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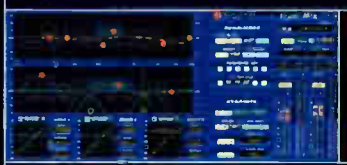

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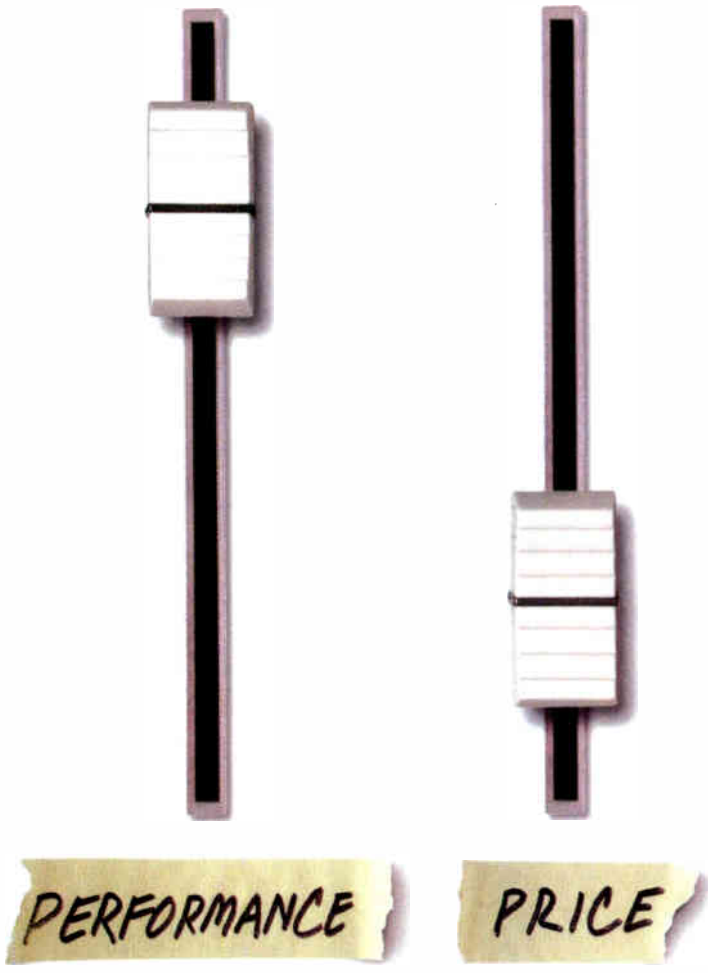

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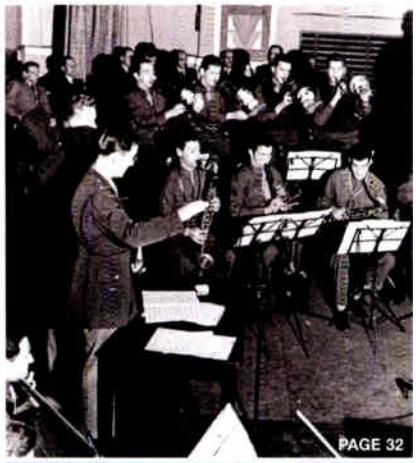
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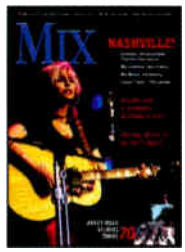
On the Cover: Emmylou Harris, one of Nashville's leading lights, will be headlining this summer's Down From the Mountain Tour and re-releasing the classic 1979 album *Roses in the Snow* in 5.1. For more on the tour, turn to page 22; for more on the album, see page 171. **Photo:** Daniel Coston.



MIX

PROFESSIONAL AUDIO AND MUSIC PRODUCTION

July 2002, VOLUME 26, NUMBER 8

features

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Trade Show Fever

The soul of any trade show is the people who attend it. Conventions are an important part of our industry, providing a forum for the exchange of ideas and opportunities to advance one's knowledge, whether through AES papers and workshops or via more structured learning sessions such as the "university" programs run by NAMM and NSCA. But if people are the soul of a trade show, then exhibits are the backbone, allowing participants to examine and explore new technologies close-up and first-hand.

Clearly, the key to any successful trade show is a vibrant mix of exhibits, industry events and, of course, an enthusiastic audience of showgoers. However, there are two key points to keep in mind: First, conventions are a business, and a mighty competitive business at that. Second, a trade show is a dynamic entity. In order to survive—especially in less-than-ideal financial times—a trade show has to be tough, aggressive and willing to change to reflect new directions in the industry.

As an example of what to do right, consider this month's Summer NAMM. In the latter years, when the show was based in Chicago, it was often referred to as the "wake on the lake," due to its sluggish attendance and lack of direction. Nearly a decade ago, NAMM decided to focus the summer show on guitars and the acoustic instrument market and moved the expo to Nashville. The venue change not only brought NAMM to Music City—a draw for attendees—but also served the town's thriving recording community, which boosted the participation of pro audio exhibitors. To cite a cliché, it was a "win-win" situation.

Having just returned from AES Europe (see report on page 96), I was able to experience a much different trade show situation. Certainly, today's ecomomic climate is hardly rosy, but surviving rough times requires aggressive action, and the success of last year's New York AES—in spite of the worst possible conditions—proves this point.

In days of yore (actually, not even so "yore" ago), AES exhibits reflected the entire pro audio industry—recording, live sound, broadcasting and duplication. Little by little, certain market segments fell away, starting with the duplication/replication exhibitors, and to a smaller extent, live sound products. At AES Munich, there was barely a handful of live sound exhibits, and the overall perception was that EuroAES is becoming a local broadcasting show. Germany is a massive market in the area of home/project studios, but this niche was mostly absent from AES. Perhaps AES felt this audience wasn't packed with serious "tonmeister" types, but this market represents a substantial number of audio buyers, which, if exposed to AES, could become more serious, educated users.

While AES seems to have been specializing of late, other shows have expanded their horizons. Once strictly an MI show, Frankfurt Musikmesse now includes entire exhibit halls devoted to music software, pro recording, P.A., DJ/lighting and installation products, catering to dealers and pro users during its first three days, followed by the general public on the weekend. Trade shows aren't forever, as we learned with the SMPTE and APRS shows, for example. In order to flourish, AES Europe needs to widen its scope and look ahead, and so far, examining new host cities is a step in the right direction. Let's hope this movement continues.

George Petersen
Editorial Director

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EDITORIAL DIRECTOR George Petersen *gpetersen@primediabusiness.com*
EDITOR Tom Kenny *tkenny@primediabusiness.com*
SENIOR EDITOR Blair Jackson *blair@blairjackson.com*
SENIOR ASSOCIATE EDITOR Barbara Schultz *bschultz@primediabusiness.com*
TECHNICAL EDITORS Sarah Jones *sjones@primediabusiness.com*
Chris Michie *cmichie@primediabusiness.com*
ASSOCIATE EDITOR Sarah Benzuly *sbenzuly@primediabusiness.com*
ASSISTANT EDITOR Robert Hanson *rhanson@primediabusiness.com*
EDITORIAL INTERN Natalie Verdone *nverdon@primediabusiness.com*
LOS ANGELES EDITOR Maureen Droney *msmdk@aol.com*
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CONTRIBUTING EDITORS Rick Clark Michael Cooper Bob McCarthy
Eddie Ciletti Oliver Masciarotte Gary Eskow Randy Alberts

SENIOR ART DIRECTOR Dmitry Panich *dpanich@primediabusiness.com*
ART DIRECTOR Kay Marshall *kmarshall@primediabusiness.com*
GRAPHIC DESIGNER Mae Larabis *mlarabis@primediabusiness.com*
GRAPHIC DESIGNER Lizabeth Heavern *lheavern@primediabusiness.com*
PHOTOGRAPHY Steve Jennings

VICE PRESIDENT Pete May *pmay@primediabusiness.com*
PUBLISHER John Pledger *jpledger@primediabusiness.com*
ASSOCIATE PUBLISHER Erika Lopez *elopez@primediabusiness.com*

EASTERN ADVERTISING DIRECTOR Michele Kanatous *mkanatous@primediabusiness.com*
NORTHWEST/MIDWEST ADVERTISING MANAGER Greg Sutton *gsutton@primediabusiness.com*
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CLASSIFIEDS ASSISTANT Heather Choy *hchoy@primediabusiness.com*

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Primedia Business-to-Business Group
745 Fifth Ave., New York, NY 10151
President & Chief Executive Officer David Ferm *dferm@primedia.com*
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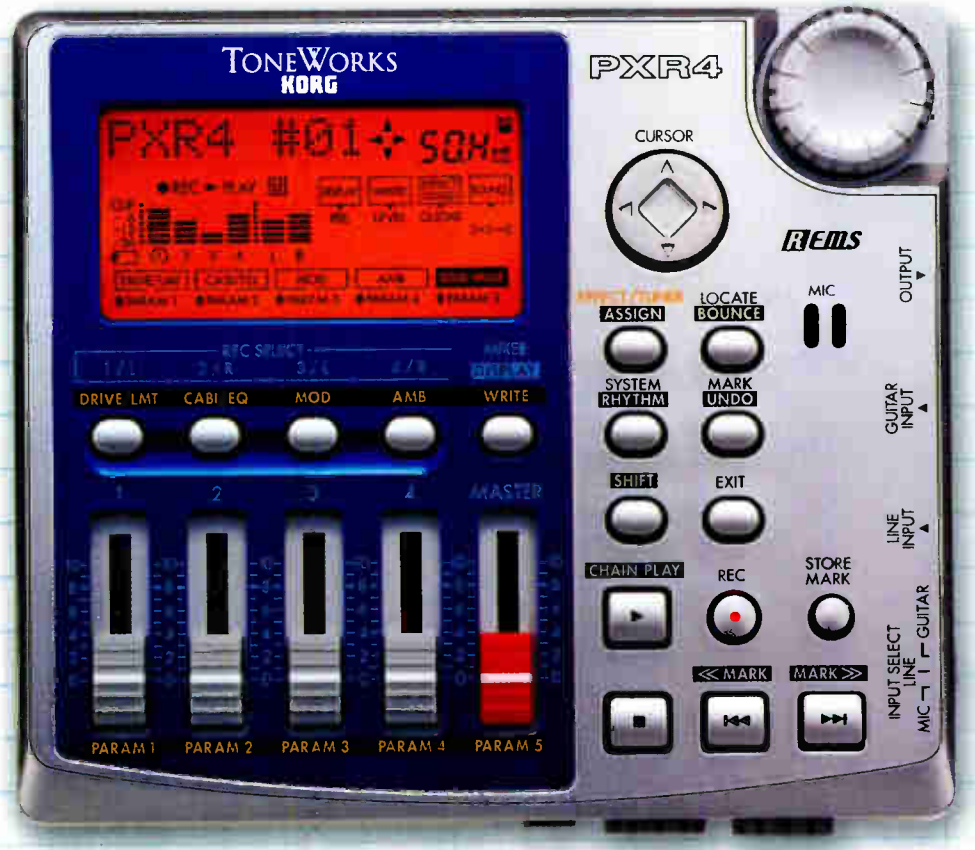

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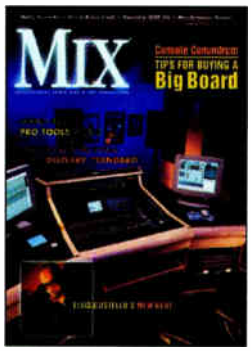

STRAIGHT INTO THE FIRE

"Mixing in a Pro Tools World," which appeared in our May issue, raised the eyebrows—and the ire—of more than a few Mix *readers. Here is a representative sampling of the opinions expressed, followed by letters on a variety of topics.*

GLAD GOODBYE

When I read the article "Mixing in a Pro Tools World," I was looking forward to some good information. I was extremely disappointed. Of the four engineers in the article, only one of them really liked the sound of Pro Tools, and even he has to use an SSL to mix.

It seems to me that someone had an agenda to slam Pro Tools; there was a definite analog bias to the article. There were some bold statements made about the superiority of analog over digital and insinuations made about the inferiority of an engineer who did not prefer analog sound over digital. What about those engineers who can hear the difference between analog and digital and still prefer digital?

Some of the statements made by the engineers in the article were also flat-out wrong. Most of them do not understand digital recording, and yet they were used to give misinformation to the masses. I just hope that young, aspiring engineers who read your magazine don't take this article as truth concerning Pro Tools, and digital recording in general.

I also find it interesting that these engineers were chosen to talk about mixing in a Pro Tools world when none of them actually uses Pro Tools to mix. It would have been more fair if the article included some engineers that actually mix within Pro Tools, or at least use digital consoles to mix.

There are many stories of seasoned engineers comparing mixes done within Pro Tools to mixes they themselves have done on SSLs or other expensive analog consoles. Most of the time, the Pro Tools mixes equal, and even sometimes exceed, the quality of the big console mixes. The deciding factor always seems to be the guy behind the controls. Yet, this article would lead many readers to believe that the only way to get that professional sound is to mix with a certain console or a certain type of equipment.

Blair Leishman
Via e-mail

SHAME, SHAME, SHAME

Having had my attention drawn to the *Mix* magazine cover article about "Mixing in a Pro Tools World" by several people confused about the seeming misinformation brought up, I was compelled to read it myself in order to come to understand what the murmuring was about.

After reading this article, I am completely surprised that *Mix* would take it upon themselves to publish such inane drivel. This article had great potential of providing advice to users on how to work in Pro Tools to make the rest of the process (mixing and mastering) easier, but instead, it provided an outlet for a few engineers to moan about their begrudgings of digital recording compared to analog recording. There were plenty of opportunities to provide useful information to the reading public, such as the need to properly calibrate converters, the importance of quality converters (the only mention to converters was somebody mistaking "db Technologies" converters as D/D converters. Huh?), appropriate uses of the busing within the system, proper use of the master fader, how plug-ins are implemented on the master fader, how to avoid dither/truncation error from your mix exceeding one DSP chip, when it's appropriate to use/not to use the "dithering mixer," etc.

Instead, you provided an outlet for a bunch of people who don't use or know Pro Tools to moan and groan about their misunderstanding of digital technology as a whole. There were so many statements made by these guys that were totally incorrect about digital technology (and, it's no surprise, as it appears that *none* of them record or mix digitally at all) that it's very concerning to me that they will be read by a populous who will accept them as truth merely because guys like Puig or Brockman said them.

It is discouraging to have to spend *my* energy diffusing the myths promoted by the major publishers in our industry. I hope that *Mix* magazine can avoid publishing this stultiloquy in the future.

Nika Aldrich
Via e-mail

SOMEDAY, SOMEWAY

Jack Joseph Puig advises young engineers to learn Pro Tools because "it's not going away." I see his point, and that may be true now, but doesn't the history of the pro audio industry over the past 20 years indicate that it *will* go away? Or, doesn't the fact that three out of four of your interviewees say (in so many words) that Pro Tools sounds like sh*t indicate that it might go away? In 1989, I recorded an album on one of those Mitsubishi 32-track digital machines, at a time when many thought that they were God's gift to audio. Now, you won't find a studio on the face of the Earth using one of those machines. Maybe people got tired of the nasty sound, or maybe, judging by the current popularity of Pro Tools, it didn't sound nasty enough. I may be wrong, but I think it's possible that in 10 years' time, Pro Tools will be in the pawnshop next to the 32-track Mitsubishis and the Simmons drum pads.

Marshall Crenshaw
Via e-mail

SOMETHING'S GONNA HAPPEN

Your recent article in which top mixers outlined the pros and cons of mixing in a Pro Tools environment was very revealing. The first thing I noticed was that they only talked about mixing in very broad terms. The real discussion was still the core debate about which is the superior recording format, analog or digital. Overall, those interviewed had typical attitudes toward digital audio.

Coming from a low rung on the audio production ladder, I can say, for those of us not doing major-label sessions, digital is hands-down superior to analog. Perhaps in the rarefied environment of high-end pro studios that have first-class equipment and a maintenance staff to keep it in peak working order, engineers can actually discern the sound of digital clock jitter or poorly biased analog tape. In the project studio trenches, where you struggle to get a good performance out of inexperienced bands or decent tone out of their crappy instruments, digital audio's stability and clarity are by far preferable to all of the inherent problems associated with analog tape.

In 10 years of all-digital recording, I have only had minor problems of system crashes or data corruption. I have never had the problem of cross-talk, drop outs, stretching or breakage. I have never had to bake a CD to get the recording medium to stabilize for me to retrieve the information. Anyone who started out scrubbing and splicing tape with a razor blade knows that digital is better for editing.

So the real question is, which sounds better? The next generation of engineers will have been raised on nearly completely digital audio. They will not have the same precepts that we have as to what audio "ought" to sound like. As far as

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the lack of depth in digital audio, I would say that has more to do with tracking technique than the medium. When every track is an overdub and the dynamics are almost totally removed to maximize volume, how can a track have depth? The lack of harmonic distortion and an audible noise floor are often thought of as a lack of warmth; in other words, the signal is too clear.

Analog has a nostalgic quality some of us find appealing, it has a counter-culture chic that some identify with, but for the average minor-league engineer, it can't stand up to the quality of digital. For me, I still like the sound of 78s on a gramophone, but they aren't coming back, for obvious reasons.

Todd Zimmerman
Studio 139/Uma Nota Records
Via e-mail

ROCKIN' AROUND IN NYC

If I'm not mistaken, your article on Mixing in Pro Tools was about just that: *mixing* in Pro Tools—using all of the virtual tools, mixer, plug-ins, etc. Your article was actually about using Pro Tools as a tape machine. I'd like to hear how Dave Pensado's mixes come out if we were to take his SSL away and all of the other expensive outboard gear that has been tried-and-true since the beginning of audio engineering. And, make sure we track all the drums using the Control 24 and the real-time compressors with virtual mic modeling and amp modeling. See how those mixes come out.

I never thought DAWs sounded inferior—well, after 24-bit came along, anyway—but it's all that beautifully made analog gear that brings the mixes to life. Let's all remember, there is no software that comes remotely close to a good old Neve or Fairchild. That's where the mix lives, not in Pro Tools. A good musical performance doesn't hurt either.

Malcolm F.
New York City

SOMEBODY LIKE YOU

I must take issue with comments made by Bob Brockman and Jack Joseph Puig regarding recording in the digital medium. The comment about "maximizing the bits" in digital is a myth, one that has been perpetuated for far too long. If it were true that a softer signal in a 24-bit recording was actually only 10- or 12-bit, that would mean that digital is a fatally flawed medium, certainly one far below any standard for critical recording. It would also mean that extremely dynamic material such as classical music could not properly be recorded with digital, as the softer passages would be at lower bit rates and extremely grainy and dirty-sounding.

Having listened to many varied dynamic digital recordings, I can say that this is not the case. If you don't record extremely hot in digital, it doesn't mean that you're not using all of the "bits," you're just not using the entire dynamic range. The idea that the bit rate for a recorded signal varies with its level makes no sense. Why, then, would we even need to bother setting a bit rate for a session, since it would simply be dependent upon the level of each signal? I'd expect you guys to know better.

Zach Ziskin
Ft. Lauderdale, Fla.

SO DIGITAL IT'S ANALOG

This letter is regarding Paul Lehrman's "Insider Audio" column in the March issue, "The World Above 20 kHz." Lehrman appears not to have had the pleasure of hearing music above 20 kHz. I have had the thrill of hearing "high-resolution digital music." We have done a significant amount of work "above 20 kHz" at Redwood Digital, Sony Music Studios and Georgetown Masters. We have transferred analog recordings through HDCD Model 2 or Meitner DSD converters, and we have compared the results to 44.1 and to the analog originals.

Our results from listening:

1. We converted analog at 176.4 and then downsampled it to 44.1. The 44.1 that was downsampled from 176.4 sounded cleaner, brighter, bigger and "more analog" than the direct 44.1 (using same Model 2 converter).

2. 192 transfers sound analog and were phenomenally better sounding than 44.1.

3. Analog multitrack mixdowns to 96/24 sound substantially more open and analog than do multitrack mixes from 96/24 digital copies of the original multitracks.

4. DSD transfers from analog sound *analog*.

What is "analog"? It is a warm and happy feeling one gets when listening to audio where the medium is much less obvious than the music.

Elliot Mazer
New York City

SETTING STANDARDS

Glancing through the March issue, I came across my friend Larry Blake's piece "Data Management and Archiving." While his treatment, as usual, was thorough, I wonder if he has overlooked a couple of points?

If the idea for any archiving scheme is to be able to recover both the data and session information—the "ingredients" and "recipes," to borrow from OMF-speak—then a universal file and archiving format might be worth considering. One candidate that, as we know, has been attracting a great deal of attention is AES31. Rather than rely on proprietary formats from companies whose future might look a little... volatile, why not transcode the information to a robust, application-independent format? Many DAW and recorder manufacturers are already offering AES31 compatibility.

And, while many of us are using Super DLT media to archive large projects—and its 110GB capacity certainly offers a great deal of advantages—I wonder if this tape format will hold up over time? While there is no current evidence to the contrary, backup formats tend to be designed to hold data for a commercially useful three to five years. (And, despite protestations from manufacturers, there is little pragmatic evidence of long-term reliability that matches that of 35mm mag film.) Just because our film/video post community opts to use Super DLT formats, we may not make up a sufficiently large market to ensure that DLT drives remain in production once mainstream computer users migrate to a newer format.

It may be that a universal archiving scheme needs to spread the load across more than one technology. Copying and verifying data backups from one format to another will continue to be a necessary behind-the-scenes archiving function. Again, AES31-compatible files would fall nicely into such a scheme.

Maybe Larry's articles will provide the catalyst for developing an industry consensus, including the drafting of a tape-archive standard?

Mel Lambert
Creative director, Media&Marketing
Via e-mail

WRITER REDRESS

This letter is in response to Tom McClure's letter to *Mix*, which appeared in the May 2002 issue. McClure wrote that a statement made in the article entitled "Building Your System" (which appeared in the March issue of *Mix*) was in error. Specifically, he disputed the fact that ADAT Lightpipe cards for the Yamaha 02R are only capable of passing 20-bit audio maximum. (He attributed that statement to *Mix*'s New York editor, Paul Verna, but it was actually I who wrote it.)

According to Yamaha, a 20-bit ASIC chip in all 02R Lightpipe cards prevents the digital transmission of bit depths higher than 20 bits via those cards. Although one could record directly to a 24-bit DAW using outboard 24-bit A/Ds, busing the recorded tracks afterward to an 02R via ADAT Lightpipe cards would truncate the audio to 20 bits. (Unless, of course, the audio was intentionally dithered to 20 bits or less inside the DAW before busing it to the 02R.)

Michael Cooper
Via e-mail

Send Feedback to *Mix*
mixeditorial@primediabusiness.com

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NEWSFLASH: WAVEFRAME CHANGES HANDS

WAVEFRAME SOFTWARE GROUP TO TAKE OVER PRODUCT LINE

WaveFrame announced that its entire WaveFrame product line and the WaveFrame trademark have been acquired by a new company, Cybermation Inc., which will do business as the WaveFrame Software Group. FrameWorks/DX will continue as Pyramix Virtual Studio, sold by Merging Technologies (www.merging.com).

For more, visit www.waveframe.com or www.mixonline.com.

PAUL W. KLIPSCH, 1904-2002

Paul W. Klipsch, founder of Klipsch Audio Technologies, died on May 5, 2002, at the age of 98.

Born on March 9, 1904, in Elkhart, Ind., Klipsch is best known for his contributions to developments in audio loudspeaker technology. After being drafted in World War II, where he served in the areas of ballistics and photography, and ultimately discharged with the rank of Major, Klipsch committed his life to building loudspeakers. After continued research and experimentation, patents and trademarks were applied for and ultimately granted, including his first patent for horn design; throughout his life, Klipsch had three patents in ballistics, eight in geophysics and 12 in acoustics. The name Klipsch and Associates was registered in 1946, although his first employee wasn't hired until 1948.

In a memorial letter from CEO Fred S. Klipsch, Paul W. Klipsch is remembered as a legend in sound. "Stories of Paul's lasting wit and superior intellect were indeed true, which is what often made it difficult to accept the fact that he was 98 years old.

"It has been said, and I firmly believe it, that every time you listen to recorded music, you're hearing the passion, the genius and the legacy of Paul W. Klipsch. He was a verifiable genius who could have chosen any number of vocations, but the world sounds a lot better because he chose audio."

In honor and in memory of Paul W. Klipsch, Klipsch Audio Technologies has published the family's obituary on its Website (www.klipsch.com). In lieu of flowers, the family requests that donations be made to the Paul Klipsch Scholarship Fund at New Mexico State University.

THREE-RING CIRCUS

STEVE BRUNO WELCOMES INDIE BANDS

Business has been good for studios that focus on indie labels. Case point in, producer/engineer Stevo Bruno, owner/operator of the multimedia, 10-room music complex Klown Records (Santa Monica, Calif., his fourth studio), has hosted numerous sessions for local indie bands and labels. "I like to keep an ear to the wall and listen for new talent," Bruno said. "I actually have labels calling me all the time looking for new bands. [Klown Records] is basically a 'Disneyland' for musicians. I wanted to create a really fun, unique and professional place.

Klown Records boasts a fully loaded Pro Tools TDM Mix Plus studio with a Focusrite C/24 console. A Pro Tools-centered room (aka, the "Aquarium," because of its "underwater" design) has two iso booths and is digitally linked to five other rooms in the Klown complex. The control room was acoustically designed by Vincent Van Haaff, and is equipped with a pair of E-V Sentry 500 mains. Recently taking advantage of what Klown has to offer were Boy Hits Car (Wind-Up Records), Strapt, Mother's Finest and the Union Underground. Check out www.klownrecords.com for more.

SUNSET SOUND CELEBRATES 40 YEARS

From left: Wren Rider, chief technician at Sound Factory; Phil MacConnell, general manager of Sound Factory; Paul Camarata, owner of Sound Factory and Sunset Sound; Eric Simpson, technician at Sunset Sound; Craig Hubler, general manager of Sunset Sound; Lisa Matthews, traffic manager at Sunset Sound, and expecting her second child an October 19; and Mick Higgins, chief technician at Sunset Sound.

This month, Sunset Sound and Sunset Sound Factory will celebrate a shared birthday cake: 60 years of creating hits. (Sunset is 40 years young this year, while the Factory celebrates its 20th anniversary.) Founded in 1962 by Tutti Camarata, Sunset Sound remains under the day-to-day guidance of his son Paul; the Sound Factory, founded in 1969 by David Hassinger, became part of the Sunset family in 1982.

"The philosophy [to maintain a high-quality standard that best suits our customers' needs] has proven itself over the decades," said Sunset Sound's studio manager Craig Hubler.

Upcoming changes include a cosmetic remodel of Sunset Sound's Studio 1, including decor changes for the control room, performance areas and lounge. "Of course, we will retain the legendary acoustic characteristics of the control room and performance areas," Hubler stresses. "We will be adapting the vocal isolation booth to a dual-use configuration. It will act as an iso area during tracking and overdubbing, but can also double as a functional annex to the existing lounge via new facing doorways." The renowned Live Chamber adjacent to Studio 1's control room will be retained.

COMPILED BY SARAH BENZULY

THREE-POINT PLAY FOR COMPOSER KEANE


PHOTO: DARLEEN RUBIN

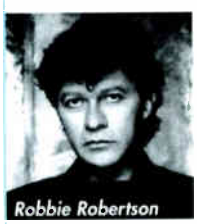
Composer Brian Keane broke a three-way tie (with himself) in late April, when he walked away with the Sports Emmy for Outstanding Music Composition/Direction/Lyrics for the CBS special *Pistol Pete: The Life and Times of Pete Maravich*, which he co-wrote with Buckwheat Zydeco. With three separate projects competing for the same award at the Sports Emmy Awards, Keane was alone in the field. He took home a second Sports Emmy that night for *Do You Believe In Miracles? The Story of the 1980 U.S. Hockey Team*, which won the Sports Emmy Best Picture Award.

Keane will soon be unveiling his new studio, designed by John Storyk and located on a 10.5-acre site in Sandy Hook, Conn.

ROBBIE ROBERTSON, GEOFF EMERICK TO BE HONORED AT TEC AWARDS


Geoff Emerick

Robbie Robertson will be awarded the prestigious Les Paul Award at the 18th Annual Technical Excellence & Creativity Awards, to be held Monday, October 7, at the Wilshire Grand Hotel in Los Angeles. Also during the ceremony, famed engineer/producer Geoff Emerick will be inducted into the TEC Awards Hall of Fame.


Robbie Robertson

Robbie Robertson first rose to prominence as part of The Hawks, backing rockabilly star Ronnie Hawkins. That group evolved into The Band, taking Bob Dylan's music electric and creating groundbreaking albums of their own. After they bowed out with *The Last Waltz*, Robertson moved his musical skills into film scoring, working closely with director Martin Scorcese. His solo recordings include both conceptual works and modern music, with ancient roots in his Native American heritage.

Geoff Emerick is best known for his work with The Beatles, including both *Revolver* and *Sergeant Pepper's*, and Paul McCartney, with whom he has worked on more than a dozen albums. His adventurous and experimental touch has also been evident on albums by artists as varied as The Zombies, Badfinger, Robin Trower, America, Art Garfunkel and Elvis Costello.

For tickets or information about the TEC Awards, call Karen Dunn at 925/939-6149 or e-mail Karen@tecawards.org. Registration forms are available at www.tecawards.org.

WAITING FOR THE TAPE TO ROLL


PHOTO: ALAN MORPHEW

Dwight Yoakam and Deana Carter in Track Record's South Studio. From left: actor Ritchie Montgomery (Monster's Ball, ER), owner Tom Murphy, Yoakam, Carter and engineer Tony Peluso.

Dwight Yoakam returned to **Track Records** (North Hollywood) with Deana Carter for an Arista Nashville project. Yoakam and Carter sang a duet titled "Waiting For Your World." Engineer Tony Peluso (The Carpenters) and assistant Sean McLaughlin captured the performance using South Studio's SSL 6000 E Series.

ON THE MOVE


Anders Fauerskov

Who: Anders Fauerskov
What: managing director, Tannoy (Scotland) and CEO, TC Group
Previous Lives:
- 1997-current, CEO, TC Group, Denmark
- 1993-1997, managing director, TC Electronic, Denmark
- 1989-1993, project manager at Boston Consulting Group, Germany
- 1986-1987, financial assistant at Atlas Copco, Chile
- 1985-1986, sales assistant at Bruel & Kjaer, Denmark
- 1981-1983, Danish Army, officer

Main responsibilities: helping the organization continuously improve in product offerings and service toward the users and customers. As CEO of TC Group, the role is less hands-on. I need to ensure that the strategies are set and followed in each company.

If I could do anything else as a profession, it would be... A professional soccer player. I wish I could claim that an injury held me away from realizing this dream, but the fact of the matter probably is that I wasn't good enough.

The one piece of advice that I would give to aspiring music industry professionals would be... You have to love what you are doing. We all spend most of our awake hours working, so there is nothing more miserable than waking up in the morning and having to go to a place you do not like being in.

The moment I knew I was doing a job that I love was... At TC, there are a lot of people who have moved to new positions taking on much more responsibilities, and it is great to see them continuously succeed.

In my CD changer: Pink Floyd's *The Wall*, Nickelback, Creed, Puddle of Mudd, Staind, DAD and Dizzy Mizz Lizzy.

When I'm not in the office, I enjoy... When I get the chance, I always enjoy a good game of soccer or squash, or any other sport where there is a ball involved.

NOTES FROM THE NET

OFF AGAIN, ON AGAIN: Mid-May, Napster CEO Konrad Hilbers quit because Napster rejected an offer to be bought by Bertelsmann (the same company that bailed them out when the major labels brought the song-swapping service to court). He was followed shortly by the company's co-founder Shawn Fanning. Less than three days later, Bertelsmann came up with an offer they couldn't refuse: to the tune of $8 million. In addition to resuming his role as CEO, Hilbers will also chair Napster's board of directors. Two weeks later, Napster filed for Chapter 11 bankruptcy protection with the U.S. Bankruptcy court in Delaware. So, off again.

TO DMCA, OR NOT DMCA: According to James Rogan, the Commerce Department's undersecretary for intellectual property and adviser to President Bush on copyright matters (he also runs the U.S. Patent and Trademark Office), the Bush administration is not too keen on plans to embed copy-protection technology in software and consumer electronics. In a speech in late April, Rogan said that "the DMCA carefully balances the interests of all stakeholders to ensure that content owners would enjoy the protection they need to put their works on the Internet, and to ensure that appropriate fair use is maintained for consumers, scientists and educators." The House will soon see amendments to the DMCA (Digital Millennium Copyright Act) from Senate Commerce chairman Fritz Hollings, D-S.C., whose Standards and Certification Acts require manufacturers to embed a digital watermark, and Rep. Rick Boucher, D-Va., who would rather have the RIAA place labels on protected CDs.

MEN OF HONOR

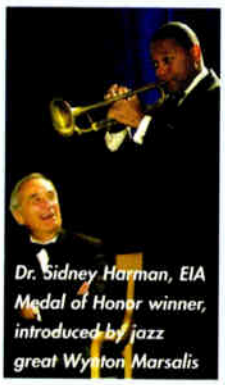
AES PRESENTS DR. FRITZ SENNHEISER WITH GOLD MEDAL AWARD

At AES 2002 Munich, the Audio Engineering Society awarded its Gold Medal Award to Prof. Dr. Fritz Sennheiser in recognition of his lifetime achievements in audio and microphone technology. Additionally, Sennheiser, the company he founded more than 55 years ago, was honored for 25 years of participation at AES conventions.

In his acceptance speech, Sennheiser said, "When I look back on the many decades as an engineer and entrepreneur, I am very thankful to call one of the most interesting fields of work my own. The field of acoustics is so wide and varied that it has never failed to fascinate me, even today. I am very grateful for the AES Gold Medal Award, knowing that it also recognizes the commitment of the many employees with whom I created my life's work."

DR. SIDNEY HARMAN HONORED AS ELECTRONICS PIONEER

Dr. Sidney Harman, founder and executive chairman/CEO of Harman International Industries, received the Electronics Industries Alliance Medal of Honor for 2002 at EIA's Annual Spring Conference on April 23, in Washington, D.C. Each year, the EIA presents this honor to an individual who has made outstanding contributions to the advancement of the electronics industry. As the founder of Harman International and developer of the first integrated receiver nearly 50 years ago, Dr. Harman was one of a handful of pioneers who created the high-fidelity industry.



Dr. Sidney Harman, EIA Medal of Honor winner, introduced by jazz great Wynton Marsalis

Industry News

Brian Offutt

Lorne Michaels' **Broadway Video Entertainment Inc.** (New York City) has appointed **Brian Offutt** as its COO...Chelsea, New York-based mastering facility **Sterling Sound** has added **Michael Drexler** (former staff recording engineer at BMG Studios) to its staff as a mastering engineer...After working at MTV for six years as an editor/producer, **C. Scott Gorman** joins **Northern Lights Post** (New York City) as an editor...**Russell Waite** has been promoted to VP of international sales for **Euphonix** (Palo Alto, CA). Waite will be based out of the company's London office... **Sabine** (Alchua, FL) new hires: **Robert Bull**, corporate quality engineer; **Byra Ferkovich**, engineer in software development; **Joel L. Motel**, director of North American sales; and **Josh Early**, sales and customer service...Based out of Los Angeles, **Denny McLane** joins **BSS Audio USA** (Nashville) as regional sales manager...Celebrating his silver anniversary with **Soundcraft** (Hertfordshire, England), **Ian Staddon** has been promoted to the position of product development director...With five years as VP of international sales and marketing for Harman Music Group, **John Batliner** of **Sraight-Line Sales** has been tapped as **Neutrik's** (Lakewood, NJ) sales representative in Latin America...**Crest Audio** (Paramus, NJ) expands its work force with the additions of **Mike Cook** and **Eric Oppenheimer**, contracting products sales engineer and Eastern regional sales manager, respectively...After 18 years of sales experience at EAW, **Sandy Macdonald** joined **Meyer Sound** (Berkeley, CA) as Northeastern regional sales manager...**Eric Colbert** fills the newly formed position of operations manager at **Groove Tubes** (San Fernando, CA). In other GT news, **Robert Moran** has been hired as an engineer manager...Indianapolis-based **Custom Electronic Design and Installation Association** (CEDIA) appointed **Margaret Sheehan** to director of professional development role...**ESI** (San Jose, CA) promoted **JJ Jenkins** to the post of senior VP of sales and marketing, as well as taking over the reins as head of the company's American operations...**SOS Management** (New York City), a division of Sound on Sound Recording, has brought on **Mira Tabasinske** to market and book the company's talent roster. The company also added **Cortez Farris**, the fourth member of its engineer/ mixer team...New at **Shure**: TaiChung, Taiwan-based **ProSound Inc.** will lead sales efforts of the company's entire line, except for phono products. **Vince Ristucci** joins Shure as its new VP of human resources.

Michael Drexler

C. Scott Gorman

Sandy Macdonald

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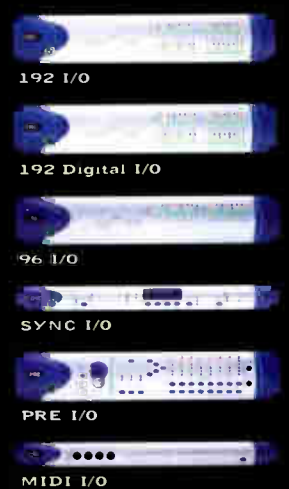

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MIX LOOKS BACK

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

NUMBER ONE ALBUM

***For the fourth consecutive month:* Rumours, Fleetwood Mac. *Producers:* Fleetwood Mac, Ken Caillat, Richard Dashut. *Engineers:* Ken Caillat, Richard Dashut. *Mastering:* Ken Perry, Ken Caillat. *Studio:* The Plant (Sausalito, Calif.).**

Live, Barry Manilow. *Producers:* Barry Manilow, Ron Dante. *Recording engineer:* Michael Delugg. *Live recording engineer:* John Venable. *Recorded live at the Uris Theatre (New York City) in December 1976, except "V.S.M.," recorded at Ravinia Festival (Highland Park, Ill.). Mixed at Media Sound Studios (New York City).*

NUMBER ONE SINGLES

Bill Conti's "Gonna Fly Now (Theme From Rocky)." Producer: Bill Conti. Engineer: Ami Hadani. Studio information not available.

Alan O'Day's "Undercover Angel." Producer: Steve Barri, Michael Omartian. Studio information not available.

Shaun Cassidy's "Da Doo Ron Ron." Producer: Michael Lloyd. Engineer: Humberto Gatica, Michael Lloyd. Studio information not available.

Barry Manilow's *"Looks Like We Made It." Producers:* Barry Manilow, Ron Dante. *Recording engineer:* Michael Delugg. *Live recording engineer:* John Venable. *Recorded live at the Uris Theatre (New York City) in December 1976. Mixed at Media Sound Studios (New York City).*

Andy Gibb's "I Just Want To Be Your Everything." Producer: Barry Gibb, Albhy Galuten, Karl Richardson. Engineer: Karl Richardson. Studio: Middle Ear Recording Studio (Miomi Beach, FL).

NEWSTED, MOSS BROTHERS ROCK THE HOUSE

The Moss Brothers, teenage music phenomenon from Oakland, Calif. (you may have seen them on *The Tonight Show*), recently visited Ashkenaz (Berkeley, Calif.) to drum up excitement for their second CD, *Electricitation*. Ex-Metallica bass man Jason Newsted jammed with the Brothers at the release party; Newsted plays bass on the CD, and the Brothers recently opened the first three shows for Newsted's new project, EchoBrain, on their first U.S. tour. For more, check out www.mossbrothers.com.

From left, Reuben Moss, Evan Moss, Jason Newsted

WHERE HAS BRIAN BEEN?

Grammy-winning producer/engineer/mixer Mark Linett (Los Lobos, Tom Petty, Eric Clapton, Jane's Addition) recently returned from recording four sold-out shows with Brian Wilson at London's Royal Festival Hall for a live *Pet Sounds* album to be issued later this summer through Sanctuary Records. For more, check out www.brianwilson.com.

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Down From the Mountain...And Into Your Town

By Blair Jackson

Nearly three years after the release of the Coen Brothers' quirky film *O Brother, Where Art Thou?*, and the accompanying soundtrack of Depression-era country music and blues, the phenomenon shows no sign of letting up. The album has sold millions, been awarded Grammys (including Best Album at this year's fete), and a tour featuring a number of the musicians from the soundtrack—dubbed the Down From the Mountain tour—is now on its second leg, drawing large, appreciative crowds wherever it goes.

Down From the Mountain began as a one-shot benefit concert for the Country Music Hall of Fame at Nashville's Ryman Auditorium in May 2000, after the soundtrack album had been released, but before *O Brother, Where Art Thou?* premiered. That concert, featuring such notables as Ralph Stanley, Emmylou Harris, the Fairfield Four, Alison Krauss, Gillian Welch and David Rawlings, John Hartford (who subsequently died) and many others, became a theatrical film (and later a video/DVD release) directed by D.A. Pennebaker (of *Don't Look Back* and *Monterey Pop* fame), and generated such a buzz that the show later went on the road—the first leg last winter was about four weeks (19 shows); the troupe is now on a 42-show tour stretching from the end of June to the end of August and encompassing a broad range of venues, from theaters to arenas to sheds. A CD of the concert won a Grammy in the Traditional Folk Album category.

When *O Brother* soundtrack producer T Bone Burnett and others conceived of the Ryman show and *Down From the Mountain* film, every effort was made to have the stage look like an old-time music concert in the '30s. Because it was composed of entirely acoustic music, there were no amplifiers onstage, and there was also nary a modern condenser mic in sight; rather, the stage was dominated by vintage Neumann U47s, mics not usually used in concert applications, but which had the appropriate *look* for the concert and film. "We tried a whole bunch of different microphones the day of rehearsal," says FOH engineer Bernie Velluti, "and I was having no luck at all. Some of these were omni patterns and figure-8s. Some of the others turned out to be props more than working microphones. So we did the U47s, and it came off fine. But the Ryman is a small auditorium, and when it came time to do the tour, I wasn't so sure. I made up two plots—one with a more conventional way of close-miking things and the other with large-diaphragm mics." Velluti and monitor engineer Frank Edmonson both work regularly with Alison Krauss & Union Station, which was also like a de facto house band on the tour. (Union Station's Dan Tyminski is the voice behind the Soggy Bottom Boys, the onscreen band led by George Clooney in *O Brother*.)

PHOTO: JON SIEVERT

Just part of the lineup (l to r: Buck White of The Whites, Patty Loveless, Ralph Stonley and Emmylou Harris).

In the end, Velluti decided to stick with the large vintage mics, usually putting a 47 in the middle, surrounded by a few U87s. "We also had a section off to the side for the little blues part of the show, and for that we had RCA 77 ribbon mics. We used an RCA 44, another ribbon, on the bass." Velluti also brought Shure KSM 32 and 44 mics, which he used to complement and occasionally substitute for the Neumann models. "They're good microphones, and they also have that look we're going for," he says. Though on the surface it seems like it would be easy to manage such a small number of microphones and performers, "the musicians change around a lot onstage, and you have to stay on top of it," Velluti says. "One person will be two feet away from a mic singing, the next person might be playing guitar, another might be five feet over playing a mandolin, there are a lot of variables in the delivery. A lot of times, I feel like I'm mixing *zones* as much as individual instruments."

For the first leg of the tour, Velluti and company traveled light—renting P.A.s as they went or using whatever was already in the venues. His favorite P.A. was a flown JBL VerTec array supplied by SE Systems, a Greensboro, N.C., company that does lots of bluegrass festivals and other acoustic music work. "I wanted something that would give me as much isolation from the stage as possible, and these array systems are the way to go—either the [L'Acoustics] V-DOSC or the VerTec are such a step up from the traditional trapezoid systems," Velluti says. For the current leg of the tour, Velluti is carrying a VerTec array.

"We had different consoles every day on the first tour," Velluti adds. "It was the system *du jour*." They did, however, carry the Crest monitor console Edmonson uses with Union Station. Monitors were a combination of wedges and Shure in-ears—different musicians used different combinations, even as the tour progressed. On this summer's tour, Velluti is bringing a Yamaha PM3500 for FOH, with a Soundcraft SM-20 handling monitors.

The current leg of the tour promises to be even more challenging sonically than the first one, mainly because so many of the venues are larger. Velluti is aware that small-group acoustic music doesn't always translate well in larger spaces. "How big does a venue get before you lose that intimacy and that feel that is so important to this kind of music?" he asks. "This is not an in-your-face kind of show. It's very intimate and subtle music; the dynamics onstage are very important, and you want to be able to get that across to everyone the audience. T Bone calls it parlor music. There's such great talent and musicianship up there that you want to represent that as well as you can. There are moments in the show where you just get goose flesh, it's so eerily good." ■

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BY STEPHEN ST.CROIX

Three's Company

A Crowd's Too Loud

ILLUSTRATION: CHARLIE POWELL

Musicians have everything they want, except money.

Fame: Some have millions following them, others have three girls and two guys from the neighborhood. Some have their cribs on MTV (Ozzy gets two years and way too many millions from that), others live in mum's basement and fight for a pay-for-play spot on local-access cable. But almost all have *some* sort of following.

Strokes: They get their monstrous egos fed. Some catch the eyes of a fan in the audience and get what they need (then or two hours later), others don't have to stand in line at Puck's place or to catch a flick at the Chinese. They can dress however they want. If they are feeling a bit unnoticed, they can put on their most outrageous gold lamé underwear and purple leather chaps, comb out their blue hair and walk down the street to be recognized as the star they are. Not like the old days when dressing like a psychopathic lunatic got you hauled in for suspicion of being a psychopathic lunatic. In fact, I am sure that the number one cover for escaped psychopathic lunatics these days is to dress like a psychopathic lunatic and wander around the streets signing breasts and foreheads. Hell, it worked for... Hell, it works.

Egos: Let's face it, musicians are allowed, even encouraged, to be assholes. In fact, the deep psychological need to be a flaming jerk is probably the fundamental driving force behind at least half of the musicians and performers on Earth being what they are. Musicians (most notably, but not exclusively, of the Rock Star genre) share a fascinating position in society with only one other group, sports superstars. People Who Have Their Picture On The Cover Of Rolling Stone can do any damn thing they want. In fact, the more outrageous they act, the more their fame and notoriety skyrocket, and their paychecks follow.

The more famous you are, the more your insane and illegal activities translate into money. What would your neighbor get if he held motorcycle races in the penthouse of the Plaza? Okay, now what would a *rock star* get?

IT'S THE NEW SOUL OF MY STUDIO

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> RAY CHARLES

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For that matter, what would your neighbor pay for a first-class, last-minute walk-on flight from New York to L.A.? I can't even count the number of times that I have walked up to a United counter at the last minute and moments later found myself sitting comfortably in 2A (my well-known favorite seat) sipping scotch while the back of the plane was loaded. Obnoxious? I think that's the point. And I've met some of the most beautiful models and most powerful people in America while sitting in 2A—all part of the fast lane, all part of the game.

And we won't even *get into* the free gear, free cars and free Willie. Don't ask. I told you, we're not going to talk about it.

A good professional musician—okay, a rock star—is so far out of the public's reach that he doesn't even know what he doesn't know about them, but he knows how to make them believe he speaks to them—and for them. He makes them think that *they* could almost have written that song, slept with that supermodel or at least crashed that Porsche.

Now don't give me noise for trashing musician's egos, clothes and damn near everything else that they do or have. Just as Sammy Davis Jr. poked Jews and blacks from his position of being in fact both Jewish and black, and as he passed on an equally deserved position of writing short people songs so that Randy Newman could do it decades later, I, as a working musician, claim the right to make these observations as I have personally done every damned one of these stupid things, more or less... mostly more.

And my opening sentence? Well, somewhat less than 1% of the musicians playing today are making anywhere near what they thought they would, so statistically they don't exist. But the few that do *are not* flying in first class for free. No, nothing that gauche. They are sleeping in their private DC-10s (or better) on their way to an island that the rest of the world doesn't even know exists for a weekend in a comped villa on the beach between gigs. Jagger is next door. Every country needs its royalty.

THE ART OF PRODUCTION FOR REPRODUCTION

Producers. Ah, yes. Producers. They get everything they want except their name in lights. Except the major ones. They do get their name in lights, but they still don't get to stand onstage and smash a '59 Strat into a vintage Marshall stack or blow the reeds out of a blues harp while thousands cheer and the front row gets wet.

But in the studio, they steer the talent, they mold the talent, they control the raw energy so that in the end, not only is the *soul and spirit* successfully caged within millions of 5-inch silver discs, but it is actually unique.

Such mysterious creatures they are. What power they have. What arguments they win. A good producer can make the label happy, convince the talent that they are happy, not make the engineer quit, and create a sound that the buying public will spend its lunch money on.

Producers are misunderstood by *everyone*. And a *good* producer makes sure that these misunderstandings are in his favor. He is both the janitor and the landlord. He senses problems that nobody else can hear, and has to figure out how to get everybody to do what it takes to fix them without letting them know what he or they are really doing, be-

—CONTINUED ON PAGE 189

The Cure for the Common PA

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BY PAUL D. LEHRMAN

Dumbing Down the Dial

Why Your Radio Doesn't Work, and Why You Should Care

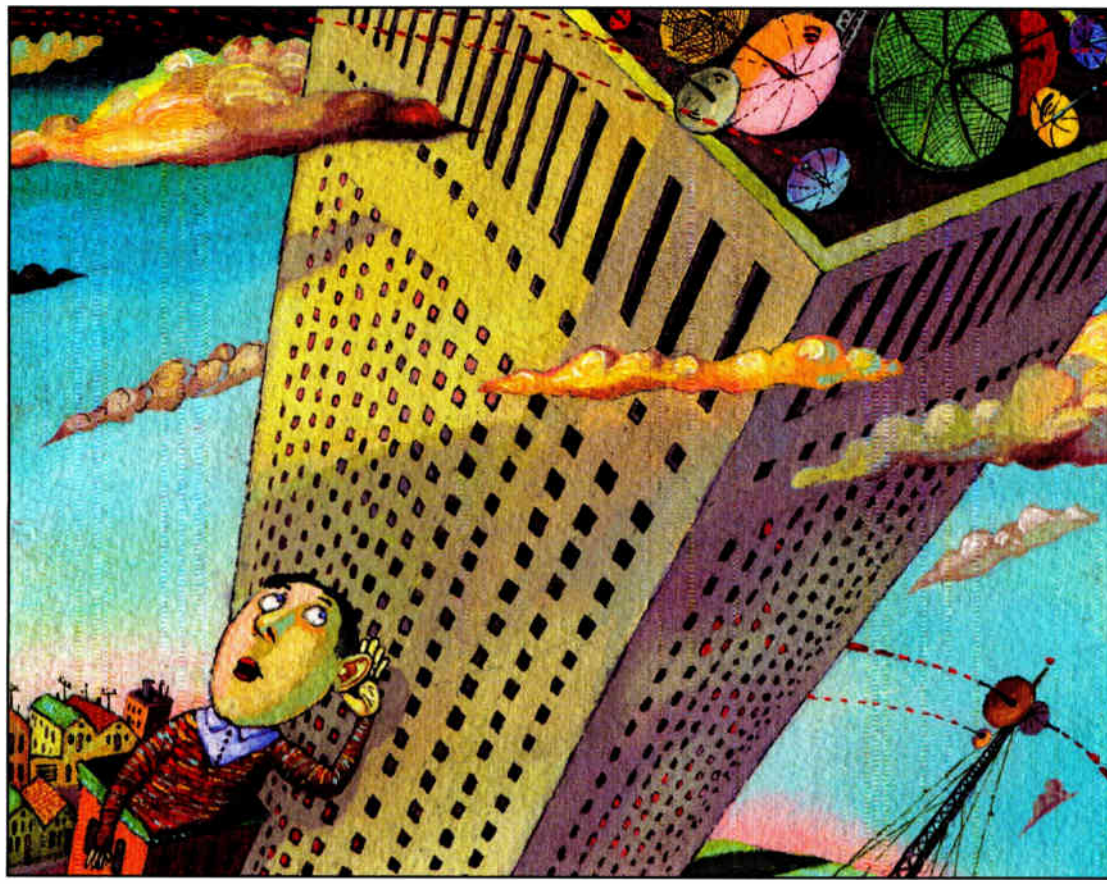

ILLUSTRATION: BORIS KULIKOV

It isn't often that I can, in the space of a few days, learn about a new application of digital technology in audio, connect with a part of the audio industry I left long ago, find out more ways our so-called government has been screwing up, find out why consumer electronics manufacturers are not necessarily our friends and fall in love with a piece of retro gear. And, I didn't even do all of this in my studio; I did it in my kitchen.

