning monster, so I am grateful that it has push-to-talk, as well. And when you get to the Harley rally, you can unplug the ear piece and boom mic and use them as conventional walkie-talkies so that whoever finds the beer first can immediately notify the other without wasting valuable time searching for him.

Okay, the beer comment is not a fair thing to say about Harley riders and the places they gather. The beer is actually right at the front gate. www.nady.com.

BOTOX INJECTIONS ON THE WAY TO A POKER GAME OR DEPOSITION
Now, I don't imagine I have to go into this one too deeply. This is certainly money well spent, as the perfect poker face is worth its weight in gold in either of these situations. Price: Well, under $1k if you have a friend in the business, or $68 if you are a tough guy and can do it yourself.

TIVO DRIVE HACKS
Buy a little TiVo, one with a wimpy 30-gig drive. Go to CompUSA and pick up a nice slow, cool 5400 130-Gig Maxtor or some-thing, go online and find out how to "bless" it to work in a TiVo, and drop it in. Bang! Weeks of recording space. Get every *Star Trek* ever made. Superfast-forward through every episode of *The Osbournes* and only stop when Ozzy is actually trying to speak. Be the first on your block to decode what he is saying and tell your friends. I think there is a cash reward.

TiVo: $299. Drive: $229. Never again be a slave to network or cable broadcast schedules.

CONTOUR DESIGN SHUTTLEPRO
You kind of have to see this thing to grok it, and then you have to be a Mac guy. So, if any Mac guys don't already know about this USB gem, go here (but not, of course, until you have finished reading this fine magazine): www.contourdesign.com.

I have been using these things for more than a year now, and they are very cool. The ShuttlePRO is a very low-profile, comfortable jog/shuttle wheel with a spring-loaded, seven-position ring and 13 assignable buttons. The thing costs 99 bucks! It is well-made and operates quite smoothly. It is a great controller for iMovie or FinalCut Pro, as well as your favorite (or least favorite) DAW.

It is so thin that it looks and feels as if it were built into your desk, and it can be operated in the dark by feel after a couple of weeks.

EGOSYS WAVETERMINAL U24
This is an interesting little box. At 9x9 cm, this USB audio interface is small enough to carry in the side pouch of my laptop case (as long as I'm not trying to get those Bose cans in there).

Sporting both S/PDIF and optical digital I/O and stereo 24-bit AD/DA, it is actually quite useful in the field. It works perfectly with a Mac, as well as with Windows 98, ME, 2000 and XP.

I have used its predecessor, the U2A, for a couple of years now and am quite happy with it. In fact, one of my companies that serves the law enforcement community ships this box with our software.

I am not real familiar with the new U24 (www.esi-pro.com), so I suggest that you listen before you buy. I don't expect it to be inferior to the earlier model, but I can't stand behind something that I have such limited experience with.

At $299, it seems like the perfect portable audio interface. ■

SSC is off to search out more tech toys. A tough job, and all that...

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nies have been able to keep this up for years. Nevertheless, we keep buying the stuff, but maybe we shouldn't.

A sin even worse than shipping products that aren't ready is not admitting that there might be problems. Hiding information from users and from dealers (who are still supposed to be the first line of support for beleaguered customers) is simply not a supportable practice, especially now that manufacturers and users can have instant access to each other on the Internet. If one user discovers a bug and the developer can't fix it immediately, maybe another user will find a workaround. But if those two people don't know about each other because the developer decides to hush up the problem, it will linger and perhaps never be solved.

Thou shalt not pre-announce products when you have no idea when they will ship.

Every time a radical new technology is introduced, sales of older equipment suffer. That's only to be expected in a technology-driven industry. But when a new technology is introduced with great hype and fanfare and it isn't ready yet, everybody suffers. Case in point: When the ADAT was first announced, reel-to-reel sales plummeted. But it was well over a year before the first ADATs shipped, and those were plagued with problems, so much so that a studio that wanted to advertise itself as "16-track" needed to have at least three or four of the 8-track machines on hand. Not only did this make life difficult for the older tape deck manufacturers, it also put the squeeze on a lot of studios that were left for months in limbo. Their customers were demanding this new digital multitrack technology they'd heard all about, but the studios couldn't deliver. A similar thing is happening now with hard disk multitrack recorders: They're new, they're hot, many of them are not at all ready for prime time, but they're killing MDM sales.

A corollary to this is…

Thou shalt not make pre-emptive product announcements.