I live in Boston, which, besides being one of the great university towns of the world, is a great radio town. That's not a coincidence; almost every college around here, large and small, has an FM radio station. Most of them are down in the noncommercial part of the band, from 88.1 to 91.9 MHz. Some are big boomers, like Boston University's WBUR, which has a large paid staff and is a major outlet for NPR programming, but it has little to do with the college itself. Others are relative pipsqueaks, run by students or volunteers, like Tufts University's WMFO or Boston College's WZBC. Harvard's station, WHRB, is actually a commercial operation; it's run by undergraduates, but it sells advertising to augment its budget and broadcasts in the commercial part of the band. The biggest gun in the noncommercial band is WGBH-FM (where, full disclosure dictates, I have helped produce a few shows and Webcasts), which is part of a nonprofit conglomerate that also contains two television stations, several production companies and a bunch of other divisions that make it one of the most successful entities in American public broadcasting.

The variety that these stations provide to listeners is, as far as I can tell, unparalleled in the country. While commercial FM stations have devolved, under the feudal leadership of the two remaining corporations that own the bulk of them, into the habitats of bottom-feeding shock-jocks and cookie-cutter "alternative" rock and rap, the independent nonprofits at the low end of Boston's FM band deliver a well-rounded diet of classical, jazz (and I don't mean Kenny G), electronic, ethnic, punk, ambient and *real* alternative rock, not to mention news from places other

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than Washington and Hollywood, and public affairs programs that actually connect with and educate their audiences, and aren't on the air at 5 a.m. on Sunday.

Am I laying it on too thick? Maybe. But as readers of this column know, I've always been a big fan of radio. Even in the age of high-speed Web access, I still believe radio is the best way to get people to listen to music that they haven't heard yet. And, exposing audiences to new music sells records, which means that someone is booking studio time and buying gear, and that's why we should all be concerned about what's been happening to radio.

But that's a big issue, and I'm going to focus on a smaller one, or at least attempt to. (I may run off a couple of times, try to forgive and stay with me...)

One of my favorite stations around here is WUMB, which is licensed to the University of Massachusetts Boston. WUMB is the only 24-hour folk-music station in the entire country. It went on the air about 20 years ago, originally using volunteers, and in 1986, hired a professional staff. Its transmitter puts out a middling 660 watts ERP (Effective Radiated Power), and it's at the top end of the noncommercial spectrum at 91.9, which means it's jammed right up against where much more powerful stations live. The university is on a peninsula jutting out into the Boston Harbor (a beautiful spot that is shared with the John F. Kennedy Library), but the station's antenna is several miles south of there, on a hill in the city of Quincy, atop a water tower.

Exposing audiences to new music sells records, which means that someone is booking studio time and buying gear, and that's why we should all be concerned about what's been happening to radio.

In recent years, WUMB has been trying to increase its coverage. But upping its power has never been an option: According to chief engineer Grady Moates, FCC rules won't allow that because it might cause interference to stations, both commercial and noncommercial, on nearby channels. So instead, WUMB has been snapping up other available licenses and re-broadcasting the signal from other sites. They now have transmitters in Falmouth and Orleans on Cape Cod to the southeast, in Worcester to the west and in Newburyport up north near the New Hampshire border. The Orleans station is on the AM band, but Falmouth and Worcester are on the same channel as the Quincy transmitter, and Newburyport is right next door at 91.7.

As I've watched this process, I've been doing more than a little head-scratching. I know from my radio engineering days that one of the worst enemies of FM reception is multipath interference—the same signal coming to your receiving antenna from several different directions, just enough out of phase to cancel each other out. Multipath is especially a problem in urban areas,

—CONTINUED ON PAGE 191

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KEEPING THE PAST AND FUTURE IN PERSPECTIVE

Abbey Road at 70

BY BLAIR JACKSON

It will probably always be known as "The Beatles' studio." Nearly every recording session in the group's storied career took place in the large, 19th-century building on Abbey Road in the St. John's Wood section of Northwest London—from "Love Me Do" to "The Long and Winding Road," and everything in between: The sitar session for "Norwegian Wood," the famous string crescendo for "A Day in the Life," the worldwide broadcast of "All You Need Is Love"; literally, thousands of hours spent creating the most famous music catalog in music history. Beatles fans would hang around the outside of the studio hoping to catch a glimpse of their heroes coming or going, and a certain wall of the exterior became an ongoing message board for graffiti about and directed to the band. And then there's the matter of The Beatles' 1969 album cover for *Abbey Road*: There were The Beatles walking across the street in front of what had long been known as EMI Studios, but which would forever after be known—first colloquially, then formally—as Abbey Road Studios.

PHOTOS COURTESY ABBEY ROAD STUDIOS

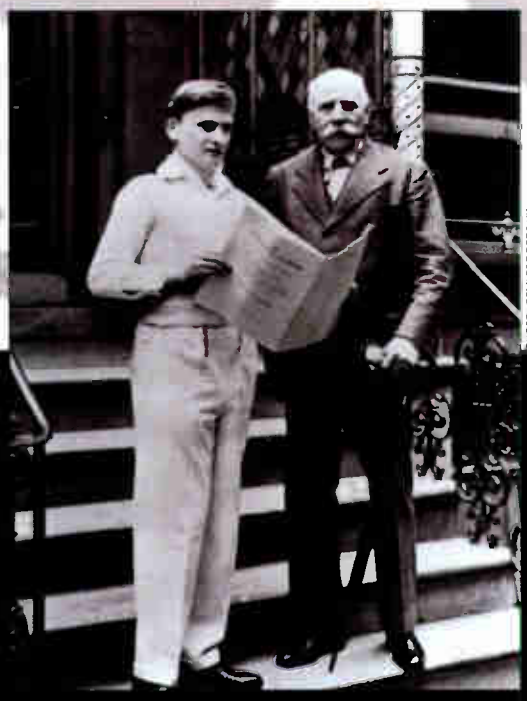


PHOTO ©EMI RECORDS UK

Sir Edward Elgar with Yehudi Menuhin, circa 1932

A view of the Penthouse studio

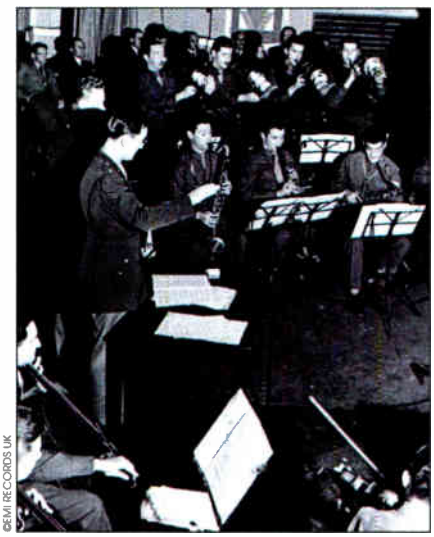
Burt Bacharach in session

Senior recording engineer Peter Cobbin

Sir Edward Elgar was the first to perform in the studio. The bearded George Bernard Shaw is seated on the stoirs.

The revamped control room of Studio One

George Lucas and John Williams have recorded scores at Abbey Road.



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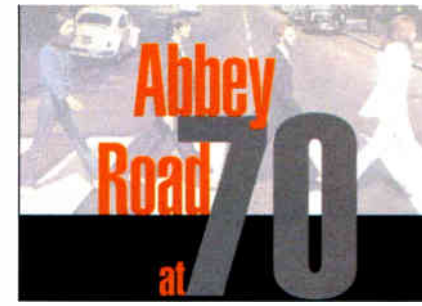
Glenn Miller's final recording session was at Abbey Road in 1944.



Abbey Road is celebrating its 70th anniversary this year, a remarkable milestone in a tough, challenging business, where staying afloat 20 years is quite an accomplishment. And, truth be told, it has *always* been much more than "The Beatles' studio." It had already been going strong for 30 years before a Beatle ever set foot in the place, and in the more than three decades since they split up, there have been hundreds of important sessions in nearly every genre of music. It is not only the most famous studio in the world, but it is by nearly every measure one of the greatest.

And that has been the case from the beginning. The building at 6 Abbey Road was originally constructed as a large, private home in 1830. Nearly a century later, in 1927, a gentleman named Osmund "Ozzy" Williams came up with the notion of turning the building into studios for the burgeoning British recording industry. Unfortunately, Williams died before he could see his dream realized, but in November 1931, EMI (Electrical and Musical Industries Ltd.) opened the doors of its grand new studio with composer Sir Edward Elgar conducting the London Symphony Orchestra to record his inspirational ode to England, "Land of Hope and Glory."

For the first decades of the studio's existence, it was devoted mostly to the recording of classical music; indeed, it was designed with that in mind. (It also proved to be a popular studio for Big Band recording, attracting many of the top acts of the day. Glenn Miller's final sessions were cut there, right before he disappeared on a pre-tour flight to Paris in 1944.) The legendary Studio One could accommodate an orchestra of more than 100 players and a full choir—its dimensions are 92x52 feet with a 40-foot ceiling—and it has remained essentially unchanged throughout the years (though the control room has been completely modernized and enlarged, and today boasts a Neve VRP Legend console). Studio Two, where The Beatles did the bulk of their recording, is roughly half the size of Studio One, but it is still large—it fits more than 50 players comfortably. These days, its control room is also outfitted with a Neve VRP Legend. Studio Three is smaller

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Peter Cobbin - Senior Engineer/Mixer
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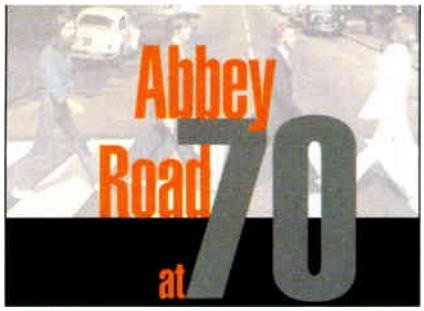


still, but can hold up to 15 players. Its control room is equipped with a 96-channel SSL 9000 J.

Recording tape was introduced in the late '40s, LPs in the '50s, and these developments combined to usher in the studio's first Golden Era: Some of the finest classical recordings ever made were recorded at EMI during the '50s, and they are still revered today. (Some of them were remastered at Abbey Road over the past few years for the ambitious *Great Recordings of the Century* series.) The year 1950 also marked the beginning of Beatle producer George Martin's long tenure at the studio; he started out doing classical, but by the mid-'50s, Martin was also working on British comedy records by Peter Sellers' group, Beyond the Fringe, and others.

By the end of the '50s, the studio had started to venture into pop music recording—Cliff Richard scored a massive hit with "Move It" in 1958. But it was the arrival of the four lads from Liverpool in June 1962 that would transform both the studio and, of course, popular music in general. There was a veritable pop music explosion in Britain during the early and mid-'60s; besides The Beatles, EMI hosted recordings for such local luminaries as Cilla Black, The Hollies, Manfred Mann and Gerry & The Pacemakers.

According to Peter Mew, who came to Abbey Road as a tape op/tea boy in 1965, and who works as a post-production engineer there to this day, the pop and classical engineers "didn't mix much professionally; you did one or the other, because it's really a different kind of recording. Later on, you got some pop engineers who moved over into the classical field, but you never got it the other way. We all got along fine. There would be some heated discussions at lunch perhaps, but we were all keen to share what we knew with each other; it was always that way. I can remember long discussions over lunch about the Tamla/Motown sound and how that was achieved and the myths that went along with it. There was always a lot of interest in 'the American sound.'"

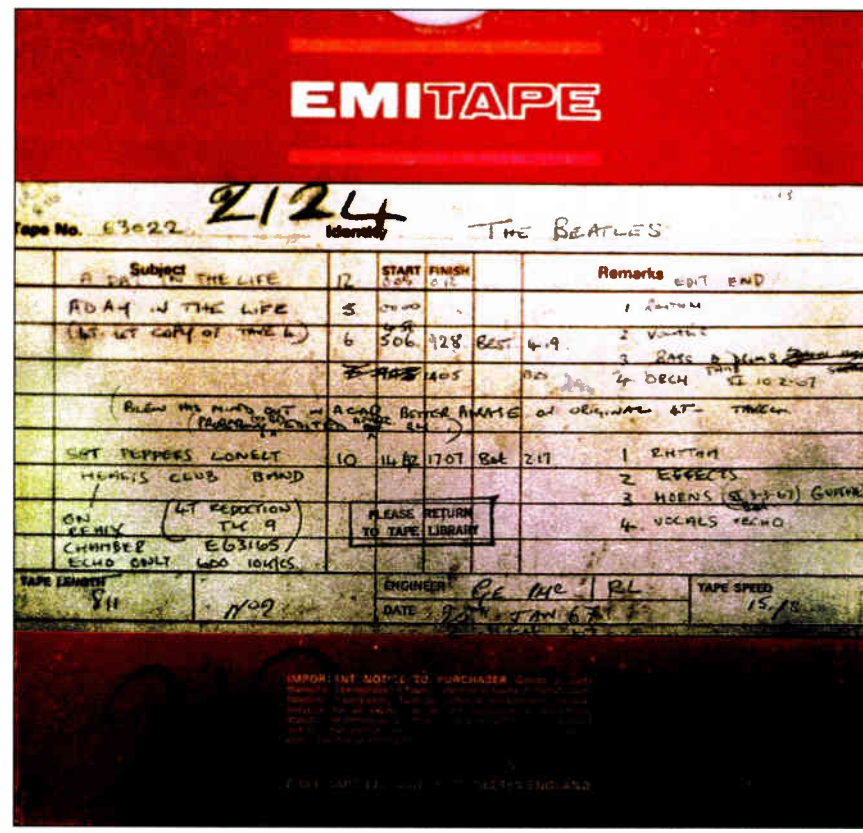
In the early '60s, there was still a prescribed career path for would-be engineers, and there was a strict delineation between the engineer's job and a producer's job. "There was a kind of career structure inasmuch as when you first started, you went into the tape library," Mew says. "And the reason for that is, it gave you a chance to meet the people in the studios, find out what the rooms were, what went on there without getting involved in any of the technical issues. You usually stayed there for six months or so until somebody got promoted, and then you became an assistant, a tape op. Eventually, because people were always moving into dead men's shoes, so to speak, everybody would move up, and the next step after tape op was cutting; don't ask me why, but that's the way it went. Then, from cutting you became an engineer. Now, this is the way it had always been. I'd been an assistant for a couple of years, I suppose, and then [engineer and later studio manager] Allen Stagg came in, and a couple of the engineers left and one of them suggested, 'Why not try Pete Mew?' So I was the first person who never did the cutting step; I went from tape op to engineer." Mew's first session as engineer was for the Pretty Things' *S.F. Sorrow* album in late 1967.

EMI Studios always had the latest and best equipment. Even in the mono days (the first Beatles album in stereo was *Help!* in 1965), its EMI custom consoles were considered state-of-the-art, and it had an unparalleled collection of mostly German microphones—"all of our microphones were either Neumann or AKG, with a few BBC ribbon mics," Mew says.

"When I first arrived here 30 years ago," says current director of operations Chris Buchanan, "EMI was still building a lot of their own equipment, including special cutting desks, which were superb. It was nice, because in those days, it was purely for internal use. They had to be the best; the cost didn't seem to matter terribly much. All the switches were special hard gold, and it was all hand-built and hand-adjusted and incredibly expensive. Those desks are still out there, too. Oasis has bought one of them. Another recently sold for over 100,000 pounds."

The success of The Beatles had a lasting impact on Abbey Road beyond its reputation—the group ushered in changes in the way the studio operated. During their

A 15 ips, 1-inch, 4-track master from The Beatles' Sgt. Pepper's Lonely Hearts Club Band sessions. Recorded at Abbey Road Studios January 20, 1967, this tape has tracks from "A Day in the Life," with rhythm on track one, vocals on two, bass/drums on track three and orchestra on track four. Recorded on February 2, 1967, the other 4-track tune on this tape is "Sgt. Pepper's," with rhythm, effects, horns/guitar and vocals/echo. Initials on the box indicate the engineer was Geoff Emerick, with Phil McDonald and Richard Lush assisting. The EMI tape was manufactured at the company's plant in Hayes, Middlesex.



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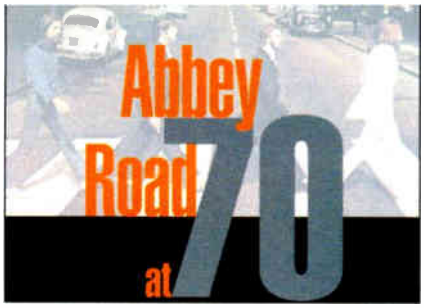


early days, The Beatles worked like any other group, churning out records quickly and efficiently; they were just one of a number of groups booking short blocks of time in the studio. But as their albums became more complex—from *Rubber Soul* on—they needed more studio time and worked longer hours, forcing their engineers to conform to their needs, whereas previously, the studio had been in complete control over when and how long the band recorded. And because of their close partnership with George Martin and their various engineers, The Beatles also became more intimately involved in the actual recording process than pop artists had previously.

"Before the late '60s," remarks Peter Mew, "there was a rather strict delineation of roles. Producers produced, engineers engineered and the artists did whatever they were told. The big record companies were all-powerful and they dictated to the artists what they would do. But, of course, come the end of the '60s, the artists got bigger than the record companies in a lot of cases, and they were able to turn around and dictate to the record companies. And as more record companies came along, especially smaller ones, things changed and the artists got more and more power. Then they started building their own studios and becoming their own producers, and that changed things, as well."

Veteran Abbey Road engineer Peter Mew

By the early '70s, The Beatles disintegrated into four solo careers, and Pink Floyd was the top rock band at Abbey Road—all of their classic albums from that era were cut there, including *Dark Side of the Moon* and *Wish You Were Here*. The group became famous for its long, laborious sessions; indeed, one story has studio manager Allen Stagg turning off the power in Studio Three one night because he was so fed up with Pink Floyd working into the wee hours. Of course, that would become the norm in the studio

business the world over by the mid-'70s, and it's stayed that way ever since.

"Lockouts started happening here in the mid- to late '70s," Mew says. "Most albums in the early '70s took four to six weeks, which is still a lot longer than most records in the '60s. But with the coming of 24-track and groups who could command the budgets to do lockouts, everything started to take longer and longer; I don't know if that's a good or a bad thing..."

On the technical side, the studio embraced each new development, as 4-track gave way to 8-track, then 16-track, and so on, up through Sony digital multitracks and Pro Tools. "When the first 8-tracks came in, we continued to use the EMI valve consoles," Mew says, "because you were only recording a few tracks at a time. But pretty rapidly, EMI developed an 8-track console that was transistorized, and that then became our standard console. That was then expanded to 16 tracks when that came in. I think the first non-EMI console we bought was a Neve for Studio Three; that would have been in 1974 or '75."

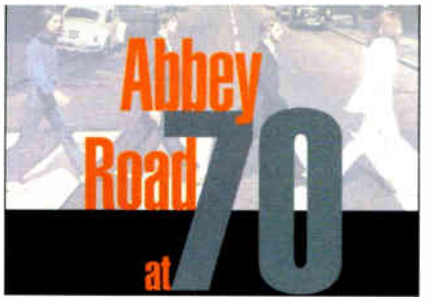
A view into Studio Two from its control room

Mew notes that the trend of deadening studios during the '70s never caught on at Abbey Road: "It really wasn't feasible. We looked into buying screens and that kind of thing, but because we were always so multidimensional, and the studios were still used for orchestral sessions, you couldn't deaden them down so that they could only be used for pop records."

With the recording of classical music either static or in decline over the past two decades, EMI/Abbey Road has, like all big studios, been forced to look for new sources of revenue for its biggest rooms. The studio continues to draw big pop/rock acts—everyone from Paul McCartney, Radiohead and the Spice Girls, to Oasis, Manic Street Preachers and Spiritualized. But also, since the late '70s, the studio has become a first-call facility for cutting film music—the combination of the magnificent Studio One acoustics and the availability of top local orchestras, such as the London Symphony, made it a magnet both for Hollywood producers and European filmmakers. Recording film music is now a core business for Abbey Road, and, not surprisingly, the studio also does a significant amount of surround mixing.

Senior recording engineer Peter Cobbin, who joined the Abbey Road staff after many years as a successful engineer in his native Australia, notes, "There still is really no better place to do orchestral work than Studio One. It's a brilliant room."

Though a veteran, Cobbin is one of the new breed of Abbey Road engineers who



are versatile enough to work in many styles and in different recording media. When we spoke, he had just completed sessions with composer Lalo Schifrin that used 48 tracks of Pro Tools with 48 Prism AD/DA converters, using a Sony 3348 *as a backup*, all mixed on the SSL 9000 J. Two years ago, he was responsible for the surround mixes for the remastered version of The Beatles' *Yellow Submarine*. ("I believe that was the first time any engineer had been asked to remix Beatles tracks from the original multitracks," he says with evident pride.) He mixed Howard Shore's Oscar-nominated soundtrack for the first *Lord of the Rings* film. And he's done work on rock DVDs for the likes of U2 and Björk. "I must say, having the 96-channel SSL J Series has made jumping into 5.1 a dream. We now have 12 rooms here that have 5.1 setups in them; it's a major commitment."

The studio has also done recordings for SACD and DVD-A releases, DVD authoring, and through its successful Abbey Road Interactive wing, has attracted a steady stream of multimedia clients. Another long-term project for the studio is to digitally archive all 250,000 tapes in their library to preserve them for future generations.

"If you don't change, you don't survive," says Buchanan matter-of-factly.

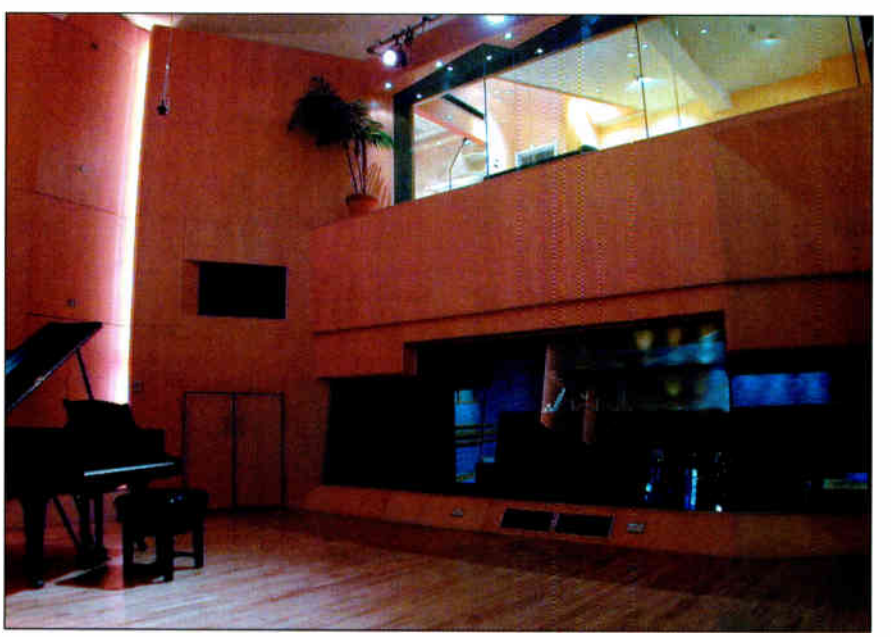
Current director of operations Chris Buchanan

"We're very much client-driven these days. When I first started here in 1972, it was pretty much the chief engineer who told you what technology was allowed to be used in the studio. Nowadays, it's gone completely commercial, and whatever a client asks for, we tend to provide. So, if we get a lot of inquiries in one area, we'll equip accordingly; or perhaps hire initially."

Though still affiliated with EMI, much of their work comes from outside vendors today, and their large staff of house engineers shares the space with independents that come in on a project-by-project basis.

It's an interesting balancing act the studio is constantly engaged in: On the one hand, everyone who works at Abbey Road is justifiably proud of the history that fairly oozes from every room. On the other, they want to be seen as a modern, forward-looking studio always ahead of the technological curve.

"Everybody who comes here to work always says, 'Wow, this is *fantastic*; you



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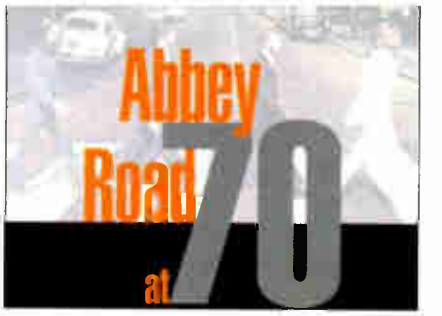

can really feel the atmosphere, feel the history,'" says Peter Mew. "There are always going to be people who say, 'Oh, Abbey Road—Beatles; living in the past.' But it isn't that way, and anyone who comes to work here knows it isn't that way. We've got modern equipment and engineers who can handle it. But you still know you're someplace special.

"I work in a room at the front of the building, and I look out on Abbey Road, and I see the tourists coming along and

Stevie Wonder at Abbey Road

signing the wall day after day after day. There aren't many studios in the world where that happens. It's not Buckingham Palace, you know. But I'm looking out now and there are flowers all the way along the railings because of George [Harrison, who had died two days earlier]. It's a special place, for innumerable reasons."

Peter Cobbin concurs. "I appreciate the sense of history about this place, and I'm keen to pass that along to some of the younger chaps coming through the business—that we are part of something bigger than all of us. And while we don't want to just rest on our laurels, we can learn a lot from the legacy that's been bestowed to us." ■

Blair Jackson is Mix's senior editor.

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New Digital Effects

by Randy Alberts

Alesis Ineko

Eighteen new or significantly upgraded digital hardware multi-effects processors have been released in the 18 months since January 2001's Winter NAMM. When *Mix* last surveyed this product category, 29 multi-effects units had appeared during a similar 18-month period. A challenging post-9/11 economy, the rising use of software plug-in effects, and the popularity of exotic, single-duty, boutique signal processors may all be factors in the relatively low number of new product introductions. But hardware multi-effects processors nonetheless remain very powerful studio tools; the current crop offers more sound-making possibilities than ever before. Increased DSP firepower, improved user interfaces, 24-bit/96kHz performance, parameter automation and add-on algorithms are just some of the exciting features in this year's roundup. Not included in this list are dynamics-only processors, portable digital recorders with built-in multi-effects, guitar multi-effects processors or reverb-only digital effects processors with fewer than five onboard multi-effects.

ALESIS

The Ineko ($199) from Alesis is a powerful desktop processor. Introduced at this year's Winter NAMM show, the tiny Ineko fits 24-bit converters, three parameter knobs, program-up/down and Bypass buttons, stereo ¼-inch in and output connectors, and a very simple interface into a slender, silver tabletop casing. Program names like "Stereo Trix," "VocoBend" and "VibroWobl" and 48 effect parameter names are handily printed side-by-side atop the unit, and two rows of LEDs cross-index which preset is loaded or which parameter is selected to control one of Ineko's 48 high-quality reverbs, delays, phasers, filters and other effects.

Alesis' Akira ($299) is a rackmounted, programmable, 2-channel multi-effects processor with 24-bit AD/DA, 28-bit internal processing, 48kHz sample rate, and 100 reverb, delay, pitch modulation, filter and special effects presets. MIDI I/O, balanced +4dBu/-10dBV ¼-inch TRS analog I/O and three parameter knobs are included, the latter for real-time parameter control of any selected preset.

Another new Alesis multi-effects entry is the PicoVerb ($99), a simple preset reverb/multi-effects overachiever. The PicoVerb provides 16 effects presets at 24-bit/48kHz resolution, including reverb, flange, delay, chorus flange and rotary speaker settings. Truly a "compact effects processor," the PicoVerb can fit in a ½-rackspace or sit on a tabletop.

BEHRINGER

Behringer has revitalized its Virtualizer Pro DSP2024P ($149) dual-engine, 24-bit, multi-effects processor both inside and out. The user interface has been greatly enhanced, and true stereo processing on most algorithms is now available, as is a separate high/low-EQ per preset. New special effects, such as Ring Modulator, Vinylizer and Voice Canceller, have been added, along with virtual room reverb algorithms, including a variety of dynamic and psychoacoustics processing algorithms. All effects parameters can now be fully remote-controlled via MIDI, and users can also now edit up to seven parameters per preset, as well as high and low EQ, when customizing the 100 onboard factory presets. New additions to

Behringer Virtualizer Pro DSP2024P

Processors

Expand Your Sound-Making Palette

Eventide Eclipse

Line 6 Echo Pro

Kurzweil RSP8

the Virtualizer Pro's 100 individual programs include distortion and tube and amp simulation effects.

twice as many features squeezed into one rackspace. Sporting many of Eventide's signature reverb, pitch change and special effects presets, Eclipse's dual-engine architecture can be configured in series, parallel, stereo or dual-mono modes. Further, its programs can be rapid-searched by category or application, and a memory card slot allows for portable presets. A well-thought-out front panel looks like a breeze to use: a Tap Tempo button, a 15-pad keypad, large silver parameter knob, two-line menu-interface screen, a pair of 7-segment signal-level meters, and lights indicating in which of the Eclipse's 44.1, 48, 88.2 and 96kHz sampling rates the unit is operating. Eclipse's Version 1.1 software update added 50 new programs and the ability to rename hotkeys, save and load setups and control one Eclipse with another via MIDI.

standard Orville, Orville/R multichannel and DSP7000 stereo-effects processors can be controlled with Eve/Net to create an unlimited number of digital and/or analog effects channels, a useful application for multichannel facilities. In the upper echelons of mainframe effects and reverb processors, Orville/R offers all of the effects and I/O-routing capabilities of the now-legendary Orville Harmonizer effects processor engine, including 4-channel reverb, distortion, dynamics, pitch shift, phasing, flanging, EQ and more.

GIBSON

A respected company name not typically associated with studio effects processors is back. The Gibson Echoplex Digital Pro ($1,150) is a rackmounted, MIDI-savvy, digital update of the classic tape-based Echoplex that incorporates elements of loop-based sampling, recording and delay with a nifty foot pedal controller (EFC7, $165) to get crazy live and in the studio

Lexicon MPX 200

EVENTIDE

Check out last month's issue for a review of Eventide's next-generation multi-effects processor, the Eclipse Harmonizer Effects Processor ($2,250). The company's first single-rackspace product, Eclipse debuted last year as a sort of H3000 with a dose of more power and

Take one Eventide Orville Harmonizer multichannel effects processor, remove all front panel controls, come up with a hefty discount and what do you have? One Orville/R "Blank Front Panel" Processor ($4,995). The unit is designed for use with Eventide's own Eve/Net remote-control system, and any combination of

with up to nine simultaneous loops. Onboard is 16 MB (198 seconds) of 16-bit memory time, tap-tempo control, and access to all Record, Play, Loop, Edit and Undo functions from the foot pedal. Loops and sound files can be saved and loaded via MIDI, and multi-effects presets include delay, chorus and flange settings.

KURZWEIL

Picking up where the Kurzweil K2600 synthesizer's world-class effects left off, the company has released the KSP8 mega multi-effects processor ($2,995) and its companion RSP8 remote controller ($595). Built in a two-space rackmount chassis and billed as a high-end 8-channel multibus signal processor with great real-time control, the KSP8 doubles the K2600 KDFX's processing power and adds a number of new algorithms, including new surround reverbs and additional stereo and mono algorithms. Up to eight channels of audio can be processed simultaneously in mono, stereo and surround combos, each sharing one of 16 available processing units on up to eight effects buses. Users can customize effect presets and signal chains for up to 999 object locations and store them to SmartMedia cards, each holding a "studio" snapshot of physical connections, analog and digital I/O routing and levels, effects chains, bus assignments and more per program. Also impressive is the fact that the KSP8 offers 249 DSP algorithms including reverbs, choruses, delays, distortions, EQs, cabinet simulators and compressors, as well as 5.1 surround audio algorithms with multichannel compression. I/O options include analog, AES/EBU, S/PDIF, Lightpipe, TDIF and wordclock connections.

TC Electronic M300

LEXICON

From under the umbrella of the company's flagship 2001 TEC Award-winning 960L mainframe reverb platform, Lexicon released the MPX 200 ($399) last year and recently came out with the MPX 110 ($329) effects processor. The MPX 110 is another affordable, dual-channel, multi-effects rackmount unit from the MPX line that includes Lexichip heart, 24-bit AD/DA converters, true stereo processing, and 240 reverb, delay, modulation and pitch presets. Users can store and edit 16 programs, tempo can be tapped in with a foot pedal, and a 44.1kHz S/PDIF output can be set to wet or dry to use the MPX 110 as a high-quality, stand-alone sample-rate converter, if needed.

Lexicon's MPX 200, also a true stereo, dual-channel processor, combines the best of the original MPX 100 with many new features, including 24-bit internal processing, digital compression and an internal power supply. The MPX 200 adds 64 user settings, and its 240 presets include all of the classic Lexichip reverbs and choruses of its predecessor. Features include up to 5.5 seconds of delay, detune, echo, flange, pitch shift, rotary speaker and tremolo effects. Up to four program and compression parameters can be controlled by the MPX 200's front panel adjust knob, and simultaneous analog and digital streams can be output.

Kurzweil KSP8

LINE 6

Already well-known for its line of POD amp-modeling units and an expanding line of high-quality floor pedals for guitarists, Line 6 now has set its sights on a studio line—and it's one of the best-looking lines of rackmount gear to come along in a while. The Studio Modelers line of rackmount effects processors includes the **Echo Pro**, **Filter Pro** and **Modulation Pro**, each listing at $699.99. Each unit emulates features of one or more classic effects units and is ready to be synchronized and locked to MIDI clock and tap tempo right out of the box. Able to lock in to a 16th-note triplet, dotted whole note and everything in between, each of the Studio Modelers' extensive MIDI and synchronization features and expression pedal controls (pedal optional) are well-suited for performance, experimentation and live studio mixing.

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unbalanced I/O; and dry, analog, input mute and all mute mix options. Echo Pro emulates classic machines such as the Maestro EP-1 Tube Echoplex, TC Electronic's TC2290 Dynamic Delay, the Boss DM-2 Analog Delay, and a variety of various pingpongs and reverse effects. Filter Pro pays homage to a Mu-Tron III (both up and down positions), an Oberheim VCF, an Octisynth, and a number of Moog, Sequential Circuits and ARP synthesizer filter banks. Modulation Pro covers all of the sonic territory of a Fender Deluxe Optical Tremolo, an Ibanez Flying Pan, a Leslie 145, an MXR Flanger and a Song Bird/Dytronics Tri-Stereo Chorus.

TC ELECTRONIC

In the past 18 months, TC Electronic introduced four new multi-effects processors and a major software upgrade for System 6000, its flagship reverb platform. Improvements include the first stereo-to-5.1 surround-conversion processor released for the music and film industries.

The TC Electronic **M-One XL** ($699) does its own classic hall, large room and grainy snare reverbs quite nicely, while including a generous selection of high-quality compressor, limiter, EQ, flanger, gate, expander, de-esser, phaser and tremolo algorithms.

The new **M300 Dual-Engine Processor** ($299) puts high-quality TC reverb and multi-effects channels in the hands of budget-minded studios, live mixers and musicians who are looking for 24-bit true-stereo processing, auto-sensing S/PDIF input, MIDI control, and a decent dose of reverb and delay, vintage phase shift, hard tremolo, soft chorus and dynamics processor presets.

TC's **D-Two Multitap Rhythm Delay** ($699) incorporates the company's new Rhythm Tap feature, which allows rhythmic tapping and actual rhythm patterns to be tapped or quantized according to a specific tempo and subdivision. Also included are chorus, filter, spatial, dynamic delay and pingpong effects for locking together one incredible tempo- or MIDI-based effects loop with the rhythmically inclined D-Two. ■

Randy Alberts is a California-based audio and music journalist affected by multi-effects. His first book, Tascam: 25 Years of Recording Evolution, *is being printed by Hal Leonard Publishing.*

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AKG WMS 81 UHF Wireless Microphone System

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HOT PICKS FOR THE WIRELESS SET

by Randy Alberts

As new digital television (DTV) broadcasters' and emergency response units' signals continue to eat up wireless frequencies each year, wireless mic manufacturers must upgrade their products to take advantage of the remaining available frequencies. *Mix* talked with 20 wireless mic manufacturers to find out what's new with each company's top system. Thirteen new wireless systems have been introduced since *Mix*'s 2000 guide (see the February 2000 issue), including two new all-digital wireless systems, and several existing flagship systems have been enhanced with new options.

AKG's WMS 81 UHF Wireless Microphone System ($862 with AKG D880 handheld; $1,936 with C535 WL head and CK77 WR lav) is a half-rack model (with a rackmount kit) that offers up to 20 selectable channel frequencies between 246 and 710 MHz. The WMS 81 system features switchable mic/line outputs, interchangeable mic elements, tone-code squelch, RF and AF signal-strength indicators, and a removable rear-mounted antenna. The transmitter packs feature adjustable frequency and gain control, power on/off, Mute switch, signal peak indicator, and can operate on two AA batteries for up to 10 hours. On the market for several years and still going strong, the WMS 81 offers options that include a wide-band antenna splitter, directional antenna, external antenna, a choice of three modular mic capsules, and a bodypack system that includes two headworn mics, two lavalier mics and a wind/brass instrument mic.

Announced late last year from Applied Microphone Technology were the Roam I ($775) and Roam II ($795) Wireless Mic systems for live instrumentalists. Operating in one frequency per channel on U.S. channels between 801 and 805 MHz, the Roam I system can be used with 40 different instruments including most brass, woodwind and percussion; the Roam II is designed for use with the violin, viola and mandolin. Roam I includes Samson's Airline UHF 1-channel wireless system, a hard-shell case, and an AMT microphone with flexible gooseneck and ISO ring, the latter suspending the microphone in a four-point isolation ring to help eliminate valve, key and instrument-handling noises.

Applied Microphone Technology Roam I

Audio-Technica's 7000 Series wireless family now includes the ATW-7373 Handheld Condenser Microphone System ($999), which comes with the company's ATW-T73 handheld transmitter and ATW-R73 wireless receiver. Available in two frequency ranges (656 to 668 MHz for channels 45 through 47; 728 to 740 MHz for channels 57 through 59), the automatic switching,

Audio-Technica ATW-7373 System

Azden Corporation 411LTH

true-diversity ATW-7373 system comes with a wide range of options including bodypack mics, antenna-distribution packages and joining plate kits. The ATW-T73 handheld mic/transmitter uses the same condenser as the company's legendary AT4033 studio mic, and users can select among 100 available television channels.

Improving on its 311DRH VHF Wireless system, Azden Corporation introduced its 411LTH Wireless System ($720, including bodypack transmitter and electret condenser lapel mic) at this year's Winter NAMM Show. The 411DRH receiver, operating in the 793 to 805MHz UHF channel range, is a half-rack version of the company's 411UDR, which adds RF/audio displays, an on/off switch, external squelch and rear-mounted detachable antennas. The newly designed Azden handheld mic employs a super-

ceiver, a deluxe Jensen carrying bag and the UT 801 handheld transmitter. The system operates in the 794 to 804, 806 to 814 and 863 to 865MHz UHF frequency ranges, and allows for the use of up to 10 systems at a time. The system is also offered with a belt pack for lavalier or headset mic configurations and with an instrument cable. Both the handheld mic and body

Lectrosonics UCR411 Digital Hybrid Wireless

Microphone Systems

cardioid element and 63 user-switchable channels, and the bodypack transmitter provides user selection of the same 63 channels and employs an input level control, Stand-by switch, locking input connector and a metal belt clip.

Electro-Voice's new fully programmable RE-1 Series Wireless Microphone System ($1,550, with handheld mic), expected to ship this fall, utilizes Advance ClearScan technology to automatically make frequency-agile selections of the best of 15 UHF channels for seamless mic performance. The dual-band compander RE-1, which operates in two frequency ranges (680 to 704 MHz, TV channels 49 through 52; 722 to 746 MHz on channels 56 through 59), also includes the handy SoundCheck mode that allows one live sound engineer to handle dropout/deadspot checks with a built-in, 1kHz audio test tone without needing a second engineer. Optionally, E-V N/DYM 767a Handheld Transmitters ($600/each) and Bodypack Transmitters ($520) can be added to the system. Also from the E-V family is Telex's FMR-1000 ($1,830 for handheld/bodypack Combo System), an almost identical wireless system to the RE-1 that is targeted at the sound contractor market.

Jensen Music Industries JW 801.DV UHF Diversity System

Jensen Music Industries' JW 801.DV UHF Diversity System ($389, with handheld mic) includes the company's JW81.DV receiver, a deluxe Jensen carrying bag and the UT 801 handheld transmitter. The system operates in the 794 to 804, 806 to 814 and 863 to 865MHz UHF frequency ranges, and allows for the use of up to 10 systems at a time. The system is also offered with a belt pack for lavalier or headset mic configurations and with an instrument cable. Both the handheld mic and bodypack transmitter include built-in transmission antennae, and will mute signals to the receiver when set to "mute" or "off" positions. Additional features of the JW 801.DV include front panel controls and display for squelch, level, RF signal meter, power on/off switch and detachable UHF antennas. The receiver's unbalanced ¼-inch and balanced XLR outputs may be used independently or simultaneously.

Lectrosonics' UCR411 Digital Hybrid Wireless ($3,825) debuted at this year's NAB and promises to ship this month. The UCR411 receiver comes teamed with a choice of three different Lectrosonics lavalier microphones and either the company's UM400 belt pack or MM4000 mini-submersible belt clip mic transmitters. Aimed largely at the motion picture and high-end TV production markets, the UCR411 Digital Hybrid operates between

537 and 862 MHz (in 25.6MHz blocks) and is expected to be developed for studio and stage versions later in 2002.

Mipro, whose UHF and VHF wireless systems are now distributed by Beyer Dynamic, is now shipping the Mipro ACT Modular System (starting at $2,600). This compact, true-diversity, half-rack wireless series uses the company's Automatic Channel Targeting (ACT) technology to provide rapid and precise channel setting of the transmitter, while automatically locking the receiver and transmitter into a common operating frequency. Operating in the 620 to 960MHz frequency range, over 100 channel presets per 24MHz bandwidth, the ACT-707S also features a multifunction color LCD front panel display of RF/AF and diversity-signal metering, transmitter battery fuel gauge, performer's name, squelch level, mute on/off and address.

The UHF-16 ($529.95 handheld with a Shure SM-58 cartridge; $449.95 for the lavalier) is an affordable, new wireless system debuting at this year's Summer NAMM from **Nady Wireless**. This frequency-agile UHF system (726 to 863 MHz, 16 channels switchable in pre-programmed bands up to 20MHz wide) offers 16 user-selectable channels, up to 500-foot line-of-sight operation, 120dB dynamic range and a selectable Tone Squelch feature for increased protection from RF interference. The half-rack UHF-16 receiver boasts dual-removable antennas, IF filtering for multiple UHF-16 system operation in one location, and comes with the choice of Nady's UB-16 handheld mic with no antenna protrusion, its UH-16 instrument, lav or headworn bodypack with three-way input switch for either input, or the optional Shure cartridge mentioned earlier.

Combining the wireless traits of the company's flagship 5000 Series Wireless System with a top-notch Neumann handheld mic, **Sennheiser** now offers the SKM5000-N ($3,150, with Neumann KMS 105 condenser/transmitter). Features of the SKM5000-N and its transmitter include 16 user-selectable frequencies, an integrated antenna design, a selectable bass roll-off filter and a five-way sensitivity switch. Neumann's KK105-S small-diaphragm condenser capsule provides clarity without excessive sibilance, and features a supercardioid pattern for a wider sweet spot with good rejection. A proprietary multilayered grille assembly helps eliminate popping and breath noises.

Sabine has significantly upgraded its top-of-the-line True-Mobility Wireless Series with the new 2.4GHz Spread-Spectrum SMW-5000 Series ($2,299.99 for Combo System with a 2-channel receiver and Audix OM3 handheld and Sabine lavalier mic transmitters). The 2.4 comes with Sabine's FBX Feedback Exterminator, compressor/limiter, de-esser and microphone-modeling DSP, remote control of up to 50 systems via PC and access to 50 available local television channels. The sleek front panel of the 1U rackmounted SWM-502R diversity receiver includes dual signal, battery, audio and locked channel meters, and provides controls over mic modeling, compression, de-esser, and channel and program selection. The sys-

Nady Wireless UHF-16 receiver and UB-16 mic

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Samson Wireless UHF Synth 32 system

Shure UHF Wireless Series U24D/Beta 87C system

tem uses rechargeable NiMH C and AA batteries for both handheld and beltpack transmitters.

The Samson Wireless UHF Synth 32 system ($1,024.98, with Sennheiser's MKE-2 omni-directional lavalier) provides 32 user-selectable UHF frequencies (from 801 to 805 MHz) in both the receiver and transmitter units. Shipping now, the Synth 32 sports a compact half-rack receiver with a large front panel LCD, and features like-PLL-synthesized VCO transmitter circuitry, the company's Surface Acoustic Wave (SAW) filters and built-in noise squelching. Additional features include balanced XLR and unbalanced ¼-inch outputs, battery life indicators and a 3-pin mini-XLR connector.

The UHF Wireless Series U24D/Beta 87C system ($4,646.30) from Shure Incorporated has been the company's flagship wireless system configuration since 1996. This dual-channel system comes with two handheld Shure Beta 87C microphone transmitters and now boasts a total of 75 possible wireless systems (24 per frequency band), thanks to the new M4 and J4 frequency bands made available for the UHF Wireless Series family (U.S. television channels 28 through 36, 46 through 54 and 66 through 69). A user-programmable display on the U24D receiver shows group, channel, frequency, name and squelch levels, and Shure's Noise-Squelch circuitry analyzes signal quality rather than signal strength to virtually eliminate noise bursts. The U24D/Beta 87C system also sports a 25-pin serial connector for future computer control and monitoring via an accessory interface box.

Sony expanded its Legacy 800 Series wireless family at this year's NAB Show with the introduction of the single-rack-space MB-8N Rackmount Tuner Base ($2,750), WRU-8N UHF Synthesized Tuner Unit ($1,000/each), WRT-8B UHF

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Sony WRT-8B Bodypack Transmitter

Bodypack Transmitter ($1,850) and WRT-847 Wireless Microphone ($1,000 body, plus five capsules ranging from $445 to $550 each). This Sony wireless system, designed for applications requiring a large number of wireless mics such as broadcast program production, theater and live P.A., sports a dynamic range of 116 dB and 20 to 20k Hz frequency response, and can be controlled from any Ethernet-equipped PC via the included software. Up to four WRU-8N tuners, each with LED AF/RF level and transmitter battery alarm indicators and an LCD screen for viewing channel, frequency and group settings, can be installed in one MB-8N base. Up to four MB-8Ns can be linked (to provide 16 channels total) without requiring an antenna divider. The WRT-8B bodypack transmitter's size (2.5x3x1

TOA Password Series UHF Wireless

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The DM-24's features are usually reserved for super high-end mixers. With 24-bit/up to 96kHz digital audio, the DM-24 blows away the standards in sonic quality for affordable consoles. With its internal automation, you'll get more power at your fingertips than you would from those huge consoles in commercial facilities. With some of the finest spatial and modeling processing from TC Works™ and Antares™, you can create fully polished productions without ever going to the rack. With incredibly flexible routing, fully parametric EQ, machine control capabilities, touch-sensitive motorized faders, and lots of audio interfaces, you can integrate the DM-24 into any studio environment.

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inches) and ultra-lightweight (4.9 ounces) make it a great choice for ENG, documentary production and sports coverage.

A password is all that you will need to get 64 user-selectable UHF channels (690 through 722 MHz), dual built-in switching antennas and operation of up to 16 simultaneous systems. TOA's Password Series UHF Wireless ($1,600) is designed for A/V rental companies, boardrooms, schools, fitness clubs, hotels and houses of worship. The Password Series includes the company's WT-4800 true-diversity receiver with onboard interference scanner and dual squelch protection (noise and tone-key), a diversity antenna distributor and the YW-450 powered dipole antenna. Also included are WM-4200 dynamic handheld and WM-4300 bodypack lapel microphone/transmitters. Password Series mics will operate continuously for up to 10 hours on one 9-volt battery. The system is covered by a new five-year warranty for all of TOA's commercial and engineered sound products.

The Vega U-2020 Wireless Microphone ($1,600, with an A-T ATM89 capsule) from Vega/Clear-Com Intercom Systems is a frequency-agile, 100-channel UHF wireless microphone system consisting of the company's R-2020 receiver, BT-2020 bodypack and HT-2020 handheld mic transmitters. The latter comes with a choice of E-V N/D767 ($521), E-V 557 ($421), Audio-Technica ATM89 ($621) or Audix OM6 ($614) handheld mic elements. U-2020 system operates on two 20MHz frequency bands (708 through 728 MHz, 728 through 748 MHz), and may be expanded with the MC-2020A multi-coupler that can feed up to four receivers ($570). A variety of UHF antennae, rack kit, Euro power supplies and other op-

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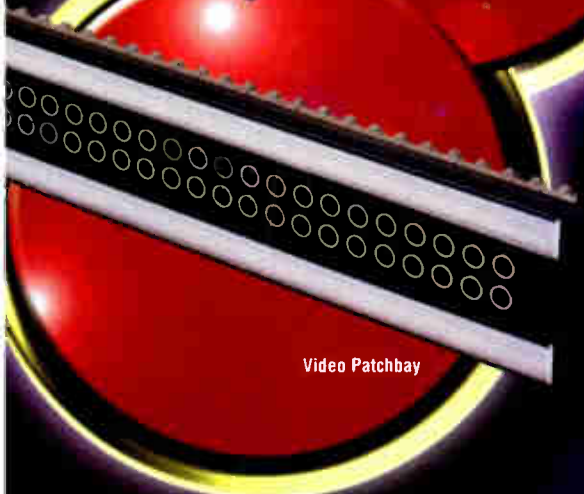

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Zaxcom Wireless Digital System

tions are also available. The R-2020 UHF receiver's front panel has RF level, diversity, channel and audio level displays, and over 20 U-2020 systems can be operated simultaneously.

Zaxcom's Wireless Digital System ($3,940, with beltpack) began shipping last year as the first digital wireless system for the television and film industries. With a receiver measuring only 4.5x1.2x6 inches and a 2x3-inch transmitter (smaller transmitters are available), the Wireless Digital System also offers several significant audio advantages: 24-bit/96kHz audio conversion, secure transmissions, alignment-free digital filtering/compression, very low THD and a 117dB dynamic range. Zaxcom's system operates between 500 and 1,000 MHz, and can be ordered in blocks of 25 MHz. Other features include by far the industry's smallest transmitter, pushbutton transmitter control, and analog and AES/EBU digital receiver I/O. ■

Randy Alberts is an audio and music journalist in Montara, Calif. His first book, Tascam: 25 Years of Recording Evolution, *is in final production with Hal Leonard Publishing.*

MANUFACTURER CONTACTS

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AP6020	2000 x 2	1300 x 2	800 x 2	4000 @ 4Ω
AP4040	N/A	1200 x 2	750 x 2	2400 @ 8Ω
AP4020	1200 x 2	750 x 2	475 x 2	2400 @ 4Ω
AP2020*	600 x 2	450 or 600 x 2	250 or 400 x 2	1200 @ 4 or 8Ω
AP800*	400 x 2	260 or 400 x 2	160 or 250 x 2	800 @ 4 or 8Ω
A4.4	N/A	1200 x 2	750 x 2	2400 @ 4Ω
CR12	400 x 2	575 x 2	400 x 2	1200 @ 8Ω
CR5	N/A	250 x 2	170 x 2	525 @ 8Ω
SR-300	N/A	150 x 2	110 x 2	N/A

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BY DAN DALEY

Producer Billy Sherrill

Brilliant Career of a Nashville Legend

The modern country music establishment in Nashville—meaning since Hank Williams died in 1952—can be traced back to a triumvirate of producers who made the country music industry what it is today. The production approaches of Owen Bradley, Chet Atkins and Billy Sherrill set standards that haven't changed much since the trio's heyday from the 1950s to the 1980s. Bradley and Atkins have both passed away in the past several years, and Sherrill retired in the late 1980s. But not before he made dozens of landmark, career- and genre-defining hit records for Tammy Wynette, George Jones, Barbara Mandrell, Tanya Tucker, Johnny Paycheck, Janie Fricke, Charley Rich and many others. "Stand by Your Man," which Sherrill wrote and produced for Wynette, is all over the cultural landscape, from its use in the Blues Brothers' classic film to Nancy Reagan's reference to it in defining marriage.

Sherrill was born in 1936 in Alabama, not far from Muscle Shoals, where he and his best friend, Tom Stafford, did demo recordings in a room upstairs from the drug store Stafford's father ran. The son of an evangelical preacher, Sherrill played piano at church weddings and funerals, as well as saxophone in the high school band. But he was lured by the sounds of R&B and rock 'n' roll, and was soon playing in bands throughout the mid-South. By the time Sherrill got to Nashville, in the late 1950s, Atkins and Bradley had established recording protocols that were already deeply entrenched. Sherrill viewed both men as role models, but he also brought his own ideas to the table; he ushered in a lush, highly produced sound that brought many new listeners to country music, and he is credited with bringing in the auteur approach to making records: He wrote, played, produced, engineered and served as an executive for a major label (Epic). Writing the songs his artists cut or owning part of the publishing earned him serious enmity from Nashville's elite songwriting community. But if you look at the business today, there are few producers in country music—or in most other genres—who don't follow that practice to some degree.

Sherrill has come out of retirement to cut a gospel album with George Jones, scheduled for release later this year. His career, from his early days in Nashville until this much-anticipated comeback, has been, as he puts it, "quite a ride."

When you were growing up in Alabama, you learned piano and played a lot of church music, but then you got hooked on jazz and R&B as a sax player. What caused that shift?

Starvation. Do you realize what a Southern Baptist evangelist makes a year? I'm not talking about Jim Bakker. My dad was being paid in cabbages and pigs, milk and fruit. There wasn't a whole lot of money in church music, but there was some in rock 'n' roll.

What were your earliest recording experiences like in Alabama?

You can't really call them sessions. Everyone was learning as we went along—the engineers, the producers and the musicians. We were just mostly doing demos, never really master sessions. Just an old Ampex recorder and no sound at all, really. This was before they built the studio in Muscle Shoals.

You came to Nashville by accident—a royalty check in the mail you weren't expecting. What was the

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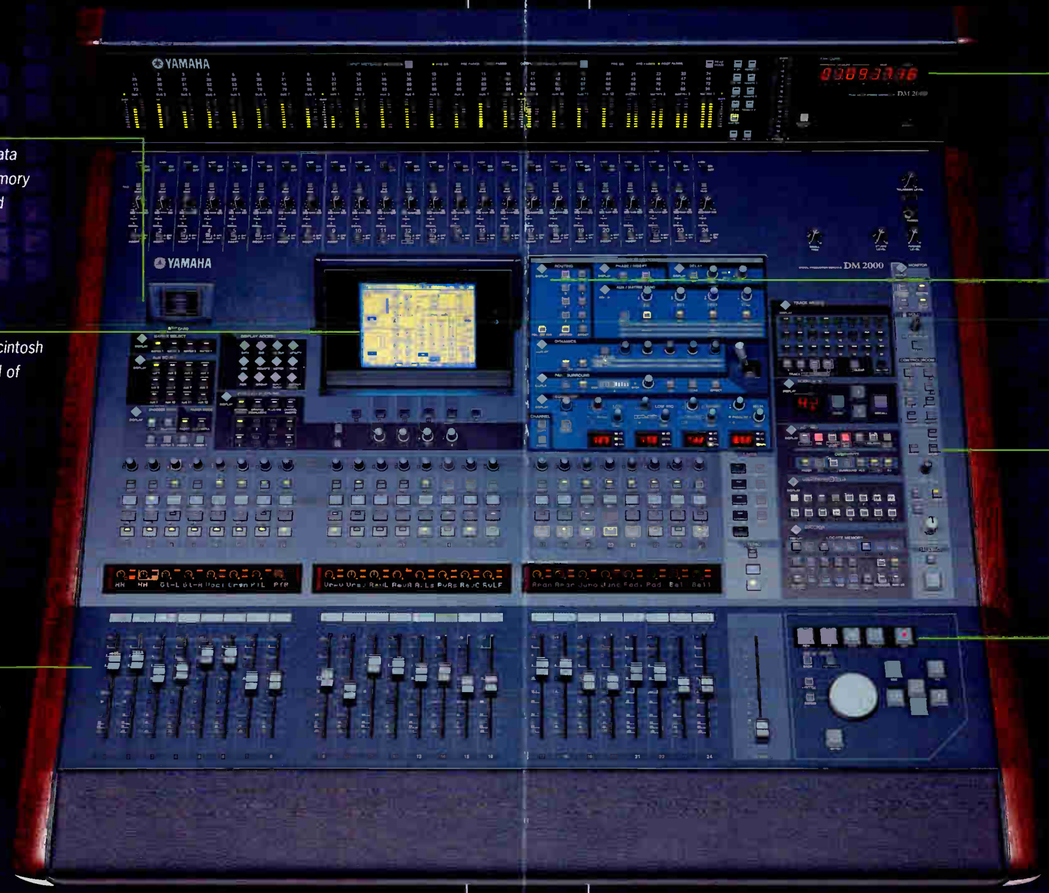

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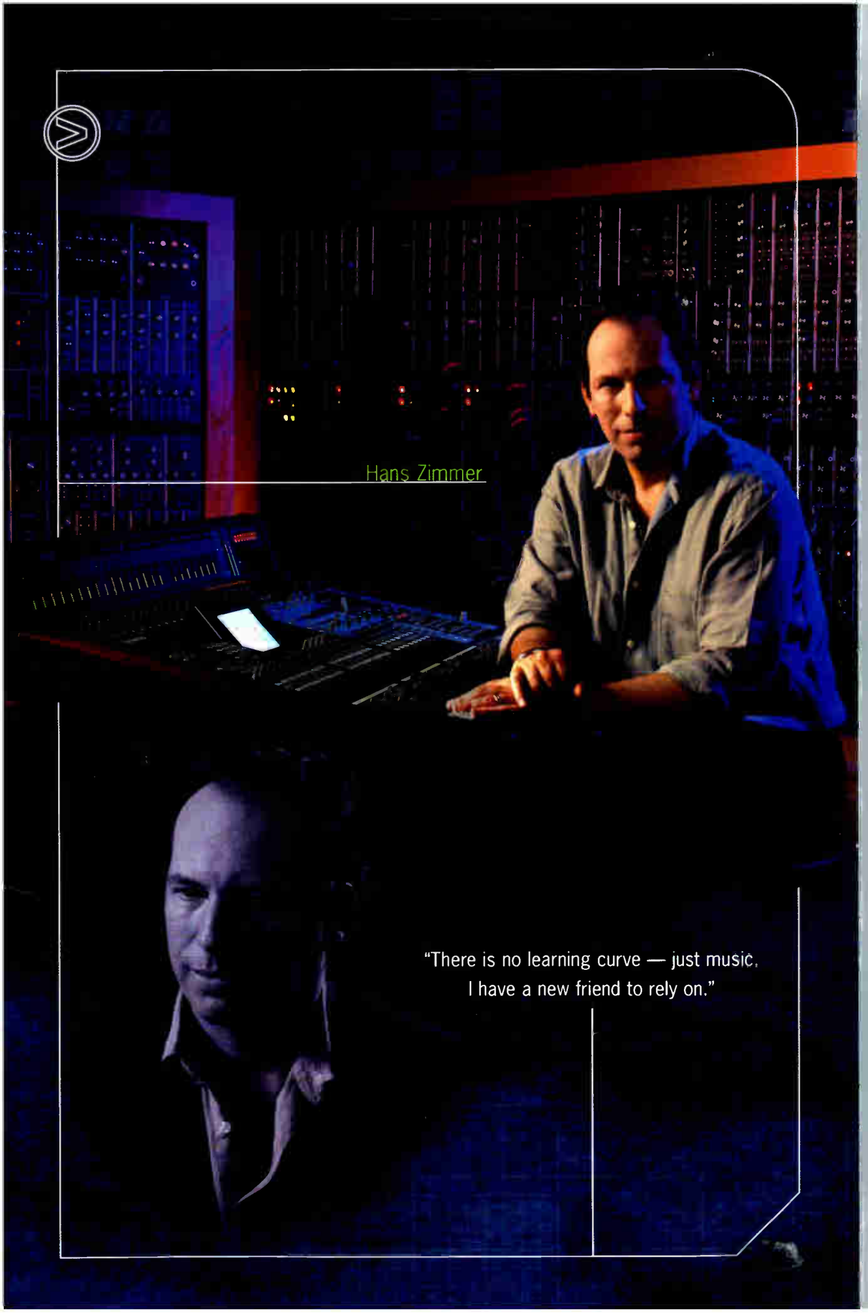

Hans Zimmer

"There is no learning curve — just music. I have a new friend to rely on."

The DM2000 is available only through these Yamaha Commercial Audio dealers —

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Boynton Studio, Inc.	Melody Pines Farm	Morris	NY	13808	607-263-5695
Broadcasters General Store, Inc.	2480 Se 52nd St.	Ocala	FL	34480-7500	352-622-7700
Brook Mays Professional Recording Sales	8701 Carpenter Fwy. Suite 250	Dallas	TX	75247	888-286-0566
Comprehensive Technical Group, Inc.	2195-G DeFoor Hills Road	Atlanta	GA	30318	404-352-3000
Cutting Edge Audio Group	290 Division St., #103	San Francisco	CA	94103	415-487-2323
Dale Electronics Corp	7 East 20th St.	New York	NY	10003	212-475-1124
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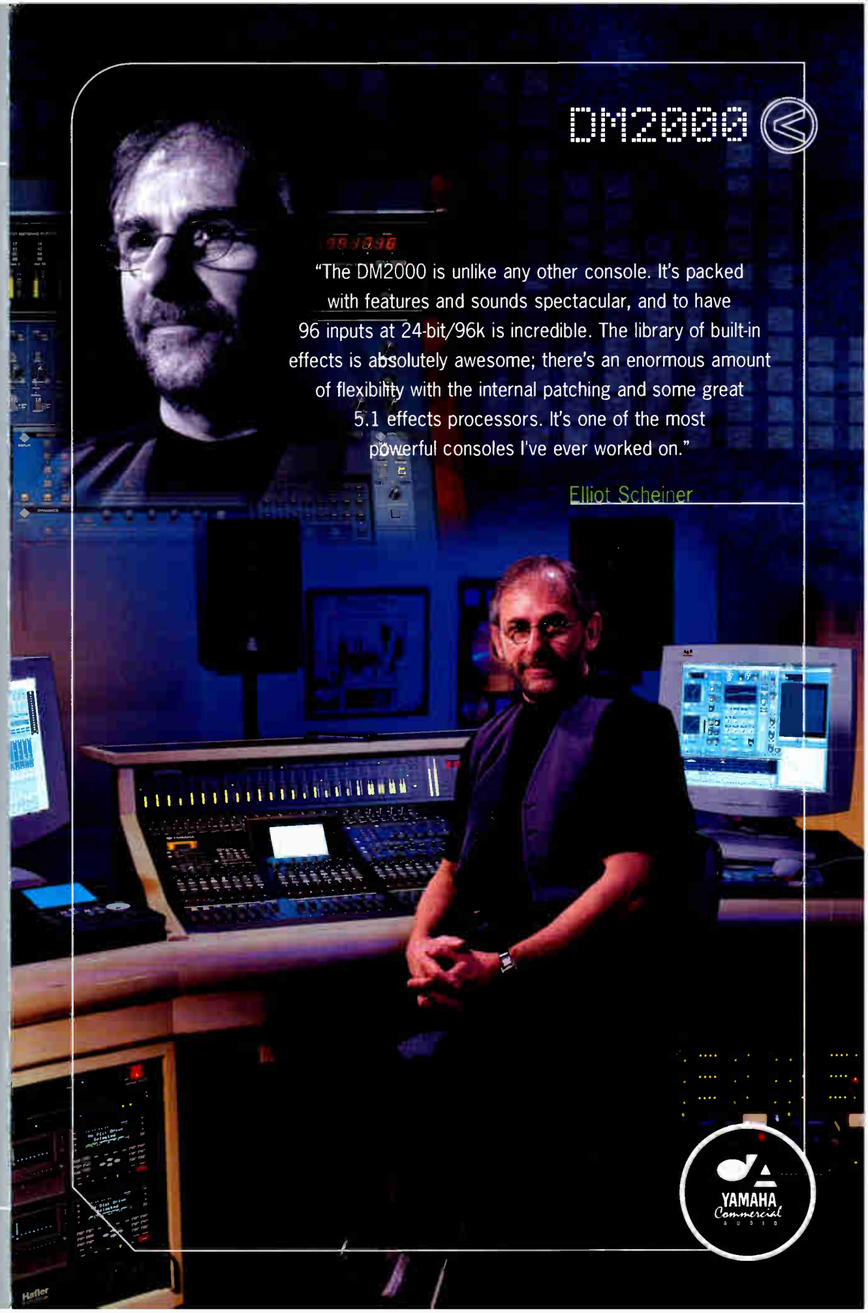

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What got everyone's attention was "Almost Persuaded" [co-written by Sherrill], which we did as a B-side for David [in 1966]. Back then, selling 30,000 albums was amazing; 25,000 albums got you to Number One. I get this call at Epic from a distributor, Comstock, in Atlanta. Guy says, "Send down 10,000 copies of the record." I'm wondering, "Is this some kind of mistake? Isn't this a country record?" Later that afternoon, he calls back and says, "Better make that 20,000." That song stayed at Number One for 13 weeks, and it sold 250,000 copies. [The song won the Grammy™ the next year for Best Country & Western Song and has since become a standard, covered by dozens of artists including Louis Armstrong, Etta James and Louis Prima.]

In Nashville, nothing succeeds like success.

I guess. After that, no one ever mentioned budgets to me.

But that went against the Nashville way, too—the division of roles of producer and songwriter. Did you catch heat for that?

That was kind of a conflict. I had gotten wind that the songwriters were annoyed by it. One guy says to me, "You got a lock on this now—you write the song and you're a VP at Columbia Records and you record it." I said I would only record it if it was the best song. But it still bothered me. So I called up [Columbia Records president] Clive Davis and said, "I'm coming to New York, I want to talk to you." I walked in his office and told him about the feedback I was getting in Nashville, how people said what I was doing wasn't fair. And Clive said to me—and I will never forget this—he says, "Who am I?" I said, "You're the president of Columbia Records." He says, "Can I fire you?" I said, "Yes, you can." He said, "Do want to get in trouble with me?" I said, "No way." Then he said, "So get back down to Nashville and keep doing what you're doing and making hit records."

What was that first meeting with Tammy Wynette like in 1966?

She came to the office, and my secretary told me a girl was here to see me. I was thinking, "Oh, man, it's 4 o'clock," and I was ready to get out of there. I actually forgot she was there and I went to leave, and an hour later she was still sitting there. Her real name was Virginia Pugh. So, I invited her in. She had a weird little demo tape that was pretty mediocre. She did have a different type of voice, but the song wasn't very good. I told her, leave your number. If I ever get the right song, I'll call you. I could see the hope draining out of her. She told me I was her last stop, that she had to go back home the next day.

Sherrill with the late, great Tammy Wynette.

So she went back to the Anchor Motel, where she was staying with her two kids. I felt bad, but the song just wasn't there. Meanwhile, I was trying to pick up a master recording to a Fuzzy Owen song called "Apartment #9." I wanted it, but they were saying, "We think this is gonna be a hit, and we're not giving it out to anyone." They were kind of smart-ass about it, and that rubbed me the wrong way. I thought, I bet Virginia could sing this one. So I called her at the Anchor Motel and told her, "I have this song I want you to record tomorrow night." She says, "Please don't joke with me." I told her I wasn't joking. She showed up at daylight the next morning to learn the song. We went into the studio [the Quonset Hut, Owen Bradley's old studio that had become part of Columbia Records] and cut it. And I tell you, when she sang the first line, [musicians] Jerry Kennedy looked at me and Bob Moore looked at Buddy Harman and we all went apeshit. This was a great voice.

How did your productions evolve over time?

The sound got lusher. I liked the way violins sound on a love song. I don't want to hear a [pedal] steel on a love song. My records were smoother-sounding than a

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In session with George Jones

Nashville music scene like at the time in terms of making records?

I was playing for $30 or $40 a week in a square dance band in Alabama, and I had sent a song I had written to Tree Music up in Nashville. Never knew what happened to it until I get this check for $4,000 in the mail! It seems Bob Beckham [then a recording artist but destined to become one of Nashville's music publishing moguls] cut it as a B-side. I figured I was in the wrong place, and I headed up to Nashville. Me and a few friends started a demo studio in the Cumberland Lodge [now the site of the National Life building in downtown Nashville]—Bill Cooner was the money man, and he put up $10,000 to build the studio; Doug Warren was the starry-eyed singer type; and me. [Sun Records and Sun Studios owner] Sam Phillips was looking to put a studio in Nashville, he saw ours and he bought it. Everyone else left, but I hung around and started learning.

The studio had a huge tracking room, about the size of a basketball court, with really high ceilings. Sam had hired guys to glue insulation to the ceiling, and they were working up on scaffolds. One of them got high from the glue and rolled off and fell down 20 feet. The place had the Memphis touch of Sun—wooden louvers on the walls that could be opened and closed to change the room's sound. The studio had a live echo chamber that was the size of half a basketball court, which Sam had shellac painted on the walls to give it that shiny sound. We also had some EMT plates. Sam hired me to be a mixer, at $55 a week, and I did that while also doing a regular rock band gig in Fort Campbell, Kentucky, with [FAME Studios owner] Rick Hall. It was a helluva time, wonderful. We had all kinds of music we were recording and playing. We lived in this dream world where we could sleep till 3 p.m. every day. When the sessions were over for the night, I would stay at the studio and record stuff with me playing all the parts. [Sun's Nashville facility would become Monument Studios later in the 1960s, when Monument Records owner and Roy Orbison producer Fred Foster bought it.]

When you went to work for Epic in 1962, you began to develop a production style. Did it run up against the conventional Nashville way of doing things? Were you incorporating production styles from different styles of music?

I was low man on the totem pole. They sent artists down to my office that no one else could do anything with. They didn't want to drop them, so they figured, give the new guy a shot. In terms of production, I was stealing from everyone—Chet, Owen, Phil Spector. If you asked me who was the greatest producer around, I would say there was Owen Bradley, and then there was everyone else. He cut stuff 50 years ago that sounds like it was recorded yesterday. I was in awe of Owen and Chet. But I couldn't just walk up to Chet Atkins. It was like walking up to the President of the United States. I was shy. I was a kind of loner. I wasn't part of that Nashville society of the music business. And [all these] years later, I'm still a loner.

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lot of people wanted on a country record. That's why a lot of them crossed over to pop.

What were you like working in the studio? You were bringing in some non-traditional approaches to Nashville records. How did the musicians and engineers react?

I knew what I wanted to hear, and [the musicians] knew what they wanted to play. Sometimes, it happened to be the same thing. But there was always mutual respect. I worked mostly at the Quonset Hut, because that was Columbia's studio and there were union rules in those days. The engineers were staffers and they were union, and I could not touch the board. It took

My records were smoother-sounding than a lot of people wanted on a country record. That's why a lot of them crossed over to pop.

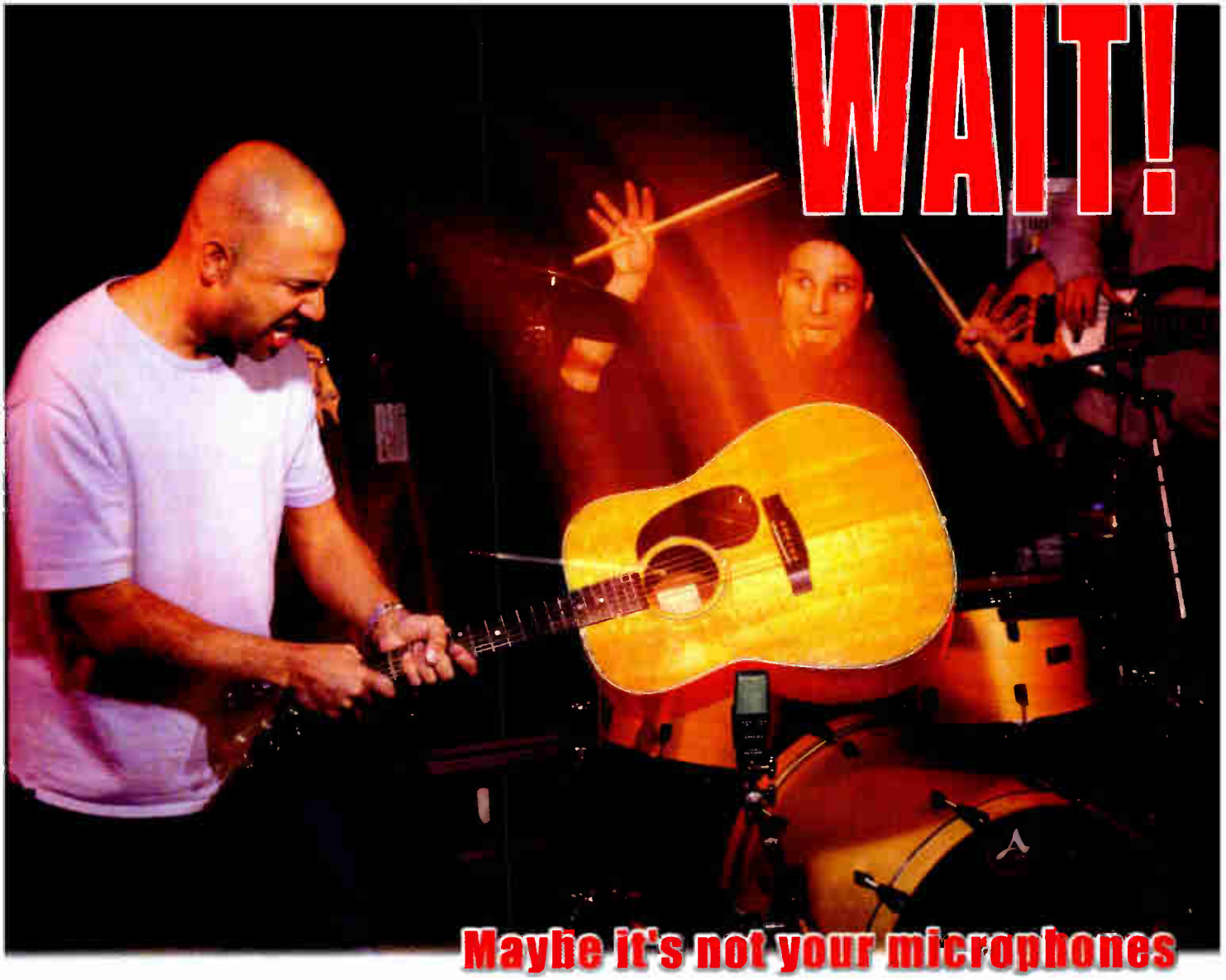
two engineers to run a session—one on the board and another to run the machines. Also, you couldn't overdub. The A.F. of M. laws wouldn't let us. If I finished a track and decided I wished I had a harp on it, I would have had to go back and pay all the musicians all over again. So, I did a lot of cheating in those days. But the engineers were good—guys like Selby Cofeen and Ron Reynolds—and I learned from them. I knew what they knew and they knew what I knew, so we got along.

Did you like working at the Hut?

Oh, yes. It was a place where the guys didn't have to lock themselves into a little world of earphones. They could hear each other play without them. But in the '60s, earphones suddenly came in like the plague—the first 30 minutes of a session were now taken up by guys asking the engineer to turn them up and turn the drums down. One day, I just blew up and told everyone to take the damned 'phones off. I said, "Trust me, if it sounds good to me, that's all that matters." There were other studios around, but most were owned by labels and every label had to use their own studio.

How did you get together with George Jones?

He fell in love with Tammy Wynette. Un-



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fortunately, he was still married at the time, and on another record label. I signed him to Columbia.

That must have made for interesting sessions when they did all those great duet records. How did you record them?

It did increase my scotch intake some. We started out trying to record the vocals together, but George drove Tammy crazy with his phrasing. He never, ever did it the same way twice. He could make a five-syllable word out of "church." Finally, Tammy said, "Record George and let me listen to it, and then do my vocal after we get his on tape." Tammy was a very quick study. With George, I don't think he had ever been truly "produced" before. Pappy Dailey was listed as the producer before me, but the musicians really produced those records. Pappy owned the record label. What I thought about George's voice, and I told him, was, "You whine too much. You've got a good range, let's mellow you out." He has an unbelievable low, bass-type voice that, when it's on tape, sounds amazing. I wanted more of that, and we used more ballads to get it.

In the Quonset Hut with Charlie Rich

How involved were you in choosing equipment like microphones? Did you have preferences for each artist?

Not at all. The engineers did it. I really didn't know one from the other. I just knew what sounded good. I liked the big [large-diaphragm] microphones. But we'd try a few till we found one that sounded good, and stayed with it for years.

You stayed with Columbia's studios for a long time, but did you consider going elsewhere to record country or anything else?

I did the Staple Singers in a Chicago church. This was in the late 1960s, and the riots were going on. Pop Staples was a cool guy. He called and asked when I was coming in. He said, "Go straight to the hotel. I'll pick you up. You're not riding around Chicago by yourself." I also recorded James Taylor in New York for a duet with George [Jones], and I did one Janie Fricke record in Muscle Shoals. But, otherwise, it was always Nashville. That city simply has everything you need to make a good record.

Country music has had an obsession with youth lately, with artists like LeAnn Rimes and Billy Gilman. But you worked with the first teenage superstar, Tanya Tucker. What was that like?

Tanya was 13 years old when we did "Delta Dawn." But she grew up real fast. She was young, but not a kid, if you know what I mean. We knew "Delta Dawn" was going

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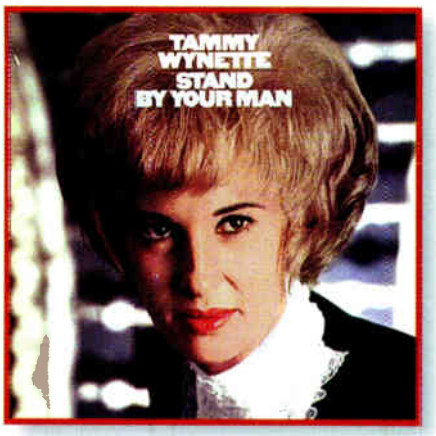
to be a hit, and we had to get an album together real fast. But the publishers were sending me kids' songs. I had to convince them I wanted grown-up songs for her. We were doing pretty gothic stuff—"What's Your Mama's Name," that sort of thing. She could sing that very convincingly. Nashville thought I was getting a little too blue with her, too adult. But her voice did the talking for her. She was very good, always sure of herself. She was never nervous about anything. And her vibrato tore me up. It reminded me of Kitty Wells.

You were a VP and an executive producer for Columbia through much of the 1980s, but you slowed it down during that period. Did you retire, or did you just get tired?

I got tired of it. I burned out. The way I look at it, if you're a record producer and you dread going into the studio with George Jones, then it's time to stop and smell the roses. It wasn't the actual making of records, but doing the same thing all the time that got to me. The title meant nothing to me. Clive gave it to me, and I said thanks and just went back to making records. But when I was making records, the whole thing felt like a 25-year vacation.

How do you feel about how the recording process has changed?

I never paid attention to the transition from analog to digital. All I knew was that there was a little less hiss and it sounded a little cleaner. But there were some things I didn't care for about the way making records had changed. I got a call from [producer] Norro Wilson a few months ago, and he wanted me to help out on a Lorrie Morgan track of a song I had written. I got to the studio, and the drummer worked on the drum sounds for nearly an hour. Same on the guitar sounds. I couldn't stand it. There's no reason to take an hour to get drum sounds. It's like killing a fly with a sledgehammer. And radio's gonna roll it all off at 4,000 cycles anyway. I was wired and bored at the same time. The whole recording process has gotten kind of gratuitous. I had done a session with Johnny Paycheck years ago, and I never even went to the studio. I had a line run up to my office. I told him, "You know the songs, just sing them." I'd call down to the engineer and tell him to turn up [steel player] Pete Drake a little or something like that.



The new project you're working on is a George Jones gospel album. How does it feel to be back in the producer's seat?

I did it because George is comfortable with me, and I'm comfortable with him. And it'll be nice working with The Statlers and The Jordanaires again. But it's pretty cut-and-dried. If the right thing came along, I'd jump out of my chair in a heartbeat. But seldom do I hear anything like that. Tim McGraw's "Please Remember Me"—I had to pull over to the side when I heard that one. But there's not many like there used to be. Right now, I've got a boat in Panama City [Fla.] and a boat in Nashville. I've turned doing nothing into an art form. ■

Dan Daley is a Nashville-based writer.

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With the old setup, I also had to do a lot of file management. Now, it's much easier to put it on one drive and rock! And it's fast—something like 10 times faster than my other drives. You can easily do 128 tracks on one drive without having the system freak. I don't see DAE errors anymore, and I can run a backup at the same time on the same computer. I keep the backup running all day at the same time as I'm doing quick, intensive editing, and the system never hangs me up.

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You don't mix inside of Pro Tools though, do you?

No, I use individual outs, usually 48 into the console, and I feel like I get the best of both worlds. With some of the pop stuff, I may have 80 or 90 tracks to mix; the old Pro Tools systems were 64-voice, and sometimes you had to get real creative with drive management and sharing voices.

But you still have to combine tracks to end up with only 48 out.

Yeah, and I actually prefer having some things combined down. In general, I would rather have two to six tracks of backgrounds than 18 to 25 coming up on the console. Actually, I think if I could get away with a stereo track of drums, I would do that! The less I have to worry about eight hi-hats and four snares, the more I can focus on mixing.

What consoles do you like?

It depends on what I'm mixing. I remixed "Break Me," the new Jewel single, on the API console at Sound Kitchen, which sounds really good; I like it for tracking as well. I also mixed SHeDaisy there. I thought it would be a good match for them, and it really turned out great. They have a lot of vocal work on the record, and to have a little more openness in the overall console sound really made a big difference. I also like the SSL 9ks and 4ks. There are a couple of 4ks in town that I've mixed a lot of records on. In fact, the album mixes on Jewel's record were done at Emerald's Studio A on a 4k with a G Series computer.

So, you consider the overall sound of the project and try to choose a console that's complementary.

Definitely! The right tool for the right job. To me, that's part of being versatile and adapting to a record's style. The same with recording: A lot of times, I'll use a totally different chain to record digitally than I would with analog. I know I need to adapt to the sound of the converters and also to take into account that the sound won't change after I put it to a digital medium—unlike recording to analog, where it sounds different a week later.

Can you give an example of what you do differently?

For instance, I'm a fan of vintage gear and tube gear. So, if I'm recording to digital and I use a Pultec EQ to put an edge on

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a vocal, I'll use the Pultec before the converter to avoid also bringing out the top edge of the converter. Generally, when you add 10 or 12k on a vocal, you'll get extra out of it before it gets converted to digital. Whereas with analog, it might be better to use the EQ coming back after you've got that analog tape compression.

What processing do you prefer to use after your digital conversion?

If I'm recording vocals to digital, I'll usually compress them after they're recorded. If I was recording a real rangy vocal to analog, I always felt like I had to compress on the way in, because, with all the hiss, etc., there's no way to put that wide of a dynamic on analog tape. But then, that one over-the-top vocal blast might get swallowed or distorted from the compression. And if that's the magic take that the producer wants, I'm up the creek. I'd rather have the note clear and deal with it later in the mix.

Doesn't that mean you have to record at very conservative levels to avoid any digital distortion?

Not really. I cut a lot of my vocals at -12 or -14 dB, as far as the input level going to the converters. That way, I can pack it on as hard as I want; but when it gets low, it's not a big deal. The thing that you really have to watch—regarding input level and older gear that may not have much headroom—is overdriving the preamps and compressors, etc., trying to put a hot level to digital.

If I'm recording vocals to digital, I'll usually compress them after they're recorded. If I was recording a real rangy vocal to analog, I always felt like I had to compress on the way in.

Say you're doing drums through a Neve. If you don't pay attention to whether you're cutting it at -20 or -12, you may overdrive the preamp so hard that you get compression or distortion out of it (unless you want that sort of effect!) while, on your digital meter, it still looks like your levels are low. I usually cut at -14, -16. You don't see a lot of VU meters anymore, and that way I'm sure I'm within the headroom of my gear—especially the older gear.

What preamps do you like for vocals?

[Laughs] Actually, I sometimes feel like I'm in the preamp-of-the-month club.

Yes, I've heard that you like to change things up a lot on your sessions. What's this month's favorite?

For vocals, right now I'm a tube preamp fan, and there are a couple that are sounding good to me. The Telefunken V76m—the one without the roll-off—and the Martec, which I'm using for Faith Hill right now. It has a nice open top.

How about microphones?

Lately, I'm a Neumann fan; the old ones just have a certain air and "core" to their vocal sound. There's a vintage Neumann U269 that I like a lot. It looks exactly like a U67, but it has a little bit more air on the top.

What's this month's drum mic setup?

[Laughs] I use what everybody else does!

Right now, I like an Audio-Technica AT25 on the kick, a Shure SM57 on the snare with an AKG 451 on the bottom. For toms, it varies depending on the room, the drummer and, of course, the drums; but it can be anything from AKG 414s to TLM 170s, if you want a nice, warm fat sound.

For overheads, it varies. I use Audio-Technica 4051s sometimes, or [AKG] C 12s. There's also an old Neumann tube mic I like—a 582. It's a small-diaphragm mic. You can't get them too close or they will snap from the sound pressure, but they sound great. They're also great on acoustic instruments. It's definitely one of the best-sounding mics nobody's ever heard of.

Wait a minute. I just remembered you're an owner of a rental company! That's why you get to try so many different things all the time! You do R&D for your customers.

[Laughs] Yeah, I'm one of the owners of Underground Sound Inc. In fact, the Neumann 582 was one of the pieces [co-owners] Bill Whittington, Brown Bannister and I found a few years back. They've been a big hit in Nashville.

What preamps do you like on drums?

Neve 1081s and 1073s. Although, when I cut at Sound Kitchen's Big Boy room, I use the API preamps in the console. They sound great, too.

Are you also likely to use your compression after recording the drums?

It depends on the style of record I'm doing—the room, the drum setup–but I usually don't put the kick and snare down-compressed. I like having whatever options I might need open later. From the tracking standpoint, I'm probably a little more old-school. I like to get a good fat sound down. But I don't shy away from compression if it's what the project needs, and the rooms usually get a little compression.

What's your favorite room mic compressor?

A few that sound great are the UREI 1178 and the Neve 33609s or 33264s. Another compressor that has a cool character for a lot of things is the Empirical Labs Fatso Jr.

You like character in a compressor.

Yeah, a lot of times I look to the com-

SELECTED CREDITS

Bryan White: *How Lucky I Am* (1999)

Chely Wright: *Never Love You Enough* (2001)

Clay Davidson: *Unconditional* (2000)

Collin Raye: *Tracks* (2000)

Faith Hill: *Breathe* (1999)

Jewel: *This Way* (2001)

Lee Ann Womack: *I Hope You Dance* (2000)

Lila McCann: *Something In the Air* (1999)

Lonestar: *I'm Already There* (2001), *Lonely Grill* (1999)

Megadeth: *Risk* (1999)

Reba McEntire: *So Good Together* (1999)

Self: *Breakfast With Girls* (1999)

Shania Twain: *Come on Over* Australian CD (1999)

SHeDaisy: *Whole Shebang* (1999)

Trace Adkins: *Chrome* (2001)

Trisha Yearwood: *Real Live Woman* (2000), *Where Your Road Leads* (1998)

Wynonna Judd: *New Day Dawning* (2000)

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pressor to add color. I can really vary in the sound of what I'm looking for—from hi-fi to totally quirky—but I can't say there are a lot of times I grab for that compressor you can't hear.

Well, with Pro Tools, you either have to add color on the way in or on the way out.

If you're talking tonal coloration, I like adding as much as possible on the way in, because when you're recording, you're compensating for the sound of whatever you're recording to *and* whatever you're recording through. If those devices have a sound to them—and everything does—you're trying to find what works in that setup that gets you what you want to hear in the monitors.

And what are the monitors you'd most likely be using?

There are a few I'll use. Mainly Tannoy SRM 10s with Mastering Lab crossovers. They're a workhorse that I've had for years, and a lot of producers like to listen on them. I've got an amp that matches them really well—a Yamaha 2200 that's been modified by Mastering Lab, as well.

Also, Mackie 824s can be a great reference. You're not going to get anything muddy by mixing on them. I still listen to [Yamaha] NS-10s; there's stuff that you hear on them that you don't catch on the others. And I mix a lot at Emerald where I like the Hidley rooms and I use the big monitors.

Are you originally from the South?

[Laughs] No. I'm from a small town in Illinois; I came to Nashville to go to Belmont University. I'd been heading into electrical engineering and started thinking, "I don't want to do this." So, what *did* I want to do? Like everybody else, I'd played guitar in rock bands through high school, so the music business sounded like the obvious choice. I wanted to make records. I really didn't think about the possible downfalls on the income side; I just wanted to do it. I think a lot of people head into engineering thinking they're the next hot thing. But when they get into the studio and see what's actually involved—the hard work, the long hours and the "no problem" attitude required—they go, "On second thought, this really isn't what I want!" But I loved it. I just lived and breathed it.

I was fortunate enough to have a roommate at Belmont who was a senior, Steve Fralick. He was studying recording engineering as well, and he took me under his wing. My last year in college, I took a job as chief engineer at a small Christian studio in Brentwood, Tennessee. I met Keith Thomas there and started working with him, and while I worked there, I also recorded a band named Whiteheart, the band that Dann and David Huff were in back then.

I guess my last question for the day is what do you do in your spare time?

What spare time? [Laughs] Well, I'm married and I've got two kids and what little spare time there is I try to spend with the family—watching the kids' sports and doing outdoor stuff. And something else: For a few years now, I always put aside the first couple hours of the day for me. That usually involves going to work out. I owe my good friend Dave Mustaine [of Megadeth] for getting me into working out. I try to keep that part of my life together because sitting in a studio all day, you can get pretty out of shape. I go to the gym, do the routine and have a healthy breakfast. It's made a real difference in how I feel in general and also in how I feel at the studio. ■

Maureen Droney is Mix's Los Angeles editor.

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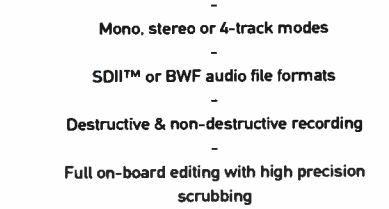

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"Men In Black 2"

Aliens Walk Among Us...Again

by Blair Jackson

PHOTO: MELINDA SUE GORDON

Skip Lievsay, with pipes

Fourth of July weekend. It's hot dogs and parades, flags and fireworks, and more often than not in recent years, the opening of a new movie starring Will Smith. This year, Smith brings in the Fourth with the hotly anticipated sequel to the 1997 action-comedy-sci-fi hit *Men In Black*. Remarkably, director Barry Sonnenfeld was able to bring back many of the key players who worked on the original, including principal actors Smith, Tommy Lee Jones and Rip Torn, production designer Bo Welch, composer Danny Elfman, supervising sound editor Skip Lievsay and production mixer Peter Kurland.

"From our point of view, it's a rare opportunity to fix all the stuff that didn't work in the first movie," Lievsay says. "Almost every movie I've worked on, with maybe one or two exceptions, feels like a series of missed opportunities to me. I hate that about my job. It's very exciting and creative, but there are always things that never get fixed or never get addressed, or both, usually for time or money reasons."

Lievsay has had an extraordinary career as a first-call supervising sound editor operating out of New York (and now, bi-coastally). He has worked extensively with some of film's great auteur directors, including multiple projects with the Coen Brothers, Spike Lee, Martin Scorsese, Jonathan Demme and Barry Sonnenfeld, as well as movies with Tim Burton, Robert Altman, John Sayles, Ed Burns and others. For more than a decade, Lievsay has spearheaded C5 Editorial, one of Manhattan's leading post houses.

When it came time to make *MIB2*, Lievsay knew he'd be able to use some of the sonic environments and effects that he and others had created for the first film. In fact, he says, "At the outset, the picture department ordered copies of the FX masters from the first film. I'm happily allowing that. There was a lot to recycle; there are a lot of similar elements between the two films.

"There's still a neuralizer [a gun that wipes out a person's memory], but that's an interesting example of how we went back and modified the sound because we weren't happy with how it turned out in the first movie. There were some high-frequency sounds that were made with a strobe flash as it recycles, and the particular sound recording we used had this high-frequency distortion that I didn't like. So this time, Eugene [Gearty, sound designer] and I found another way to do that using the Synclavier. I'm sure no one will know the difference or care, but I do."

Naturally, there are a number of new alien life forms that required creative sound generation, particularly the evil Serleena character, played by Lara Flynn Boyle. "All through the film, she has these snaky appendages that keep coming out," Lievsay says, "and then near the end of the movie, she turns into a really big branchy, snaky thing. When she has these branchy things shooting out of her fingertips, we went with little Foley wooshy, whippy sort of sounds. But then she keeps changing through the movie and getting more snake-like, so we're going with more gooshy, goopy sort of sounds. On one pass, they took the sound of some toy goop squishing between two hands. On another, they took tree branches, put them inside a rubber membrane and pushed that around and added some water. We did the usual dog-food-in-the-can noise. We did a very nice watermelon, too—we took it and ripped it and gushed the inside; very nice!" he adds with a laugh.

Lievsay likes to combine natural elements with electronic ones, and he's always on the lookout for new gear. One of his recent favorites is a very retro-sounding analog synth that is "a new iteration of what is essentially a Buchla module from a company called Wiard—this guy from Milwaukee named Grant Richter makes them in his house. They're very modular, old-fashioned patchboard-type analog synths. They use control voltage instead of MIDI; it's ancient technology—it feels like *Forbidden Planet* all over again. In the film, there is a sense that some of this supposedly futuristic technology has been around for quite a while, and these sounds help to get that across to the audience. It also adds a little humor, we hope, which is definitely a part of these films."

Lievsay and his cohorts have used network-based systems for many years, and he also notes that in the past, much of the sound work was done "direct to Avid, but we've been transitioning our effects department away from Avid onto Pro Tools, which is now a fact of life. Since Avid and Pro Tools aren't compatible, our Avid work must either be saved as Pro Tools sessions or be laid off to some other kind of media."

MIB2 utilized more than 850 CGI shots, so the sound team really had their work cut out for them. There was also more time and a bigger budget for the first film, so there was the predictable scramble when it came time for re-recording mixers Greg Russell and Kevin O'Connell at the Cary Grant Theater on the Sony lot this past spring. On a project like this, after the mad dash to the finish is complete, a neuralizer would really come in handy. ■

"Minority Report"

The Sounds of Future-Past

by Michael Axinn

PHOTO © 2002 TWENTIETH CENTURY FOX FILM CORPORATION

PHOTO: STEVE JENNINGS

Richard Hymns

After working on five Steven Spielberg films, three of which have garnered Academy Awards for sound effects editing, sound designer Gary Rydstrom and supervising sound editor Richard Hymns may have discovered a little secret about success. "Gary and I have worked on so many films with Steven now that we've gained his trust," says Hymns. "Instead of having him approve every detail along the way, Gary sends him guide tracks of the essential elements, and then we show him the reels as we final-mix them."

With *Minority Report*, Spielberg's futuristic action-thriller starring Tom Cruise, the director offered them further latitude to create the sounds for a huge number of devices that do not yet exist. From the magnetically charged cars of a vast commuter grid to the mechanical spiders used by the police as detection devices, Rydstrom and Hymns had numerous opportunities to show their virtuosity.

It was in the more familiar that Rydstrom once again found his forte, using one of the everyday tools of a re-recording mixer to express an idea that says past, future and present at the same time.

The story revolves around the idea of police who are able to capture criminals before they commit their crimes. "They have this technology that's able to plug into the brains of these genetic mutants that can see the future and put on a screen the images and sounds that they see," says Rydstrom. "Tom Cruise's character, who works for the government, is trying to find clues to a murder. Spielberg is clever enough to put a horse or a sprinkler in the scene so that it can show up as they scroll through these visions. It's real montage-like. But it's also playing with time, going backward, playing in different perspectives."

Rydstrom's response was like the age-old advice to writers, *Start with what you know*. "We were down in L.A.," he recounts, in reference to an earlier project, "and they were recording all the digital sound sources onto Tascam MMR drives, but we were mixing to film. The sound that the digital audio would make as it tried to catch up to the film system, grinding to a halt or starting up, was pretty cool. So, I set up the same thing here [at Skywalker]. Then I put all these various sounds onto a drive, jogged through it, and made all these weird, sweeping sounds."

A bit like a rap artist, scratching records, only digital. "One of my favorites is when the images freeze, as if the sound is caught in this loop and pulsing. I would jog to a crawl and the jog system would have this speed-up slow-down, speed-up slow-down, speed-up slow-down pattern to it. You get these eerie little sounds that you can place on these images.

"It wouldn't have sounded cool enough if we were just using tape," continues Rydstrom. "Digital has a stuttering quality as you speed up or jog through that's very interesting."

The sound works well as a representation of the future. Yet it shows a technology with which we are currently surrounded, and therefore points to an essential truth about all science fiction: Our conception of the future is necessarily pieced together from images past and present. "The whole idea of these visions," says Rydstrom, "are projected in a way that looks very unique to me, although there are times when the images remind me of old silent movies."

As the film reaches it climax, "You see a vision of a future murder, and you start hearing and seeing those things that led up to it in real life," he says. "The images are past, in that we've heard them before, and future, in that they have not yet happened. Spielberg's intervention as a director and Rydstrom's, in the way he manipulates sound, reminds us that they are also present.

"Spielberg's using very distinct visual moments to key these visions. So we're trying to do the same thing with sound cues. There's a merry-go-round that you see outside one of these murders. You scrub it and do things to it, and when you slow down enough, you start getting digital artifacts. We didn't want it to sound like bad digital, but it creates a lot of interesting sounds."

In the end, Spielberg presents us with a harrowing projection of what we live with today. "It's a darker thriller than he's done before," concludes Hymns, "and it's got a huge variety of material." This meant that Hymns and Rydstrom had their work cut out to get it ready for the final. The final, of course, being the place where the success of that work is finally determined. But with three Academy Award successes already in the databanks, it seems almost possible for Rydstrom and Hymns to predict the future. ■

"The Sum of All Fears"

Keeping It Real

by Maureen Droney

Although filming was completed before September 11, one might have expected some concerns at Paramount Pictures about the release of *The Sum of All Fears* and its story, in which terrorists, determined to provoke worldwide war, detonate a nuclear warhead during the Super Bowl. But, according to director Phil Alden Robinson, no such debate occurred. A writer himself whose previous directing credits include *Field of Dreams*, *Sneakers* and an episode of HBO's World War II epic *Band of Brothers*, Robinson was able to take *Sum* beyond standard summer thriller into multidimensional experience, with an ending that some have called inspirational.

In spite of its status as a big Tom Clancy movie featuring Ben Affleck and Morgan Freeman, *Sum*'s budget wasn't extravagant. Location effects recording wasn't an option, so every sound—the flyover of troop-carrying helicopters, emphatic footsteps into a Russian president's hushed bedroom, and locations from the streets of Vienna and Washington, D.C., to the countrysides of Russia and Virginia, as well as a nuclear explosion and its aftermath—had to be created from scratch. Fortunately, supervising sound editor John Leveque is a partner at Soundstorm, with its enormous library of sounds collected over the years for such films as *L.A. Confidential*, *Batman Forever* and *The Fugitive*.