The Grand Prize winner in this category is not one of us; it is, of course, Microsoft. As soon as any other company comes out with an innovative software product, Microsoft announces that it, too, is coming out with an equivalent product, only it will be cheaper and will link seamlessly to all of its other products. But sometimes it takes years for this to happen, during which time the original company, its sales blunted due to the "imminent" competition from Microsoft, fades away or merges

with another company and heads in a different direction, or—and this has happened more times than you can imagine—gets bought by Microsoft. Then, Gates and his gang come out with the *original* product (or something very similar), jazzed up with new packaging and a higher price tag (because there is no longer any competition that they need to undersell), and another monopoly is born.

But our industry suffers from creeping, premature me-too-ism as well, even if it's not executed quite so ruthlessly. It seems that every interesting product announcement is followed by a string of similar announcements from competing companies, whether or not said companies had any plans at all, prior to the first announcement, of proceeding in that direction. It's dishonest, it's anti-competitive and, ultimately, it's destructive.

Here's a true story, which makes a good ending to this diatribe. It shows what can happen when the pressure to keep up with announced, if illusory, specs and features results in some pretty bizarre corporate behavior.

A few years ago, a well-established manufacturer (call it "company C") decided not to ship a long-anticipated product—a low-priced digital mixing console—even though it had already fabricated thousands of units. Why? Well, in between the product's initial announcement and its release date, all of company C's competitors had announced similar products. Furthermore, all of the competition's spec sheets included a feature company C had left out: moving faders. Why leave them out? Because at the time company C's engineers were designing the console, which was long before it was even announced, moving faders were just too expensive.

Deciding that its product was going to be a dud, even though the competition's products were still far away, company C canceled the marketing and distribution plans. At that point, it could have sold its existing inventory off at cost through its dealer network, or perhaps it could have donated them to educational or religious organizations. But, for reasons I still don't quite understand, company C opted not to do either of those. Where did the units end up? The company bulldozed them into a landfill. ∎

Paul Lehrman has nothing to be ashamed of, at least not that he can recall at this point in time.

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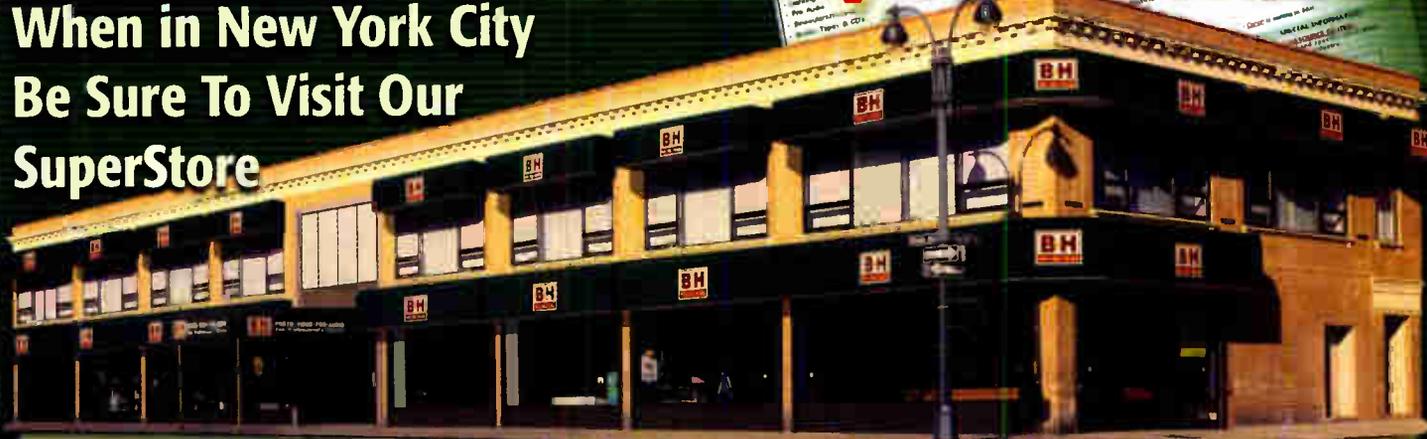
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Completely redesigned. Smoother faders. Higher resolution encoders. Dozens of enhancements made specifically for DP3. The Radikal Technologies Software Assignable Controller gives you automated, touch-sensitive mixing. The ultimate hands-on experience for Digital Performer.