"It's enhanced reality, cheated reality," comments dialog/ADR supervisor Kimberly Voigt. "Phil has a particular gift for making strange things work. When a bomb is found in the desert, someone puts a hand under it searching for the fuse. But it's a nuclear bomb; there is no fuse. Phil wanted the sound of flies buzzing because it's evil and weird, and in the temp, it actually was flies. It got more sophisticated in the final, but it's based on flies buzzing and it gives the sense of evil that he was after."

A major challenge was Robinson's determination to avoid ADR. "I programmed 220 lines of ADR and we got to do 90 of them," says Voigt. "Most actors and directors prefer to avoid ADR, but Phil is on the extreme side. We did the things that we absolutely had to—that was it. I've been thanking my lucky stars that we have [dialog mixer] Chris Jenkins."

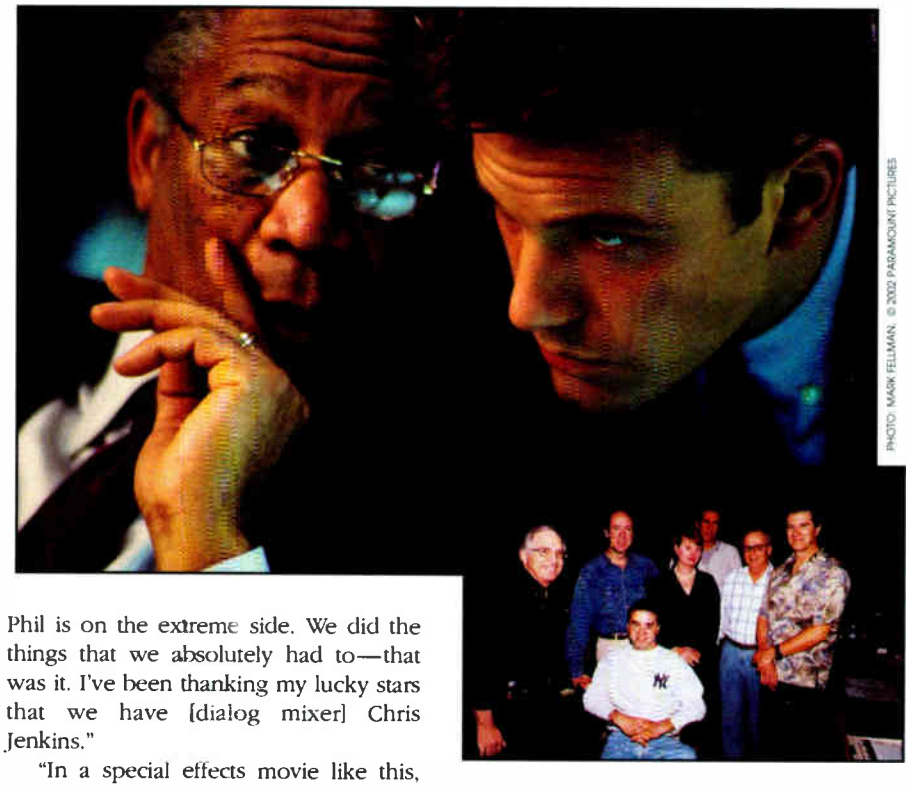

PHOTO: MASK FELLMAN. © 2002 PARAMOUNT PICTURES

Left to right, John Leveque (supervising sound editor), Chris Jenkins (dialog mixer), Kim Voigt (dialog/ADR supervisor), Bob Bayliss (behind, assistant music editor), Kenny Hall (music editor), Tony Milch (co-supervising sound editor) and, seated, Frank Montano (sound FX mixer).

"In a special effects movie like this, with heavy equipment and machines, it's especially difficult to make production sound work," adds Leveque. "When you do, there's much more sense of reality. For example, there's a scene where soldiers arrive to rescue the president; that had real helicopters and real Marines and you can feel it."

Voigt, who handled both ADR and dialog supervision, found Pro Tools a boon for melding tiny bits of ADR with production dialog. "My favorite thing about being digital is that I have the whole movie in different versions," she explains. "I can create hybrids. For example, we had a line of ADR because one of the actors had mispronounced a Russian name. I was able to just take the little piece I needed and cut it into the dialog track."

During the final mix on Universal Studios' Hitchcock Stage, a conscious effort was made to keep levels reasonable, resulting in a mix that avoids the problem of digital harshness that's endemic to recent action movies. "Of course, loudness has an emotional effect," says Leveque, "but often it's detail, rather than loudness, that makes it exciting. When Jack Ryan is inside the helicopter getting thrown around, if you can hear the detail—things hitting the walls, alarms going off, all the components—you've achieved something more real. Fortunately, [effects mixer] Frank Montano is also very much in that mode."

The veteran members of Leveque's sound team concur that *The Sum of All Fears* was an unusual project. "There was an inspiring nature about this movie," states co-supervising sound editor Anthony Milch. "Not only because of its content, but because of the director's skill. It's not overworked or preachy, but the socially relevant issues come through.

"In our work, we often try to remember what we felt the first time we saw a film, to re-create that experience. You want to keep your focus on that emotion to heighten with the sound what the director has already provided. At the first screening of this film, a lot of us were noticeably touched. When you're lucky enough to work with a team of people who really care, the end result can be far in excess of the actual work that was done. I think that's what happened here." ■

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BITSTREAM

BY OLIVER MASCIAROTTE

Sven, Where's My Mead?

Choices for Working in a Wireless World

ILLUSTRATION MIKE CRUZ

Imagine having an Internet connection all the time as you tote your computer hither and yon. Imagine the power of sharing files, directories and applications with your collaborators without plugging into a wired network. Well, stop dreaming and get with it! The wireless paradigm is here, and, *man*, it is great!

Wireless networks provide portability, flexibility and scalability, as well as simplicity for the user. Modern wireless local area networks, or WLANs, use either of two protocols: 802.11x or Bluetooth. I'm going to start with 802.11b, because Bluetooth is typically used for the quaintly named PAN, or Personal Area Network.

Anyway, 802.11b ("eight oh two dot eleven"), or Wi-Fi, is a subset of the larger 802.11 IEEE standard for WLANs. The standard includes several PHYs or physical layer choices, including infrared and the 2.4GHz frequency band with spread-spectrum channel coding. Data rates are defined from 1 to 11 Mbit/s, about the same as 10BaseT. Also, no FCC license is needed for any of these WLAN/PAN technologies.

Let's start with adapters and access points, the stuff Wi-Fi networks are made of. Adapters are hardware, typically mobile, that bridge the host's OS and 802.11 transceivers. Mobile implies small, and adapters typically are PC (PCMCIA) cards or USB blobules, a technical term for science wrapped in little bits of plastic.

Access points are base stations—fixed-location hardware that buffers the transmissions and bridges 802.11 to wired LAN services. Access points can act as extension points when they are physically separated and/or tied to other wired networks. This effectively extends the reach for seamless coverage and roaming across "microcells," where a wireless node maintains a network connection as it moves from one wireless cell to another. For really large spaces such as a college campus, an office building or an auditorium, external antennas can be deployed for signal reinforce-

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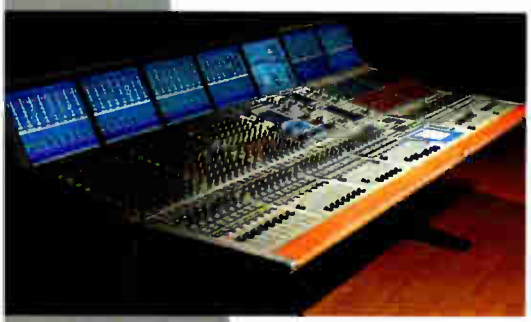


StageTec Aurus

BY GEORGE PETERSEN

From May 10-13, 2002, thousands of audio professionals rolled into Munich, Germany, for the the 112th convention of the Audio Engineering Society. Typically, any AES show would be filled with dozens of hot new technology debuts, but arriving on the heels of the Musikmesse, NSCA and NAB shows, this particular convention had less sparkle, especially with the debut of major new digital recording and broadcast consoles from AMS Neve, Calrec, Euphonix, Harrison, Soundtracs, Solid State Logic, Studer, Wheatstone and Yamaha just weeks earlier. To be fair, there were some hot new products at AES Munich, but you had to dig a little to uncover the gems. Here are a few that caught our attention:

CONSOLES

Clearly, the most talked about product was Aurus from **StageTec** (www.stagetec.com), the creators of the well-known Cantus digital console and Nexus routing systems. Nicknamed the "Direct-Access Console," Aurus is a large-format 24-bit/96kHz board with up to 256 buses, 300 inputs and as many as 96 channel strips. The board is designed with an analog feel, based on nimble ergonomics with large TFT screens, and its 11 concentric rotary encoders per channel strip (for one-knob-per-function operation) are accompanied by dual-fan LED and multiple alphanumeric readouts offering instant visual feedback at the source; it's ideal for working in fast-paced situations, such as live, on-air broadcast or theater applications.

Aurus is based on a cool-running, fanless control surface that connects to all audio processing electronics via fiber optics up to 1,000 meters away. Additionally, multiple mixers (and/or console surfaces) can operate and access the signal chain via Nexus for sharing DSP, files, I/O converters, routing, etc., in a true digital audio network. The TFT displays offer high-res metering (with switchable peak or VU characteristics), as well as detailed views of console parameters or configurations. Other features include snapshot and dynamic automation for all console parameters, 28-bit TrueMatch A/D conversion on mic inputs with 150 dBa typical dynamic range, 24-bit ADCs on line inputs (133 dBa typical), onboard or external sample rate conversion, and support of multiple digital audio formats: AES/EBU, AES 42, S/PDIF, Y2 (MEL2), SDIF-2, MADI, ADAT and SDI.

Having seen many of the AES exhibitors at other shows just days before, I often asked "What's new since last week?" Usually, they laughed and gave me a quick update on shipping dates or first installations, without going into a detailed dissertation on a product I'd already seen. Not so with the new **Studer** (www.studer.ch) Vista 7 Digital Mixing System, which has numerous software additions and new features since its NAB 2002 debut in April. Vista 7's new layering option allows for the integration of Soundmaster ION hardware with control of up to eight transports, including large recorder-style transport keys, sync offsets, track arming, calculator and more—all with fingertip touchscreen access.

Speaking of transport control, **Brainstorm** (www.aidinc.com) unveiled "The Remote," a console-top controller for up to eight machines, with track arming,

looping functions, jog/shuttle wheel, 100 memory registers, offset calc, GPOs for ADR beeps, and 9-pin and MIDI I/O. Price? About $2,000.

WORKSTATIONS

Another major AES showing was **Cube-Tec's** (www.cube-tec.com) AudioCube5-Dell530, which packs the punch of the company's earlier custom, dual-Pentium III systems, but is based on Dell's affordable, off-the-shelf D530 workstation. With the price of the new audio mastering/archival/restoration system dropping from around $27k to $12k, it's little wonder that the company has sold 24 systems worldwide in the past few months, with more than half going into the U.S. market. In addition to eight new and/or improved VPI plug-ins for mastering/restoration, Cube-Tec also unveiled Quadriga Tape-24, with ample inputs for capturing up to 24 tracks of analog session tapes directly to disk at up to 192kHz rates.

Cube-Tec AudioCube5-Dell530

Co-developed with Matsushita Electric Industrial Co., and slated to begin shipping last month, DVD-Audio Creator LE from **Sonic Solutions** (www.sonic.com) is a Windows 2000-based system for authoring, creating and developing masters in the high-res DVD-A format. Price is $6,000, well within the range of most studios or mastering facilities.

Fostex (www.fostex.com) is the first licensee of **Digigram's** (www.digigram.com) EtherSound™ technology. EtherSound enhances established technologies to easily (and economically) create low-latency audio networks using standard Ethernet cabling and components, connecting digital audio sources to networked audio devices. Up to 64 channels of 24-bit digital audio at 48 kHz, plus bi-directional control information, can be transported to virtually any number of networked audio devices. Fostex plans to show EtherSound-compliant P.A. and pro sound installation products by year's end.

STUDIO MONITORS

Belgium-based F.A.R. (**Fundamental Acoustic Research, www.far-audio.com**) took the prize for coolest speaker at AES. The Tsunami-10 is an innovative loudspeaker that combines a radical look, a clever design and a great sound. The triple-layer front baffle places a resilient material between two 22mm MDF slabs to eliminate unwanted vibrations, sophisticated internal bracing locks the entire enclosure into a single, nonmoving block, and a huge rear port reduces air compression and lowers distortion. A 10-inch woofer, 1-inch soft-dome tweeter with symmetric waveguide, 220 watts of onboard bi-amplification and an optional remote control complete the package.

Last year, **A.D.A.M. Audio** (distributed in the U.S. by McCave Intl., www.mccave.com) wowed me with its three-way S3-A active monitors and their ultrasmooth folded-ribbon tweeters. Now, the company debuts the S2.5A, a near-field that also uses the ribbon-tweeter technology, but in a compact two-way system. An unpowered version is also available.

Not enough bass? **KRK** (www.krksys.com) demoed its M118 (128 dB peak) monitors and offered a sneak preview of the M218 dual-18, active four-way monitors coming this fall at AES L.A. The integrated 14 kW of amplification ensures that the M218s will move some air. With these installed, who needs air conditioning?

SIGNAL PROCESSING

Celebrating its 20th anniversary, **Quantec** (distributed by HHB, www.hhbusa.com) showed two new models in its Yardstick line. Both the digital I/O-only MC-2404 (about $4,320) and the analog and digital I/O MC-2405 ($6,480) are 8-channel, 24/96k units offering surround reverbs, delays, IIR/FIR filters, EQs, flange, chorus, gates, companders and the classic room simulation that made the company's QRS a hit back in 1982.

Portugal's **Sintefex Audio** (distributed by GPrime, www.gprime.com) demoed two new 24/96 digital units designed to replicate the sounds of classic analog gear. The CX2000 has samples of actual UREI and Fairchild compressors; the FX2000 takes the CX2000 sounds and adds samples of actual Pultecs and various console EQs.

Beyer MC 930

MICROPHONES

For the past few years, trade shows have been overwhelmed with new large-diaphragm condenser models. This time, however, the small-diaphragm mics took center stage. **Beyer's** (www.beyerdynamic.com) cardioid MC 930 true condenser is optimized for piano, percussion, brass and overheads, and offers high-end performance at a low price. Keep this quiet: We can't say more about it now, but **Sanken** (www.sanken-mic.com) will unveil a new small-diaphragm condenser at AES this fall. No stranger to small-diaphragm mics, **DPA** (www.dpamicrophones.com), whose origins go back to the days of B&K's pro audio division, celebrated 10 years of providing no-compromise products for discriminating users worldwide. And speaking of manufacturers of great studio mics, the Audio Engineering Society awarded its Gold Medal to 90-year-old **Sennheiser** founder Professor Dr. Fritz Sennheiser in recognition of his lifetime achievements in audio and microphone technology. Congratulations!

MORE TO COME...

Perhaps the biggest news at AES was AES itself. Based on a survey of visitors and exhibitors, the AES has decided to expand the current Amsterdam-Paris-Munich European show rotation to include new cities such as London, Berlin, Barcelona, Vienna and possibly Rome or Milan. Next year's show returns to Amsterdam from March 22-25, 2003—a week after NSCA, less than two weeks after Frankfurt Musikmesse and 11 days prior to NAB. Given the reality of today's economic climate and the logistics of shipping exhibits over great distances, the situation leaves many exhibitors with tough choices ahead on which shows to attend. But, in the meantime, see you in L.A. this October! ■

Tools of the Trade

CAKEWALK SONAR 2.0

The latest version of Cakewalk's (www.cakewalk.com) PC-based workstation, SONAR 2.0 features the Cyclone DXi Groove Sampler, a DXi software synth that lets users edit individual slices of Groove Clips and ACID loops, add effects, extract the rhythm of one loop and remap it to another, trigger grooves with MIDI events in a track and export to create new variations of existing loops. SONAR 2.0 offers ReWire 2.0 support, has a multiport, graphical drum editor and provides bidirectional communication with any MIDI control surface hardware, with dedicated support for CM MotorMix, Tascam U-428/U-224 and a Learn mode for other devices. Yamaha's Open MIDI Plug-In technology is supported. SONAR 2.0 features a new Synth Rack for more flexible integration of DXi software synths, ACID .WAV file export, and includes new third-party DXi soft synths, DirectX 8 automatable effects, real-time MIDI FX plug-ins, audio loops and SoundFont libraries. Also shipping is SONAR 2.0 XL, a premium version of SONAR that includes two 64-bit, automatable DirectX 8 mastering effects plug-ins and an advanced DXi soft-synth drum sampler. SONAR 2.0 lists for $479; SONAR 2.0 XL is $599.

AUDIO-TECHNICA AT4040 STUDIO CONDENSER

Audio-Technica (www.audio-technica.com) debuts the AT4040, a cardioid, large-diaphragm condenser mic. The transformerless AT4040 features an extended, flat-frequency response (20-20,000 Hz), wide dynamic range (133 dB, 1 kHz @ max SPL) and handles SPLs up to 145 dB (1 kHz @ 1% THD), 155 dB with 10dB pad. A switchable 80Hz, -12dB/octave LF rolloff is also provided. Additional features include an aged, vapor-deposited-gold, large-diaphragm capacitor element and a symmetrical housing assembly that minimizes internal reflections. Price is $495, with shockmount, dust cover and carrying case.

DIGIDESIGN 192 DIGITAL I/O

New from Digidesign (www.digidesign.com), the 192 Digital I/O is a high-definition, 24-bit/192kHz, multichannel audio interface specifically designed for the Pro Tools|HD environment. The 192 Digital I/O has a range of digital I/O options, including up to 16 channels of single-wire AES/EBU at 96 kHz, up to eight channels of AES/EBU at 192kHz sample rates, 16 channels of TDIF I/O at up to 48 kHz, 16 channels of ADAT I/O at up to 48 kHz, two additional channels of AES/EBU or S/PDIF digital, and eight additional channels of ADAT optical I/O at 48 kHz or two channels of optical S/PDIF I/O at up to 96 kHz. Word Clock I/O and Loop Sync I/O clock to other HD peripherals, and an expansion port connects additional 192 and 96 I/O interfaces. A Legacy Peripheral Port is also included to accommodate previous-generation Digidesign interfaces such as the 888|24, 882|20, ADAT Bridge I/O or 1622 I/Os. The 192 Digital I/O retails for $2,495.

BIAS DECK 3.5 FOR MAC OS X

Berkley Integrated Audio Software Inc. (www.bias-inc.com) unveils Version 3.5 of its Mac-based DAW software, which now offers OMF import, real-time surround mixing features and OS X support. As a native Mac OS X application, Deck 3.5 supports Apple's CoreAudio and CoreMIDI (for remote fader/transport control, MIDI file playback, and timecode with CoreMIDI-compatible SMPTE LTC to MTC converters). This multiprocessor-aware software is optimized for the PowerPC G4. Deck 3.5 also supports up to 64 tracks of audio playback, real-time VST plug-in support, SMPTE synchronization, QuickTime sync, and real-time mixing, featuring level and pan automation with breakpoint envelope editing. Deck 3.5 runs on either Mac OS X or Mac OS, and will be available this quarter for a retail price of $399.

COOL EDIT PRO 2.0

Syntrillium (www.syntrillium.com) is shipping Cool Edit Pro 2.0. This latest version of the Cool Edit Pro workstation offers recording, editing and mixing of up to 128 stereo audio tracks with most sound cards. New effects features include real-time effects with a dedicated effects rack for each track, automation of some parameters over time and a dedicated real-time EQ on each track. Other features include enhanced looping tools, new effects, a Mixer Console window, additional envelope support in multitrack for automation, CD ripping, MIDI playback, Video (.AVI) soundtrack editing, SMPTE/MTC Master capability, Group waveform (RMS) normalize, improved frequency analysis, instant undo/redo and more. Also, a new customizable interface features dockable/sizeable windows, dual-monitor support and more.

MIXED LOGIC M24

The Mixed Logic (www.mixedlogic.com) M24 is a dedicated remote-control surface for DAW software, featuring 24 100mm, touch-sensitive motorized faders and 24 reassignable pan controls. Controls can be custom configured, and presets and templates are available for common applications. A dedicated EQ section has 12 controls divided into four bands. Channel strips feature switches for Solo, Mute, Soft and Select (which activates the dedicated controls for dynamics, sends and plug-ins). Other features include 53 rotary encoders, three MIDI In and Out ports, USB and expansion ports, a 40-character/4-line LCD, jog wheel, bank swapping and two internal power supplies. Retail: $3,499.

NIGEL FOR UAD-1 POWERED PLUG-INS

The Nigel Guitar Processor for the UAD-1 card and Powered Plug-Ins are developed by Universal Audio and distributed by Mackie (www.mackie.com). Nigel is a multi-effects plug-in featuring a range of guitar tones and effects, such as a "Clean & Warm" California tube sound, "British" tones and an array of original tones; Nigel's Preflex modeling technology allows variable morphing between any two amp presets. Classic effects include a gate/compressor, phaser, mod filter, tremolo, fade-in, modulated delays and an echo delay (up to 1,200 ms). Nigel modules can also be used as individual plug-ins.

Z-SYSTEMS OPTIPATCH LIGHTPIPE ROUTER

Z-Systems (www.z-sys.com) offers the OptiPatch Matrix Audio Router, a digital patchbay that handles multiple sets of ADAT Lightpipe-format digital I/Os. OptiPatch can store up to 99 I/O routing patterns, each recallable via one front panel button. The unit's rear panel has eight Lightpipe inputs and eight Lightpipe outputs, for a total I/O capacity of 64 digital audio sources and 64 destination channels. Price: $399.

GROOVE TUBES STUDIO MICS

Midiman (www.midiman.com) is distributing a new line of Groove Tubes studio condenser mics. The six different models include medium- and large-diaphragm models (tube or FET). All have ultra-thin, evaporated-gold diaphragms and measure within ±1 dB of a standard reference mic, so matched pairs are available at no additional cost. Top of the new line is the GT66, a cardioid, side-address design with Class-A tube electronics, -10dB attenuation pad and a 75Hz low-frequency roll-off switch. The GT67 adds multiple polar patterns, while the GT55 Studio FET replaces the GT66's tube with FET circuitry. Other models include the GT57 Studio FET multipattern condenser, the GT44 Studio Tube and the GT33 Studio FET. The cardioid GT44 and GT33 feature interchangeable capsules (omni or super-cardioid).

E-MU COMMAND STATION V. 1.31

E-mu (www.emu.com) has released Version 1.31 software for E-mu XL-7 and MP-7 Command Stations and Proteus 2500 Command Module. Features include a sequencer engine optimized for speed and stability, improved MIDI routing, improved sequencer functions, expanded controller range and automatic track selection. E-mu's Beats mode has been integrated, complete with Beats Triggers. A new tool called E-Loader Version 1.1 enables users to download/upload SMF sequences via USB and MIDI and to troubleshoot any component of their MIDI setup. Both V. 1.31 software and E-Loader can be downloaded from the company's Website.

APHEX 212 AD/DA CONVERTER

Aphex Systems (www.aphex.com) has introduced the Model 212, a 2-channel AD/DA converter offering multiple stereo outputs (AES, S/PDIF and optical) and two separate mono AES outputs. For un-

balanced 75-ohm applications, optional BNC outputs can replace the XLR AES outputs. Features of the Model 212 include patented circuitry designed specifically to address and overcome the DC drift inherent in all A/D converters, jitter-canceling D/A and a full range of output options. Retail: $995.

MIDIMAN/M-AUDIO DMP3 PREAMP

Midiman/M-Audio (www.midiman.net) introduces the DMP3 instrument/mic preamp. Each of two identical channels offers XLR and ¼-inch TRS inputs and ¼-inch TRS balanced outputs; high/low-gain controls accommodate a range of microphone and instrument levels, with up to 66 dB of gain. Each channel also features a VU meter, phantom power, low-cut filter, clipping indicator and phase switch. Frequency response is stated to be 20-100k Hz (+0/-1 dB), and THD+N is 0.002% @ 1 kHz. Retail: $249.95.

EMAGIC EVD6

EVD6, the latest in Emagic's (www.emagic.de) Vintage Instrument line of software instruments, is an emulation of the Hohner D6 Clavinet. The EVD6 calculates sounds in real time using 32-bit, algorithmic-component modeling, and, like the original, reacts dynamically to performance, changing both volume and timbre. (For example, hitting the keys hard results in a more metallic sound, while striking the keys softly produces a smoother tone.) The software re-creates key clicks, and can combine and alter the position of "pick-ups." Other features include switchable filters and phaser, wah-wah and distortion effects.

ROSENDAHL NANOCLOCKS CLOCK SERVER

Now distributed in the U.S. by HHB (www.hhbusa.com) are the new Rosendahl Studiotechnik Nanosyncs Version 3 Reference Generator and the Nanoclocks

Digital Audio Clock Server (a wordclock distributor with an integrated audio master-clock generator). Both units feature transformer-isolated A and B wordclock inputs, 12 outputs controlled by a programmable output matrix, ±5ppm crystal accuracy and clock jitter of less than 10 picoseconds RMS (20-20k Hz). A 4x multiplier gives the Nanosyncs 176.4 and 192kHz sample clock output, and AES/EBU and S/PDIF outputs now support 88.2 and 96kHz. Nanoclocks is $1,299; Nanosyncs is $1,599.

DPA 4071 MINIATURE MIC

The new 4071 Miniature Microphone from DPA Microphones (www.dpamicrophones.com) is an omnidirectional miniature condenser designed for voice applications in broadcast and film. The 4071 has a built-in 5dB soft boost at 4-6 kHz to compensate for the natural resonance of the human chest cavity. Optional accessories include a versatile range of mounting clips, pins and grids for inconspicuous placement and a handy kit of concealment accessories.

BENCHMARK 2-CHANNEL DAC

Benchmark Media's (www.benchmarkmedia.com) DAC1 is a 2-channel, 24-bit/96kHz D/A converter featuring total jitter immunity and a 117dBa S/N ratio (@ 48 kHz). The DAC1 has an auto-detecting input sample range of 28-96 kHz, and Benchmark's UltraLock technology provides totally jitter-free conversion at any sample rate and with any degree of input jitter. Digital inputs are AES, S/PDIF and Toslink; analog outputs are balanced XLR and unbalanced RCA. The unit has an internal headphone amp, and output levels can be controlled from the front panel or preset via selectable trim pots (+10 dBu to +30 dBu at 0 dBFS). Price is $795; a rackmount kit is optional.

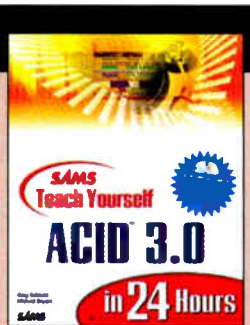
AUDIO CONTROL RTA

Audio Control Industries (www.audiocontrol.com) is celebrating its 25th anniversary with a special edition of the company's popular SA-3052 real-time spectrum analyzer. The special Anniversary Edition SA-3052 is distinguished by a cosmetic makeover with nearly 300 blue LEDs in the analyzer display. Price: $1,559.

MICROBOARDS ORBIT PRO

Microboards Technology (www.microboards.com) debuts the Orbit Pro standalone, automated CD duplicator, a desktop unit with dual 24x recorders, an internal hard drive and an input hopper that holds up to 150 discs. Ca-

OFF THE SHELF



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by Gary Rebholz and Michael Bryant

Written by Sonic Foundry experts, *Teach Yourself ACID 3.0 in 24 Hours* promises to teach you all the ACID skills you will need to create, mix and edit music in Sonic Foundry's ACID 3.0. The book takes the reader step by step through synchronizing music with video and Flash movies; using the new Beatmapper and Chopper tools; mixing, editing and creating loops in Sound Forge XP and Vegas Audio LE; applying audio effects; using MIDI options; and burning to CD-ROM. For more information, visit www.sonicfoundry.com.

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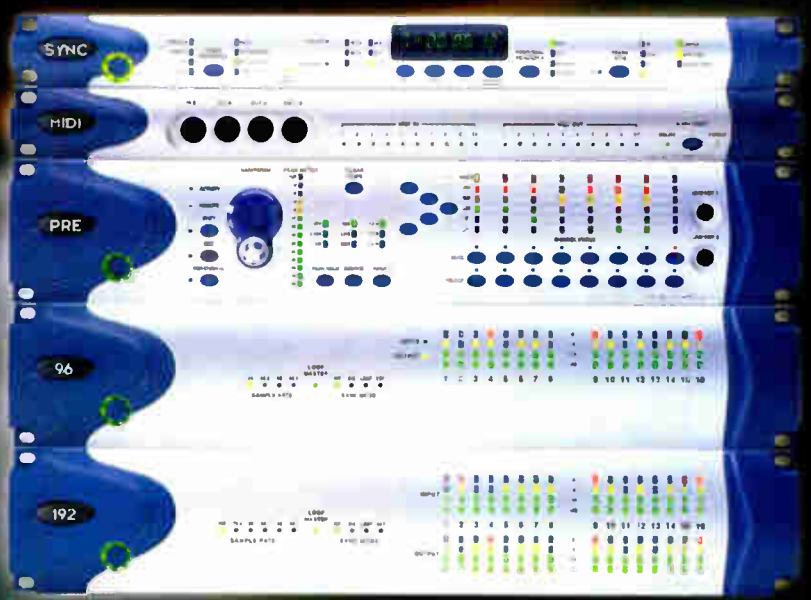

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D-Verb provides you with several professional-quality reverb algorithms in a very DSP efficient package.

DINR is the award-winning Digidesign Intelligent Noise Reduction Plug-In for realtime, high-quality reduction of both broadband and pitched noise.

The DPP-1 Pitch Processor brings high-quality, 24 bit pitch change and delay processing to the Pro Tools .

Maxim offers world-class peak limiting and sound level maximizing plug-in. Maxim optimizes the overall level of your audio input while preserving the integrity of the original sound.

Reverb One is an uncompromising acoustic space simulator that gives you complete control of the reverberant characteristics of your mix, and is equally at home in music and post production.

SoundReplacer eliminates the tedious process of replacing tracks by letting your original track trigger the desired samples. Substituting new samples into your existing mix is effortless. It's ideal for drums, but can be used with virtually anything.

SurroundScope lets you visualize the surround capabilities of Pro Tools software. With its intuitive interface, you can accurately see what your listeners will hear – right from within Pro Tools.

digidesign

Focusrite D2/D3

Modeled after their Red Range hardware counterparts, the Focusrite d2 and d3 bring high-quality equalization and professional dynamic control to Pro Tools, with the same exacting control and sonic character you'd expect from Focusrite.

Focusrite

Access Virus

The Access Virus Plug-In is the first step into a new world: A TDM-based synthesizer plug-in for Pro Tools. Based on the highly-acclaimed and successful Access Virus hardware synthesizer, the Virus plug-in is a luscious synth that delivers up to 8 simultaneous instruments and a whopping 160 voices at 48k or 80 voices at 96k to Pro ToolsIHD – all on a single DSP chip.

ACCESS

DUY Plug-ins

DUY plug-ins are made for the creative artist in you, not the computer technician.

The DaD Analog Tape Simulator features modeling of an array of analog tape recorders, including a vintage machine with valve circuitry, a late 60's transistor based machine, an op-amp based machine of the 70's and more. There's also authentic simulation of the three most common noise reduction systems, plus a proprietary noiseless-tape mode.

The DaD Valve provides real valve sound, with classic warmth, within the digital domain, and with characteristics and control impossible to achieve in conventional valve systems!

DSPider allows you to actually "build" your own plug-ins. A huge range of unique and exciting effects and processors can be created with just one plug-in. You drag and drop various "modules" (like filters, shapers, and pitch trackers) and "interfaces" (like sliders and meters) to create your own processor of any imaginable type.

The DUY Shape provides professional sound enhancement via the exclusive FDWS (Frequency Dependent WaveShaping) algorithm. This delivers a huge menu of processing features, including three band smooth filter with full audio range and continuous crossover points and three independent user defined Shapers with virtually infinite resolution and accuracy.

SynthSpider, provides advanced tools and synthesis algorithms for the creation of complex sounds and textures for exclusive sound design.

DUY Wide is a spatial enhancer which widens your stereo image and even allows for sound placement outside of physical speaker locations.

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Focusrite

Waves TDM Masters Collection

Masters – The next level in quality for precision mastering with Pro Tools HD. TDM Masters is also available to current Gold V3.x users as an upgrade, providing the latest in mastering tools in an incredibly affordable package.

Linear Phase EQ – Innovative phase linear filters eliminate your phase distortions to provide you more transparent sound that better preserves your musical balance. "Waves has challenged my hardware EQ favorites such as Weiss and Manley in a way that makes me never want to go back to hardware again." – Ambrose Field, International Prize Winner for sound-design Bourges 2000.

Linear Phase Multiband Dynamics – Supports independent gain and dynamics on five bands with linear phase crossovers. Adaptive Thresholds reduce masking on higher frequency bands. "A hear-it-to-believe-it compression breakthrough. Its Adaptive Threshold feature dramatically reduces compression squashing." – Bruce Richardson, Composer/Producer, Sr Editor ProRec.com

L2 Ultramaximizer – The next step in peak limiting with Automatic Release Control™ to add the extra gain you need to master. "Creates a more open, translucent and clear sound without sacrificing loudness and presence." - MIX

Native Instrument Collection

Native Instruments is one of the world's leading manufacturers of music and audio software. One of the first companies to use the possibilities of real time sound synthesis on standard computers, Native Instruments continues to break new ground with dozens of award-winning software products that cover practically every application in professional audio. From the Reaktor 3 sound design tool to their line of vintage keyboard plug-ins like the B4 and the Pro-52 to their Battery Studio Drums sampling collection, Native Instruments offers innovative tools for professional musicians, producers, sound-designers, DJs and newcomers to audio production, tools that open up new possibilities in sound and extend creative horizons.

Auto-Tune 3 — The industry standard in pitch correction

Auto-Tune 3 is the last word in professional pitch correction. Hailed as a "holy grail of recording" by Recording Magazine. Auto-Tune is used daily by thousands of audio professionals around the world. Whether to save studio and editing time, ease the frustration of endless retakes, or to save that otherwise once-in-a-lifetime performance, Auto-Tune 3 has become the professional pitch correction tool of choice. Never content to leave a good thing alone, Antares is proud to introduce Auto-Tune 3 for Pro Tools|HD.

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Unity Session

Unity Session has combined the functionality of hardware samplers, analog synthesizers, and physically modeled instruments into one fully integrated environment. Over 2 gigabytes of content are included along with the famous Black & Whites stereo Steinway samples. Unity Session plays 24-bit Gigasampler files from RAM or hard disk. Play Retro AS-1, Unity DS-1, Sound Designer II, AIFF, SampleCell II, DLS, SoundFont II and Physical Models at the same time!

Working in both OS9 and OSX environments, Unity Session is an instrument so pure in sound and so dedicated to the art of creating music that it has united the acoustic past with the electric present to bring you the virtual future of sound generation and creation.

- Fully HD compatible
- No additional hardware required
- Outstanding 32-bit, 96 kHz sound quality
- Up to 256 note polyphony (CPU dependent)
- FreeMIDI, OMS, PC-300 & OS X CoreMIDI compatible
- RTAS, DirectConnect, & ReWire support

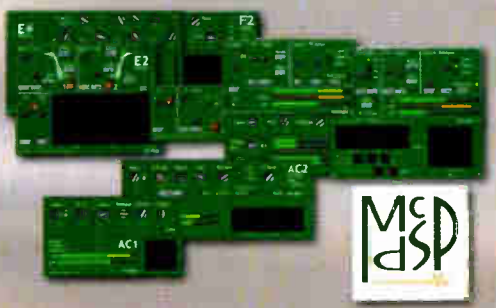
SoundBlender – The Ultimate Sound Transformer

SoundBlender is like having a rack full of separate effects in a single plug-in. SoundBlender offers an amazing collection of time, pitch, filter and modulation-based effects — all available simultaneously, and in realtime. With exclusive Tri-Modulation Matrix™, and tempo-based control, SoundBlender transforms music in ways you've only imagined.

By combining two channels of intelligent pitch-shifting, delay, panning, amplitude modulation and resonant filtering with a powerful modulation matrix, you can create an almost limitless variety of effects. Used alone, each effect module from SoundBlender would make an incredibly useful effects processor. Used together, the effects are devastating. SoundBlender comes packaged with over 200 preset patches from simple and useful chorus, delay, filter, pitch shift and panning effects to completely unique mind-altering sonic experiences. There is nothing anywhere that sounds like SoundBlender.

WaveMechanics

McDSP Plug-Ins



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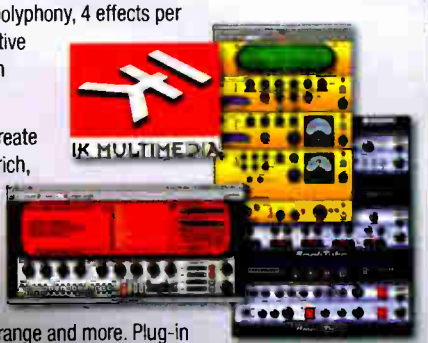

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Alesis ADAT HD24

Hard Disk Recorder

It's been almost two years since the first modular, 24-bit/24-track hard disk recorders were introduced to the pro audio world. The Alesis ADAT HD24 ($2,499 list) follows the lead of previously released Tascam and Mackie models, and incorporates tape recorder-style transport control buttons into its front panel user interface. But unlike the competition, the HD24 takes tape recorder emulation one step further by writing its 24 tracks to its removable hard disks in linear fashion. This type of formatting, which Alesis dubs ADAT FST™, has both its advantages and disadvantages.

Because ADAT FST writes a song's tracks to adjacent sectors of its hard disk, fragmentation and seek time are greatly reduced. This allows reliable read/write operations using common 5,400 rpm IDE drives, which cost less in dollars-per-gigabyte than the VHS tapes used in earlier 16- and 20-bit ADATs. The price advantage of using 5,400 rpm drives over faster drives will diminish over time as the cost of all drives continues to fall. However, reduced fragmentation is always a good thing.

The downside of ADAT FST formatting is that it doesn't allow multiple track takes or a Record/Undo function, which competing hard disk recorders offer. When you punch in on an HD24 track, any pre-existing material on that track at that point in the song is irretrievably erased (written over), just as it would be on a tape-based ADAT.

In simple terms, the HD24 is a 24-bit/96kHz ADAT in hard disk clothing. But there's a lot more to this story. Let's take a closer look at what makes the HD24 spin.

LAYOUT AND DISPLAY

The HD24's control and display layout are very user friendly and intuitive. Looking at the unit's front panel, all meters and track-arming buttons are located on the left side and directly above two hot swappable drive bays. Buttons for setting metering and monitoring options lie immediately to the right of the meters. The bottom-right portion of the front panel are buttons that provide transport control, as well as access to editing functions, MIDI and other utility settings, and digital sync, sample rate and audio input (analog or digital) source settings. Familiar up/down and left/right cursor buttons are also provided here to adjust parameter values and to help you navigate the informative alphanumeric display, which resides in the top-right portion of the front panel. The display provides an absolute-time readout in hours, minutes, seconds and frames; shows which drive is currently selected and how much recording time remains available at the current sample rate; and indicates the values of a host of other parameters. Four other buttons located in the front panel's far-right corner let you create, name, select and delete songs.

The HD24 ships with two custom-engineered drive caddies, each of which can theoretically accept drives up to 2,000 GB in size (though drives that size don't currently exist in the HD24's 3.5-inch tray configuration) and from most any manufacturer. One of the caddies comes loaded with a removable 20-gigabyte hard drive (you'll need to buy another hard drive for the second caddy), which allows you roughly 90 minutes of 24-bit/48kHz linear-PCM recording time on 24 tracks. Thankfully, the HD24 does not use data compression.

Of course, you can only record on one drive at a time, but you can back up all or part of one drive's contents to the other using a Utility menu accessed from the unit's front panel. It only takes a few minutes to back up an entire drive in this manner. And back up you should; although I found that the HD24 was extremely reliable, there was one isolated instance when two bars of music on one track suddenly and mysteriously disappeared. To further safeguard your data, you should always use the front panel "soft" power switch to park the drive heads before removing power with the rear panel "hard" power switch.

Each of the HD24's tracks has its own track-arming button and 10-segment, tri-colored LED ladder meter—+4 dBu is factory-calibrated to -15 dBFS. You can switch the meters from normal ballistics to momentary or continuous peak-hold mode. The dedicated peak-clear button is handy. The HD24 uses the "all input" (all tracks receive source inputs) and "auto input" (used for punching in/out) monitoring modes familiar to ADAT users. You can't punch in using the track-arming buttons; tracks must already be in record-ready status before you press Record.

The Rewind, Fast Forward, Stop, Play and Record transport buttons are self-explanatory, with a few notable exceptions. Each tap of the Fast Forward or Rewind button skips the song (in either stop or play mode) five seconds forward or backward in time. Holding the Stop button together with Rewind or Fast Forward causes the HD24 to scrub audio, at first slowly and then at an increasingly faster (and arbitrary) rate the longer you hold the buttons. You can limit your scrubbing to select tracks if you don't want to hear the whole enchilada.

You can store, edit and select up to 24 locate points in each of the HD24's 64 possible songs, and the unit provides instant access to six of these points via dedicated front panel buttons. Along with the "locate 0" point provided for each song (all songs start at 00:00:00:00), there is a total of 1,600 locate points. By the way, you can edit the "locate 0" point to create an offset, useful for synching the HD24 with tape-based ADATs. Locate points can be used with Auto Return, Auto Record, Auto Play and Rehearse buttons to perform loop recording/playback and re-

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hearsed auto-punches. You can name 20 of the 24 locate points for each song; the remaining four are dedicated to punch-in/out and region start/end points (the latter for cut/copy/paste editing, which I'll discuss shortly).

A front panel Track Slip button allows you to slide entire tracks forward or backward in time up to 170 ms, in as little as 1/10 ms increments, which is useful for aligning the phase of different sources. A MIDI button gives you access to a number of MIDI functions (more on that below).

YOU SAY YOU WANT A RESOLUTION

The HD24's stock analog I/O can operate at 44.1- or 48kHz sampling rate, courtesy of 24-bit, 128x over-sampling converters. An optional high-resolution board, available for $1,249, allows 88.2- and 96kHz analog I/O as well. A Pitch button lets you varispeed the HD24's internal clock as much as -300/+100 cents at 48/96kHz nominal settings or ±200 cents at 44.1/88.2 kHz.

You can also slave a stock HD24 (via its rear panel wordclock input) to an external high-res clock source (such as a converter) to enable digital I/O at 88.2/96 kHz. The HD24 can only record 12 tracks max at 88.2/96 kHz, so you lose half your track count when you record at these higher sampling rates. The HD24 recognizes a user bit in the ADAT optical subcode that identifies high-sample rate signals as such, and splits each high-res track between two Lightpipe channels (i.e., track 1 uses channels 1 and 2, track 2 uses channels 3 and 4, and so on). Older Lightpipe-equipped devices such as digital mixers that can't function at 88.2 or 96 kHz simply treat the two channels as separate but identical-sounding 44.1- or 48kHz signals, respectively.

SLICE AND DICE

The HD24 allows simple cut, copy and paste operations between any tracks and across songs. Region start and end points can be captured on-the-fly and edited to 1/100-frame resolution, which is more than adequate for most simple edits. The HD24 automatically applies crossfades across edit points, and they sound very smooth as long as your edit points are chosen wisely. Before committing to your edit points, you can preview the first five seconds of audio after the edit start point, the last five seconds before the edit end point or all of the audio within the selected region. I liked the ability to immediately tweak these edit points during preview playback, instead of having to wait for playback to cease. The HD24 allows 99 levels of undo for cut, copy and paste operations, but you cannot undo punch-ins and song deletions.

The HD24 doesn't provide any graphic waveform display or connections for an external monitor for editing purposes. You'll need to rely on your ears and a little trial and error to get edits to sound perfect. Simple edits are a snap to accomplish. More complex arrangement tweaks, such as staggered edit points across multiple tracks (e.g., to avoid cutting off ringing cymbals), would be mind-boggling to attempt on the HD24 and are better left to a DAW to perform.

The HD24's rear panel features a generous allotment of ready-to-rock audio I/O, distinguishing the unit from competing models that require expensive add-ons and/or custom cabling. There is a balanced ¼-inch TRS jack for every analog input and output (48 total), and these can also be used with unbalanced signals and tip-sleeve phone plugs without wiring modifications or signal loss—plug and play! A programmable input-normaling function takes analog signals routed to lower-numbered tracks and mults them to higher-numbered tracks as well, saving you the hassle of repatching during later overdubs. Six ADAT Lightpipe connectors provide 24 channels of digital I/O.

Also on the rear panel is the air outlet for the HD24's built-in fan. The fan noise is a bit distracting, but not noisy enough that I felt it interfered with critical mixdown decisions with the unit mounted in a rack three feet away from me. (However, consider that the backs of my racks face Fiberglas wall panels that absorb high-frequency ambient noise.) The rackmountable HD24 takes up three rackspaces.

The unit's rear panel MIDI In and Out connectors are used to send MTC and send/receive MMC and software updates. The HD24 worked well as an MTC master (30 fps only) for timecode feed to my 02RV2 at mixdown, with the caveat that the 02R generally seems to prefer slaving to SMPTE. Note that the HD24 cannot slave to MTC.

The HD24's ADAT 9-pin sync in and out connectors allow you to sync up to five HD24s for a total of 120 tracks, or you can use them to sync the HD24 to tape-based ADATs and/or an Alesis BRC remote. I was also able to perform sample-accurate transfers to and from Digital Performer using the HD24's 9-pin sync connectors. Because the HD24 does not provide SMPTE I/O, the 9-pin sync input also comes in handy as an avenue to receive timecode from a device such as the Alesis BRC or MOTU Digital Timepiece that converts SMPTE to ADAT 9-pin sync.

An all-important wordclock input is also provided on the HD24's rear panel (on a 75-ohm terminated BNC connector), enabling you to use high-end, multichannel outboard converters to get audio in and out of the unit. You can also sync the HD24 to its fiber-optic inputs, a method inherently more prone to jitter.

Two tip-sleeve phone jacks accept a momentary footswitch (for hands-free punching) and the supplied LRC transport remote-control unit (which is almost identical to the LRC included with Legacy ADATs), respectively. Alesis plans to offer an optional full-function remote ($TBA) sometime later this year. You'll also find an IEC power receptacle for the supplied 3-prong AC cord, the aforementioned "hard" power switch and an Ethernet jack on the rear panel. The Ethernet jack gives the HD24 cool networking capabilities, which we'll examine next.

NETWORKING

You can configure the HD24 as a standalone FTP server with its own IP address and connect the unit's Ethernet port to a local computer network (10Base-T systems only) or to a cable modem that's hooked up to the Internet. With the HD24 connected to your computer, you can transfer tracks in standard .AIFF or .WAV format between the HD24 and your DAW, allowing you to edit tracks in your computer. That's cool in principle, but digital transfers via the HD24's fiber-optic I/O are roughly 4x faster than going the Ethernet route. The real story here is that the HD24's networking capabilities allow you to collaborate with any other HD24 users who have Internet access—download tracks from a friend in another state while you sleep through the night, do some overdubs the next morning and then upload the new tracks back to your friend during an extended lunch break. Project studios can also send finished tracks via e-mail to distant commercial studios for mixdown on virtually any DAW. The Ethernet jack can also be used in lieu of the MIDI In jack to update the HD24's software.

SYNCHING TO TAPE-BASED ADATS AND BRC

There are several factors to consider when synching your HD24 to tape-based ADATs and the Alesis BRC via the HD24's rear panel 9-pin sync connectors. First, you'll always want the HD24 to be the last slave in the chain; placed elsewhere, it would immediately begin playback before down-

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stream tape-based ADATs would have a chance to locate to your chosen playback point. Second, if your Legacy ADATs are playing a song that doesn't start at 00:00:00:00, then you'll need to offset the HD24's "locate-0" point in order to keep all of the tracks across all decks locked to the correct timecode address in relative terms. Third, the BRC cannot control an HD24 that is operating at 88.2- or 96kHz sampling rate. And, finally, you can't save BRC setup data to the HD24. There are a few more minor compatibility issues, as well. The upshot is that synching with a Legacy ADAT system is clumsy but workable if you have the patience.

NOW I KNOW MY ABCS

I performed an A/B/C test comparing the HD24's A/D converters to those in my Yamaha 02RV2 mixer and Apogee Rosetta, in all three cases using the Rosetta as wordclock master in order to minimize jitter. The test sources consisted of stereo recordings of acoustic guitar, captured via a spaced pair of DPA 4011 mics routed through a Millennia HV-3 mic pre. The HD24 ADC's dynamic range spec of 103 dB belies the quality of the converters. Compared to the 02R's ADCs, the HD24 provided notably superior transient response and high-frequency extension and a wider stereo image. The HD24's converters also sounded more open in the upper bass and generally flatter across the entire audio spectrum. Understandably, neither set of stock converters could hold a candle to the Rosetta, which sounded markedly warmer and smoother.

Perhaps the HD24's biggest selling point is that, aside from its useful networking and editing features (which you may choose to ignore) and a few simple hard disk management routines (which you must learn), the unit is as easy to operate as a 24-track tape recorder. And, it costs much less. The AD/DA sounds great for stock converters at this price point, and the comprehensive audio I/O beats the pants off the competition. The unit's portability makes it a slam-dunk for live recording applications. For those looking for an idiot-proof, stand-alone MDM or a lickety-split recording companion to a computer-based DAW, the HD24 offers an elegant solution at a fire sale price.

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

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Audio Ease Altiverb 1.4

Sampling Reverb Plug-In

A virtual sampling reverb: The Altiverb plug-in lets you sample your environment and save the set of impulse responses as a preset. You can even import a picture for the scrapbook.

The ability to sample the reverb of an environment and then use that sample to recreate the location's reverb in your studio is an amazing engineering feat. Sony's DRE-S777 is capable of this, but its power comes with a hefty price tag (nearly $10,000) and the rack unit itself is equally hefty (over 33 pounds). Altiverb, created by the Dutch company Audio Ease (which also makes VST Wrapper and Rocket Science Bundle), offers an alternative to the DRE-S777 by harnessing the power of an Apple G4 processor to create a sampling reverb plug-in. At $495, Altiverb competes with the DRE-S777 in terms of sonic quality at a 20th of the price and, because it's software, it's virtually weightless.

The CD-ROM I received from Audio Ease came with Version 1.1 software. While this version worked well for the most part, it was plagued by occasional processor overload peaks, which affected its performance. Audio Ease suggested I update to Version 1.4, a reportedly more stable build, and the problem disappeared. Version 1.4 had not yet been released at the time of this review, so I was able to download it at a secure Web page set up by Audio Ease. However, by the time you read this, all registered users will be able to download it directly through the company's Website (www.audioease.com).

Altiverb was first released as a MAS plug-in for MOTU's Digital Performer. I tested it with Digital Performer 3.02 using both a single-processor 400MHz and dual-processor 800MHz Apple G4 computers. Altiverb requires nothing less than a G4 to operate, and Audio Ease recommends a minimum of 30 MB of free system RAM allocated to the host program. By the time you read this, VST, RTAS and HD TDM versions of the plug-in should be available. Copy protection is via challenge and response.

VIEW OF THE VERBS

Despite the advanced processing power Altiverb packs, the plug-in's interface is streamlined and simple to understand. Among its more conspicuous controls is a large silver dial to adjust the reverb decay. More precisely, this dial trims the reverb sample, called an impulse response, by applying an exponential decay. (Remember, because the impulse response is sample-based, you can't make it longer than the initial sample's length.) There is a control for changing pre-delay, which can be set to positive or negative values. A positive value delays the reverb return, while a negative value delays the dry signal, causing the reverb to begin before the original sound (a neat effect). Independent dials are available for wet and dry levels, giving you more control over your wet/dry ratio than a single wet/dry mix knob.

The plug-in has its own built-in scrapbook to illustrate pictures of the actual space that was sampled and notes on the current preset specifications. Most of the stock presets include microphone-placement diagrams and recording information, along with interior and exterior photos of the location. Double-click on the images and they blow up to their full size in a separate window. Custom pictures can be added to any preset by simply dropping an image in the Preset folder. (The program recognizes JPEG, GIF, PICT and TIFF file formats.) To see the newly added image among the preset photos, reboot the host program. The scrapbook's preset specifications page is automatically generated by Altiverb, and includes each impulse response's name, the name of its parent folder, length and sample rate.

Altiverb comes in a variety of configurations to suit your processing needs. On a mono channel, the choices are mono to mono, mono to stereo, and mono to quad. The choices for a stereo channel are stereo to stereo, stereo to quad, stereo-mix to stereo, and stereo-mix to quad. The stereo-mix settings combine a stereo source's left/right channels that feed a mono signal to the plug-in; this configuration uses less processing power than a true stereo-to-stereo instantiation. When a quad plug-in is selected, a menu to assign the rear outputs to the appropriate buses in your system becomes active. Many of Altiverb's factory presets were recorded in quad, and though they sound fine as stereo plug-ins, they sound spectacular in quadraphonic sound; sitting in the middle of a surround system and listening to my tracks through one of Altiverb's quad presets is inspirational.

The CD-ROM only comes with nine sampled spaces, but they all sound great. All of the environments were recorded from several different positions using omni and cardioid microphones at 48 kHz, 24 bits. Each recording, which is made up of a set of impulse responses (left, right, center, rear left, rear right), equals a space's preset. The Utrecht Conservatory Chapel that was recorded from center of house using cardioids sounded particularly sweet on acoustic guitar and voice. There's even a set of impulse responses from car interiors—a Ford Transit van and a Fiat Tipo—that are fun. Ad-

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ditional impulse responses are available for download at Audio Ease's Website, and users can also post and share their own sampled environments.

SHOOTING THAT SAMPLE

To create and store your own samples, generate an initial impulse response by running a sine wave sweep or firing a starter pistol in the selected environment and then record the result. A sine wave sweep audio file accompanies the program. If you want to use a starter pistol, then you'll need to provide this yourself. However, though a starter pistol is a lot more convenient than hauling studio monitor speakers and a playback device for the sweep to a location, this latter setup is said to yield much higher-quality impulse responses. Besides, pulling out anything that even remotely looks like a weapon in a public place is never a good idea.

An application called the IR Pre-Processor, which also ships with Altiverb, is used to extract the dry impulse sound from the wet impulse return. It reads SDII audio files (I wish it also recognized .AIFF and .WAV) and converts them during processing to a proprietary format for Altiverb. The Pre-Processor is simple enough to use: Just tell it to subtract either a sine wave sweep or a starter pistol, depending on what you used, and feed it your samples. The only tricky part of the operation is making sure that all of your initial impulse-response files are properly named; if a file is misnamed, it may appear to the Pre-Processor to be missing, which results in an abrupt halt to processing. After a new impulse response is added to the Impulse Responses folder, the host application must be restarted in order for Altiverb to see the new preset. Altiverb's Impulse Responses folder does not need to be kept on your system drive because the plug-in can address it from a different drive.

Details on how to position your speakers and microphones are nicely explained in the manual, so I won't discuss that here. Suffice it to say, the quality of your initial recordings is directly related to the quality of your final presets; if you're going to sample your own space, don't skimp. My friends and I used Alesis M1 Active studio monitors, a MOTU 828 and Digital Performer, and a matched stereo pair of Neuman KM184 microphones to record the swimming pool space beneath the Hollywood Athletic Club in Los Angeles. We also sampled a vintage AKG BX10 spring-reverb unit. In both instances, the sine wave sweep was used and recordings were at 48 kHz, 24-bit. (You can check out our BX10 example on Audio Ease's site.)

Altiverb is not timid when it comes to devouring processing power. In fact, it is certainly the most processor-hungry plug-in I have encountered to date. My 400MHz computer was hard put to run two simultaneous, mono-to-stereo instances of Altiverb. Sometimes trying to change presets on either instantiation caused Digital Performer to crash. However, Altiverb performed much better on the dual-G4 800MHz machine, which handled two stereo-to-stereo and one mono-to-stereo instance comfortably.

A word of warning: For those of you with Digidesign hardware, Digi's Direct I/O ASIO driver is not very efficient and tends to bog down Digital Performer, resulting in poor real-time processing performance. MOTU's interfaces, such as the FireWire 828 or PCI-324 card with an interface, do not suffer from this problem, and give a much better performance all around. Also, because Altiverb's presets are at 48 kHz, 24 bits, loading them into a 44kHz 16-bit session takes a little longer.

It is truly amazing what software engineers can accomplish on today's computers. Altiverb is a perfect example of this type of impressive software, a plug-in that fully utilizes the G4's power, is well-designed and certain to be a valuable addition to any studio. Though it pushes the G4 to the wall, especially in its "no-latency" mode (its default setting is "high latency," which sounds fine for most situations), central processors will only become more powerful and Altiverb will only shine brighter. If you dream of owning a sampling reverb unit but can't afford the Sony machine, then check out Altiverb. You can't go wrong for $495, especially considering that this plug-in can emulate more than just reverbs; P.A.'s, microphones, hardware EQ, vintage tape-delay units—you get the idea. Altiverb works well and sounds great, and I found that sampling a location's ambience for use in my personal computer is a very satisfying experience.

Audio Ease bv, Lagenoord 26, 3513 GW Utrecht, the Netherlands; 31 30-243-3606; fax 31 30-243-8500; www.audioease.com. ■

Special thanks to Victor Owens, Jeff Hutchins and Scott Greer for all of their help field testing Altiverb, and Patrick at the Hollywood Athletic Club for accommodating our field recording session.

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Aphex Model 207

2-Channel Tube Mic/Instrument Preamp

Aphex has a decades' long legacy in developing industry-standard dynamics controllers for critical recording, broadcast and mastering applications. And, in 1995, when the company branched out into the mic preamplification realm, the result was the Model 107, an award-winning product featuring patented Reflected Plate Amplifier (RPA) circuitry. The RPA approach offered all of the advantages of tube technology, without the weight, bulk and fragility common to conventional tube designs.

Two years ago, Aphex debuted its Model 1100, a high-end, high-performance RPA mic preamp/96kHz A/D converter, which drew widespread acclaim for its astounding -135dB noise specs and transparent MicLim® circuit that essentially eliminated the fear of transient overloads. Unfortunately, the 1100's $2,500 price kept it out of the mainstream. Now, with the launch of the Model 207, Aphex offers an RPA tube preamp with MicLim, low -129dB noise specs and a few new tricks as well, but at a rock-bottom retail of $649.

Housed in a single-rackspace chassis, the 207's controls are laid out cleanly, set back into a thick aluminum slab front panel. The internal power supply (no wall warts!) automatically handles any AC input from 100 to 240 volts. Each channel has a ¼-inch direct box input for high-impedance, instrument-level signals, along with backlit illuminated switches for 48VDC phantom power, polarity ("phase"), -20dB pad, low-cut filter and MicLim. A continuously variable gain control sets input gain, and output is monitored by dual 10-segment LED headroom meters. Each channel also has an output gain pot, recessed into the front panel, providing fine adjustments to match your particular system.

Speaking of outputs, the back panel has both XLR and ¼-inch TRS balanced connectors and a switch for setting outputs to either -10 dBV or +4 dBu. Also on the rear are the XLR mic inputs and ¼-inch TRS jacks for inserting outboard gear after the low-noise, discrete NPN gain stage and MicLim, but before the low-cut filter and tube output stages.

The outputs handle balanced or unbalanced signals equally well, so operation is plug-and-go. The 207 shares certain upscale features from the high-end Model 1100, such as expensive, bifurcated, gold-contact relay switching on the -20dB pad and phase-reverse circuits, and a phantom power switch ramps up slowly to reduce thumps and is gentle on your mics. Another nice touch, the 207 mutes the outputs on power-up, and its power LED glows yellow until the tubes are sufficiently warmed up (about 40 seconds), at which point the LED changes to green, the outputs are unmuted and the unit is ready to go.

On all kinds of mics, condensers or dynamics, ranging from Neumann tubes to Shure SM-57s, the 207 offered excellent results. The unit's ultra-clean output and 65 dB of gain was even ample with low-output mics like E-V RE-20 and Royer Ribbons. The 207's RPA tube section adds a hint (about 0.02%) of desirable even-harmonic distortion, just enough to add a bit of color without an overly gushy "tubey" sound. The result is a velvety character with lots of detail, especially with low-level signals such as long decays picked up by distant room mics.

The 207's low-cut filter is similar to that used in the Model 107. It's a second-order, -12dB/octave design centered at 70 Hz, and includes a slight emphasis around 120 Hz to improve the low-end phase distortion and increase the perception of LF fullness, even when the low-cut filter is selected. The net overall effect is protection from nasty vocal blasts and popping "P" and "B" consonants, without the typical thin or feeble-sounding result that most low-cut filters yield. And, removing unwanted low-energy allows more headroom for the signals that you do want.

Certainly one of the 207's strongest features is the MicLim peak limiter, which puts an optically coupled attenuator before the preamp and drives it via a peak detector from the preamp output, rather than the conventional approach of putting the limiter just before the output stage. This way, MicLim not only takes the mic's self-impedance into account, but also the peak-limiting protection occurs before the insert point, so there's no worry about overloading de-essers or other outboard gear connected to the 207. In every case, MicLim provided ultra-smooth, transparent limiting, which allowed plenty of punch without destroying transients.

Guitars and basses plugged into the instrument jacks sounded round and full, especially with the MicLim switched in. The overall—and unanimous—reaction I received from studio players was "don't touch that switch" whenever I tried to turn off the MicLim to make A/B comparisons.

Retailing at $649, the Aphex 207 would be a great deal even without its MicLim overload protection and direct-box functions. However, once those are factored in, you'd be hard-pressed to find a better stereo preamp under $1,000. What you do with the extra $350 savings is up to you.

Aphex Systems, 11068 Randall St., Sun Valley, CA 91352; 818/767-2929; www.aphex.com. ■

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AKG Acoustics C 900

Emotion Series Handheld Condenser Mic

Introduced last winter, AKG's newest Emotion performance microphone is the C 900 condenser vocal mic. It closely resembles the handheld dynamic mics in the Emotion Series, and shares the same tapered body and matte finish, the latter a feature that helps keep the mic in the performer's grip. In fact, the C 900 looks similar enough to the Emotion D 880 dynamic that AKG has added a thin gold ring below the windscreen to distinguish it. As with most electret condensers, it runs on a range of phantom power from 9 to 52 volts.

The first thing I do with any new vocal mic is unscrew the windscreen to inspect the capsule. The C 900 comes with the PB 1000 presence adapter installed over the end of the capsule, resulting in about an octave of 4dB presence boost centered around 7 kHz. Without it, the C 900 is relatively dull, and, while AKG calls the PB 1000 an accessory, I can think of many applications where this added response would help. Be aware, however, that repeatedly removing and replacing the PB 1000 makes it all too easy to misplace this dime-sized plastic device. The PB 1000 was originally added to the C 1000 when that mic was redesigned a few years ago, and it seems reasonable to guess that the C 900's capsule is derived from the C 1000's. My suggestion for users of both mics is to leave the PB 1000 installed and forget about it. And, if you like the C 1000, this is a road version that can double as a great project studio mic.

Users familiar with the C 535—AKG's popular live performance condenser for vocals and acoustic instruments for the past two decades—will want to know how the C 900 compares to it. Having spent many years pointing speakers at a certain Canadian chanteuse, I can say that I have an intimate relationship with the 535. On-axis, the 535 is fairly flat, with response tilted slightly toward the highs and with a peak around 7 kHz.

The response of the C 900 is more contoured than the 535. The 900 has a pronounced proximity effect, which broadcast engineers will love. Live sound engineers will quickly learn to roll off the 900 with a highpass filter and possibly also cut some lows. Singers who enjoy the extra power that proximity lends to their voice in the monitors will find the 900 attractive. This mic will stand out in any mix without adding much equalization.

The region from 630 to 800 Hz stands out a few dB, while the rest of the midrange is smooth. A slight dip around 1,500 Hz helps accentuate a gentle peak around 4 kHz. With the presence adapter installed, the boost at 7 kHz is similar to that of the 535, but rolls off more quickly, making the 900 a better choice for loud stages, especially with a drum kit behind the singer. Although there's less 10 kHz, there's nearly as much 13 kHz.

At 120° off-axis—the angle most susceptible to feedback when double wedges are used—the 900 exhibits better pattern control and is about 4 dB less sensitive from 1 to 6 kHz than the 535. Monitor engineers know that cardioid mics perform better with a single wedge directly off-axis. At 180°, the 900's advantage over the 535 is narrowed down to the 2kHz region. I should point out that the 900 costs a third less than the 535.

Comparing the condenser C 900 to a dynamic mic like the Shure SM-58 is not fair, though instructive. The 900 has a bit less "bite" at 1,500 Hz and from 3 to 6 kHz, but provides more "air" around 14 kHz. With the presence adapter installed, there's also more 7kHz. If you spend a lot of time EQ'ing your favorite dynamic vocal mic, then the C 900 might get you there faster. Monitor engineers will like it because at 120° off-axis, the 900's rejection is several dB better throughout most of the upper mids, and that advantage extends beyond 4 kHz for sound arriving from directly behind.

Like a few other newer condensers, the 900 has more output than typical vocal mics—as much as 10 dB—so it will seem much louder in comparison, unless the gain is trimmed back. It really stands out from others when used with in-ear monitoring, where its contoured sound provides presence and warmth that make vocals stand out in a mix.

Puzzled by its sound, I wound up A/B'ing the C 900 with a dozen other condensers and dynamics. In my opinion, the 900 is a cat that thinks it's a dog. Some singers and sound engineers have found that the change from a dynamic to a condenser vocal mic is too drastic. With a list price of $250, the 900 is affordable, competes favorably with higher-end dynamics, and is more likely to convert users of dynamic vocal mics than users of other condensers. Soundwise, it's midway between what you'd expect from either: A condenser that acts like a dynamic. For those who haven't made the switch from a dynamic because they haven't found one they liked or could afford, the C 900 is the vocal mic they've been waiting for.

AKG Acoustics, 1449 Donelson Pike, Nashville, TN 37217; 615/360-0499; fax 615/360-0275; www.akg-acoustics.com. ■

Mark Frink is Mix's sound reinforcement editor.

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Mackie HR624/HRS120

Studio Monitor Package

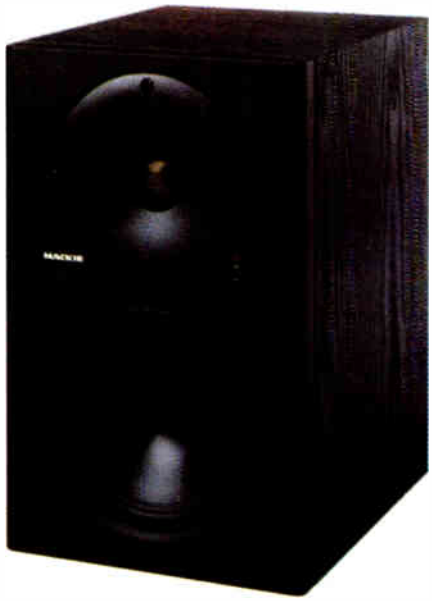
It's no secret that near-field monitoring has its limitations. Creating an accurate listening environment in less-than-ideal surroundings can be a maddening dilemma—proximity and volume can only do so much to overcome bad acoustics. With this in mind, I was eager to put the new THX®-certified Mackie HR624 active monitors and HRS120 subwoofer to the test.

The HR624 is simply a smaller version of the HR824, and both models use the same components and materials. The HR624, however, is geared toward smaller project studios and 5.1 and 7.1 monitoring applications. The 624s utilize a bi-amp design that feeds 40 watts to the 1-inch, aluminum-cooled tweeter and 100 watts to 6.7-inch transducer; the internal crossover point is 3,000 Hz. Back panel controls include sensitivity, an 80Hz highpass crossover, ±2dB high-frequency shelving and a selectable Acoustic Space control for managing bass frequencies in different rooms. The stated frequency response is 52 to 20k Hz, with a maximum output of 112 dB/per pair. The 624s, weighing in at 25 pounds each, sport a black, woodgrain finish, and the front panel includes a Mute switch with corresponding LED.

The HRS120 subwoofer, though intended to integrate with the HR624 and HR824, is touted as a perfect companion for any monitoring system that requires a dedicated low-end channel. The HRS120 houses a 12-inch driver driven by an internal 400-watt amp. The back panel controls enable users to tailor the HRS120 for use in various Dolby/THX applications and to adjust crossover points for use with full-range monitors. Connections for both the HR624 and the HRS120 include balanced XLRs and unbalanced RCAs. Multiple HRS120s can also be daisy-chained via the Slave In and Master Out connections. The HRS120 has a flat response between 21 and 150 Hz at up to 100 dB, and is housed in a hefty 94-pound chassis with a removable dust guard.

I tested the HR624/HRS120 setup in my home project studio, an average 12x12x8 bedroom with some minor acoustical treatments. I set the HR624 pair on speaker stands at eye-level, but had to spend some time moving the HRS120 around the room for best results. Ultimately, I positioned the sub to the right of my console, between the desk and one of the HR624s.

Fortunately, on the day I began testing the Mackies, I had already spent several hours inside Morning Wood Studio in San Francisco, listening to some Pelonis Signature Series mains. When I fired up the HR624s, I was immediately impressed with their clarity and accuracy. After a few hours of listening to purpose-built mains within the confines of a professional control room, the HR624s, even in my modest studio, sounded right on the mark. The sound was tight, uncolored and non-fatiguing (which is a miracle in itself for near-fields). They also compare very favorably to standard Yamaha NS-10s, producing an accurate, uncolored sound that is not as taxing on the listener.



The HR624 active monitor

Working with some of my own unfinished material, I put up a few problematic mixes that included everything from distorted drum loops and synth bass elements to straight-ahead vocals and guitars. The Mackies were, again, right on the mark, and the mixes I worked on held up in a variety of listening environments. I felt totally at ease using this setup and wouldn't hesitate using the HR624s in place of my current monitors.

For people working in project studios on either music production or multimedia projects, the HR624s will provide an accurate and uncolored sonic image that will hold up anywhere. For that extra thump, the HRS120 is more sub than most of us will ever need. The HR624 lists for $649/each; the HRS120 lists for $1,499.

Mackie Designs Inc., 16220 Wood-Red Road N.E., Woodinville, WA 98072; 800/258-6883; fax 425/487-4337; www.mackie.com. ■

Robert Hanson is an assistant editor at Mix. *Check out www.blacksnakemoan.com to see what he's up to when the sun goes down.*

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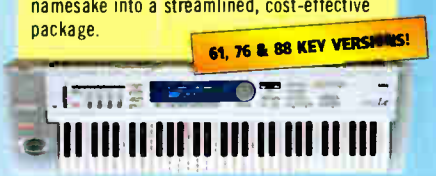

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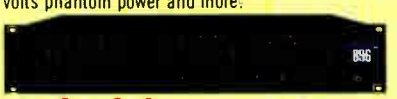

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Royer R-122

Active Ribbon Studio Microphone

Until now, fans of ribbon mics have had to put up with the historic drawbacks of such transducer designs, including low-output level (usually requiring use with a high-gain mic preamp) and compromised tonal performance when used with a low-impedance load. The Royer R-122 ($1,695 list) incorporates a revolutionary design that overcomes these limitations.

The R-122 uses the same ribbon-transducer assembly as the previously released Royer R-121 microphone, but it adds a head-amplifier system that operates on 48-volt phantom power. The new design gives the R-122 several distinct advantages, including 10mv/PA sensitivity (which is on par with condenser mics), uncompromised performance when used with low-impedance and standard-gain mic preamps, and reduced signal loss with long cable runs. Users can forget any concerns they might have about damaging the ribbon element with the unintentional application of phantom power; in fact, the R-122 is the first commercially available ribbon mic that *requires* phantom power in order to operate.

Interestingly, the R-122's head amplifier doesn't amplify the capsule's signal. The mic's gain increase is accomplished through the use of a specially designed transformer, which also provides the optimal load for the ribbon element, a feature Royer terms Z-match. The head amp is essentially a buffering device, presenting a high impedance and minimal load to the ribbon element and transformer, and a low-impedance output for your mic preamp.

HAND JIVE

The R-122 is a completely handcrafted, side-address mic that measures 8.5 inches long and 1 inch in diameter. As with all ribbon mics, the polar pattern is bidirectional, or figure-8. The head capsule uses a 2.5-micron-thick aluminum ribbon and rare-earth neodymium magnets.

The sturdy, 10.9-ounce R-122 features a low-carbon steel body rather than brass, because steel offers the superior magnetic shielding that ribbon mics require for low-noise performance. The body comes standard with a burnished, satin-nickel finish, but a matte-black chrome finish is also available. Standard accessories include a spring-loaded mic clip, protective wood case and microphone sock. Optional accessories include the PS-100 ($47.50) and PS-101 ($59) windscreens (the latter featuring a gooseneck) and the AT84 shockmount ($72). You can also order matched mic pairs. The R-122 comes with a generous lifetime warranty to the original owner.

One of the primary goals that Dave Royer had in designing the R-122 was to get the frequency response as flat as possible from 50 to 10k Hz. The mic exhibits a significant, broad dip centered around 15 kHz, due to the offset arrangement of the ribbon element with respect to its front and back damping screens. Royer intentionally positioned the ribbon approximately 3/32 inches from the front damping screen and roughly 5/16 inches from the back damping screen. This arrangement gives the ribbon a farther distance to travel before hitting the back damping screen when subjected to high SPLs at the front of the mic. As a result, the R-122 can handle sound levels in excess of 135dB SPL, very respectable for any mic and especially impressive for a ribbon mic.

But offsetting the ribbon element also causes the aforementioned dip in frequency response at 15 kHz for sounds arriving at the front of the mic. (The mic's frequency response is stated to be 30 to 15k Hz ±3 dB.) The dip is caused by phase cancellations due to the correlation between the mic's physical dimensions and wavelengths at high frequencies. That is, frequencies around 15 kHz arrive at the front and rear of the mic element out of phase with respect to each other and tend to cancel.

Dave Royer welcomed the dip at 15 kHz, because it understates the reproduction of high partials on instruments such as horns. The designer's intention was to create a mic that produces a warm recording of instruments such as brass and electric guitar that can sometimes sound glassy when recorded with condenser mics.

If you wish to mitigate the R-122's high-frequency dip, then aim the back of the mic at the sound source. An air pocket between the ribbon element and the front damping screen creates a resonance that counteracts the phase-loss effect caused by the mic's dimensions. This resonance produces a greater high-frequency extension than that achieved by facing the front of the mic at the sound source. In plain English, pointing the back of the mic at the sound source will produce a brighter, more detailed recording than you'll get by pointing the front of the mic at the source. Practically speaking, it's great to have two very different tonal responses to choose from with one mic. *[Note: As the rear side of a figure-8 mic is out of phase to its front face, reversing phase at the mic pre is required when recording on the R-122's rear side for in-phase recording. Also, Royer suggests not using the rear side of the R-122 for high SPL recordings, because the ribbon element is being driven toward the closer damping screen when the mic is reversed.—Ed.]*

The R-122's self-noise is conservatively rated to be less than 20 dB, unweighted.

TO THE TEST

Jangling a set of keys about four inches from the R-122 as I walked around the mic, I heard a noticeably greater high-fre-

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quency extension and better transient response at the rear of the mic, as expected. In an A/B test with a Neumann U87A condenser mic set to bidirectional mode (i.e., the same polar pattern as the R-122), the R-122's transient response at the back of the mic sounded at least as good and perhaps a little better than the Neumann's. The front of the R-122 produced significantly duller results.

My tests also confirmed that the R-122's off-axis frequency response is very uniform out to at least 70° to either side of the front or rear of the mic. Beyond 70°, the mic's excellent rejection (as you approach the 90°/270° nulls) makes it difficult to judge the response subjectively.

Next up was an A/B test of the R-122 and the U87A (again, set to bidirectional mode) on male lead vocals. Singing into the front of both mics from a distance of about seven inches, the U87A sounded clearer and the Royer very muffled. The spectral balance produced by singing into the rear of the R-122 was a lot closer to that produced by the same application and setup for the figure-8 U87A. Both mics lacked the clarity and transient response I typically regard as optimal for recording lead vocals (with the U87A in figure-8 mode), although it's conceivable that the Royer could deliver great results on an overly bright or thin-sounding singer. All things considered, lead vocals are not the primary application that I would choose to use the R-122 for, although the mic's flat frequency response provides a "clean slate" starting point for adding EQ.

Next up was an A/B comparison between a pair of R-122s and a pair of (cardioid) DPA 4011 small-diaphragm condenser mics, recording acoustic guitar at a distance of six inches in spaced-pair configurations. The 4011s sounded noticeably flatter and exhibited better transient response and a much wider stereo image. However, the R-122s (pointing the front side of the mics at the source) sounded much more soothing and warm compared to the 4011s. Pointing the backside of the R-122s at the guitar resulted in a noticeably improved transient response and an overall brighter tone, but the Royer mics still lacked the clarity and detail produced by the 4011s. For recording warm and full-sounding acoustic guitar tracks with minimal or no accompaniment, the R-122s would be an excellent choice. Where more detail is needed to cut through dense arrangements, I'd probably go with very fast, small-diaphragm condenser mics.

I achieved outstanding results recording a ukulele with two R-122s placed in a Blumlein configuration (with the rear side of each mic facing the source). The performer sang her lead vocals at the same time she played her instrument, so figure-8 mics were needed to achieve the best separation between all three tracks. (I used a Brauner VM1 Klaus Heyne Edition mic in bidirectional mode on the lead vocal, along with the two R-122s on the ukulele.) Not only did the R-122s' nulls perform admirably here, the mics also provided a nice stereo image and the perfect spectral balance for the ukulele tracks. The instrument sounded very warm and nicely detailed, without being too plucky. In fact, no EQ was necessary during mixdown. One cautionary note: As with all bidirectional mics (ribbon or otherwise), the R-122 used with its stock mic clip tends to pick up mic stand rumble caused by foot-tapping performers, so use of the optional shockmount is recommended.

Perhaps the best applications for the R-122 are recording horns and electric guitars, just what Dave Royer had in mind when he designed the mic. Pointing the front of the mic at a trumpet, the recording sounded well balanced and had plenty of presence, without sounding glassy or brittle. Using the front of the mic on electric guitar cabinet also produced warm and smooth-sounding results. Shaker overdubs sounded smooth and detailed when recorded with the rear side of the mic.

CONCLUSIONS

The R-122 is best used to record instruments where a warm and round tone is sought over detail. It's not that the R-122's transient response is particularly slow; it's fast enough to capture the detail needed for particular applications, yet understated just enough to let the warmth and smoothness of the mic predominate in the overall sound. Because of its unique character, I wouldn't recommend the R-122 as the one mic to buy for a small studio on a budget. However, larger facilities needing a broad array of tools will find the R-122 very useful for many applications. In short, the R-122 is a high-quality mic with a distinctive sound that should usher it into many a professional mic cabinet.

Royer Labs, 821 North Ford St., Burbank, CA 91505; 818/760-8472; fax 818/760-8864; www.royerlabs.com. ■

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

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BY EDDIE CILETTI

Sleep Like an Egyptian

Preparing Tape for the Afterlife

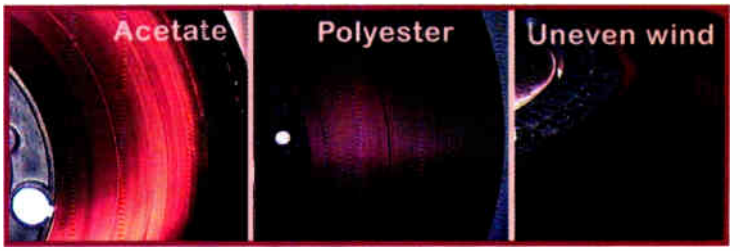


Figure 1: To determine tape composition, place a light behind the reel. Acetate is translucent, polyester/mylar is opaque, and, hopefully, your stored tapes don't look like the image to the right.

I am not the first person to write about tape restoration; Phil De Lancie documented his treatment for "sticky shed" way back in May 1991. In a previous life, I built a hair-dryer-powered Easybake oven with great success, and while other folks have been using convection ovens since, I've found an equally clever solution. Would you believe a food dehydrator? Perfectly suited to the task, its round shape matches the incoming wounded, the temperature range is appropriate (and completely safe), and it's more affordable. *Plus,* it makes jerky and "sun-dried" tomatoes on the side!

THE OLD TAPE'S HOME

The aging of magnetic tape affects every tape-based recording medium; not just old analog recordings, but digital, data and video, as well. Since the late 1960s, certain tape formulations have been prone to shedding, a problem that is, in part, due to chemical inconsistencies beyond the control of tape manufacturers. The problem is especially acute for mid-'70s-era, high-output tapes, such as Ampex 406/407/456, 3M 250 and AGFA 468. Some tapes of more recent vintage also have shedding problems.

Tapes should be stored in a cool, dry environment between 50° F and 70° F, 20% to 45% relative humidity. Lower numbers are better for longer-term storage. Recorded media should be treated as if destined to become an essential part of history. Most recorded tape has received only average treatment early in its history when it is still being regularly accessed and handled, and perfect conditions are hard to achieve unless measures that make the recordings difficult to access are taken. By the time a tape reaches "proper" storage, the damage has already started.

You may have noticed that new tapes are often sealed in plastic, which protects them from the environment until they are ready for use. Too bad it's not resealable. This article will show how to treat the ailing patients, then apply Egyptian-style preservation techniques to maximize their usefulness in the Afterlife (cue: Bell Tree).

INGREDIENTS

Recording tape consists of four primary elements: the plastic carrier (mylar/polyester), the magnetic oxide (*rust* for storage, yeah!), an optional conductive back treatment (carbon impregnation improves "winding" performance while reducing static), plus the binder (the glue that holds it all together).

The combination of time, extreme conditions and/or chemical instability can make tapes unplayable to the point where they can't even be rewound. The culprit is binder hydration, the gradual absorption of moisture that turns this special "glue" into the consistency of molasses. Dehydration reactivates the binder. To keep it that way, reseal the tape in plastic to keep moisture out, adding a silica gel pack to absorb any moisture trapped in the bag.

WHO R U?

A tape in an unlabeled white box on a hub provides little clue as to its type, age or recorded direction. European tapes are the exception, because make and type are often printed on the back coating. Prehistoric acetate does not require baking, so it's important to learn how to distinguish it from mylar/polyester. Repeat: *Do not bake acetate!* Hold a reel of tape up to a light as in Fig. 1; acetate is translucent, and polyester is opaque. Acetate was primarily used from the '50s until the '60s; it never stretched, breaks clean and can be quite brittle *now.*

Vintage tapes like Scotch 111 have an orange-ish oxide, whereas later tapes like Scotch 201 have black oxides. Other oxide color variations can range from red to brown. Mylar/polyester eventually replaced acetate. It handles stress well, can be stretched to a string before breaking and makes nifty apparel when recycled. 1960s-era mylar tapes with black oxide and no back coating will be the least problematic.

DO BEE AND DON'T BEE

People who make analog recording part of their daily routine take for granted that the tape is new and that the machine is in a happy state. When called to remaster, remix or restore a vintage recording, the machine *must* be in top form *and* your business should be insured. Tape condition is the one variable that can't be predicted. You really don't want to discover a prob-

Figure 2: The Snackmaster Pro FD-50 dehydrator, showing standard and modified trays (for 2-inch tapes) overhead. Do not process food and tapes together!

lematic tape during fast wind. Repeat: *Do not fast-wind vintage tapes before first determining condition.* In order to reduce the risk of damage, the safest approach is to *play* the tape in whatever direction needed, but don't play anything yet.

SLOW RIDE

In order to be baked, a tape must have a smooth, even "wind." The right-most image in Fig. 1 is anything but. Tapes stored in a carelessly wound state absorb more moisture, and if they are baked that way, then they will have severe edge deterioration. Tapes stored in the played state are said to be "tail out," minimizing any print-through between layers, or at least masking it as "post-echo." (Pre-echo is the annoying alternative.) If the pack is good and the tape is known to be tail out, a conservative first pass in the dehydrator is possibly unnecessary, but it's better than wasting time repacking a gooey tape. Properly stored tapes may still deteriorate but recover well with treatment.

Once you are ready to repack a tape, it is best to remove the head assembly to minimize the number of contact surfaces. The goals are to preserve the oxide and minimize the clean-up. Every stationary surface—head, guide or lifter—will scrape oxide off the tape. Although in most cases, this will only be a little bit scary, stopping the tape will deposit clumps of oxide that are hard to remove and will ultimately become baked into the tape.

The best machines for slow-winding traumatized tapes are those with all-rotating guides. The Ampex ATR-100 is almost perfect, because it has two stationary lifters that can be avoided if the headstack is removed. Studer machines are also well-suited for slow winding, because all guides rotate. Model 800 Series Studer machines are dangerously powerful, so it is worth repeating: Do not fast-wind questionable tapes. Don't use the remote, stand by the machine at all times, pay close attention and be ready to stop at a moment's notice. Play tensions are lower than wind tensions; some machines have "small-reel" settings that further reduce tension.

If the headstack can't be removed, or if there are stationary guides that can't be avoided, then cover them with a cloth or a paper towel to soften the hard edges, collect the oxide and minimize cleanup. If possible, figure out a way to slide or rotate the cloth to a clean section while the tape is rolling. Be prepared for splices to fail before and after baking. Once the tape is at the head, "play" the tape one more time so that its "tail" is out and the pack is smooth. I know this is an excruciating amount of detail, but it's better to know the issues in preparation for that one truly funky tape than to find the oxide stuck to the wrong side of the plastic—it has happened to me.

HUB BUB

Tapes on plastic reels with small hubs should be rewound onto large reels with NAB hubs. Be careful to thread the tape around the hub without any creases. There should be about five minutes' worth of pad at the head of the tape; add if necessary. The goal is to minimize mechanical distortions that can be impressed upon subsequent layers, especially after baking, causing dropouts. When baked, the tape will expand and become loose around the hub. For this reason, use reels with flanges to protect the tape from coming unwound in a way that is scarier than any Stephen King or Anne Rice novel.

NOTHIN' SAYS LOVIN' LIKE SOMETHIN' FROM THE OVEN

The device *du jour* is the Snackmaster Pro model FD-50 made by American Harvest (800/288-4545; www.americanharvest.com). At $90 with shipping, it comes standard with four trays, each of which can comfortably handle a reel of half-inch tape. (Additional trays and jerky mixes can be ordered. Shipping is generally fast, but allow up to four weeks for delivery in case *Mix* readers deluge their ordering system.) To accommodate 1- and 2-inch tapes, modify one tray by cutting out the plastic spokes along the perimeter with a wire cutter. This creates a "dummy tray," adding height to the tray below.

The FD-50 features an adjustable thermostat and a built-in fan to circulate the air. I checked for magnetic fields and found none, though I do use the upper trays just to be safe. (The fan is in the bottom of the unit.) The heat is adjustable from 95° F to 145° F and is accurate within 5° when checked with a photographic thermometer.

DON'T SHAKE, BAKE!

I bake quarter-inch tapes on 10-inch reels at 135° F for two hours, flipping every half-hour. You'll find that cooking time varies with tape width, type, brand, condition, and the size and number of reels being baked. Ampex tape from the '70s might require twice as much time as 3M tape from the '80s (as reported by Wendy Carlos when restoring her masters from that time period). The table below can be used as a guide.

I am conservative about baking time and temperature, not for fear of losing high frequencies, but to be safe and slow; hence, the wide range. It is best to start with noncritical tapes. For example, I have baked funky test tapes—without degrading the tones—to show that the process works. The alternative—heads clogging

TAPE WIDTH	DEHYDRATION TIME	TIPS APPLY TO ALL FORMATS
¼-inch	1 hour to 4 hours	Tape pack must be smooth.
½-inch	2 hours to 5 hours	Position near top cover and flip every 30 to 60 minutes.
1-inch	3 hours to 6 hours	Cooling time should be as long as baking time.
2-inch	4 hours to 8 hours	Check for splices and shed after cooling.

Recommended baking times based on 130° F to 140° F

Figure 3: An unbaked tape leaves a trail.

with gooey gunk every minute during transfer—is worse.

After baking the tape, return it to its box and let it cool for the same amount of time as it was baked. Include a silica gel pack if possible. To confirm that the process was successful, put cloth across the head assembly and play the tape backward for five to 10 minutes. Stop and observe. Shed should be minimal. For noncritical tapes, I've sandwiched a piece of cloth around the tape and held the cloth between two fingers while the tape was rewinding. A minimal a-mount of oxide shed is normal, but Fig. 3 shows what happens before baking. If the tape still sheds after treatment, put it back in! Based on my experience, tapes can be baked more than once.

Figure 4: Multiple views showing the effects of wear on a tape head

POST-RESTORATION STORAGE

Wrapping tape in a plastic bag and including a silica gel pack to absorb moisture is one way to preserve baked tapes. Silica gel can adsorb up to 40% of its weight in moisture—40 grams protects three cubic feet—and it can be baked to reactivate! Silica gel packs are available from www.foodsave.net (follow the Magnetic Media Preservation Area link), as well as from photo stores such as www.keh.com. And, if you really want to preserve like an Egyptian, a 12-inch plastic-sealing tool (model TEW H-300C) is available at www.hillas.com for $80. All you need is the appropriate-sized bag.

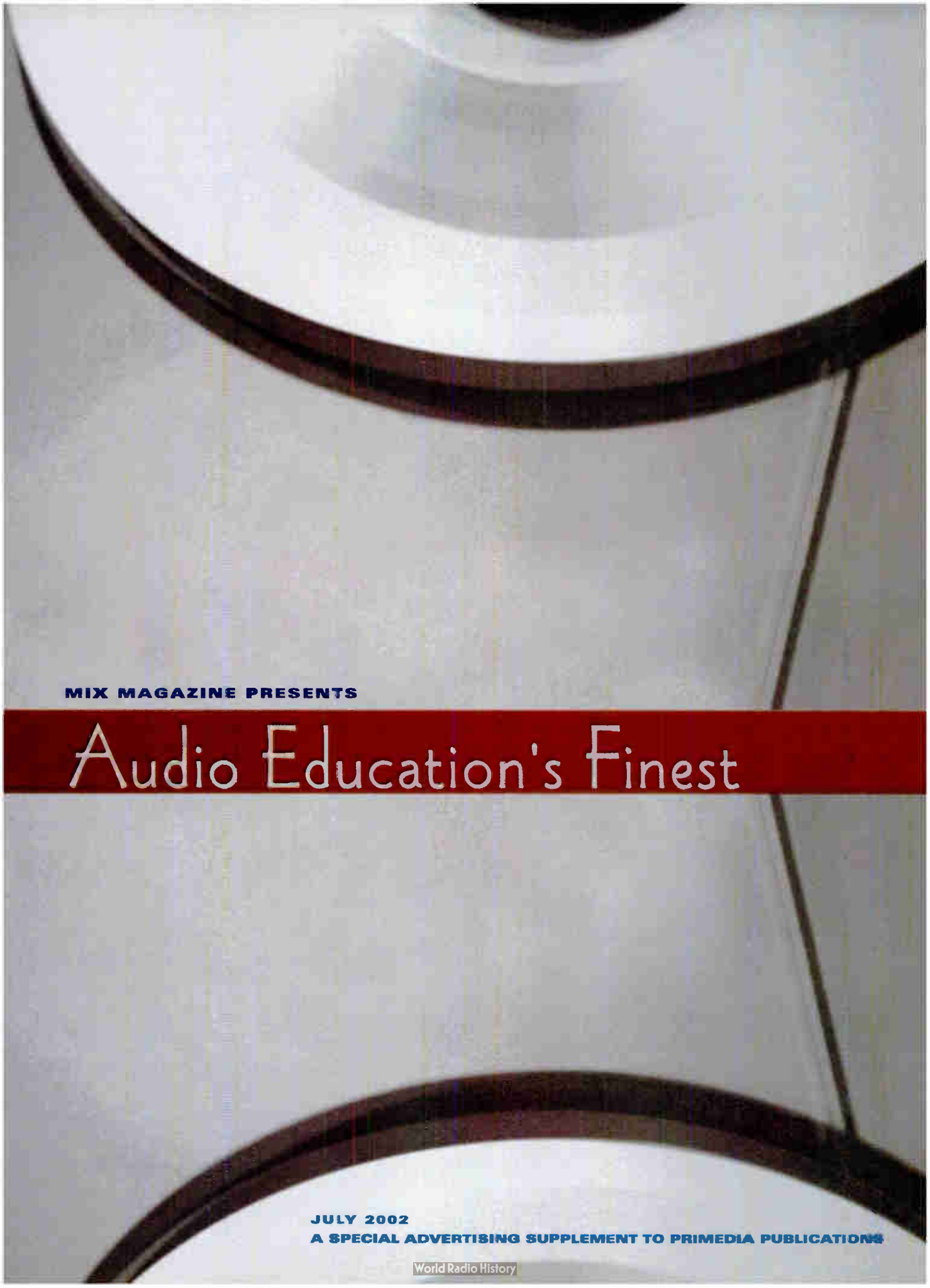
IT'S A CLEAN MACHINE, VERY CLEAN

Once it is baked, the tape should play like new, but worn heads will aggravate the process of getting a good transfer from new or old media. Figure 4 shows multiple views of a 2-track head. At the bottom, the lighting conveniently darkened the wear pattern of the worn head, making it appear as a horizontal bar across the center. Just above, arrows point to where oxide gets trapped in the groove worn by the tape. Use a toothpick or a business card to remove stubborn dirt, along with your head cleaner of choice.

Worn heads like this one should be relapped to improve high-frequency response and reduce low-frequency muddiness. To prevent a future groove from trapping dirt and degrading performance, "relief slots" can be cut into the surface as indicated in the top image of Fig. 4. John French at JRF Magnetic Sciences (973/579-5773; www.jrfmagnetics.com) restores and sells tape heads, and he carries test tapes, demagnetizers, reel hubs and other related accessories.

While I'm on the subject, if your demagnetizer has a switch, it can do more harm than good. Defeat the switch or throw it away and buy an Annis Han-D-Mag (www.maginst.com). That's all for July. Have a great summer, and keep humidity in your facility below 45%. ■

Eddie never got around to posting pics of number two son, Justin Marcello, but Polly did.



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World Radio History

Media Arts Institutions Have Arrived

It's Academic

by Dan Daley

Until the 1970s, it was still possible to become an attorney without having to go to law school. Many lawyers—several presidents of the United States among them, including Abraham Lincoln—learned their trade by apprenticeship, spending years within the art and science of the law under the tutelage of seasoned barristers. It has only been in the past 30 years that the law, like virtually every other discipline, would become so complex and specialized that the legal profession would mandate formal academic training before the term "Esquire" could follow a name.

Driven by quantum leaps in technology, the same evolution has taken place in the media industry, and at a much faster pace. For more than 100 years of media development, most of those wishing to practice sound, film/video, theatrical and other technological arts learned by watching and doing. But with the complex technological leaps of the Information Age, the old paradigm simply can no longer keep up.

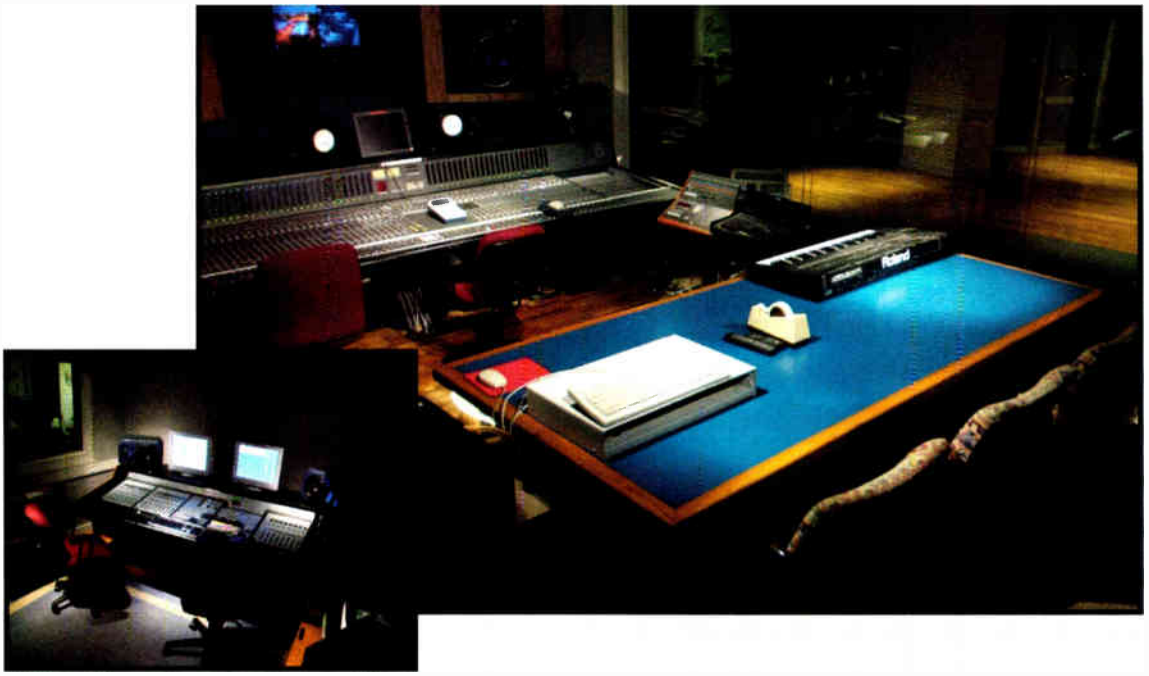
The past quarter-century has seen a tremendous proliferation of media arts and sciences academic environments, in response to the knowledge that is required to work the levers of the entertainment media machine. The number and diversity of technology platforms, software and hardware, and the innovative techniques to use them have become too numerous to expect any one individual to master through an apprenticeship.

But the media schools are more than knowledge repositories. In a very real sense, media arts has become the liberal arts of our time. The opportunity to attend a media arts school offers students exposure to myriad aspects of what truly has become a diverse, global industry. Many students enter with one set of goals and depart having achieved those and much more, thanks to a chance to experience the entire landscape of media. Aspiring audio engineers get a glimpse of the world of animation, and the next Walt Disney has arrived; a video post-production hopeful gets a chance to feel the excitement of a live performance, and the course of theater production might be changed dramatically.

These are not opportunities that could come easily when sound, film and video students apprenticed in a facility that, by nature, would focus on a few core disciplines. The possibilities have always been endless; we can now thank this innovative generation of media academies for making dreams more accessible than ever before.

This edition of "Mix's Finest" encapsulates many of the best of these media arts institutions in a single reference guide. Each school profiled here offers exceptionally high academic standards. They will each have differences that make them unique, but they are all dedicated to one thing: Ensuring that media, technology and the human imagination are able to intersect, and that creativity is able to blossom. ■

Contents



Mike Curb School of Music Business, Belmont University

When Belmont University commenced its Music Business program in 1973, the school was already one of the country's leading business and liberal arts institutions. The mainstreaming of the music industry with contemporary business and culture taking place at that time, combined with Belmont's location at one end of Nashville's famed Music Row, made the new program a perfect match at the perfect time. Over the ensuing three decades, Belmont's Music Business program has expanded and evolved with the industry, as well as contributed a long list of eminent graduates who have gone on to make their own marks on the music industry.

Belmont's Music Business curriculum comprises both business and production tracks. Structured as a four-year B.B.A. degree, both tracks are comprehensive; business courses cover areas including administration, law, copyrights, contracts and management; production courses include audio engineering, studio production, studio maintenance engineering, sound reinforcement, recording techniques and post-production techniques. Students also take general business and liberal arts courses, as well, resulting in, as the coordinator of Recording Studio Curriculum Dr. Wesley Bulla says, a graduate ready to tackle the entertainment industry's multifaceted world.

"Belmont's program has always emphasized a very practical, hands-on approach to teaching these courses," he says. "But we've also always made sure the process of education has a firm connection to the real world. We are squarely in the center of one of the world's leading entertainment centers, and students benefit from that every day, in the form of seminars and guest lectures given by industry leaders in business and record production. We also have tremendous access to ongoing internship programs that cover literally every aspect of the industry."

In 1999, the School of Music Business opened what they call "Belmont West," a satellite facility in Burbank, Calif., the heart of Southern California's film and video post-production, broadcasting and music industries. Each year, about 30 Music Business and Production students in their senior year spend one semester attending classes and working in the bustling milieu of this entertainment Mecca, with classes taught both by Belmont faculty and by area experts.

Back in Nashville, Belmont has two main control rooms, fitted with a classic Sony 3056 console and a 5.1 surround-capable Otari Elite. Each has its own recording spaces, and each is tied into a central machine room. The studios utilize designer Russ Berger's unique signature wall of glass between the studio and its control rooms, which promotes easy communication among musicians, recording engineers and students. In addition, the school owns renowned producer Jimmy Bowen's personal microphone collection and offers two Pro Tools post-production and editing suites, as well as numerous classrooms and labs.

Belmont has moved forward on many fronts in recent years. Its Mike Curb School of Music Business was funded by a multimillion-dollar donation from one of the record industry's most successful figures; in October 2001, Belmont acquired Ocean Way Nashville Studios, with three Neve rooms, an impeccable microphone collection and a rare collection of outboard gear; and most recently, Belmont is in the process of renovating the classic RCA Studio B, a former museum and site of many timeless recordings by artists such as Elvis Presley and Chet Atkins, into a working studio lab that will allow students access to the record-making process of years gone by.