Antares kantos 1.0

The company that gave you AutoTune, the holy grail of pitch correction, now brings you kantos: the world's first audio controlled synthesizer. Use your voice (or any other monophonic source) to play, shape, warp, bend, convolve or otherwise control the powerful kantos synthesis engine in ways you never thought possible. Or feed it rhythmic loops for truly mind-bending results. And you can play kantos directly into Digital Performer. This changes everything.
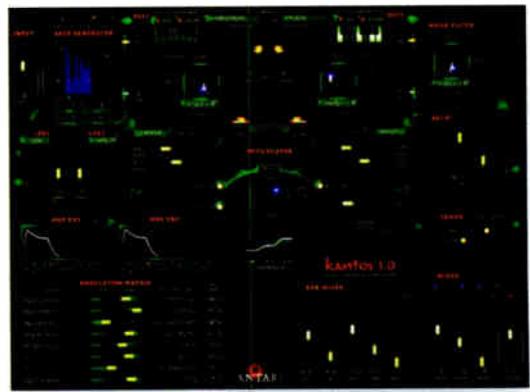
Waves Native 3.5

Waves, the most sought-after plug-ins for Digital Performer, have just undergone the most sweeping performance enhancements ever in Version 3.5. Enjoy support for DP3's fully symmetric multiprocessing, sample-accurate automation, 96kHz operation, and optimizations that allow you to run dozens more Waves plug-ins simultaneously. Available in various-sized bundles at numerous price points, including the Platinum Native bundle (shown). With 25 plug-ins, it's an amazing value and covers the full spectrum of audio tools. Waves 3.5 is native processing in full glory.
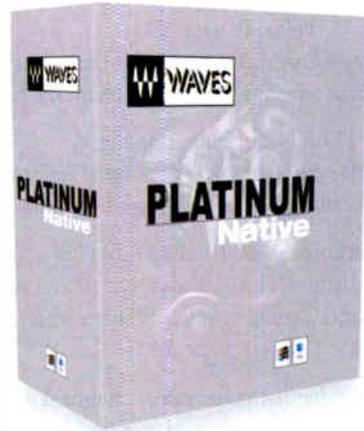
Spectrasonics Stylus

Stylus™ is a breakthrough native virtual plug-in instrument for Digital Performer from renowned developer Spectrasonics that integrates a massive 3GB arsenal of incredible Groove Control™ activated loops and unique drum sounds, with a powerful user interface for shaping and creating your own grooves. Features all NEW sounds, over 1,000 new remix grooves by acclaimed producer Eric Persing, elastic Tempo, Pitch, Pattern and Feel with Groove Control, killer live percussion loops, thousands of cutting-edge drum samples and real-time jamming with Groove Menus.
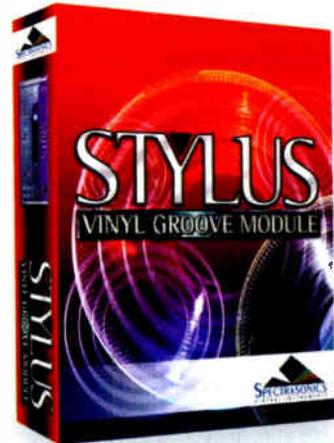
IK Multimedia Amplitube

Amplitube is simply the best guitar amp and FX modeling plug-in ever made. 1,260 possible combinations, mic emulation, 200 presets and 10 different stomp, amp and rack effects. Amplitube sounds superb on guitar — and just about everything. Amplitube delivers the largest arsenal of guitar tones ever to your Digital Performer mix. Play it live or use it post. Now just plug in your inspiration...
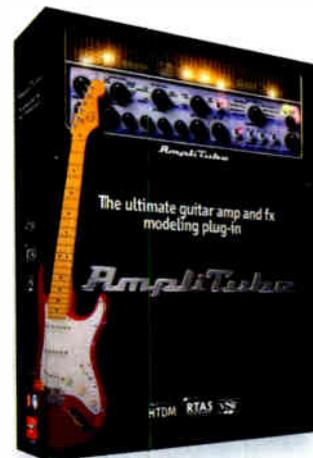
Mackie UAD-1 Powered Plug-ins

UAD-1 is a PCI card that allows you to run dozens of sophisticated effects plug-ins inside Digital Performer without bringing your Mac to its knees. What's the secret? A custom-built, monster DSP. It's like adding an extra $20,000 worth of effects gear to the dozens of native plug-ins included with DP. UAD-1 ships with this growing list of powered plug-ins:

Real Verb Pro
The most flexible, natural sounding reverb available. Design your own rooms, down to the smallest detail.