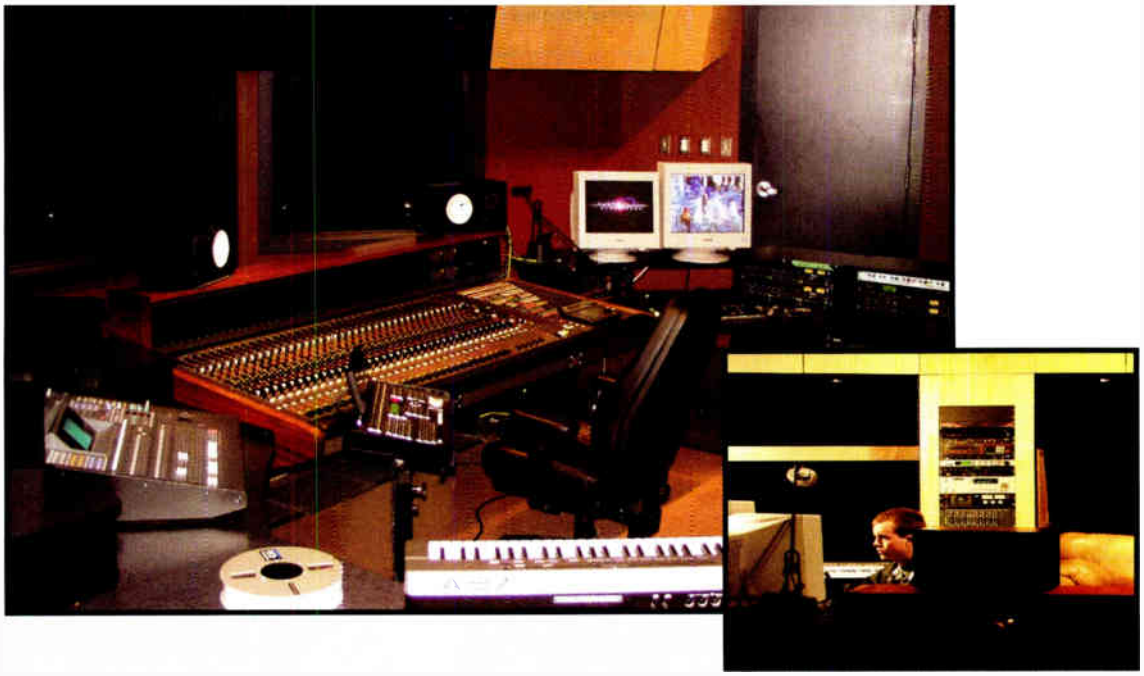
"Belmont has a lot to offer," says Bulla. "But one of the things we pride ourselves most on is that our graduates also learn to give back." ■

At a Glance

Name: Mike Curb School of Music Business, Belmont University **Contact:** University Admissions Office **Major Courses of Study:** Music Business, Music Production **Degree Offered:** B.B.A. **Accreditation:** Association to Advance Collegiate Schools of Business (AACSB) International **Main Technology Platforms:** Neve, Sony, Mackie, Otari, Pro Tools, RADAR, all digital analog tape formats, Nuendo, AKG-sponsored premium microphone cabinet **Tuition:** $6,520 per semester Financial **Assistance:** All Federal assistance, plus scholarship programs.

BELMONT UNIVERSITY

Mike Curb School of Music Business, Belmont University
1900 Belmont Boulevard
Nashville, TN 37212
Tel.: 615/460-5504
Fax: 615/460-5516
Website: www.belmont.edu/cob/mb
E-mail: muzzbuss@mail.belmont.edu



Center for Digital Imaging and Sound

For 23 years, the Center for Digital Imaging and Sound (CDIS) has offered students from around the world one-, two- and three-year programs that are intense, creatively challenging, and designed to produce highly skilled new media professionals. CDIS's curricula is broad and includes comprehensive education in a variety of media, including audio recording arts, digital media, digital film, animation, game development and other disciplines. Altogether, CDIS offers 36 programs in nine areas of study leading to one-year certificates, or two- and three-year diplomas.

For audio, CDIS offers an extensive set of programs taught by leading professionals in a state-of-the-art technical environment. All students participate in the initial Recording Arts Foundation (RAF) program, which offers beginners a solid skill-base in the techniques and equipment used in multitrack recording, sound reinforcement, and post-production for film/video, broadcast and new media. Students train in advanced digital and analog studios using the latest technologies. The curriculum includes topics such as MIDI, signal flow, critical listening and audio/acoustic principles.

With that foundation, CDIS students can then pursue specific fields of study. Students choose either Music Production (RAP/M) or Audio Post-Production for film, TV and video (RAP/P). Linear and nonlinear digital audio theory, practice and integration are emphasized, along with technical expertise, production and project management, and problem solving/troubleshooting skills, which they apply to projects modeled after real-world scenarios. They also learn to create and publish audio for the Web and new media applications. In addition, the RAP programs also place an emphasis on the business of the media industry, providing instruction in areas such as Music Management & Marketing and Recording Studio Operations.

The majority of instruction takes place in CDIS's new Entertainment Technology Center (ETC), opened in 2000, on the 43,000-square-foot campus. The ETC has two recording studios, a mix-to-picture surround-capable studio, and a film soundstage, as well as extensive digital video, effects and animation labs, all available 24/7.

CDIS remains a partner with its students after graduation through the, for Students with two or more years of study completed have an additional four months of access to CDIS facilities through the Graduate Access Program (GAP). Highest-level graduates are eligible to receive credit for their courses, leading to a Bachelor of Science in Management degree at the University of Phoenix. In addition, an agreement with the renowned Liverpool Institute for the Performing Arts, founded by Sir Paul McCartney, provides eligible CDIS Recording Arts Master Program graduates the opportunity to continue on to an undergraduate degree.

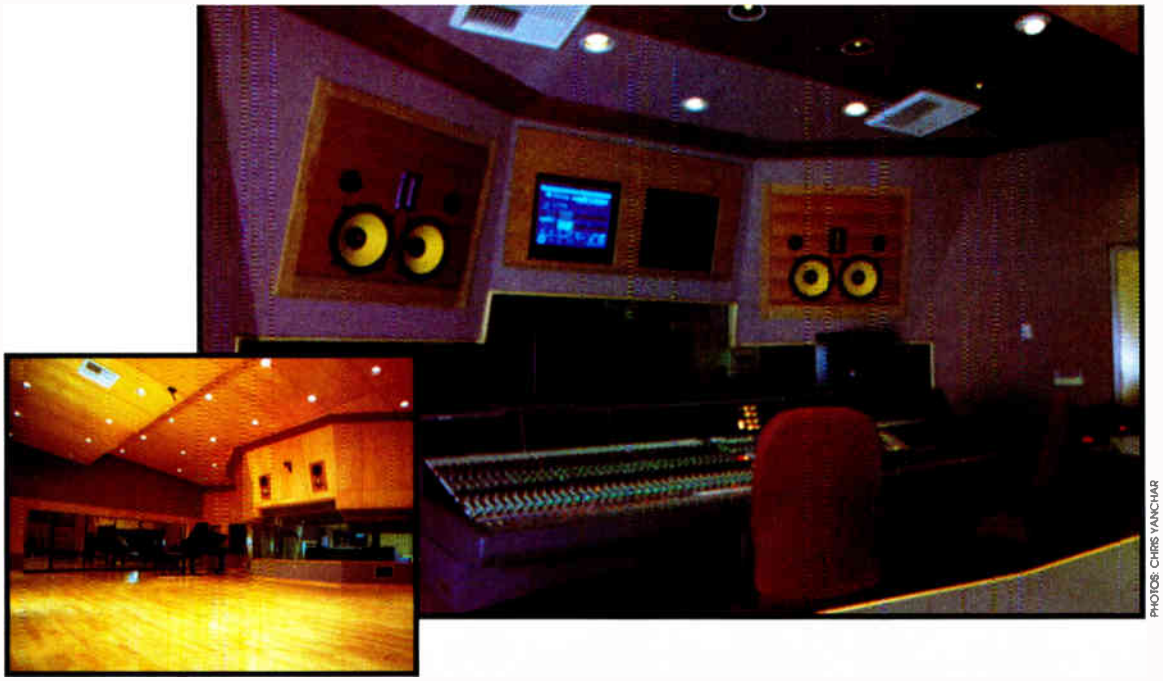
"CDIS places a profound emphasis on the basics of media technology," explains CDIS president and CEO Niels Hartvig-Nielsen. "Graduates come out with a very 'can-do' approach to the technology. This attitude extends to their entire outlook on the industry: They understand they will need to work their way up through the ranks of the media business. We give them the skills and the confidence to do just that." ■

At a Glance

Name: Center for Digital Imaging and Sound **Contact:** Admissions Office **Major Courses of Study:** Recording Arts Foundation (Certificate); Recording Arts Production–Music/Post Production (Diploma); Recording Arts Master-Music/Post Production (Diploma); iMIX Independent Entertainment Artist/Producer (Diploma) **Degrees Offered:** Diploma, transfer of credits to Liverpool Institute for Performing Arts (U.K.) and the University of Phoenix for accredited undergraduate degree available **Accreditation:** Private Post Secondary Education Commission of British Columbia; registered with the Ministry of Advanced Education, Student Services Branch **Main Technology Platforms:** RADAR 24, Pro Tools, Neve, Amek, Studer, Tascam, Mackie, Yamaha, Roland, Sony, Genelec, JBL, Macintosh **Tuition:** $11,000 per year, Canadian **Financial Assistance:** Various commercial, proprietary and government programs available, as well as scholarship programs. Consult a Program Adviser for details.

CDIS
artschool.com

Center for Digital Imaging and Sound
3264 Beta Avenue
Burnaby, BC, Canada V5G 4K4
Tel.: 604/298-5400; 800/661-1885
Fax: 604/298-5403
Website: www.artschool.com
E-mail: info@artschool.com



PHOTOS: CHRIS YANCHAR

Citrus College Recording Arts Program

The Recording Arts Program at Citrus College has been in place since 1998 and continues to evolve and expand, offering a broad range of classes and a varied curriculum taught by experts. Main tracks include Fundamentals of Audio Technology and Recording Studio Workshop I (taught as a pair, including both analog and hard disk recording); MIDI, Computers and Music, which provides the skills to work with sequencers in a studio environment; Live Sound Reinforcement, which serves as a first step toward a concert/event engineering career; Critical Listening Skills for Engineers; Advanced Audio Technology and Recording Studio Workshop II (also taught in tandem); Digital Audio Technology, which is an intense Pro Tools course with mixing, editing and audio-for-video projects; Acoustics for Engineers, with an emphasis on acoustical reflections, absorption, surfaces and speaker placement; and the Music Business/Audio Careers, which deals with the business aspects of the music industry, from records to movies, rates, contracts, royalties and career choices.

Citrus College students train on contemporary technology platforms in studios professionally designed by Carl Yanchar of Wave:Space Inc. The facilities function as both a teaching environment and as a working studio available for commercial rental, which enhances the real-world benefit of the program.

Studio A is the main tracking studio, equipped with a 72-input Neve VR Series console with Flying Faders automation. Studio B, equipped with a Euphonix CS2000 72-channel console with Cube matrixing and 7.1 surround mixing capability, offers two iso booths and is used to teach overdub and mixing techniques. The Digital Audio Computer Lab is equipped with 25 Pro Tools|MIX workstations and Digital Performer 3.0, as well as consoles, MIDI keyboards and modules.

As a commercial studio, Citrus College's facilities have been used for a wide range of major productions, including music scores for *L.A. Law*'s reunion and a remake of the classic film *High Noon*, as well as a variety of film/TV sessions for companies such as HBO, Warner Bros., The Walt Disney Company and Nickelodeon.

"The philosophy of the program is to give a well-rounded, basic education of how the industry works and the equipment and techniques involved so that a student can go out, get a job in a studio and not only understand the technical aspects, but also the musical and budget considerations," explains Tim Jaquette, recording supervisor at Citrus. "Since we are also a rental facility, we take the opportunity to have students first observe and then assist on professional sessions so that they get a real concept of what goes on in a studio. These sessions vary from custom albums to film and television scores to stage show underscores, so there are a wide variety of environments for students to participate."

In addition, the Recording Arts Program at Citrus College plans to add programs focusing on post-production, film score mixing and record production; a new high-definition TV program is currently in the planning stage.

The Recording Arts Program also has an excellent internship program and graduate placement. This service has helped graduates achieve positions at major facilities including Cello Studios, Cherokee Studios, Martin Sound, Sony Pictures, Enterprise Studios, Studio 56 and at NARAS. ■

At a Glance

Name: Citrus College Recording Arts Program **Contact:** Tim Jaquette, recording supervisor **Major Courses of Study:** Audio Recording, Sound-for-Picture, Digital Audio Ed ting and Mixing, and Live Sound Engineering **Degrees Offered:** Certificate; A.S.-certification pending **Accreditation:** Western Association of Schools and Colleges **Main Technology Platforms:** Neve VR Series, Euphonix CS2000, Digidesign Pro Tools **Tuition:** California resident, $396; out of state, $5,148; international $6,084 **Financial Assistance:** State and federal grants, (i.e., Pell Grants, Federal Work Study, etc.) and other funding sources.

Citrus College

Citrus College Recording Arts Program
1000 West Foothill Blvd.
Glendora, CA 91741
Tel.: 626/852-8061
Fax: 626/852-8063
Website: www.citrusstudios.org
E-mail: etc@citrus.cc.ca.us

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Conservatory of Recording Arts and Sciences

Established in 1980, the Conservatory of Recording Arts and Sciences moved to a state-of-the-art, 14,500-square-foot,. high-tech campus in Tempe, Ariz., in 1995. Over the years, the mission has remained the same: to comprehensively prepare graduates for a career in professional audio. Consequently, the school's curriculum is constantly updated to keep pace with the rapid advancements in the music industry.

Via intensive lab, studio and classroom hours working hands-on with top-tier technology, the Conservatory's 37-week/900-hour Master Recording Program II (MRP-II) is geared solely and exclusively toward audio engineering and production. Graduates have achieved Gold and Platinum sales awards, and one Grammy nomination thus far.

The Conservatory has created a highly focused curriculum and philosophy aimed at producing goal-oriented graduates. The school practices a selective enrollment, seeking only the most motivated applicants. Class sizes are kept small, never exceeding 12 students per instructor, an excellent teacher-to-student ratio, where faculty can better convey the knowledge and benefit of their own experience in the industry.

Furthermore, the Conservatory is unique in that the school's internship program is mandatory, assuring extensive experience in a real-world environment as part of the education process. A dedicated internship office staff works to match students with specific facilities requested by students.

"We have kept ourselves relatively small by design," explains John F. McJunkin, senior admissions representative. "The students who are here are ones who should be here, because they have shown a genuine commitment to a serious career path in this industry. There's tremendous synergy between that and the fact that our faculty is similarly committed to the success of our students. That's evidenced by the very, very low turnover in staff we have here. That gives the teaching process a lot of continuity."

Students at the Conservatory work on a high level of equipment designed to reflect the reality of what's found in today's top-echelon recording and mixing facilities. The flagship A Room features an SSL 4056 G-Plus; acoustically, this traditional live end/dead end room is considered by many to be the finest studio in the Southwest. The B Room is a sophisticated production environment including a 32-input Neotek Elite console. The C Room console is a Neve VR-48, fitted with Flying Faders automation, recall and built-in dynamics processing. These studios also feature analog and digital recording systems from Studer, Tascam and Otari. The D Studio is a specialized environment for training in surround mixing. The Pro Tools Lab features six audio and video workstations. The Conservatory's Live Sound room is set up in a stage-like environment, so students can gain real-world experience in setting up and mixing. Other facilities include the multi-workstation Digital Recording Lab and the Studiomaster Mixdown Lab.

"Our formula is very simple," observes Kirt Hamm, the Conservatory's administrator. "We select the best and brightest applicants, then award-winning professionals educate them on world-class equipment. We are focused: We don't teach any video or digital animation or Web design. We have one iron in the fire, and we're very good at it. We have painstakingly developed a world-class curriculum that covers every detail of what you need to know to start a successful career." ■

At a Glance

Name: Conservatory of Recording Arts and Sciences **Contact:** John F. McJunkin, senior admissions representative **Major Course of Study:** Master Recording Program II (MRP-II) **Degrees Offered:** Diploma program; authorized education and certification center for Avid/Pro Tools, TC Electronic, SIA Smaart, Waves **Accreditation:** Accrediting Commission of Career Schools and Colleges of Technology (ACCSCT); licensed by the Arizona State Board for Private Post-Secondary Education; Job Training Partnersnip Act (JTPA); The Arizona State Approving Agency for Veteran's Training **Main Technology Platforms:** SSL, Neve, Pro Tools, Studer, Neumann, Otari, Yamaha and more **Tuition:** $12,500 **Financial Assistance:** A variety of federal and other financial assistance programs are available, including Stafford Loans, Pell Grants, PLUS program, VA benefits and other financial resources.

CONSERVATORY of Recording Arts & Sciences

Conservatory of Recording Arts and Sciences
2300 E. Broadway Rd.
Tempe, AZ 85282-1707
Tel.: 800/562-6383; 480/858-9400
Fax: 480/829-1332
Website: www.audiorecordingschool.com
E-mail: info@.cras.org

Ex'pression Center For New Media

In January of 1999, Ex'pression Center For New Media arrived on the educational scene at the same time that the media industry itself was hitting its stride. Located in a stunning, ultramodern building in the heart of the San Francisco Bay Area, Ex'pression was also at the boom's nexus in Silicon Valley, where so much of the new-media engine was developed—the home of technology pioneers such as Dolby, Pixar, and Industrial Light & Magic. The school is also in-tune with the area's values; for instance, much of Ex'pression's power is generated by alternative sources, such as nearby wind farms, and recycling has always been part of the culture at the school.

Ex'pression takes full advantage of its time and place, applying leading-edge but proven educational techniques to the media arts and sciences. The school's three main degree programs—Sound Arts, Digital Visual Media and Digital Graphic Design—utilize the Total Immersion methodology. Total Immersion was originally developed and introduced during World War II, with spectacular and tangible results, quickly and effectively teaching U.S. military and intelligence personnel language, technology and other skills. At Ex'pression, these same learning techniques, applied to an intense 14-month program, convey media skills with an exceptional degree of comprehension and depth. Students learn not only the mechanics of media technology, but also the culture and application of media. And, they do it working on complex projects start to finish, rather than in isolated fragments.

Classes at Ex'pression begin every two months, six new classes a year, 30 students to a class. The design of the campus center helps students maximize their experience. For instance, the innovative Tascam Heptagon Studio allows six control rooms to simultaneously but discretely access live sessions in a central recording studio, while the instructor can monitor and assess individual activity from a main control area. And with access to the equipment available on a 24/7 basis, Ex'pression's Total Immersion approach teaches more than just technique. As Karen Wertman, the school's director of marketing, puts it, "They learn endurance, which any veteran of a recording studio will tell you is a critical trait to success." Another benefit of such universal access is that students are able to build extensive and diverse personal achievement portfolios, which become their calling cards upon graduation.

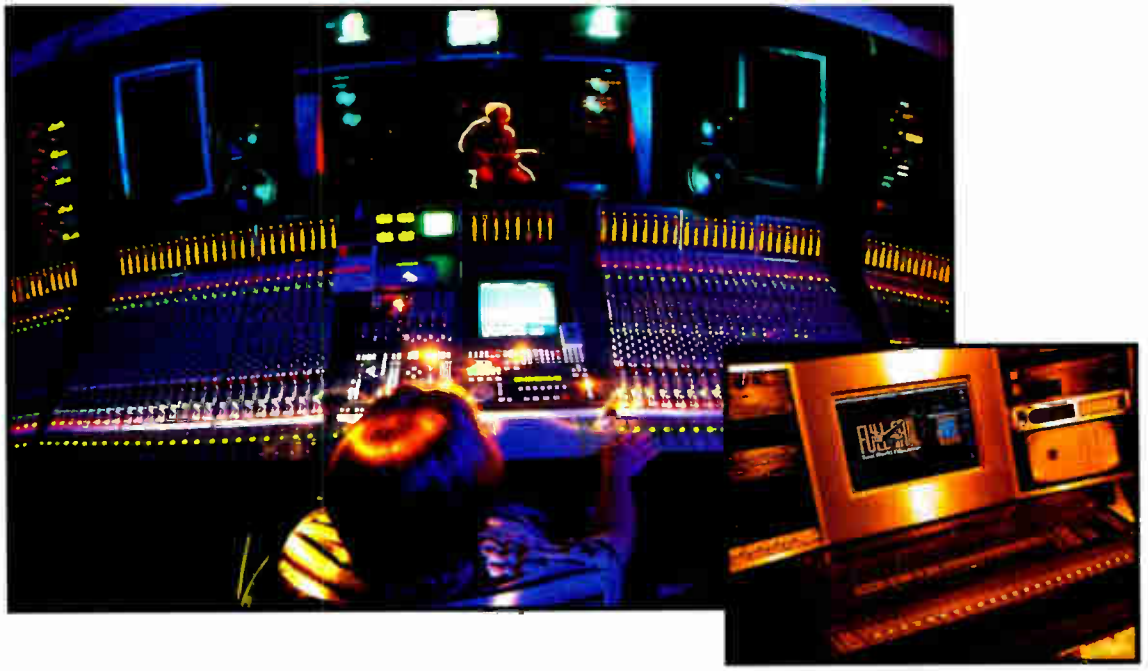
Ex'pression offers SSL G-Plus and Neve VR analog studios to familiarize students with the main boards in the real world. The facility also includes a showcase 5.1 room featuring the latest version of the Studer D-950 digital console, for which Ex'pression was a major beta test site. Even the streaming Web workstations have 5.1 surround audio capability.

Expression was created as a true "center" for media experimentation and discovery. Students in each degree program take basic courses in all three major degree tracks, providing a solid foundation in media arts. For instance, incoming students all work on a multimedia project, such as a film or computer game, which requires audio, video, special effects and animation, but also requires script creation and casting. In this way, media technologies are directly applied, often by teams, to real projects. And, adds Wertman, "That's a combination that builds success skills that will last a lifetime." ■

At a Glance

Name: Ex'pression Center For New Media **Contact:** Yee-Ju Riddell, director of admissions **Major Courses of Study:** Sound Arts, Digital Visual Media and Digital Graphic Design degree programs **Degrees Offered:** A.A.S or B.A.S degrees via 14-month Total Immersion program **Accreditation:** Licensed and degree granting by State of California, Bureau of Private Postsecondary & Vocational Educational (BPVVE) **Main Technology Platforms:** SSL, Neve Studer consoles; Otari, Studer analog media; Digidesign Pro Tools; other major technology systems **Tuition:** $32,950, includes all course material and supplies **Financial Assistance:** Student loans available through various programs, including Sallie Mae and other private funding.

Ex'pression Center For New Media
6601 Shellmound Street
Emeryville, CA 94608
Tel.: 877/833-8800 (toll-free); 510/654-2934
Fax: 510/658-3414
Website: www.expression.edu
E-mail: data@xnewmedia.com



Full Sail Real World Education

One of the pioneering facilities in media education, Full Sail Real World Education has been in continuous operation since 1979. In 1989, the school undertook an ambitious construction program that turned a 30,000-square-foot facility into a spacious and spectacular campus, in which 280,000 square feet of classroom, laboratory, lecture hall and studio space offer the 3,000-plus students a comprehensive array of media arts career tracks. And, Full Sail continues to expand, regularly adding new educational facilities and curricula additions, reflecting continued changes in the professional media industries. "The industry never stops evolving, so why should we," states Bill Smith, program director for Full Sail.

Full Sail offers well-planned and real-world-based curricula that cover six main fields of media arts: Recording Arts, Film, Digital Media, Show Production & Touring, Game Design & Development, and Computer Animation. Each of these degree paths culminates in a fully accredited Associate of Science (A.S.) degree. Furthermore, Full Sail has deftly adapted its various career tracks to reflect the interactive and converging nature of the media industry. Exposure to such a wide range of media choices helps students refine their own career goals as they progress through the curricula.

Helping students achieve their goals is a large and diverse staff of instructors, many of whom are also working professionals within their respective academic areas. "In fact, that's one of the prime directives of our mission statement," notes Smith. "Most of our instructors are still active and successful in their fields. This is not a place for retired engineers to come and teach; we are focused on people who can deliver what they did in a session yesterday to a lecture today. This is truly what sets Full Sail apart."

The school also has a rigorous student-to-teacher ratio goal, which varies according to course type and application. For instance, in Full Sail's well-equipped audio recording studios, the ratio is never more than six-to-one when students are sharing equipment. Full Sail has all major analog and digital console types, including SSL, Neve and Amek, as well as 24 full-sized Digidesign Pro Tools systems. It is also the site of the largest Unity network server in the country, with all Pro Tools and Avid editing systems networked, because they are in the most advanced media environments. Visiting lecturers from various genres of the media and entertainment industry, from record label executives to legendary engineers, regularly augment the planned study course, further broadening the vistas of students.

Full Sail's graduates continue to find success throughout the entertainment industry. Last year alone, three Full Sail graduates were nominated for Grammys, 24 worked on Grammy-winning projects, and 75 worked on Grammy-nominated projects. Grads also worked on some of this year's biggest releases, including Creed's *Weathered*, Jennifer Lopez' *J to the L-O* and OUTKAST's *Stankonia*.

Full Sail grads also earned credits on some of this year's biggest motion pictures including *Lord of the Rings*, *Spider-Man* and *Black Hawk Down*, and worked on animated movies such as *Ice Age* and *Lilo & Stitch*. And in the sound reinforcement arena, Full Sail graduates have been working on some of the biggest tours including U2's Elevation Tour, NSync's Celebriy Tour, Paul McCartney and Ozzfest.

"The goal at Full Sail is for our graduates to enter directly into the mainstream of the media industry, at any level," Smith explains. "From small recording studios to major post-production and film studios, a Full Sail graduate is ready for anything." ■

At a Glance

Name: Full Sail Real World Education **Contact:** Admissions Department **Major Courses of Study:** Recording Arts, Film Digital Media, Show Production & Touring, Game Design & Development, Computer Animation **Degree Offered:** A.S. **Accreditation:** ACCSCT **Tuition:** Depending upon course of study, ranges from $30,000 to $32,000 **Financial Assistance:** Yes.

FULL SAIL
Real World Education

Full Sail Real World Education
3300 University Blvd.
Winter Park, FL 32792
Tel.: 800/226-7625
Website: www.fullsail.com
E-mail: admissions@fullsail.com

Future Media Concepts

Founded in 1994, at the cusp of the new-media revolution, Future Media Concepts offers a unique approach to digital media training. Dozens of courses, ranging from entry level to master class, and configured in concise and intensive formats allow students to create a customized curriculum covering the entire spectrum of digital media arts—nonlinear sound and video editing, sound design, Web design and programming, video streaming, DVD authoring, 3-D animation, compositing and desktop publishing.

FMC is renowned throughout the industry as one of the world's leading Pro Tools training facilities, with an ideal learning environment and suites equipped with Pro Tools Mix 24 and HD systems. The successful completion of these courses leads to official certification, by Digidesign, as a Pro Tools operator or Pro Tools expert, as well as other important benefits, including a listing on Digi ProNet and the right to use a special logo on their business cards.

"The courses are intensive, the testing is serious, and programs are designed to allow the pro audio industry to immediately distinguish the real experts in Pro Tools," says Jeff Rothberg, FMC VP and co-founder.

With learning centers in New York City, Boston, Washington, D.C., and Philadelphia, FMC works in strategic cooperation with leading manufacturers and developers to assemble a course of study. This ensures that graduates get the most comprehensive training on the absolutely latest versions of the most widely used hardware and software systems in the entertainment media industry. In addition to Avid/Digidesign, FMC is also a manufacturer's authorized training center for Adobe, Apple, Macromedia, Sony, Softimage, Newtek, Discreet, Pinnacle, Boris/FX and others.

Future Media Concepts' instructors have applied their extensive real-world experience to help students transition into careers in the expanding digital media industry. The courses are also available to professionals who wish to enhance their existing skills and broaden their marketability. "We purposely target technology platforms that are the most widely used in the media industry," explains Rothberg. Another benefit of FMC's approach to learning is its small class sizes (only four to six students per hands-on course). And FMC has designed its Master Class course groupings to give trainees a solid foundation in their particular software of interest.

The approach has worked brilliantly for over eight years, and has provided quality digital media training for individuals from major broadcast and cable networks (including ABC, NBC, CBS, USA Networks and MTV), major post-production facilities and major corporations. FMC's instructors have traveled to as far as Japan and Singapore to provide onsite digital media training, and they are constantly re-certified as new versions of systems/software come to market, keeping their students on the cutting edge.

Finally, FMC offers one of the most extensive quality guarantees in the industry: If, for any reason, a participant feels he or she has not received the full benefit from a course, then he or she can audit the same course at no additional charge. "Our goal is to get the student up to speed on specific technologies as quickly and as efficiently as possible," says Rothberg. "We call it 'just-in-time training,' and it really works." ■

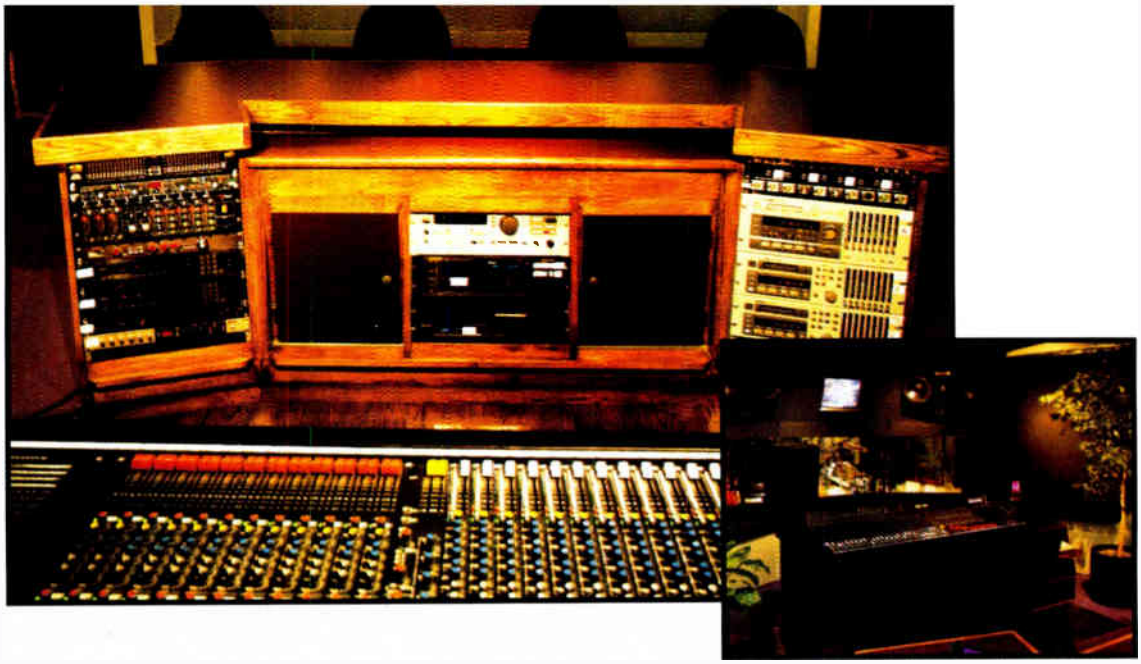
At a Glance

Name: Future Media Concepts **Contact:** Scottf@fmctraining.com **Major Courses of Study:** Nonlinear video editing, sound design, Web design and programming, video streaming, DVD authoring, 3-D animation, compositing and desktop publishing **Degrees Offered:** Manufacturer's Certificates, Pro Tools Certification Program **Accreditation:** New York State Department. of Education, accreditation pending; manufacturer-approved training on all technology platforms **Main Technology Platforms:** Digidesign Pro Tools; Avid Media Composer, Xpress and Unity Media Net; Sonic DVD Creator; Apple Final Cut Pro, Quicktime; Macromedia Director, Flash MX, Dreamweaver MX; Adobe Photoshop, After Effects, Premiere, Acrobat; QuarkXpress; and many others **Tuition:** depends on level and intensity of curriculum chosen; ranges from two-day introductory class to master classes **Financial Assistance:** Various financing options available.

Future Media Concepts
Training a New Generation of Digital Artists

digidesign | AUTHORIZED PRO SCHOOL

Future Media Concepts
305 E. 47th St.
New York, NY 10017
Tel.: 212/888-6314
Fax: 212/888-7531
Website: www.fmctraining.com
E-mail: info@fmctraining.com



Harris Institute for the Arts

Founded in 1989, Harris Institute for the Arts offers two comprehensive career educational tracks, each leading to a fully accredited post-secondary diploma. Both tracks cover the music entertainment industry from a wide range of perspectives, and each makes use of a highly practical and signature approach to learning.

Harris Institute's Recording Artist Management (RAM) program and Producing/Engineering Program (PEP) have an extensive array of classes in up to 50 subject areas. The RAM curriculum covers the entire spectrum of music industry business, including artist management, concert promotion, publicity, marketing and promotion. The PEP track offers an in-depth, one-year program that covers the entire array of analog and digital audio production and engineering, ranging from large-scale analog consoles and traditional tracking sessions, to nonlinear digital audio production, mixing and editing, as well as sound-for-picture courses.

But what makes Harris Institute's curricula most unique is its creation of a very real working environment for each career track. In the RAM program, for instance, students operate in groups of three and literally start their own businesses in artist management, concert promotion and other areas. They will then scout, sign, develop and market recording artists, signing them to actual independent record labels, or they will promote full concert tours. In the PEP curriculum, students learn not only the basics of recording technology in lectures and classrooms, but will also record and produce their own artists. Furthermore, the PEP program places detailed emphasis on music business and integrates coursework into the overall curricula. Thus, production students study and implement fundamental principles of contract negotiation, such as royalty points and advances.

"The things that characterize the learning process at Harris Institute are that every component of the curricula is taught with a truly hands-on, pragmatic application of the principles the students are learning about," explains school founder and president John Harris. "Our approach is not one of immersion learning, but of exposure to the widest array possible of technologies, techniques and situations. Few industry veterans will have seen as many potential scenarios as our students will experience in a year's time."

Harris Institute's PEP program provides a wide range of technologies, from the large Amek Big-equipped tracking studio to the MIDI and audio post-production studios outfitted with systems such as Pro Tools, Logic and Cubase. Harris Institute's faculty mirrors the school's educational philosophy, employing 54 educators who are working professionals. For instance, the Institute's studio facilities were designed by a faculty member, Martin Pilchner of Pilchner/Schoustal Associates, a world-renowned, Toronto-based acoustical design firm. "You're able to learn acoustical and studio design principles from a professional—not only in a great studio facility, but one that the teacher designed himself," says Harris. "There's a tremendous educational synergy there, like learning archaeology onsite."

One other element that sets Harris Institute apart is its socially conscious approach to learning and business, as illustrated by the Harris International Media Arts Program (MAP). This generous program brings together students from violence-torn areas, such as Northern Ireland, and promotes peace and reconciliation through the media arts.

"We're especially proud of the MAP program," says Harris. "It's all part of an approach to education that emphasizes a realistic environment and entrepreneurship." ■

At a Glance

Name: Harris Institute for the Arts **Contact:** Lance Reckzin, registrar **Major Courses of Study:** 12-month courses in Recording Artist Management (RAM) and Producing/Engineering Program (PEP) **Degree Offered:** Diploma program **Accreditation:** Ministry of Training, Colleges & Universities of Ontario (MTCUO) **Main Technology Platforms:** Amek, Digidesign Pro Tools **Tuition:** RAM program, $8,844 Canadian; PEP program, $11,508 Canadian **Financial Assistance:** Part of Canada Student Loan (CSO) program and Ontario Student Assistance Program (OSAP); available for students who qualify.

HARRIS INSTITUTE FOR THE ARTS

Harris Institute for the Arts
118 Sherbourne St.
Toronto, Ontario M5A 2R2
Tel.: 416/367-0178
Fax: 416/367-5534
Website: www.harrisinstitute.com
E-mail: harrisinstitute@rogers.com

Middle Tennessee State University (MTSU)

Middle Tennessee State University's Department of Recording Industry and its Recording Industry Major (RIM) program were initiated in 1976. Since then, the program has remained remarkably focused on its two primary academic paths—Production & Technology and Music Business—both of which are four-year Bachelor of Science degree tracks. However, the RIM program's core focus on the technical and business aspects of the music industry is set in a unique context: While it has always been an autonomous program, RIM is situated within MTSU's acclaimed College of Mass Communication. As a result, the RIM program has substantial synergies with Mass/Comm's own media curricula, including study courses in radio and television broadcasting, and digital multimedia. Furthermore, MTSU itself is a large, fully accredited state university with entire colleges within it, including schools of business and music, all of which are available to RIM program students.

"It's that very comprehensiveness that sets MTSU apart," observes Chris Haseleu, chairman of the Recording Industry department. RIM students can choose a minor from an eclectic but highly complementary array of possibilities, without any base-course restrictions. Adds Haseleu: "You can major in Record Production and minor in Business or Music—both very applicable to the major—but without having '17th-Century Counterpoint' as a required base course." Other related minors include Business Administration, Computer Science, Electroacoustics, Entertainment Technology, Entrepreneurship, Film Studies and Theatrical Design.

Students attending MTSU's RIM program will find the school has made a substantial investment in technology. Inside the 90,000-square-foot Mass/Comm building are three full recording/mixing studios, including one fitted for 5.1 mixing; a nine-station MIDI lab; a nine-station digital media lab; a digital imaging and animation lab; an ENG news room; a $1 million 30-foot mobile tele-production vehicle; and a pair of audio post-production stations, all equipped with cutting-edge equipment, including SSL, Studer and Otari digital and analog consoles, Digidesign Pro Tools 24 Plus and SADiE workstations, and Studer and Sony analog and digital multitrack decks. Haseleu points out that the facility is open 24/7, so hands-on time for the approximately 1,400 RIM students is ample.

A state university, instructors at MTSU must have at least a Master's degree; extensive and ongoing experience in their respective fields is required. Thus, students receive top-notch instruction from teachers familiar and comfortable with both the academic and professional environments.

MTSU's RIM curricula encompass all types of music—evidenced on the school's acclaimed annual CD compilation of student recordings—but it does benefit from the school's proximity to Nashville. Visiting lecturers come from the working ranks of the city's music industry elite, including record producers, engineers, record label executives and musicians. Those same connections contribute greatly to MTSU's successful intern and graduate-placement program.

Says Haseleu, "Our Music Business and Production programs are as close as you can get to a truly liberal arts-based approach to media education." ■

At a Glance

Name: Middle Tennessee State University (MTSU) **Contact:** Admissions Office **Major Courses of Study:** Production & Technology, Music Business; Master's Degree program in development **Degree Offered:** B.S. in Recording Industry **Accreditation:** Southern Association of Colleges & Schools (SACS) **Main Technology Platforms:** SSL, Studer and Otari digital and analog consoles; Pro Tools 24 Plus (4) and SADiE workstations; Studer and Sony 24-track digital and Studer 24-track analog multitrack decks **Tuition:** In-state, full time, $1,597/semester; out-of-state, full time, $4,833/semester **Financial Assistance:** Pell Grants and others. Scholarships available.

MIDDLE TENNESSEE STATE UNIVERSITY

Middle Tennessee State University (MTSU)
P.O. Box 21 MTSU
Murfreesboro, TN 37132-0021
Tel.: 615/898-2578
Fax: 615/898-5682
Website: www.mtsu.edu/~record/
E-mail: record@mtsu.edu

Musicians Institute

Musicians Institute has taken an organic approach to music and media education ever since the facility opened its doors in 1977. The result is a hands-on approach to music education as an effective alternative to the traditional, theory-based path to becoming a music professional, taught by a close-knit and dedicated group of artists, technologists, educators and music professionals.

While the curriculum is designed to accommodate a variety of individual student goals—the Institute offers three-month to four-year Bachelor of Music programs to students of guitar, bass, drums, keyboard and vocals—the school's approach to teaching the recording arts and sciences is equally innovative and effective, with a unique two-pronged approach.

The Recording Institute of Technology (RIT) program is a six-month intensive course of study tailored to students who intend to pursue careers in the professional studio industry. Classes on microphone placement, recording techniques, editing, mixing and working in the studio environment offer a skill set that allows graduates to move easily into engineering careers.

RIT students will work in a million-dollar studio facility designed by the renowned studio bauston architects, and they have available to them the finest technology platforms, such as SSL and Neve automated consoles and analog and digital multitrack systems.

Musicians Institute's intensive six-month Recording Artist (RA) program provides a unique approach that accurately reflects the state of the music business today. Using a combination of technologies and techniques found in most personal and project studios—programs like Reason, Recycle, Nuendo, along with Mackie mixers—RA students learn how to maximize session time and how to take control of recording their own music and career paths. RA students also benefit from practical classes in music business, songwriting and copyrights, and they are exposed to distribution and promotion strategies, including Website design.

The RIT and RA programs operate in parallel with Musicians Institute's traditional music instruction, which offers up to a Bachelor's degree in music, allowing students to take advantage of an eclectic range of educational offerings in several ways. For instance, RIT students can use the live music performance workshops, which take place every day in the Institute's 500-seat theater and two 50-seat performance suites, to hone their abilities on tracking sessions; the live spaces are wired to Control Room A. RA students can also participate in these sessions, as well as in the Institute's acclaimed and informal open-counseling sessions with staff instructors and visiting artists.

Musicians Institute offers other benefits, including a well-developed internship and placement program, which takes full advantage of the school's location in the heart of Southern California's studio industry.

"All of the programs at Musicians Institute, as well as the Institute itself, were designed to make the most of music and technology interacting with each other," says Steve Lunn, the Institute's director of admissions. "And, every graduate from any of our programs leaves with an education that is far more than the sum of those parts." ■

At a Glance

Name: Musicians Institute **Contact:** Steve Lunn, director of admissions **Major Courses of Study:** Recording Artist (RA), Recording Institute of Technology (RIT); also a range of customized degree and certificate programs for guitar, bass, drums vocals and keyboards **Degrees Offered:** RA and RIT programs are intensive, six-month, full-time programs leading to a Certificate; Bachelor of Music degree (instrument or vocal studios only); Encore Program (customized non-certificate) **Accreditation:** National Association of Schools of Music (NASM) **Main Technology Platforms:** SSL and Neve consoles, Digital Performer 3, Pro Tools, Nuendo, Recycle, Reason **Tuition:** $10,000 (RIT); $8,000 (RA) **Financial Assistance:** For all programs except Encore. Title IV Federal financial aid program and alternative loans also available.

Musicians Institute
1655 McCadden Place
Hollywood, CA 90028
Tel.: 800/255-7529
Fax: 323/462-6978
Website: www.mi.edu
E-mail: admissions@mi.edu

PHOTOS: RIK SFERRA

Musictech College

Musictech College is a leader in contemporary music education, attracting the finest students and faculty both nationally and internationally. Over the past 17 years, the college has developed one of the most advanced recording and production programs in the country, alongside a prestigious school for professional musicians. Musictech College offers an Associate of Applied Science degree in Recording and Production Technology, as well as AAS degrees in Music Business, Motion Imaging and Music (for guitar, bass, drums, keyboard, vocals, brass, woodwinds).

At Musictech College, recording students follow a curriculum crafted by industry professionals, including multi-Platinum record producer and engineer Chopper Black and veteran engineer, producer and musician Scott Jarrett. Musictech College's new 100,000-square-foot campus includes the region's largest recording complex, with nine studios, a MIDI lab, a Pro Tools lab and a synthesizer lab for group learning and theory classes. Each studio at Musictech is designed to provide training on equipment found in the range of professional recording environments. From the most advanced all-digital 5.1 surround equipment and an SSL board to more traditional analog consoles and processing equipment, recording students at Musictech have hands-on experience on a wealth of gear found in professional studios worldwide.

Most importantly, students at Musictech can reserve private studio time to hone their craft on personal recording projects. "It's a dream lab," says Scott Jarrett, head of the Recording and Production department. "On their first day at Musictech, students are working on some of the best equipment in the industry, and then they have the opportunity to use it after-hours. It makes me want to go back to college."

By their third semester at Musictech College, recording students are working with Chopper Black in Studio 1, which features an SSL 6048 G-Plus with Total Recall; Lexicon, Eventide, TC and Yamaha effects processing; Avalon and Aphex dynamics; and recording to an Otari MTR-90 analog or directly to Pro Tools. Studio 2 houses a Trident Series 80B console and has a performance space identical to Studio 1 with a Kawai grand piano. The all-digital Studio 3 boasts a Sony DMX-R100 automated 5.1 surround console, Blue Sky monitors and recording to an iZ Technologies RADAR 24. Studio 3 shares a performance space and isolation booth with Studio 4, where first-semester students cut their teeth on all-digital equipment using a Ramsa DA-7 digital console.

Musictech launched a new Motion Imaging program this year, opening an additional creative realm to students with training in digital photography and video, multimedia design and nonlinear editing. Beginning with the fall 2002 semester, Musictech will also offer a diploma program in Live Sound, utilizing a new 300-seat recital hall. Students also gain hands-on experience in professional venues—from clubs to arenas—throughout the Twin Cities.

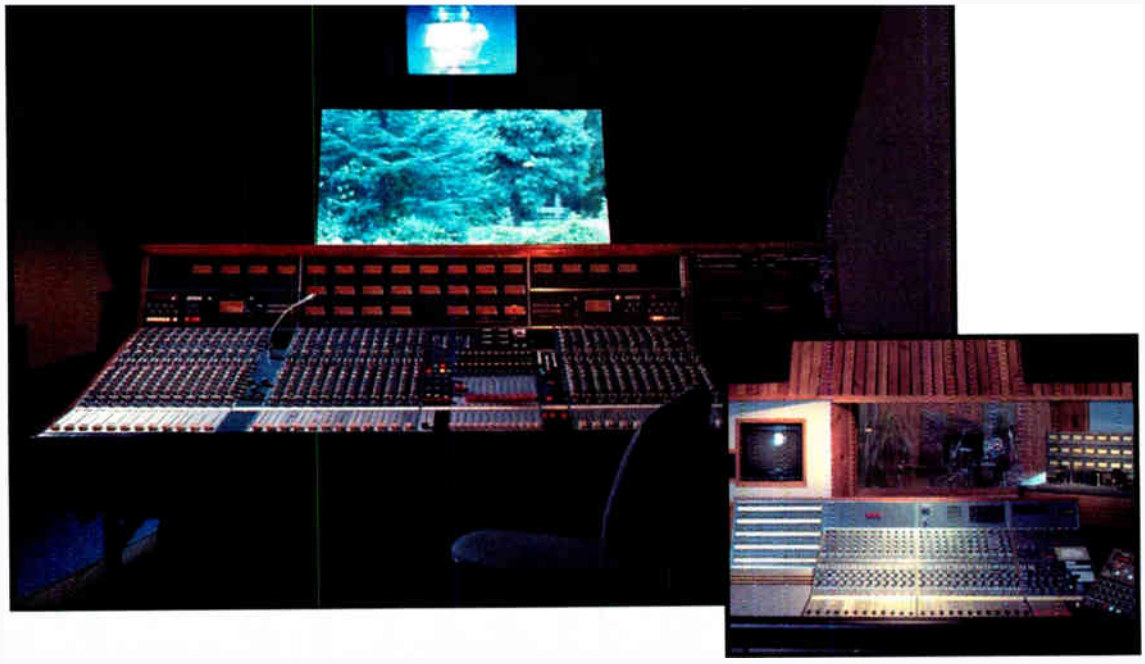
"We have worked for 17 years to create a great place for musicians, producers and engineers to come together and practice their craft," says Jack McNally, president of the college. "And with a new campus, new equipment and some of the best faculty in the nation, our future looks brighter than ever." ■

At a Glance

Name: Musictech College **Contact:** Debbie Sandridge, director of admissions **Major Courses of Study:** Recording and Production, Music Performance, Music Business, Motion Imaging **Degrees Offered:** Associate of Applied Science (AAS) in Recording Technology, AAS in Music, AAS in Motion Imaging, AAS in Music Business, Advanced Professional Musicians Course, Diploma Programs in Guitar, Bass, Percussion, Keyboard and Vocal Music. Through a direct-transfer agreement, Musictech students can continue on to a Bachelor of Arts degree in Music at Augsburg College **Accreditation:** National Association of Schools of Music (NASM) and licensed by the State of Minnesota Higher Education Services Office **Main Technology Platforms:** SSL, Trident, KRK, Digidesign/Pro Tools, AKG, Neumann, Otari, Blue Sky, Sony, Mackie, Lexicon, RADAR and Yamaha **Tuition:** $7,150 average per semester; four semesters required for AAS **Financial Assistance:** Federal Pell Grants, EOG and Family Educational Loans; Minnesota State Grant, Self Loan and State Work Study; Minnesota Indian Scholarship Fund, JTPA, Veterans Administration, DRS and Musictech Scholarships.

MUSICTECH COLLEGE

Musictech College
19 Exchange St. East
Saint Paul, MN 55101
Tel.: 800/594-9500; 651/291-0177
Fax: 651/291-0366
Website: www.musictech.com
E-mail: dsandridge@musictech.com



Recording Arts Canada

Since its establishment in 1981, Recording Arts Canada has offered a practical and intimate approach to audio education. With two major locations—one just 40 minutes from Toronto, the other a newly renovated facility nestled in the heart of old Montreal—Recording Arts Canada offers a comprehensive curriculum in audio engineering and sound design compacted into a fun, stimulating and intensive 26-week program.

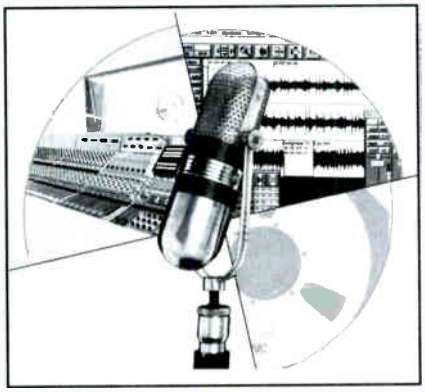
At Recording Arts Canada's world-class facilities, students benefit from a creative and progressive atmosphere that includes a generous 60:40 ratio of "hands-on" studio instruction, along with a seasoned staff of award-winning educators and lecturers who work in many facets of the music and media industries.

Students learn the science and art of music scoring, sound for film and television, interactive media, live sound, MIDI and hard disk digital editing—the core elements of album, radio, television, film and multimedia production.

"It's important for our students to be adaptable to any situation, especially in light of the continuous expansion many of our related industries seem to be going through," says John Keca, Recording Arts Canada's program director. "Our well-rounded curriculum is geared to help students develop their professional skill sets. We're constantly installing the latest technologies to reflect changes in the marketplace so we can equip our students with the tools they need to learn and succeed. At the same time, we're reinforcing the basics to provide a concrete foundation of knowledge."

At a Glance

Name: Recording Arts Canada **Contact:** Admissions department **Major Courses of Study:** Audio Engineering, Computer-Assisted Sound Design and Post-Production **Degree Offered:** Diploma Program in Audio Engineering **Accreditation:** Ontario Ministry of Education and Training, Quebec Ministry of Education, U.S. Department of Education **Tuition:** $8,950 to $13,000, Canadian **Financial Assistance:** Yes.



Recording Arts Canada
PO Box 11025
984 Highway, #8
Stony Creek, Ontario, Canada L8E 5P9
Tel.: 905/662-2666
Fax: 905/643-7520

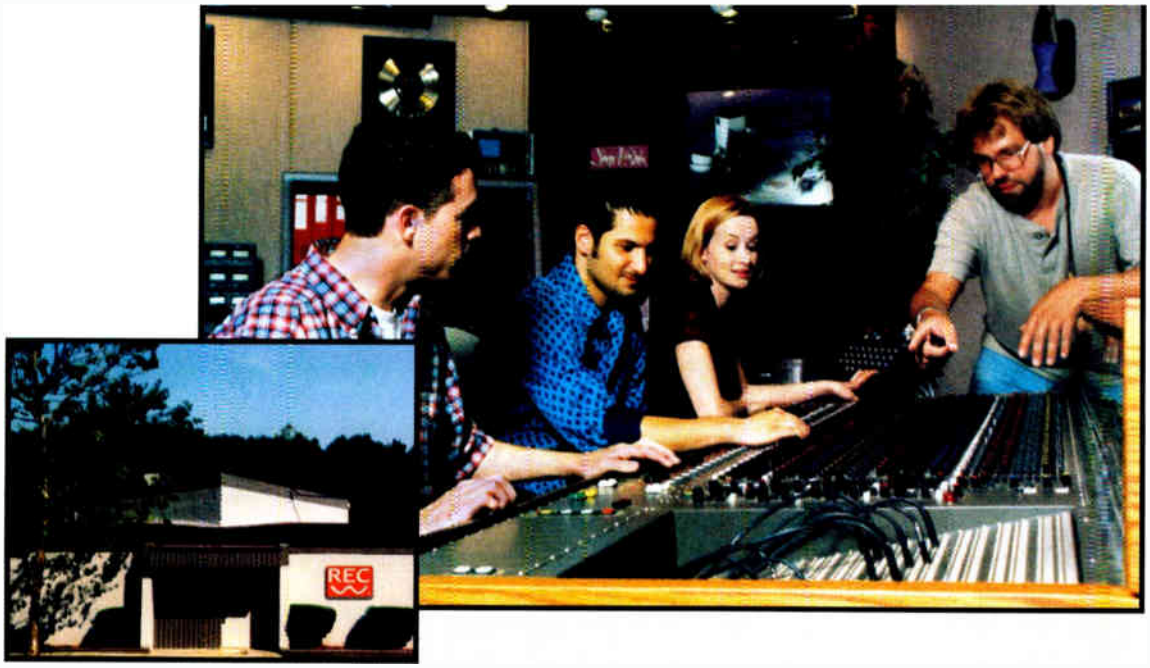
390 Notre-Dame Ouest, Suite 320
Montreal, Quebec, Canada H2Y 1T9
Tel.: 514/286-4336
Fax : 514/286-0650

Website: www.recordingarts.com
E-mail: admissions@recordingarts.com

That knowledge isn't restricted to studio applications. Courses in music aesthetics, product manufacturing and the business of music immerse students in real-life situations. "There's no substitute for occupational know-how," notes Keca. "We help them develop the highest degree of professionalism and technical competence. And, by showing students that there is an interrelated life outside the studio, it allows them to think outside the box, allotting them more options and better preparing them for the future."

RAC is one of the few schools that boasts a trio of vintage large-format Neve studio consoles, but students can complement their analog skills with the latest digital technologies. They include Yamaha 02R and Mackie Digital 8-bus consoles, Tascam MX-2424 hard disk and modular digital multitrack recorders, Macintosh G3 and G4 computers, and such industry-leading workstations as Pro Tools and Digital Performer3.0. Classes max out at 15 pupils and a one-student-per-digital-audio-workstation ratio, ensuring each individual an opportunity to master their newly acquired knowledge at their convenience. Throw in a high job-placement rate, and Recording Arts Canada is confident that its well-rounded curriculum provides its graduates with the proper professional skills needed to succeed—and flourish—in today's dynamic and competitive audio industry.

"By the time a student leaves Recording Arts Canada, we will have imparted him or her with the knowledge to make them an instant fit with their potential employer's needs," promises Keca. ■



Recording Workshop

Recording Workshop, founded in 1971, has just entered its fourth decade of providing a tightly focused curriculum that specializes in short-term training programs for the creative use of professional audio recording equipment in music and post-production. Classes are taught by a staff of 20 experienced, full-time engineer/instructors who work with about 90 students per term; the students come from literally every state and from over 30 foreign countries.

Recording Workshop's educational menu, which garnered a TEC Award nomination, comprises four main programs, each of which cycles seven times a year. The five-week Recording Engineering and Music Production Program builds a strong foundation in the operation of professional studio equipment, incorporating extensive hands-on studio experience in recording and mixing music, as well as projects in sound-for-picture. This program provides a complete preparation to enter the job market, yet it can be enhanced with several optional extension tracks. The Studio Maintenance and Troubleshooting Program teaches routine maintenance of recording equipment and practical methods of finding and fixing common technical problems. It also features exercises in equipment installation and the basics of studio acoustics and design. The Advanced Recording Engineering and Music Production Program substantially extends a student's studio experience, going beyond the mechanics of recording and deeper into the concerns of the record producer. Meanwhile, students become more fluent on equipment, increasing their speediness in the studio. The NewTech Audio Production Program builds upon the basic and advanced engineering courses and offers exercises in the assembly, setup and troubleshooting of computer-based audio production systems. Projects include music mixing/processing, 5.1 surround, sound-for-picture and CD mastering.

Teaching is done in a state-of-the-art environment: Studios A and B were designed by John Storyk and Steven Durr, respectively, as classic tracking and mixing environments. Studios C and D showcase the increasingly widespread, smaller, all-digital environment with Mackie D8B digital consoles and the HDR24/96 hard disk recorder. Studio E is equipped with a Pro Tools|24 MIXplus system to handle sound-for-picture projects. Studio F specializes in audio mastering. Studios G and H are geared to represent the project studio environment, with big doses of DAW and MIDI technology. The Pro Tools Lab has six individual iMac stations with Digidesign software, as well as a select piece of outboard equipment for computer-guided exercises in signal processing.

"We're one of the very few schools that does short-term training right," says Jim Rosebrook, director at Recording Workshop since 1980. "Our short-term programs offer as much curriculum content as some other programs that extend over many months, with a very efficient schedule of lectures and studio classes. Also, students live in on-campus housing, within a one-minute walk of all activities. Our curriculum teaches skills and knowledge that are practical and essential, but also emphasizes skills and knowledge that transcend specific gear and production trends. And, just as importantly, we teach good attitude—we are not cranking out audio 'prima donnas' that expect to sit behind an SSL mixing major artists six months after graduation. We're teaching life-long career skills." ■

At a Glance

Name: Recording Workshop **Contact:** Admissions Office **Major Courses of Study:** Audio recording, engineering, production, maintenance, audio post-production **Degrees Offered:** Certificate programs **Accreditation:** Licensed since 1980 by Ohio State Board of Proprietary School Registration. Associated since 1981 with Capital University Conservatory of Music (Columbus, Ohio) providing 12 semester hours of college credit toward a Bachelor of Arts in Music/Commercial Music Degree **Main Technology Platforms:** Sony, Digidesign, Focusrite, Yamaha, more **Tuition:** Recording Engineering and Music Production Program (five weeks/180 hours), $2,490. Studio Maintenance and Troubleshooting Program (one week/38 hours), $520; Advanced Recording Engineering and Music Production Program (one week/60 hours), $780; NewTech Audio Production Program (one week/36 hours), $780 **Financial Assistance:** Federal, state and commercial finance options available.

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Chillicothe, OH 45601
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Website: www.recordingworkshop.com
E-mail: info@recordingworkshop.com

SAE/Miami

SAE/Miami opened its art deco-esque doors in March 2002, the third U.S. location for SAE's global network of media educational facilities and its 34th school worldwide.

The SAE/Miami location reflects both the nature and the needs of the burgeoning South Florida music recording landscape. The 14,000-square-foot facility offers students 22 studios, control rooms and labs equipped with a wide array of technology platforms designed to address the particular music genres in the region, including Latino and dance music. The curriculum also provides a firm foundation in both basic and advanced recording, mixing and editing techniques common to all music applications.

A key element of SAE's success as a business, and its effectiveness as a teaching institution, has been its skillful tailoring of a program to local and regional markets. In Miami, the learning emphasis is placed on digital recording techniques and formats, most notably knowledge in every step of digital music production, including the creation of loops, waveform editing and virtual mixing. In addition, they learn the basics of music recording and production on the most widely used technology platforms in the industry, including SSL E Series consoles and the world's largest Sony Oxford digital console.

"Miami is becoming the center of digital music production in the U.S.," states Mark Martin, SAE's director of North American marketing and expansion. "We have adapted SAE's core Audio Engineer curricula to take full advantage of what Miami has to offer in this regard. The result is an audio engineering graduate who can work comfortably and be familiar with all of the approaches to hard disk-based recording, as well as handle even the most complex of large recording sessions."

The Audio Engineer program offered at SAE/Miami provides necessary skills for today's successful audio engineer, including the technical and creative aspects of the recording process, along with the peculiarities that arise in complex recording projects. Students also learn about career management and contracts, as well as financial issues related to the music business. And, each student receives intensive and comprehensive instruction from a faculty with one of the lowest student-to-teacher ratios in the industry.

In addition, the Audio Engineer program imparts other audio-related skills, including techniques and technologies found in sound reinforcement systems and staging operations.

"Every SAE location takes the school's proven core curricula and adapts it to each new region," explains Chris Davie, SAE's director of Miami. "Miami is a perfect illustration of this approach. As a result, SAE students are extremely well-rounded, and this contributes greatly to SAE's exceptionally high rate of post-graduate placement."

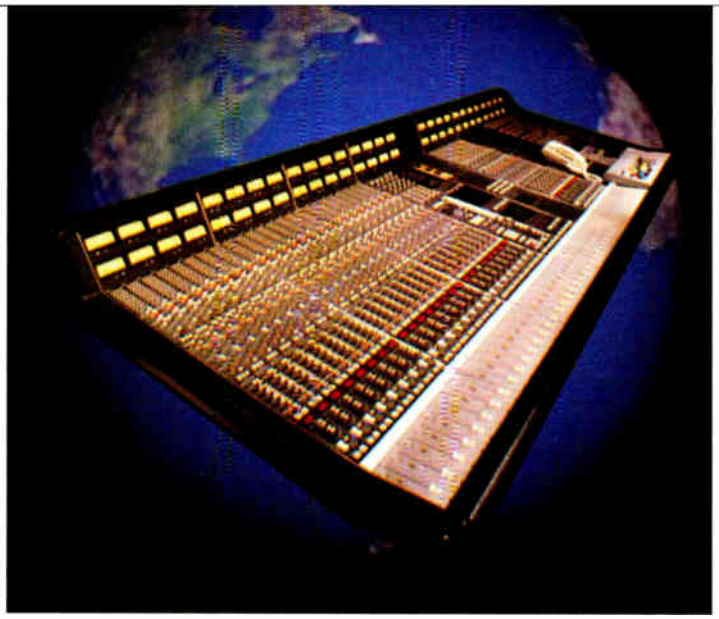
Michael Cronin of Michael Cronin Acoustic Construction has constructed some of the world's most prestigious studios, including Masterfonics, Ocean Way Nashville, Bop Studios in Africa and Mutt Lange's private studio in Switzerland. Cronin was also the logistical mastermind behind SAE's Miami facility and specified at world-class studio level, with features such as $40,000 worth of custom acoustic doors from Acoustic Systems. The SAE/North Miami Beach campus is a convenient commute for students from Miami and Fort Lauderdale.

Tom Misner: "I chose Miami due to the increasing demand for qualified, correctly trained personnel to sustain Latin music's ever-expanding market share. Miami and its culture play an important role in that market. Our goal is to support Miami's growing music industry by providing capable, dedicated and educated individuals." ■

At a Glance

Name: SAE/Miami **Contact:** Chris Davie, director **Major Courses of Study:** Audio Engineering **Degree Offered:** Diploma program **Accreditation:** Florida State Board of Non-Public Career Education **Main Technology Platforms:** SSL, Neve, Sony Oxford and other analog and digital consoles; Pro Tools; other major technology systems **Tuition:** $13,800 per year for nine-month, 900-contact hour program **Financial Assistance:** Sallie Mae (SLM), school-based financing available.

SAE/Miami
16051 West Dixie Highway
North Miami Beach, FL 33160
Tel.: 305/944-7494
Fax: 305/944-6659
Website: www.sae.edu
E-mail: saemiami@sae.edu



The Sheffield Institute for the Recording Arts

The Sheffield Institute for the Recording Arts was founded in 1995 with a mission to provide the professional audio and video industries with highly trained and motivated graduates for the challenging landscape of media technology. The Institute's comprehensive and extensive curricula in audio, video and systems integration is designed to help aspiring media professionals achieve their personal goals and meet the increasingly complex and demanding requirements of the expanding media industry.

The Sheffield Institute for the Recording Arts offers three primary educational career pathways, each of which earns graduates a fully accredited certificate of completion. The AudioWorks program trains students in basic, intermediate and advanced audio engineering and production theory and applications. The 292-hour course of study prepares graduates to work in a variety of audio-related fields, including music recording and mixing, sound reinforcement, sound for picture, MIDI (computer and electronic music production), remote recording, and nonlinear digital audio recording and editing.

The VideoWorks program effectively teaches a full skill set in video arts and sciences in a 244-hour certificate program. Graduates leave this track ready to work in all areas of video production and post-production, including A2 and E2 positions, nonlinear video editing, camera operation, lighting, video graphics design and many other roles.

The innovative and unique TechWorks curriculum provides an in-depth and intensive study in systems integration and audio/video system maintenance. One of the few programs in the world dedicated to installation and maintenance, TechWorks trains graduates who will find that they are readily in demand in a broad range of applications including broadcasting, recording studios, post-production facilities, live sound, multimedia, film and other industry sectors. With intense instruction in electronics, test equipment use, troubleshooting, signal path, cable construction, wiring design and installation, and preventive maintenance, TechWorks program graduates are enthusiastically welcomed into the media business as the people who keep the industry's infrastructure running smoothly.

All three courses of study, which start quarterly and enroll about 125 students annually, were created by Sheffield's faculty in a unique manner. "We polled many major-media industry employers, collected and analyzed their longterm skill requirements for entry-level employees, and reverse-engineered the curricula based on that," explains Sal Chandon, Sheffield's director of education. "As a result, our graduates have excellent employment prospects, because they come out of here well-prepared for a variety of positions."

At Sheffield, students work on state-of-the-art equipment, including Solid State Logic analog consoles, Digidesign Pro Tools hard disk recording systems and Avid nonlinear video-editing platforms. The school's two main studios were designed by Sheffield founder John Ariosa, and since 1968, have developed a reputation as the leading recording facility in the Baltimore area. Sheffield is also renowned for its remote-recording facilities, which have handled broadcasts and recordings for the Grammys, the Boston Pops Orchestra, Mariah Carey, Fox Sports and many others.

"Students get the benefit of learning in a working environment at Sheffield," says Chandon. "The school is not an appendage to the studios facilities; it's an integral part of them. And that advantage shows in the quality of our graduates year after year." ■

At a Glance

Name: The Sheffield Institute for the Recording Arts **Contact:** Admissions Office **Major Courses of Study:** AudioWorks, VideoWorks, TechWorks certificate programs **Degree Offered:** Certificate Program **Accreditation:** Maryland Higher Education Commission **Main Technology Platforms:** SSL, Pro Tools, extensive MIDI implementation, Avid nonlinear video-editing, all professional analog and digital media formats **Tuition:** All three program tracks range from $9,400 to $9,900 **Financial Assistance:** Commercial tuition financing available.

THE Sheffield INSTITUTE
FOR THE RECORDING ARTS

The Sheffield Institute for the Recording Arts
13816 Sunnybrook Rd.
Phoenix, MD 21131
Tel.: 800/355-6613; 410/628-7260
Fax: 410/628-1977
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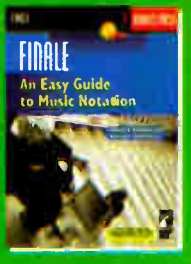

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In 1995, Alanis Morissette released *Jagged Little Pill*, which went on to become one of the best-selling records ever by a solo artist. The disc sold over 15 million copies in the U.S. alone, and over 30 million worldwide. Blending heartfelt, honest lyrics with blistering rock grooves, Morissette became an icon with confrontational songs like "You Oughta Know" and the whimsical "Ironic." Her follow-up record, the more introspective *Supposed Former Infatuation Junkie*, while not achieving the success of her debut, still sold a respectable 2.5 million copies in the U.S. and close to 10 million worldwide. Her current release, *Under Rug Swept*, debuted at Number One on the *Billboard* charts. The CD mixes some "Jagged-like" tunes such as "12 Things I Look For In a Lover" and "Hands Clean" with beautiful ballads like "Flinch."

BEARING AN ARENA-SIZED CROSS

On her current tour, Morissette is playing mid-sized venues, often hockey arenas, like Denver's 6,500-seat Magness Arena, which presents an interesting challenge for FOH engineer Terry Pearson. Pearson, an independent engineer, spent 10 years engineering for Sonic Youth and five years engineering for Beck, which is how he ended up getting the gig with Alanis. "Andy Proudfoot, the tour manager for Alanis, worked with me when I was with Beck, so that was the connection that got me in with Alanis. Most recently, before working with Alanis, I toured with REM, Pete Yorn and David Byrne."

ALL PHOTOS BY STEVE JENNINGS

For this tour, Pearson is using a Midas XL4 console. "I prefer Midas consoles," he says. "The last couple of tours I worked on, I took a Heritage 3000 out, but for this one, I think the XL4 is a little more precise and has more features. It has lowpass as well as a highpass filters. The automated features let me turn off gates, auxes and mutes for each song, allowing for a less-tactile approach with the console. The automation also gives you a VCA gain reference for each song. Alanis is varying the set list for each show from a list of about 30 songs, and I have programmed scenes for each of them. The VCAs allow me to use one fader to push the band up and one to push up Alanis. I'm using a total of 34 inputs


Monitor engineer Randy Bryant

on the console."

Though Pearson uses the XL4 mic pre's for most of the microphones onstage, for Alanis' vocal channel, he uses an Avalon VT737SP tube compressor/mic pre for more accuracy. "I route that into a BSS DPR-901 II selectable-frequency compressor. Then I have a Klark-Teknik DN410 Parametric EQ that I assign to the vocal group on the Midas, so I can EQ specifically for her voice. Alanis writes all of her lyrics, and I think people come to the show to hear those lyrics, so I try to mix so that [the lyrics] are on top and out front and intelligible. She is a wonderful singer and really carries the show with her voice. However, she doesn't sing very loudly, and because of that, her vocal mic has a lot of gain, and she moves all over the stage, so you pick up stage volume through the vocal mic, which is the biggest challenge in mixing the show."

For effects, Pearson uses a variety of multi-effects units to help create different sonic textures. "I have a TC M5000 multi-effects unit, a Lexicon 480L reverb, a [Yamaha] SPX-990 multi-effects, a PCM 42 delay and an Eventide H3000 Harmonizer. On Alanis' CDs, she overdubs her voice a lot to create harmonies and textures, so I use a variety of delays and the harmonizer to create different textures between the verses and the chorus. But [I] keep it sounding natural to imply the effect that she uses on the CDs.

"I use six dbx 160A compressors for the bass and acoustic guitars, then two dbx 160XT for the kicks and snares, coupled with four Drawmer DS201s stereo gates so you have a gate/compressor setup there, where the signal goes into the Drawmers then into the 160XTs. I also have a Drawmer 1960 tube compressor that I use on the guitars. I also use a dbx 1046 compressor; I use two lines for the keys and two for the stereo Leslie inputs."

Despite current trends, Alanis' band still prefers to play through amplifiers onstage instead of using isolated cabinets offstage or DIs. Pearson uses a variety of different microphones to get everything through the P.A. "Each of the guitar cabinets is miked with a Sennheiner 409. On stage right, there is one Marshall 4x12 cabinet and a Fender 1x12, which is used for effects and loops. Alanis uses a Fender 4x10. On stage left, there is a Divided by 13 and a Matchless amp, which are both 2x12s." For the keys and bass, Pearson uses Countryman DIs as well as mics. "The DIs are used on two key lines, the loops and three acoustic guitars. On keys, I have a Sennheiser 421 on the low Leslie cabinet and a stereo pair of Shure SM81s on the highs. The keyboardist has a submixer so that he does the effects loops onstage and then sends me stereo lines. The bass has a Shure SM98 on the Ampeg bass cabinet in addition to the Countryman." Alanis sings and plays harmonica into an Audix VX10.

The drum setup is relatively simple. "There are two kick lines; one is an SM91 and one is Shure B52. I have a Shure Beta 56 for snare top bottom, an AKG 460 for the hi-hat, and three SM98s on the rack and the two floor toms. The drummer also uses a djembe [hand drum], which is miked with an E-V 408 underneath. There is a second snare with an SM56 on it. The overhead mics are AKG 414s, and the ride is another 405."

On this tour, Morissette is carrying her own P.A. Like many rock acts, they have switched to a line array system. "It's a Clair Brothers 14 line array system that is controlled by the new Clair IO controller. Each zone has four speakers. We have four 14

speakers run at a 2.5-degree angle that go up in the upper reaches, four at a 5-degree spread for the middle of the room and four at 10 degrees for the bottom. There are also six flown I4B subs and four 2x18 S4 subs on the floor per side. The IO controller lets us manipulate each speaker with individual delay time, gain and EQ to tailor it to the best coverage for the venue. The controller is wireless; it is a computer screen that you can carry anywhere in the venue to make your changes wherever and whenever you want. I also have a Klark-Teknik DN6000 Analyzer to get a readout of how the frequencies are reacting in the room to isolate problem areas. We fly the P.A. for every show. My system engineer walks the room after the show starts and suggests adjustments for each zone to smooth it out. During soundcheck, I do a walk-through to get the initial setup done."

THANK YOU SILENCE

On this tour, there have been a variety of monitor engineers. At the Denver show, Glen Collett of Clair Brothers and a veteran of tours with Bette Midler, Bryan Adams, Paul Simon, Mariah Carey, Julio Iglesias and most recently 'N Sync was handling monitors. "I happened to be home and have time to do this part of the tour. I came out for four dates on Alanis' tour. Randy Bryant, who has done monitors for her on several of her prior tours, will be coming back on tour after I leave; he had some other commitments and couldn't do the first part of the tour."

Collett is mixing using a Midas XL3 desk. Clair brothers has provided 12AM wedges for use as monitors by most of the musicians. "The stage-right guitarist has a pair of the 12AMs. He gets lots of guitar, both his and the other guitarist's, plus a little drums and some of Alanis' vocals. The other guitarist also has a pair of 12AMs. He gets a general band mix with his guitar a little bit on top. The bassist is in the center and has a pair of 12AMs, also. He gets bass, guitars and Alanis' vocal, as well as some kick drum. The keyboardist gets a pair of 12AMs running in stereo. He gets everything in the mix, with everything he plays on top. The drummer has a pair of 12AMs and a Clair Brothers ML-18 subbass. He has the entire band in his mix with drums on top."

While everyone in the band uses wedges, Alanis prefers in-ear monitors (IEMs). "She uses Ultimate Ears UE-5s," says Collett. "Alanis only has her vocals in her mix. She sings very quietly. She likes the band very close to her so a lot of the stage volume bleeds into the mic, so you can't put anything else in there without it getting very messy." ■

Candace Horgan is a freelance writer based in the Denver area.

KF760 Line Array

The Line is Drawn

The KF760 long throw module combines PPST™, VA4™ and SuperSub® technologies to create an array building block that is both compact and powerful:

The outputs of 2x MF and 2x HF drivers exit through a single horn mouth. The parabolic separator - borrowed from a KF910 - combines the vertically separated HF cells and delays a portion of the MF drivers' output. The horizontally open horn mouth helps expand the usable coverage area.

A patent is pending on the SuperSub -based technology used to load the dual 12-in woofers.

Like a micro KF910, the dual 2-in exit HF compression drivers use a parabolic separator to combine efficiently. The bottom wall of this module's horn would be mirrored in the top of its lower neighbor, creating another parabolic separator for seamless integration of all HF drivers.

Dual 10-in mids, each with a patented Radial Phase Plug , enter horn throats that exit as slots into the back of the parabolic separator. This "flattens" the wavefront through the midrange, enhancing the line array coupling.

The KF760 Series uses a proprietary rigging system made of load rated, heat-treated, structural steel. To avoid loose parts the connecting pins stay with the enclosure. The modular fly bar fits in a standard road case.

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YOUR Tech RIDER Part 1

A BASIC ROAD MAP FOR TOURING ENGINEERS

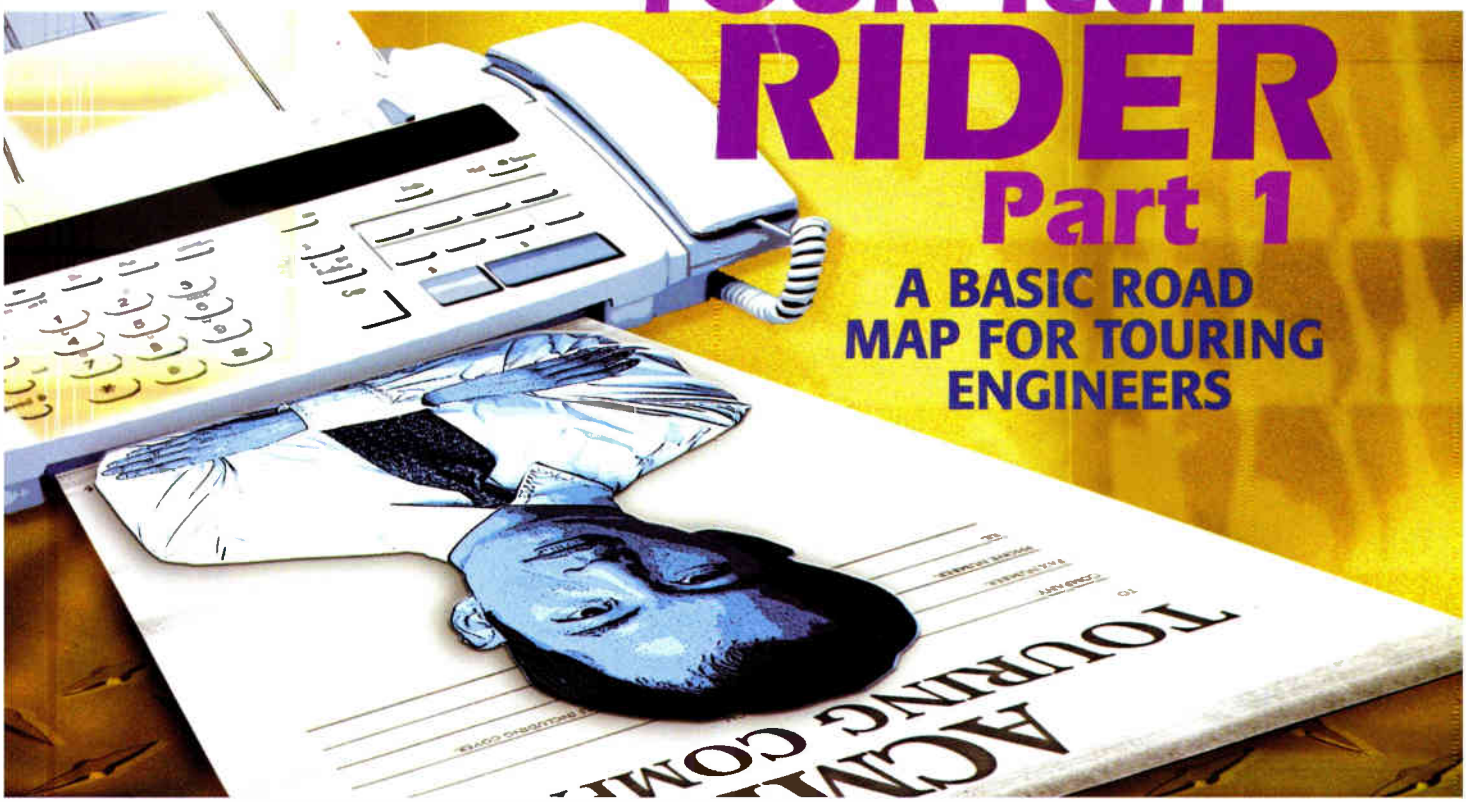


ILLUSTRATION: MIKE CRUZ

How often does out-of-date stage documentation cause last-minute panic, doubled efforts and wasted time? Enough that when working for a sound vendor at a local festival, I start the day by offering $10 to any visiting engineer whose stage plot and input list are 100% accurate. So far, I have only had to pay the Village People's crew (and only because the performers' names weren't listed).

The input list and stage plot are the core of any technical rider and serve as a daily road map for helping a local crew organize stage gear and console inputs. Festival production crews must have accurate information beforehand, and, with accurate documentation, a local promoter's crew can place risers, mics, wedges and backline, label the consoles and run line checks when a touring road crew is delayed. Headliners are happier to accommodate a support act if they know the information is up-to-date. Neatness counts, and good-looking documentation gains respect.

My own solution is the "One-Page Technical Rider Update," a combination input list and stage plot that fits on a single page and incorporates any last-minute changes. Faxing or e-mailing this document a week before the gig shows that you care.

MAKING A LIST, CHECKING IT TWICE

The software you need is probably already on your computer. Microsoft Word incorporates two features that easily create this combination input list and stage plot: Tables and Insert Picture.

Every input list starts as a simple document: a column of channel numbers on the left, a column of input names and specific microphone assignments next to each name. Further columns can show sub-snake assignments, mic stand choices and console inserts, with each column separated from the previous one by a tab.

To convert the list to a table, highlight the entire input list and select "Convert Text to Table" from the Table menu. Bam! The list becomes delineated by grid lines that improve its look and readability. You can reset your tabs to better format the columns, and add and delete columns under the Table menu.

When making up your list, stick to the usual conventions of starting with the drum and bass inputs and ending with the vocals. You may want to add an extra column of alternate choices for mic selections. You should indicate where substitutions are unacceptable, as well as which mics or DIs travel with you so that they aren't unnecessarily duplicated. These are both easily indicated in the alternate mic selections column. I also include a mic inventory summary.

A PICTURE EQUALS A THOUSAND WORDS

Now, let's build a stage plot below the input list. (I built mine using Word on a PC, but Mac commands are simi-

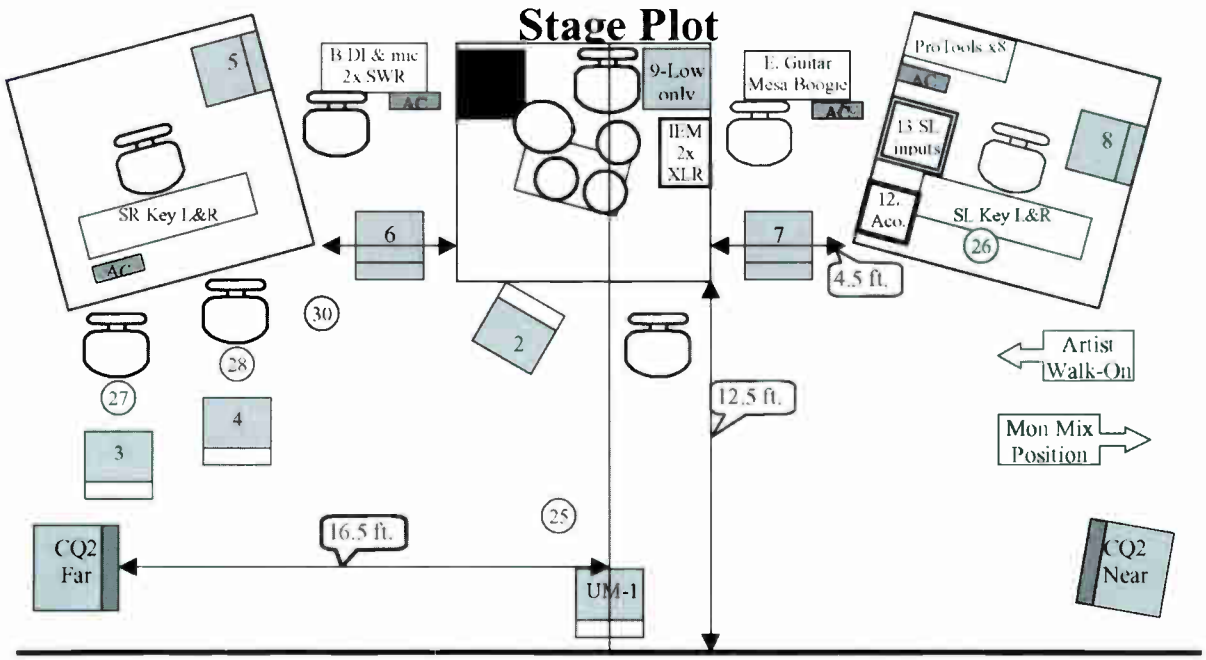
—CONTINUED ON PAGE 162

Input List May '02

inputs, stands, monitor mixes, inserts and effects as per chart and plot

1.	Kick 1	Beta-52	*or*	M-88	short boom #1	10-ft.	DR-1	gate 1
2.	Snare	SM-57	*or*	Audix D-3	short boom #2	10	DR-2	comp 1
3.	Hat	SM-81	*or*	AKG451	straight stand #1	10	DR-3	
4.	Rack 1	SM-98	*or*	MicroD	-	-	DR-4	gate 2
5.	Rack 2	SM-98	*or*	MicroD	-	-	DR-5	gate 3
6.	Floor	SM-98	*or*	MicroD	-	-	DR-6	gate 4
7.	OH SR	KSM32	*or*	AKG414	tall boom #1	10	DR-7	
8.	OH SL	KSM32	*or*	AKG414	tall boom #2	25	DR-8	
9.	Bass DI	Active DI			-	10	DR-9	comp 2
10.	Bass mic	Beta-52	*or*	Senn. 421	short boom #3	10	DR-10	
11.	E. Guitar	SM-57	*or*	Audix D-3	short boom #4	10	*SL-1*	FOH comp
12.	Acoustic	Active DI			-	10	*SL-2*	FOH comp
13.	SR Key L	Active DI			-	25	DR-11	
14.	SR Key R	Active DI			-	25	DR-12	
15.	SL Key L	Active DI			-	10	*SL-3*	
16.	SL Key R	Active DI			-	10	*SL-4*	
17. - 24.	ProTools	(8) DIs			-	8x 10	*SL- 5 to 12*	
25.	Lead Vocal	Beta 87C UHF	**wireless**		straight stand #2	-	-	FOH BSS 901
26.	USL Voc	B.87A	*or*	KM105	tall boom #3	10	*SL-13*	FOH comp
27.	BG 1 Voc	B.87A	*or*	KM105	straight stand #3	25	DR-13	FOH comp
28.	BG 2 Voc	B.87A	*or*	KM105	straight stand #4	25	DR-14	FOH comp
29.	Spare WL	Beta 87C UHF	**wireless**		straight stand #5	-	-	FOH comp
30.	Spare Voc	Beta 87C			straight stand #6	50	DR-15	
31 -32.	TB & Board Mic			(2) SM-58				
33. - 40.	(4) stereo reverb returns,			(3) SPX-990 or better in monitors				
Need:	(3) tall and (4) short microphone stands, all with boom arms, plus (6) straight stands							
	(2) 16-channel sub-snakes, (20) 10-ft, (6) 25-foot and (2) 50-ft XLR microphone cables							
(2) Beta52, (2) SM57, (1) SM81, (3) SM98, (2) KSM 32, (4) Beta 87, (14) Active DI, (2) Beta 87C Wireless								

Stage Plot



version 04/11/02 Disregard all previous lists and plots Thanks for your help

An example of a tour rider viewed with PDF Mailer (see sidebar on page162 for more information).

—CONTINUED FROM PAGE 160, TECH RIDER

lar.) Center the words "Stage Plot" and choose a large font in bold. Below this, you'll place the various shapes that represent the risers and gear onstage. These won't necessarily be exactly to scale, but their relative positions provide much of the needed information. You might begin by drawing a drum riser, usually in the center.

From MS Word's Insert menu, move the cursor down to Picture and choose AutoShapes from its sub-menu. The second icon in the AutoShapes window is Basic Shapes, which can create most of the shapes that can define stage elements. Its first shape is a rectangle, which can be stretched to any size after it's placed. There is an invisible grid that objects "snap" to, making it easy to neatly line them up.

Right-click on the edge of any shape and a menu of attributes pops up. The last

PDF: NO MUSS, NO FUSS

Most everyone is familiar by now with Adobe Portable Document Format (PDF) files. Anyone can view or print out PDF documents using the free, widely distributed Adobe Acrobat® Reader. Most audio manufacturers make equipment manuals and technical papers available as PDF downloads from their Websites. Documents can be opened reliably on a wide range of computers; they look exactly as intended, with page layout, formatting and images intact; and they can't be modified any more easily than a fax can.

Many technical documents benefit from PDF publication. The 70-dots-per-inch resolution of a fax is no longer acceptable quality. PDF documents can be saved at 300 or even 600 dpi so even the small fonts and tiny images on lighting plots are legible. PDF is also useful for transmitting music scores.

Adobe Acrobat is the software that converts a document to PDF. The user can convert Microsoft Office documents by just clicking the Convert to Adobe PDF button on the Office application toolbar in Windows, or by selecting Create Adobe PDF as the printer in the Mac OS. However, the full version of Adobe Acrobat costs up to $250. "Create Adobe PDF Online" (https://createpdf.adobe.com) is a Web-hosted service that converts documents into Adobe PDF files. A trial allows creation of up to five Adobe PDF files for free. An unlimited number of PDF files can be created for $10 per month or $100 per year.

Another solution is a freeware program called PDF Mailer (www.pdfmailer.de), a 1 Meg, zipped download that prints documents as PDF e-mail attachments from any Windows application. (See an example of a rider viewed with PDF Mailer on page 161.) Its only drawback is a small, shaded line of self-advertising across the top of each page. The company's Website is mostly in German, but clicking on the American flag takes you to an English-language site. The $50 version adds TIFF capability and substitutes a sender's header for the banner. Recipients should have the most recent Acrobat version, Acrobat Reader 5.0, which is free (www.adobe.com/products/acrobat/readstep.html), to avoid problems with older versions. —*Mark Frink*

item on this menu, Format AutoShapes, has several tabs that can be used to tweak the stage symbols. The first tab, Colors and Lines, is used to give each type of shape a unique look. Sticking to white and shades of gray is recommended, as the end product may ultimately be faxed.

A complex shape, like a drum set, can be made up of several overlapping shapes: a rectangle for the overhead shape of the kick drum and circles for the snare and toms. Each shape created is opaque by default, so that one shape blocks the one beneath it. The Order attribute allows you to move larger items behind smaller ones by moving a selected object back one or more layers. When several shapes are correctly arranged, they can be combined into a single item if you select them all and use Grouping from the right-click attributes. This way, all the items on a riser can be grouped so that they move together. You can angle an object by using the Rotation feature on the Size tab of the Format AutoShapes attribute.

Items that appear several times, like floor monitors, can be duplicated using Copy and Paste. Each wedge can be labeled with its mix number. When shapes are labeled, the Text Box tab allows more text to fit in a small shape by reducing all margins to zero. A small, shaded circle is a common symbol for a vocal mic position, and you can identify each with its channel number. Although mics for drums and DI's for bass and keyboards are fairly obvious, it is helpful to indicate locations for other instrument mics and DI's (with circles and squares) at their stage positions. And *pu-leeze*, let's put a little box labeled AC anywhere you expect to have stage power provided.

Other shapes include straight lines and double-ended arrows that can be used to show boundaries and dimensions. You can also import clip art, pictures or scanned images if you want to get fancy, but I recommend the K.I.S.S. principle. Given a free afternoon, you can figure out most of this by just poking around with MS Word. Once you have built the initial document, making incremental changes is simple. All-in-all, Word is powerful software with some very non-word-processing tools waiting to be discovered.

Though several levels of Undo (Ctrl+Z) are available, save often while working. Each time you get a new version you're happy with, include the day's date as a six-digit number for a unique file name, for example: BandPlot020501.doc for a plot done on May 1st. This way, you'll be able to keep track of both your own versions and the ones you eventually send out into the world.

Use the Header and Footer feature in Word's View menu to provide your name, e-mail address and cell phone number across the top of the page. Across the bottom in large bold letters should appear the version's date and the words: "Supercedes all previous information" or "Disregard previous plot and input list."

It's a bit easier if you have someone else's input list and plot to start with. My most recent is for new RCA artist (and Tony winner) Heather Headley. It is available on the mixonline.com Website, or I could send you the original MS Word document if you e-mail me at stageplot@markfrink.com. I hereby rescind my offer of $10 for an accurate stage plot and input list. I'm going to start charging $10 for bad paperwork. ■

Mark Frink is Mix's sound reinforcement editor.

PHOTOS AND TEXT BY STEVE JENNINGS

FOH engineer Tim Lawrence used two Midas H3000s to manage a total of 98 inputs and effect returns. "For outboard gear, we have four Yamaha 990s, an Eventide H3000s and HHB tube compressors," he explained. "The HHBs are extremely accurate and an integral part of my overall sound for the depth and clarity they have.

"For our P.A. system [below left], I have to say I am probably the biggest EAW fan in the world," Lawrence continued. "I've been following the EAW array, whether it's the 550, 650, 750, 850, and now the 760 and 761 Series, and I absolutely believe in these boxes. To me, they are probably the best line array box out there right now. They have the EAW punch and warmth, and it's consistent from night to night."

All handheld mics were Sennheiser 5000s.

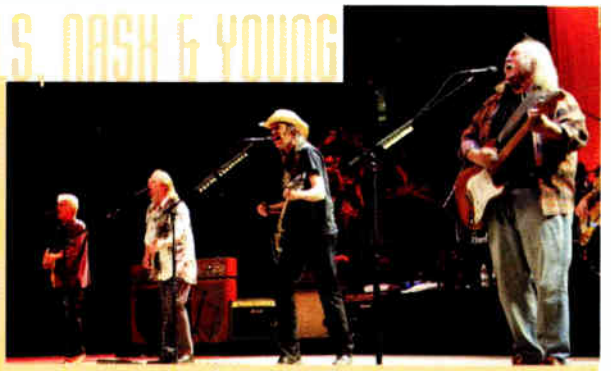
Mix caught the fifth show of Usher's Evolution 8701 Tour at the Mandalay Bay Events Center in Las Vegas. Playing both arenas and sheds, the R&B star was out touring in support of his Grammy-winning album *8701*. The set list drew from Usher's four studio albums and included chart-topping favorites "You Make Me Wanna" and "Nice & Slow."

Systems tech Jason Litt used a MX 8750 System Processor to control the entire EAW array, which included 28 EAW 760 and 16 EAW 761 cabinets. "Everybody in the entire room hears the same SPL, which is really nice," Litt said. "We control the levels and the EQ. So, instead of going to the amp racks, we keep the processors at the stage, but we run the computer at FOH so we can control in real time."

Also running two consoles, monitor engineer Maceo Price managed IEMs and standard wedges with two fully automated Midas XL4s. "I have six channels left out of 128," Price noted. "So my board is maxed out. On Usher's vocal, we have a Klark-Technic DN 410 parametric with BSS BPR 9011s and HHB tube compressors, just to keep his vocal fat, but because there's so much noise onstage, we use the parametric to pull some of the trouble spots out. Outside of that, we're running 45 compressors, which is kind of unheard of, because we have so many sequence channels and most get fed to Usher's ears. So for his protection, we individually compress every line that goes into his ears."

While Usher and the majority of his band were using Sensaphonics IEMs, there was still a need for a full complement of onstage monitors, which included 13 EAW 761 line array cabinets, 12 SB 1000 subs. Under each band riser, there was also an additional EAW SM 84 wedge and an SB 412 sub. All onstage components were driven with Crown 5000s. "Usher had said that he wanted a system that he could stand next to and still be able to talk into his microphone. The band and I are really happy with them."

CROSBY, STILLS, NASH & YOUNG



Only two years after their first reunion tour in a quarter-century, Crosby, Stills, Nash and Young played 40 shows in the U.S. and Canada between early February and late April. Fronting a band that included musical director Booker T. Jones, bassist Donald "Duck" Dunn and drummer Steve Potts, the rock veterans performed for over three hours each night, playing a broad selection of familiar and obscure songs from their joint and solo careers.

Maryland Sound Industries (Baltimore) provided a JBL VerTec line array system for the main P.A. Systems engineer and joint FOH mixer Mike Scerra, assisted by Chuck Wells and Kurt Joachimstaler, flew 16 cabinets for main L/R columns and 12 cabinets in the center. For 180° coverage, 14-cabinet columns were added to each side, with additional side hangs of four to eight cabinets for 270° coverage. Subwoofers were proprietary systems from MSI, and the monitor system was provided by Sound Image of Escondido, Calif.

At FOH, Scerra shared mixing duties with Jim Mulligan, both working on Midas consoles. "We're pretty maxed out on inputs and outputs," noted Mulligan, who mixed vocals and guitars while Scerra concentrated on band balances. "We record to 48-track every night, so all of the direct outputs and all of the group outlets that aren't being used for effects are feeding record outputs," explained Scerra.

"I'm carrying a lot of vocal processing, since each guy has a uniquely different voice," noted Mulligan. "We're doing some dynamic processing on each member to take out some of the sibilance or edge. We're using the Neumann KMS 150 for vocal mics, then we have a tube compressor on each guy, as well. It's been a challenge, but they work hard; they do a soundcheck every day diligently, and that makes it much easier."

—Photos and text by Steve Jennings

INSTALLATION NEWS

National Public Radio recently purchased 25 Neumann U87 Ai/Set Z large-diaphragm condenser microphones for its new Los Angeles facility. In the final stages of construction, the new facility is scheduled to go on the air in September 2002...Home to the Seattle Symphony Orchestra for the past four years, **Benaroya Hall recently installed 10 Soundweb 9088*ii* digital signal processors** as part of a discrete, new vocal reinforcement system for its 2,500-seat S. Mark Taper Foundation Auditorium. CCI Systems of Olympia designed and installed the system...**Shure Incorporated has upgraded the P4800 System Processor's software and hardware**, adding DSP processing power and more feature-rich Windows XP-compatible software. Version 4.0 software also includes two new audio processors: a ducker for paging applications and a peak stop limiter. Version 4.0 users can also now import and view data from SIA-Smaart and TEF directly.

NOTES FROM THE ROAD

When Lost Highway Records (Island/Def Jam) recording artist Ryan Adams brought his hard-rocking show to a tent as part of the entertainment for a fund-raising event, **Meyer Sound's M2D Compact Curvilinear Array loudspeakers provided just the right** support. The AIDS Foundation fund-raiser, which took place after the Oscars ceremony in March, was hosted by *Instyle* and the Elton John AIDS Foundation, and was held in the parking lot of Hollywood's Moomba restaurant...**MD Systems/Clair Brothers, Nashville, has been sending Lexicon 960L Multichannel Digital Effects units** out on tour with Martina McBride, Tim McGraw, Backstreet Boys, O-Town and Faith Hill. "We have four 960L units, and two or three of them are on the road constantly," says John McBride, MD Systems/Clair Bros. general manager. "With large bands asking for as many as a dozen stereo in-ear monitor mixes onstage, the eight channels the 960L gives us allows for four discrete stereo mixes." ■

MADISON SQUARE GARDEN CHOOSES EAW

Madison Square Garden recently installed EAW's MQV Series loudspeakers at the giant multipurpose arena, part of the Garden's first major sound system upgrade in almost a decade. Wrightson Johnson Haddon & Williams (WJHW) of Dallas was the system design consultant, and SPL Integrated Solutions of Columbia, Md., was the contractor. The new system includes eight primary speaker clusters arranged in a circle. Each cluster includes a single MQV1366 full-range, three-way loudspeaker, aimed almost straight down to cover main-level seating, and a single MQV2364 loudspeaker that extends coverage to the mid-seating levels. A distributed delay ring comprised of single MQV1366 full-range units covers the upper-most seating levels.

WORLD CUP GOES 5.1 WITH ATC

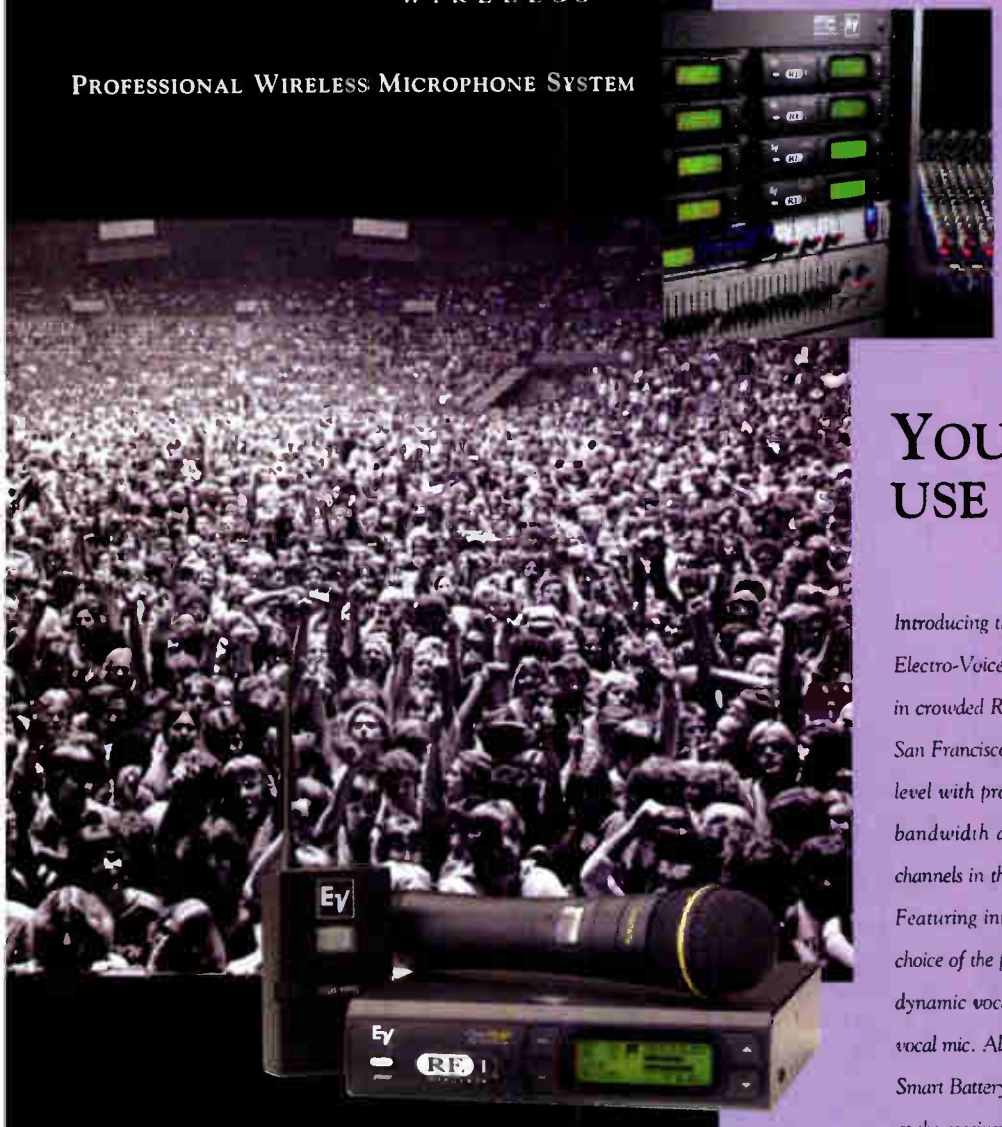
The main broadcasting center for this summer's World Cup Finals, held in Seoul, South Korea, has been outfitted with ATC loudspeakers. The center, which will provide surround sound monitoring of all outgoing TV and radio audio feeds, has been equipped with ATC's 100 Pro 250-watt three-way Monoblock active loudspeakers in a 5.1-channel configuration, plus two C6 active sub speakers for the LFE channel.