Pultec Program EQ
Stunningly realistic recreation of this classic analog EQ. Dangerous amounts of boost with musical results.

1176LN Limiting Amplifier
Another analog classic reborn inside Digital Performer. Apply liberally with host CPU cycles to burn.

Teletronix LA-2A Leveling Amplifier
This beauty defines "vintage audio gear". If you want warm, authentic analog in your DP mixes, this is it.

Nigel
A complete palette of guitar tones combined with every effect a guitar player could possibly ever need.

CS-1 Channel Strip
Whopping punch on a single DP plug-in insert: EQ, compression, delay and reverb all in one plug-in.
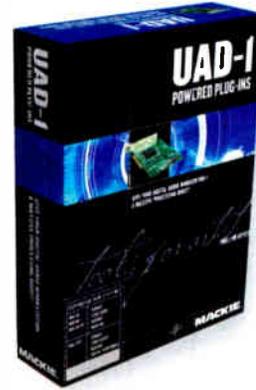
Mackie Control for DP3

Designed in direct collaboration between Mackie and MOTU, the new Mackie Control automated control surface puts nine touch-sensitive Penny & Giles automated faders under your fingers (8 plus a master), 8 motion-sensitive rotary encoders, and dozens of custom-programmed switches. Want more faders? Add 8-channel Control XT expanders. You'll feel like you are touching Digital performer itself.
Go ahead. Put your hands on it.

Digidesign Pro Tools

Takes, Tracks and Template Tips

Even the seasoned user can learn some new Pro Tools tricks.

Even though many of us are Pro Tools veterans with years of experience, there are always a few new tricks to learn. Here are some of my favorites.

MONITOR MIX MAGIC

Recording numerous tracks of background vocals requires a special managerial tracking setup that works equally well for both monitoring and recording a subsequent submix.

This setup begins by creating as many vocal tracks as you'll need. I'll pick 20, but you can also add more later at any time. Assign the outputs of all 20 tracks to buses 1 and 2 for stereo panning and create an Aux bus 1 and 2 submaster fader whose output is 888 1/2, the stereo monitor. This Aux submaster fader is where you can adjust the mix/track relationship of the entire background vocal stack and set up monitoring global effects including a stereo compressor and/or EQ. Once you've recorded all 20 tracks, completed your blends and automated any tricky moves, you're ready to record (bounce) your vocal background production to two new tracks.

Create two new audio tracks whose inputs are buses 1 and 2 and—be careful here!—whose outputs are also buses 1 and 2. To avoid a feedback loop, immediately mute the tracks *and* place the tracks in Record Ready.

Now, with your background vocal mix previously dialed in and still feeding buses 1 and 2, record onto the two new tracks while in mute. None of the monitor effects or compression will be committed to the recording, because aux 1 and 2 submaster faders and effect returns feed only the monitor. You'll maintain your exact blends without any additional setup or changes, and you can set a precise recording level by grouping all 20 BG vocals and raising them all up or down as required. When the recording is done, *first* take the audio tracks out of Ready and *then* unmute for playback and remember to mute all of the individual vocal tracks. You'll get the same sound and mix as before the bounce with

monitor effects and compression, because the new audio tracks now feed buses 1 and 2 and the monitor path.

RECORDING MANY TAKES OF MANY TRACKS

When recording a live drum kit (or any ensemble, such as a string section) across many tracks, comparing subsequent takes to one another can be problematic. You can group the tracks together and Option-Select "Playlist All Tracks" in the group for each subsequent recording; however, Pro Tools will only allow a single stream of automation data per track, so if you have automated levels or mutes on one take, it will also be applied to any of the other playlisted recordings under that take.

It's much easier to copy and paste the entire song with all tracks to certain locations later in the session. For example, if you wanted to record five takes of a 10-track drum kit overdub, then try this: After you've created the 10 new tracks, got your sounds and are ready to record the drummer, group the drum tracks and save the session. Copy and then paste the song five times starting at bar 100, then at bar 200, again at 300, at 400, and finally, at bar 500. Do not record on the original song; record on these copies. The even bar numbers make it easier to locate (by typing in the bar number) the same places in the song within each take. If you want to compare the fill the drummer played at bar 23, your choices are bar 123 (for bar 23 in take 1), 223 (for the same bar in take 2), 323, 423, bar 523, etc. This scheme assumes that you are using a tempo map and the Song Start is bar 1.

If you are not using bars and beats, switch to time where zero minutes and zero seconds (00:00:00) is the beginning of the original, and—assuming your song is about five minutes long—use six minutes and zero seconds for the start of the next copy; 12 minutes, zero seconds for the next copy, etc. Comping your final master drum recording is also a lot easier than playlist editing: Select the region
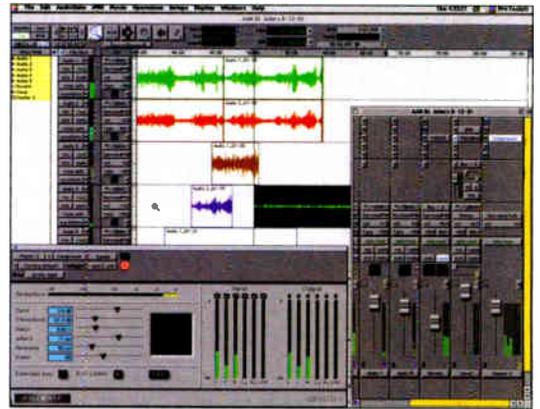
and paste the desired chunks from each pass back into the blank tracks of your original take. You can take this a step further by playlisting your new drum comp tracks and making an alternate comp. This gives you the option/advantage of saving other good drum bits for substitution in the first comp.

CUSTOM VIRTUAL EFFECTS RACKS!

Use the Import Track function to pull saved mixing templates into any new mix. This function not only lets you call up your own "virtual custom effects rack" with all routing and plug-ins ready to go, but also allows you to store preset rough mixes that are fairly close to how you'll want them for your new mix.

Remember, you're not importing any audio tracks, just aux faders, master faders and plug-ins. When music mixing, most engineers start out with a certain basic complement of effects assigned to a standardized set of send buses and return channels. You might start your mix session with two reverbs, two delays and a stereo chorus assigned to mono send buses 27, 28, 29, 30 and 31. Instead of recreating all of the stereo aux inputs for effect returns and master faders and instantiating and tweaking plug-ins for every new mix, just import them all from your last fave mix.

One caveat: Be sure that no automation was previously written to the imported tracks—otherwise, you'll have to reautomate, redraw it to flat lines or just turn it off. One suggestion: Make a copy *sans* automation and call it your mixing template—something you can add to as you go along. ∎

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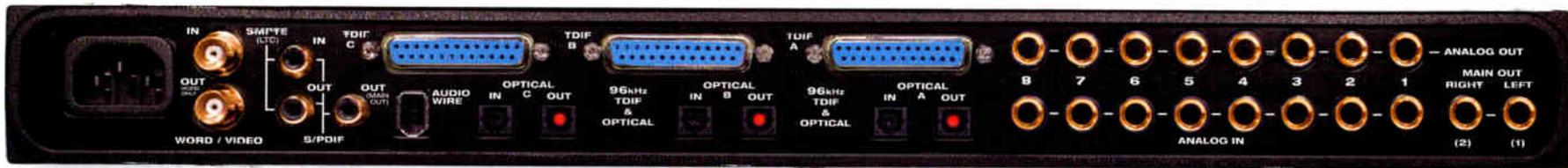
mk3 feature highlights

- **PCI-424 card** — connect up to four interfaces. Capable of delivering 96 channels of input and output at 96kHz.

- **CueMix DSP™** — a new DSP-driven digital mixing and monitoring matrix with the same near-zero latency performance as today's latest digital mixers. Connect all your gear, including live synths and outboard effects processors, and then monitor and mix everything with your 2408 system—and do it all without a mixer in your studio. Located on the PCI-424 card, CueMix DSP works across all connected MOTU interfaces with no drain on your computer.

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- **Support for 96kHz ADAT optical** digital I/O (S/MUX) and 96kHz Tascam TDIF digital I/O.
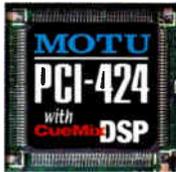
Basic features

- **Expandable 24-bit 96kHz audio interface** for Macintosh and Windows with 24 channels of simultaneous input and output.

- **8 TRS +4dB analog outputs** — perfect for surround.

- **8 TRS analog inputs** with switchable input levels.

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- **24-bit S/PDIF** digital input/output up to 96 kHz.

- **Word clock** in and out; SMPTE (LTC) in and out; video sync input; sample-accurate ADAT sync input.

- **Compatibility** with virtually all audio software on Macintosh and Windows 98SE/Me/2K/XP.

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