JBL'S VERTEC SYSTEM IN NORWAY

Norwegian sound company Audio One supplied a 28-box JBL VerTec line array system for the Spellemannprisen, the Norwegian equivalent of the Grammy Awards. Audio One's Stuart Morch-Kerrison used JBL's Line Array Calculator computer simulation program to accurately determine the number of boxes needed to cover the arena and settled on three arrays, powered by Crown MA Series amplifiers with BSS digital system controllers. Ten JBL MPro MP410 cabinets were used for frontfills, and the FOH mix was performed on an InnovaSon Grand Live console.

RE 1
WIRELESS

PROFESSIONAL WIRELESS MICROPHONE SYSTEM



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THE "CIRCLE" REMAINS UNBROKEN

BRINGING BACK A CLASSIC

By Mark Waldrep

During the course of one week in the late summer of 1971, the Nitty Gritty Dirt Band and a who's who of Nashville's greatest pickers and singers made one of the finest and most important recordings to emerge from that city in a generation. Earl Scruggs, Doc Watson, Merle Travis, Mother Maybelle Carter, Roy Acuff, Jimmy Martin and Vassar Clements had all agreed to make a record with what Acuff called "a bunch of long-haired West Coast boys." It seemed a long shot according to Mike Stewart, president of United Artists at the time, but he approved a $22,000 budget because bandmember John McEuen and his producer brother, Bill, were so intent on making it happen. What emerged from those sessions was nothing short of amazing—impeccable musicianship and singing recorded without overdubbing straight to a 2-track analog machine running at 30 ips. *Will the Circle Be Unbroken* was released as a three-LP set containing 33 tracks 30 years ago, and it went on to sell well over 1.5 million copies. For many bluegrass and acoustic music fans, the *Circle* album, as it became known, was a mandatory addition to their record collection; it seems everybody knew this record.

And they still do. When I picked up a copy of *Billboard* today (in mid-May), that same recording had climbed 12 places on the Country Catalog chart to Number 3. And yesterday, I received a phone call from John McEuen, who was in a Nashville studio recording *Circle III* with the likes of Johnny Cash and Taj Mahal. In a world of overproduced country crossover/pop music releases from the same small group of major country stars, it is encouraging to know that simple, heartfelt music can still resonate with the public. The phenomenal success of the soundtrack to the movie *O Brother, Where Art Thou?* may not be an aberration after all.

I first met John McEuen, the banjo picker for the Dirt Band, in the summer of 1980 in Aspen, Colo. While making a cross-country trip with the late Mike Denecke—audio guru and inventor of the ubiquitous timecode slate and myriad other neat devices for film audio—we stopped for a couple of days to visit the band and see a concert. Mike had spent a lot of time working at Bill McEuen's Aspen-based recording studio, home of the Aspen Recording Society, his production entity. It was during this time that I learned about some of the technical details of the original *Circle* recording sessions held at Woodland Sound Studios in Nashville way back in 1971. Partly for aesthetic reasons and partly due to the extremely limited recording budget, Bill and engineer Dino Lappas decided to capture the ensemble straight-to-tape. Most contemporary recordings were being tracked on 24-track 2-inch machines, loaded with overdubs and subsequently mixed to 2-track masters. Their decision to produce the *Circle* album this way is one of the factors that makes this recording timeless. Although it sometimes took

—CONTINUED ON PAGE 175

EMMYLOU HARRIS AND BRIAN AHERN

TOGETHER AGAIN

By Rick Clark

During the 1970s, the Warner Bros. family of labels was known for having an integrity-artist roster. Performers such as Randy Newman, Jackson Browne, Joni Mitchell, Captain Beefheart, Little Feat, Ry Cooder and James Taylor weren't selling zillions of records for the company, but they made consistently strong albums and showed real musical growth from album to album—back in the day when there was actually something called "artist development." In the mid-'70s, Warners also signed Emmylou Harris who, along with her mentor Gram Parsons (another Warners artist; he died in late 1973), was at the forefront of a movement of performers who gravitated toward traditional country and roots music, but were invigorated by the dramatic changes in popular music of the '60s and early '70s.

Beginning with her promising 1975 Warners debut, *Pieces of the Sky*, Harris

and her producer/husband Brian Ahern enjoyed considerable success by gathering an eclectic range of material from both inside and outside the normal boundaries of what was considered "country," creating a fresh, emotionally resonant amalgam that won over traditional music lovers, as well as a whole new generation of fans. Besides inventive song choices and arrangements, Ahern's productions of Harris' albums (as well as his work with the likes of Johnny Cash, Roy Orbison, George Jones, Jesse Winchester and others) were notable for displaying a sophisticated articulation of spatial placement of instrumentation and vocals.

Brian Ahern with a 1921 vintage mandocello at Easter Island Surround, his home studio

With the recent advent of surround audio, it was a natural move for Ahern to explore the format's potential for his past work. Along the way, he hooked up with Rhino Records and began working on a DVD-Audio "Producer's Choice" collection of Harris' work that he felt would be best served by this new ambient setting. For the surround collection, Ahern chose about 40 songs and baked the 2-inch masters in a convection oven. Ahern's engineer, Donivan Cowart, then transferred the tracks from a Studer analog 24-track through a computer to a quad hard drive array.

"We transfer eight tracks at a time, so as to focus and get them right," states Ahern. "Back then, we usually recorded with Dolby 361s, and at one point, moved from one tape stock to another. The levels are understandably erratic, not to mention [having] 25 years of tape high-frequency 'sag.' Sometimes, we bring up the playback level of individual tracks to overtake the Dolby decoders properly, or to exaggerate ambience to create a sense of place."

After evaluating various speakers, Ahern decided on five Mackie HR-824 powered monitors. "With all the onboard tweaks, they are perfect for a painless 5.1 surround setup," remarks Ahern. "Most of the DVD-Audio product I've been listening to is unnaturally bright to my ears, so I keep the high-frequency switches at -2 dB and roll-off the low end at 47 Hz. My 750-watt Velodyne subwoofer kicks in at just above 40 Hz. Right now, I use it to analyze rogue low-frequency problems. I'm still deciding whether this device should summarize the other five channels or be a free-standing 'special-event' reproducer. I sometimes study the 5.1 work of others by turning off the stereo speakers and listening to what's left in the mix.

"To help me choose from 11 albums and numerous duets and film tracks, I use an old Technics receiver with synthetic quad surround to evaluate the amount of,

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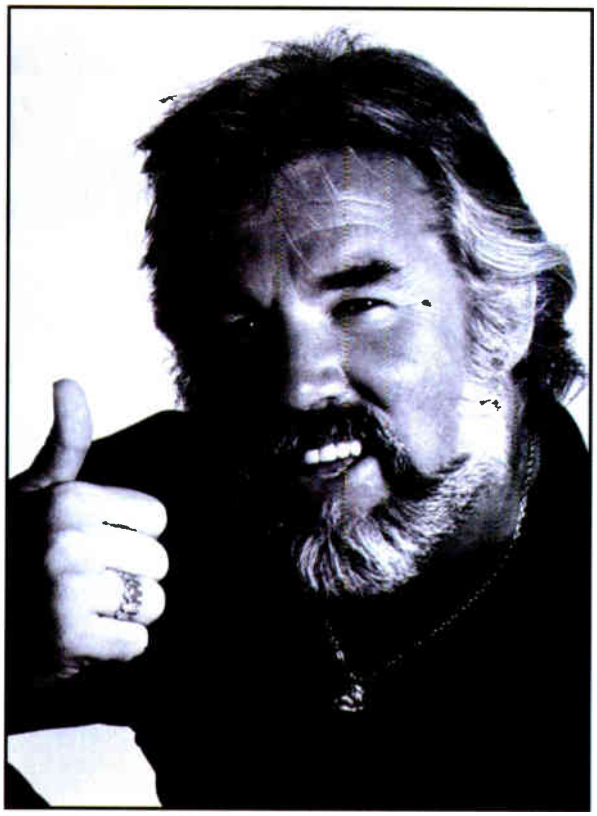
KENNY ROGERS' "THE GAMBLER"



By Dan Daley

Kenny Rogers' recording of the Don Schlitz-penned song "The Gambler" turned a simple record into an entire industry. Aside from the tens of millions of copies the record has sold since its 1978 release, aside from winning a subsequent Song of the Year Grammy and contributing greatly to producer Larry Butler's also winning the Producer of the Year Grammy (the only country producer ever to win that laurel), the recording spawned five—count 'em, *five*—made-for-TV movies, as well as the longest-running miniseries in network history, all of which to this day still fill valuable air time on the Lifetime and TNT cable channels. While other Rogers hits, including "Coward of the County" (which also sparked a movie), "We've Got Tonight," "Lady" and the Bee Gees-produced Dolly Parton duet "Islands in the Stream" helped his career span six decades, "The Gambler" became his signature song, bankable enough to have helped Rogers launch his own chicken fast-food chain in the 1980s and his own successful record label, Dreamcatcher, in the 1990s. The track also helped establish the template for country crossover hits in the modern era, just before the *Urban Cowboy* phenomenon was about to put country in the mainstream once again; instead of the lush, string-laden records made by Chet Atkins and Owen Bradley, which crossed over for artists such as Eddie Arnold, "The Gambler" was a groove record: No solos, few licks, but a slight gloss that made it work for pop radio formats. The record's endurance speaks for itself: With the re-release of the cut on Rogers' Dreamcatcher label, sales now exceed 35 million units globally.

When Rogers walked into Jack Clement Recording's Studio B to record "The Gambler," the 40-year-old Houston native was already a music industry veteran. He had scored hits as a member of the First Edition and the New Christy Minstrels, as well as solo hits such as the 1977 release "Lucille." In fact, every album he released between 1976 and 1984 would go Gold or Platinum—amazing for a country artist in those days. Rogers' career was boosted considerably by his collaboration with producer and United Artists Records executive Larry Butler, a piano player whose ability to walk the line between country and pop in the wake of the *Urban Cowboy* phenomenon would lead him to make future hit records with artists including Mac Davis, John Denver, B.J. Thomas and Kim Carnes. Butler had pressed U.A. to sign Rogers, and had to point out a clause in his own contract with the record label that allowed him to do so unilaterally after U.A.'s label head expressed a concern that Rogers was over the hill.

The studio—now called Sound Emporium—had plenty of history and would make more. Clement would eventually sell it to Butler and publishers Bob Montgomery and Al Mifflin, who, in turn, sold it to recording artist Roy Clark, who later sold it to current owner and producer Garth Fundis. But that summer evening in 1978, Studio B was still a small L-shaped tracking room with a control room fitted with a Quad 8 console and an Ampex MM-1000 16-track deck. JBL 4320 monitors were soffited above the console.

"I wish I still had that console," muses Billy Sherrill, the engineer on "The Gambler," and on most of Rogers' Nashville hits, including "Lucille." (Billy Sherrill, the engineer quoted here, spells his name exactly the same as Billy Sherrill, the producer for George Jones and Tammy Wynette's classic hits—and the subject of this issue's "Mix Interview"—and the two have worked together many times over the years, much to everyone's confusion and their own amusement.) Sherrill had recorded quite a few hits with Larry Butler in this studio, including John Denver's "Some Days are Diamonds." "We liked the sound of the room," he says. "It had a nice, tight sound that often worked better for tracking than the larger room in Studio A. What we'd often do is transfer the tracks to the 24-track Ampex deck in A and do our overdubs and mixing in there. But on 'The Gambler,' there were very few overdubs and we stayed in Studio B until it came time to mix."

The song had been around for a while. Don Schlitz had made his own recording of it on an independent country label and it had gotten some local airplay. "It was one of those songs that everyone just knew was going to be a hit," says Sherrill. "Fortunately, it had 'Kenny Rogers' written all over it. It was the perfect story-song for Kenny to work with." It also meant that most of the musicians on the session were already familiar with it. That gave them

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DVD-Audio format, the recording industry will finally get its shot at developing content with music as the central media component. AIX is actively creating products for its own label and others in this format—perhaps the *Circle* could be reborn at 96 kHz/24 bits.

John and I approached Capitol/EMI about licensing the 2-track master for release as a DVD-Audio product. Unfortunately, the request was denied. It seems that the Nashville arm of Capitol/EMI, headed by Mike Dungan (a huge fan of the *Circle* record), had plans for a 30th anniversary reissue on compact disc. John was enlisted to produce the reissue CD, and both he and the record company agreed that AIX and I should handle the transfers and digital remastering. The little-known fact that made the prospect of working on this product all the more exciting was that the original master recordings and outtakes were stored all these years by Bill McEuen, apart from the company vault. The record company has been making CDs from the 15 ips safety copies since the first CD version of the *Circle* was made available more than 15 years ago. What a treat it would be to actually work from the source masters—unprocessed, un-EQ'd and with all the warmth that can be captured using 30 ips 2-track equipment.

Step one was to locate the tapes amid all of the other boxes and paraphernalia in a storage unit out in Ventura, Calif.—a job that required flying Bill's wife Alice (the person responsible for the handwriting on the cover of the album) in from their new home in Hawaii. After several attempts to locate the box of masters, John and Alice were successful. The original master tapes and all of the outtakes were soon to be played again after 30 years!

As a recording and mastering engineer with more years of experience than I care to admit to, I've been confronted with many challenges when unearthing tapes that have been stored for any substantial amount of time. Most of us doing this kind of work are familiar with splices drying out and breaking during playback or, worse yet, during rewind or fast forward. Baking tapes of a certain vintage before playback is a commonplace technique for restoring playability to old masters, but the *Circle* masters required only a few new splices and didn't exhibit any of the problems associated with loss of lubricants or shedding. Bill and John were extremely surprised to learn that the masters were intact and ready to be transferred into our Sonic Solutions HD system.

The plan was to capture all 27 tapes using the highest-resolution A/D conversion equipment we could find. I figured if we were going to play every tape into my high-resolution Sonic HD system, then it should be done at the highest sampling rate and word size—who knows where these tapes might eventually end up? Now, I'm very familiar with most of the current crop of high-end converters, because my fledgling record company, AIX Records, is recording, mixing and mastering music produced specifically for the DVD-Audio format. In order to accomplish the kind of work that we're doing, we installed an R-1 digital multitrack and digital console, both manufactured by Euphonix. We've done many hours of critical listening and have been very pleased with the outboard converters feeding the R-1. I've also used A/D equipment from dB Technologies and DCS with great results, but it was the newest Pacific Microsonics HDCD (now handled by Euphonix) and Genex converters capable of running at 192 kHz/24 bits that intrigued me the most.

> We had to do very little dynamic compensation. These tracks come alive because they weren't heavily compressed or homogenized for radio play.
>
> —*Mark Waldrep*

I make multitrack recordings using multiple pairs of stereo mics. When producing a new set of tracks, I know that I'm going to be delivering my mixes on a DVD-Audio disc into multiple 5.1-channel surround sound mixes ("stage" vs. "audience") and in PCM stereo. One of our recent AIX releases, *Nitty Gritty Surround* with John and former bandmate Jimmy Ibbotson (along with Jennifer Warnes and the String Wizards), is essentially a 21st-century incarnation of the original *Circle*. One day before a show that they were doing in Hanford, Calif., we trucked our R-1 recorder and a slew of microphones and stereo bars to the Fox Theater to capture the musicians at 96 kHz/24 bits, while they performed live, arranged in a circle. The results of that long day can be experienced in DVD-Audio and DVD-Video, both on the same disc but on opposite sides (check out www.aixrecords.com). The highest fidelity available using state-of-the-art tools and techniques can be fully appreciated because we used 96 kHz/24 bits with performing musicians. (Most new DVD-Audio releases are remixed into 5.1-channel surround from older analog tapes. Even if they're captured at 96 kHz/24 bits, they still have the dynamic range of the original recording.)

Using MLP (Meridian Lossless Packing), the standard algorithm for the DVD format, the highest sampling rate is restricted to 96 kHz/24 bits. My experience with 192kHz/24-bit converters has therefore been somewhat limited, although I have evaluated DCS equipment. But because the *Circle* tapes were recorded in stereo, it was worth trying the highest available sampling rate. We rented the gear from DMT, a local high-end digital equipment company, and started sorting out the interconnections late one Friday afternoon. After many hours of making digital connections, trying all of the clocking options available on the Sonic I/O panel, and making repeated phone calls to tech support, several test recordings were accomplished. In the end, we opted for the lower sampling rate (96 kHz/24 bits) on a dB Technologies box. It's not that the HDCD or Genex equipment didn't work or even sound warm and transparent; they did. But with limited access to the equipment, we knew we wouldn't be able to play back the recordings as needed over the coming weeks. Finally, the increase in fidelity with 30-year-old tapes didn't warrant the additional expense of the rentals.

Bright and early Saturday morning, I set about transferring all of the masters, including the outtake reels. If you're at all familiar with the *Circle* record, you know that there are a lot of conversations left on the final release. The outtakes contain many great moments, too, and they were all run through our ATR-100 and captured at 96 kHz/24 bits and 44.1/16 bits. Yes, I did all of the transfers twice. Mike Dungan and Capitol wanted to make a compact disc, but John and I wanted to archive these recordings at high resolution and someday hope to release the "audiophile edition" on DVD-Audio. So, rather than suffer the sonic degradation of sample rate converting from 96 to 44.1, I

churned through the master reels and outtakes over the course of the next several days. John spent the time logging a variety of new "conversational" gems for the reissued CD and searching for a couple of new music tracks to include in the package. I simply kept my alignment tape, head-cleaning solution and chamois swabs handy while I thoroughly enjoyed eavesdropping on the sessions held 30 years ago.

We purchased a copy of the *Circle* CD at a local Borders for comparison, and to make sure that we were addressing the same track numbers as the original. We felt the sound of the compact disc version was dull and lacked low end. After spending the weekend listening to the masters, this wasn't a big surprise. But what did startle us was the fact that the left and right channels were reversed from the master tapes! After numerous checks and rechecks, we determined that we had to switch the left and right for the reissue. What you will hear on the new version returns the stereo assignments back to their original positions. It's hard to fathom just how that fact was missed for almost 15 years, but it was.

The final stage in the process was to balance the levels and apply equalization where required. It turned out that we had to do very little in the area of dynamic compensation—these tracks come alive because they weren't heavily compressed or homogenized for radio play. It's immediately apparent that Bill and Dino were trying to make a very high-fidelity "sonic documentary" of an extraordinary gathering of musicians, rather than feed the traditional recording industry model, which is to make tracks that pierce the speakers on your playback system! As for EQ, the low end proved to be the most problematic. At first, we thought this was the result of the 30 ips recording speed, but John remembered that the studio door was left open during much of the recording, which resulted in a balance problem in the bass. We cleared that up with some low-frequency shelving EQ. Then we inserted the bonus materials that we edited out of the new transfers and sent off reference copies to the record company back in Nashville.

The reaction was immediate and extremely positive. And the response by music consumers has been equally heartening. Apparently, the art of recording, as shown by these 30-year-old tracks, hasn't advanced as far as we would like to think. Just imagine the sound of world-class musicians playing live in front of a bunch microphones in a studio, and that is exactly what you will hear in the remastered version of the *Circle* album. All of the warmth, dynamic range, fidelity and "you-are-there" sonic reality comes through like never before. There are undoubtedly lessons to be learned from these old tracks—it will interesting to see whether the record industry pays attention. ■

EMMYLOU HARRIS

FROM PAGE 171

and usefulness of, ambient [surround] material in the original stereo. We also made a 6-track ADAT test tape of a George Jones/Mark Knopfler song that we'll play back in Denny Purcell's mastering room [Georgetown Masters] to get our bearings and keep us grounded.

"I'm committed to the surround sound

movement, which is deeper and more emotional than the leap from mono to stereo or vinyl to CD. I will spend the rest of my career in this fascinating new world."

Besides the "Producer's Choice" CD, Ahern has also teamed up with Rhino to put out a remastered and expanded version of Harris' classic 1980 bluegrass and roots music album, *Roses In the Snow* [1980]. The idea to re-visit the critically acclaimed effort came about while Harris was on the road as part of the Down From the Mountain tour, which featured the music from the multi-Platinum *O Brother, Where Art Thou?* soundtrack.

"I was discussing the 'Producer's Cut' surround project with Emmy on the phone," he recalls. "She was in Washington, D.C., and said, 'You know, we just played for 18,000 people last night and it was all bluegrass. There is a hunger out there for it.' I paused for a moment and said, 'Wait a minute! Why don't we reissue *Roses In the Snow*?' She said, 'That's a great idea!' I called Robin Hurley at Rhino and he agreed to get *Roses In the Snow* reissued, provided I could find some previously unreleased songs contemporary to the original sessions."

In his search, Ahern uncovered a 1979 version of an old Hank Williams song called "You're Gonna Change (Or I'm Gonna Leave)" that featured Ricky Skaggs on fiddle and singing live in the studio. "I remember I had just bought a vintage Fender six-string bass that I was really excited about and wanted a project to try it in the studio," says Ahern. "I came up with a bass part for 'You're Gonna Change (Or I'm Gonna Leave),' which Emmy had been singing around the house. I took it into the studio, and I got Emory Gordy to write it out and play it on my acoustic Ernie Ball bass in unison with me. We threw in a couple of 6/4 bars to make the dancers fall down.

"I also found a very cursory performance of a 1975 Celtic waltz called 'Root Like a Rose.' We only did one take. I edited quite a bit out with computer technology, which made a previously rejected track possible to use. Emmy re-sang it, because she had messed up the lyrics on the original recording. I also added some penny whistles, recorders and bagpipes that I had intended for the song."

During 1979, Harris and Ahern recorded nearly three albums' worth of material using Ahern's Enactron Truck Studio in Beverly Hills. Though a typically wide range of different song styles were cut, as the recording progressed, the duo elected to focus on assembling an album that would have a fairly strict adherence to bluegrass and acoustic roots music.

"Most of the albums we did had some little rule that would serve to set it apart from the other records," says Ahern. "In this case, it was a big rule: No drums or electric bass. The 'drummer' was my big Gibson Arch Top Super 400 guitar."

The initial record label reaction to the concept of *Roses In the Snow* was less than enthusiastic—Warners viewed the album as some left-of-center folk collection, and they made no secret of their desire to see Harris continue mining the successful formula of wide-ranging song choices and more electrified country-rock flavorings.

"It would've been easier back then to have done our usual eclectic mix of songs, which is what the record company really wanted," Harris says. "They basically wanted 'Son of *Elite Hotel*' [her successful second album]," says Harris. "We really had to stick to our creative guns, and Brian was really the one who manned the guns, more than I did," she adds with a laugh. "I started saying, 'Well, maybe we should put something in there like [James Taylor's] "Millworker," which was also cut during the *Roses In the Snow* sessions. I had braced myself for what the record company was initially convinced was going to be a commercial disaster. But Brian really held his ground and he was right all the way.

> I had braced myself for what the record company was initially convinced was going to be a commercial disaster. But Brian really held his ground, and he was right all the way.
>
> —*Emmylou Harris*

"I spoke to Brian earlier today," she continues, "and told him that at that point of my life and career and my youth, I was arrogant enough to think that I could sustain a commercial disaster. I felt positive that it was going to be an artistic success. It was in the air everywhere. All of my compadres were into traditional music and I had been doing it a lot. We had been doing bluegrass at shows, even before Ricky [Skaggs] was in the band. There had always been a thread and we had hinted at it certainly with *Blue Kentucky Girl*, so that it was moving in that direction."

"Like most record companies, courage was not on their agenda," muses Ahern. "When we started doing this bluegrass/acoustic project, marketing and management started to worry about the lack of commercial potential it would have. I stayed adamant and stubborn about it, and this economical acoustic album went as high on the pop charts as Emmy's most successful records." Eventually, the album would go Gold and become a Top 20 hit on the *Billboard* album chart. It also generated two country chart hits with "Wayfaring Stranger" and a version of Simon & Garfunkel's "The Boxer." The album served as a strong reminder in the age of the *Urban Cowboy* that there was still a sizable audience for honest, emotive acoustic roots music. "We just knew in our hearts that we were right, but I think we were surprised at how successful it was," Harris says. "I will say that the record company did come onboard when it was finally seen that they couldn't talk us out of it. Ultimately, it became a great collaboration between the producer, the artist and the record company. It shows you what a record company can do when they believe in the integrity and passion of an artist for a particular project."

Harris is particularly pleased with the Ahern's new refinement of *Roses*. "I never put on a CD of my music and listen. After I've listened to the records, as they are being made, over and over and over again, I just have to leave them and move on. I remember them," she laughs. "But when I put on *Roses In the Snow* [recently], I was pulled in by the beauty and emotional impact of the songs and what everybody played. There were a lot of live vocals and playing on there. I think that Brian did an extraordinary job.

"It couldn't be a better time for *Roses In the Snow* to come out, because 20-plus years later, this is being discovered as this almost new exotic form of music. A lot of people have never had a chance to hear music like this on commercial radio. That has really been gratifying. I think there are a lot of people who have been surprised and delighted to find something that touches them and has such an emotional resonance." ■

Cool Spins, *FROM PAGE 174*

tracks—his style and Williams' mesh beautifully. It's a pleasant and unfailing melodic outing, and even though it brings Williams into a different world than we're accustomed to, he never strays too far from his familiar sound—there's still a lot of Bach and Rodrigo in him. And, while there is definitely both fluidity and passion in his playing, on some fundamental level, some of these tunes just don't have the loose-limbed swing of the real thing. Still, a beautiful album.

Producer: John Williams. Engineer: Geoff Foster. Additional engineering: Stephane Briand. Studios: AIR (London), Guillaume Tell (Paris, one track). Mastering: Bob Whitney/Whitfield Street Studios (London). *—Blair Jackson*

René Lacaille and Bob Brozman: *DigDig* (Riverboat/World Music Network)

There's been a mini-explosion of world music reaching our shores of late, and World Music Network, a small but highly prolific English world music label, has quietly been putting out stellar world music discs since 1995. The label is perhaps best known for their "Rough Guide" compilation CDs, which share the same name as those indispensable, economical travel books. But they also have a separate label, Riverboat, for new, single-artist releases. For pure, infectious, summertime playfulness, you can't beat *DigDig*, a collaboration between Ile de La Reunion accordionist René Lacaille and renowned ethnomusicologist Bob Brozman (Hawaiian guitar, bottleneck).

La Reunion Island, east of Madagascar in the southern Indian Ocean, has been a cultural melting pot of sorts, beginning with French colonization, followed by African, Middle Eastern and Asian influences. Lacaille, who also plays charango and tschoulas and provides vocal tracks in Creole, embodies the true soul and spirit of this vibrant disc, backed by syncopatic Sega and Maloya rhythmic beds. Well-recorded and top-notch production, without losing the playful interaction of players in a studio—these

folks went on for hours after the tape stopped rolling.

Executive producer: Alain Courbis. Engineer: Daniel Thomas. Studio: Studio Digital (St. Denis, Ile de La Réunion). *—Tom Kenny*

Dave Alvin and The Guilty Men: *Out In California* (HighTone)

Singer/songwriter/guitar god Dave Alvin makes great studio albums; his most recent, *Public Domain*, won him a Grammy Award for Best Traditional Folk Album. But what he does in front of a live audience can take your breath away: Just when you think nothing could wipe away the silly grin you get when you hear him wail on "American Music," he'll stop the clock with a soulful, shimmering ballad like "Fourth of July," a song you used to think of as rock 'n' roll. *Out In California* captures all the magic and all the aspects of Alvin's live performances, including killer electric songs sprinkled with tastes of Chuck Berry, Bo Diddley and surf guitar, and acoustic heartbreakers such as "Andersonville." Alvin is backed by an expanded Guilty Men lineup that includes singer/songwriter Chris Gaffney on accordion/vocals and Dwight

Yoakam fiddle alum Brantley Kearns.

Producers: Dave Alvin and Mark Linett. Recording/mixing engineer: Mark Linett. Recorded at The Blue Café (Long Beach, CA), The Lobero Theatre (Santa Barbara, CA) and The Neighborhood Church (Pasadena, CA). Mixing studio: Your Place or Mine (Glendale, CA). Mastering: Mark Linett/Your Place or Mine. *—Barbara Schultz* ■

L.A. GRAPEVINE

by Maureen Droney

Supervising music mixer/engineer Joseph Magee has had his hands full for the past few months, riding herd on the soundtrack to *The Country Bears*, Disney's kid-oriented, live action, *Behind the Music*-style rock 'n' roll satire. Fortunately, Magee is comfortable with diverse personalities, because the cast of characters on the project included John Hiatt, Bonnie Raitt, Brian Setzer, Queen Latifah, Elton John, Willie Nelson, and producers Julian Raymond and Dallas Austin, among others, along with legendary producer/engineer Glyn Johns *and* Don Henley.

Joseph Magee "getting all tactile" inside Studio B at Signet Sound.

PHOTO: MAUREEN DRONEY

"We did have a lot going on," admits Magee, a veteran of such flicks as *Pearl Harbor* and *High Fidelity*. "Generally, for a film like this, I start in pre-production with the producers, the director, the music supervisor and Disney's music department. I get a concept of the picture, get onboard with the songs and go in—either as a tracking engineer or a supervising music mixer—to pre-record. On this film, we have been pre-recording songs at the same time we're shooting music on the set. I alternate from confirming track layout, timecode, sampling rate and [Pro Tools] grid recording in the studio to creating a new playback edit and mix on the set. From the technical perspective, I'm responsible for collecting and keeping all the materials, from pre-record to post."

The hybrid position Magee fills is new, created to deal with the complexity of many recent soundtracks in which multiple music producers, engineers, studios and formats coexist with intensely compact work schedules. His background, which includes a degree in music and stints in live sound mixing, remote broadcasting and studio engineering, made him uniquely qualified for the role.

"It used to be that a musical supervisor handled everything," he explains. "But as things got more complicated, technical aspects started to fall by the wayside. Too many things were out of sync and that gets really expensive. Tracks may have to be recut to get them back to where they're supposed to be. Sometimes, you have to go on a very time-consuming excavation dig just to figure out what happened. A couple of times, I've been called in halfway through a film to help out, and that's what I had to do the first two or three weeks—clean up sync messes."

When Disney's president of music Bill Green and VP of music production Monica Zierhut decided it would be cost-effective to have a supervising music mixer involved from the project's beginning, Magee's troubleshooting experience made him an obvious candidate. "I'm comfortable with filmmakers and with transfers and scoring and dubbing stages," Magee comments. "I'm also comfortable in the music studio as an engineer, so I'm like a bridge between the two worlds.

"With soundtracks, it used to be that you got some record industry people to create tunes and give you a stereo mix of them that could be played back on the set," he continues. "There were two completely separate worlds. What's been happening now is that the film often drives the record in a positive way. A record producer may cut the track, then we take it and start to work with it on a daily basis, on camera and in post. The

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NASHVILLE SKYLINE

by Rick Clark

Recently, while I was at Belmont University catching up with David Herrera, he handed me a CD of Latin American music and told me that it was the first release on the University's new Acklen Record label, a co-venture with Curb Records. Not only is *Musica Caliente de Nashville* a well-produced effort, it is a further statement of the increasing diversity that can be found in the area. Music ranges from rootsy numbers to high-gloss, big band performances by Nashville's finest Latin artists.

Most recently, Acklen/Curb has been producing a project with Fisk University showcasing that institution's world-renowned Fisk Jubilee Singers. The project was produced by Wesley Bulla, Mike Curb and Pamela Browne, with Herrera as associate producer.

The Fisk Jubilee Singers

Fisk University was established by the American Missionary Association in Nashville in 1866 to educate former slaves. In 1872, it became the first African American college to receive a Class-A rating by the Southern Association of Colleges and Secondary Schools. Over the years, Fisk has become one of the country's leading educational institutions and has trained a large number of important leaders in the Civil Rights movement.

In 1871, the school's musical director (George L. White) assembled two exceptionally talented and well-trained

quartets and a pianist and began touring throughout the world to raise money for the struggling school. The group quickly gained notoriety for its emotionally stirring renditions of traditional spirituals, and their tours took them all over North America and Europe with audiences including the President and Queen Victoria.

"The Jubilee Singers are the first to introduce the Negro spiritual to the whole world, and one of our assignments is to preserve this music," states Jubilee Singers music director Paul Kwami. "It's the music [that] was sung on the plantation, and the Jubilee Singers brought this to concert stages and made it an art form. Of course, there are different kinds of arrangements. Some are basically changed, but I'm very careful about what arrangements we perform. Basically, we are continuing what the original singers did performing the Negro spirituals."

My initial awareness of the Jubilee Singers came a couple of years back when I got a call to play a small part in a PBS television special on the group. While it was fun running around in 1800s doctor's garb tending to a sick Jubilee singer, the real payoff was the chance to absorb the passion and sacrifice of those historically involved in the group.

When I got home, a cursory search didn't turn up any commercially available recordings of the group; so it was with special interest that I attended one of the Jubilee Singers recording sessions at Ocean Way Nashville. Upon walking into the big room, the group gathered in a slightly curved line in front of Kwami and began warming up. Those initial sounds were wondrous, and by the time they finished running through their first song, I had "chill bumps" from their meditative performance.

"It has been great working with Paul Kwami," enthuses Belmont faculty member David Henson, who engineered the project with fellow teacher Dr. Wesley Bulla. "This group is so well-rehearsed

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NEW YORK METRO

by Paul Verna

LIVE FROM NEW YORK

On TV, it comes across as a seamless comedy show that opens with the familiar line, "Live from New York, it's Saturday Night!" But behind the scenes,

Shown with the new 96-channel Solid State Logic MT console at NBC-TV, from left, are SNL music engineer J. Vicari, engineer Josiah Gluck, engineer Marty Brumbach, and SNL technical consultant and project coordinating producer Stacey Foster.

NBC's *Saturday Night Live* is a patchwork of dialog, voice-overs, musical scores, musical performances and audience responses that only a team of seasoned professionals could put together week after week for nearly 30 years.

"It's an enormous crew and they do a complicated task," says *SNL* technical consultant Stacey Foster. "With as little rehearsal as we get, we have to divvy up the tasks to give people a slice of the pie that they can handle."

As accustomed as they were to producing the show on the SSL 9000 J console that had served them well for several years, Foster and his team felt they could benefit from a large-scale digital mixing board. After surveying all the major products, they settled on the SSL Axiom MT Production (MTP) Digital Console.

"Here at *SNL*, we constantly evaluate where we are, technology-wise," says Foster, who is employed by Broadway Video, the production company headed by *SNL* creator Lorne Michaels. "We've been taking a hard look at digital recording consoles in the past two to three years, and we felt that, for the first time in our particular application, we found a board that did what we wanted it to do and how we wanted to do it. It wasn't a complicated decision to arrive at."

It's not surprising that *SNL* would choose a digital board. After all, it's hard to imagine a production environment better suited to a digital console than a weekly variety show that demands a full spectrum of audio services. At any given moment, *SNL* is a conventional tracking studio, a post facility or a live mix room. Among its many advantages vis-a-vis an analog board, the Axiom offers instant resetability, unprecedented versatility, a digital signal path and a design that allows the engineer the luxury of never having to leave the sweet spot. While all those features were pivotal to Foster and *SNL* music mixer J. Vicari, the console's brand name also weighed heavily in their decision.

"The decision to go with one digital console versus another can be somewhat subjective," says Foster, "based on your long history of 15 to 20 years working with a company—as we've done with SSL—and knowing that they have a great organization, great support, etc. This is particularly true with digital consoles. One of the reasons you buy digital products is to take advantage of software upgrades, so we wanted to be sure that we bought from a manufacturer that's going to be around to deliver the upgrades."

Before settling on the Axiom, Vicarit test-drove one at Backstage at Soundstage in Nashville during production of a DVD celebrating the 25th anniversary of *SNL*.

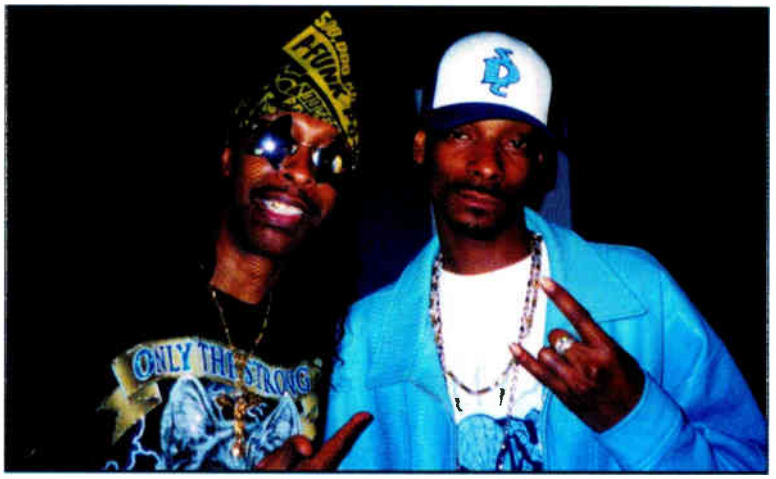
"It sold itself to me," says Vicari of the Backstage Axiom, on which he worked on 5.1 mixes of music from the show's archives. "The board is very simple to use. Anybody who knows the signal flow of an SSL 4000 or 9000

—CONTINUED ON PAGE 187

SESSIONS & STUDIO NEWS

SOUTHERN CALIFORNIA

Bootsy Collins kept himself busy at The Village (Los Angeles) recently. He worked with George Clinton and Parliament/Funkadelic laying down overdubs for a Nike TV spot. He was also busy putting the finishing touches on his new album with the help of Snoop Dogg, Fatboy Slim and Outkast...The band SR71 spent the spring at Ocean Studio (Burbank) with engineer/producer Neal Avron and Pro Tools engineer Howard Karp, tracking and doing overdubs for their new RCA release. Ocean's Dean Nelson was the assistant engineer. Also at Ocean, Boy Sets Fire spent all of April finishing overdubs for their new Wind-Up Records release. Jay Baumgartner was the executive producer, Dave Fortman produced and engineered, Jeremy Parker manned the Pro Tools rig, and staff engineers Nelson and Jason Cupp were in to assist.



Bootsy Collins (left) and Snoop Dogg at The Village (Los Angeles).

NORTHEAST

In Studio C at Sound on Sound (NYC), Whitney Houston was mixing some new material with the production and engineering team of Rob Fusari and Earl Cohen. Gza was recording vocal overdubs with producer Arabian Knight and engineer Chach for a forthcoming MCA release...The Goo Goo Dolls were in at Indre Studios (Philidelphia) for another Y100 Radio Broadcast recording. The band is touring behind their new album *Gutterflower*. The session was engineered by T. "Quake" Mark and Indre's Mike Richelle...At Dubway Studios (NYC), Jeff Alexander recorded vocals for his album *Blues To Go* in the main room. Vocalist Genie "Pepper" Swison (Boz Scaggs, Wilson Pickett) and LaRita Gaskins (Jocelyn Brown) sang backup. Al Houghton engineered the session.

SOUTHEAST

Last May, Vince Gill was at Seventeen Grand Recording (Nashville) working on his upcoming self-produced album on MCA. Steve Bishir engineered and Hank Nirider was the assistant. Travis Tritt and his producer, Billy Joe Walker, also spent some time at Seventeen. Joining them were engineer Ed Seay and assistant engineer Rob Clark. Randy Travis was busy tracking for an upcoming project with his longtime producer Kyle Lehning. Steve Tillisch engineered with the assistance of Casey Wood...Producer/engineer Jeff Powell recently teamed up with Chad Cromwell to co-produce two new tracks for Madjack Records artist Cory Branan at Ardent Studios (Memphis, TN).

Houston's own OrchestraX.

NORTHWEST

Bay Area natives Train recently began production for their next album at Studio D Recording (Sausalito, CA) with producer Brendan O'Brien. Joel Jaffe has been picked up to engineer with assistant Stephen Pierson...At Super Natural Sound (Oregon City, OR), Robert Bartleson produced and engineered a new LP for Gruesome Galore...At Haywire Recording (Portland, OR), Robert Bartleson recorded a demo for The Out Crowd, started pre-production for the new Andi Camp record and finished an LP for jazz guitarist Bob Joyce.

SOUTHWEST

Andy Bradley, chief engineer at Sugar Hill Recording Studios (Houston), recorded this season's series of OrchestraX concerts. OrchestraX, one of the largest professional orchestas in the state, is in its fifth year. The last concert of the season was American Horizons: A New Music Festival at the Aerial Theater. ■

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; fax 510/653-5142 or snail mail: 6400 Hollis St., Suite 12, Emeryville, CA 94608. Photo submissions are always encouraged, and please include the name(s) of the artists, producers and engineers on the project, and the location of the studio.

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L.A. GRAPEVINE FROM PAGE 180

sound of that track may evolve, and then the record producer may pick up that evolution, or not…but it's a much more fluid process. For example, Peter Hastings, the director of *Country Bears*, is very musical. He's a multi-instrumentalist and a Berklee School of Music grad and very Pro Tools-savvy. He's another example of how those separate worlds of film and record music are getting much closer."

Slowly but surely, word is getting out about The Steakhouse, a one-studio facility just off Magnolia Boulevard in what has become known as North Hollywood's "Music Row." Vintage mavens in particular have been taking note of The Steakhouse's private location and custom A3269/A3271 console, which was formerly housed at The Great Linford Manor in England and reportedly the largest working EMI/Neve in the world.

According to Phoenix Audio's Geoff Tanner, who has been associated with the A3000 Series from its earliest design stages at Rupert Neve and Co., seven of the desks were designed and built in the mid-'70s for EMI Records in London.

PHOTO: MAUREEN DRONEY

The whole family at Steakhouse Studio; (seated) studio manger Kelle Musgrave, (standing l-r) Geoff Tanner of Phoenix Audio, Chris Walsh of Tannoy, and studio partners Rick Bench, Lee Bench and Rex Coggin.

Those seven have since scattered around the world. One, now in Dublin, is owned by U2; one resides in Auckland, New Zealand, where it was used on several classic numbers by Crowded House; one is in Brussels; two are still at Great Linford in the UK; and two have been put together by Tanner to form the 92-input beauty owned by The Steakhouse.

"Apparently, the EMI consoles were so impressive that people asked Neve to put out a whole line of them," comments Steakhouse studio manager Kelle Musgrave. "But they were so customized it was too expensive to mass produce them. Instead, Neve ended up making a scaled-down version that became the 8078 Series."

Featuring 56 channel inputs with 1064 and 1093 EQs, 12 effects returns with 2076 EQs, and 24-track monitoring with custom 2-band EQ and Penny & Giles mini-faders, the desk is also fitted with 68 channels of Flying Faders automation with a control panel that has been crafted into the center section.

While the console is its centerpiece, The Steakhouse itself—designed by Carl Yanchar of Lakeside Associates—has a musical history. Hawaii-based brothers Rick and Lee Bench, musician/producers themselves, started building the complex in 1987. The original plan was for it to be a private production facility.

"We knocked down the buildings that were on the property and set about building a studio from the ground up," recalls Lee Bench. "We went through it all with Carl [Yanchar], from floating the floors to putting in custom power. It took almost a year just to work with the city on plan checks and things like earthquake requirements. Really, when you do this, you find that equipment is only one of the things you're concerned with. Power, for example, was a priority for us because that's something that can distinguish a great room from a good one."

The studio's direction changed a bit when, not long after the studio was up and running, L.A. session guitarist and

Toto principal Steve Lukather came by. Liking what he saw and heard, Lukather struck a deal, moved in his gear and started working. He spent so much time there that the studio became known to many simply as "Luke's Room."

"For a while, Luke had the time to always be here, and he was driving the show," Bench explains. "Later, he got more active with Toto and other projects, but he's still very much a part of it, and to this day, on certain projects, we still function as partners."

Originally, the control room had housed an AMR 24 console, but as the studio headed in a commercial direction, a decision was made to look for something else. "We spent a year and half trying to find a great console," says Bench. "Finally, we ran into Geoff, who knows where all the bones are buried when it comes to Neve consoles, and he turned us on to the ones out at Great Linford. It was a complicated deal, though, and it took the better part of two years to get them out here and interfaced properly."

The large studio area, which features hardwood floors and a compression ceiling, along with three good-sized iso booths, has become a favorite for recording drums and acoustic instruments. The complex itself is comfortable with lounges and private, gated parking. Recording equipment includes Studer 827 analog 24-track, Ampex ATR 2-track and Alesis Masterlink; Pro Tools HD is also available. Monitoring is on Tannoy Gold, KRK E8 and Yamaha NS-10 speakers. And an added benefit to the studio is the large collection of guitars, amps and processors that can be made available.

"We're starting to get very busy," says Musgrave, "mostly with long-term projects. It seems that people rarely come for less than three weeks. We just try to keep the support up and make it a pleasant environment. Our goal is to make clients comfortable so that they want to come back."

Making themselves comfortable lately have been producer Rick Rubin with engineer Ed Thacker overdubbing on Palo Alto, producer Matt Serletic with engineers Noel Golden and Mark Dobson working on Crash Radio, engineer Sally Browder working with producers John Wooler on Young Dubliners, and Pete Anderson on Dwight Yoakam, and engineer/producers Joe Barresi, Dave Schiffman and Sean O'Dwyer.

About the process of developing the studio, Lee Bench says, "We've never been in a hurry to get somewhere that we didn't want to be. Luckily, we've had

so many really intelligent people come onboard and help us with this project. Having friends you enjoy working with really makes it easier to enjoy the process. And it's really important to enjoy the process, because owning a studio doesn't make sense if all you are focused on is the end goal of economic reward from the studio.

"At the end of the day, having a studio is like having a yacht," he concludes with a laugh. "You meet a lot of people at both studios and on yachts that can lead to other things that make money. But on a 'one-for-one' investment level, a hot dog stand in front of a Home Depot probably capitalizes at a much higher rate. But this keeps us around music, and that's what we like." ■

E-mail L.A. news to MsMDK@aol.com.

NASHVILLE SKYLINE FROM PAGE 180

that the artist part of it has been a plus. When they sing, it is 'chill bump' time, and we have now been able to *capture* those chill bumps."

While I was there, Belmont University president Dr. Bob Fisher and Curb president Mike Curb dropped by to catch the proceedings.

Curb enthusiastically stated, "I always loved the Jubilee Singers, and just through conversations with Dr. Fisher at Belmont and Carolyn Reid-Wallace at Fisk, we decided this was a much-needed project, and this was the time to do it. I think that the way this is being recorded is just magnificent."

Belmont's Bulla shares Curb's enthusiasm, adding, "We have been able to do something that no one else in town has been able to do, which is essentially put about $13,000 worth of studio time into the Fisk Jubilee Singers. If there is any choir that should have that treatment, they are."

To that end, Belmont's staff, along with Ocean Way engineer Bryan Graban, recorded the event in surround and filmed it for a DVD release.

"We are using a very minimal mic signal path. We are really just going from the microphone to these Millennia Media HV-3D mic pre's straight to tape," explains Graban. "One of the cool things about this project is that they are trying to keep it quite traditional and not Pro Tool anything and Auto-Tune vocals. The only thing that we are using that isn't 'traditional' is we are going into an iZ RADAR and using a Sony 3348HR as a backup."

The recording process included AKG C12s set up in a Decca Tree configuration. "In pre-production, we actually had Bob Bradley down at the Mic Shop in Franklin redo the main C12s," says Henson. "They've been rebuilt and have his proprietary hot-rod power supplies with cables and connectors that he handmade for them. We approached this to make it the best it could be."

The project, which is tentatively titled *The Fisk Jubilee Singers*, is slated for DVD and CD release this fall.

Back in the '80s, when Norbert Putnam, producer for Jimmy Buffett and Dan Fogelberg, opened up the Bennett House in Franklin (a quaint town 20 miles south of Nashville), who would've thought his prediction that this area would become a hotbed of recording studios, production houses and record labels would materialize. Twenty years later, the countryside is dotted with facilities producing quite a range of music. Sound Kitchen alone has Faith Hill and Insane Clown Posse working in two of the studio's seven rooms.

The latest newcomer to the area is Paragon Studios, a huge 22,000-square-foot, multi-tenant complex that is the vision of Fred Paragano, most noted for his work in the pop and contemporary Christian music.

Paragon is located in the middle of the Cool Springs area just north of Franklin on the less commercially developed side of I-65. It is a block away from the Provident Music Distribution label offices, one of the most successful Christian music enterprises and one of Paragano's main clients. In fact, if Music Row is the center of the country music industry, then the Brentwood/Cool Springs and Franklin areas are the centers of the Christian music industry. Just about every label in that market is within 15 minutes of Paragon.

It was the concentration of the contemporary Christian music industry that lured Paragano to Nashville from New York seven years ago.

"I just liked what was happening here," says Paragano. "I like the music scene, and I wanted to be more involved in the contemporary Christian market than I was in New York. I took a chance and came down, and thankfully, I was able to get involved in that."

While many professional engineers have moved their work into home studio environments, Paragano felt it was time for him to move his studio out of his house and create a more dedicated commercial audio space that not only ad-

dressed his needs, but also raised the bar for what he felt a great studio needed to provide.

In order to assure the studio's sonic performance, as well as aesthetics, Paragano hired the world-renowned, Dallas-based Russ Berger Design Group. "I felt that Russ was the only designer that fully understood my specific needs and was able to integrate those requirements into the design of the rooms," Paragano says.

The facility has three rooms: two matching 5.1 mix rooms with recording spaces ranging from an array of iso booths to a tracking room large enough to handle an orchestra date. The third room is a production suite/MIDI room. There is also a central machine room that houses all of the patching that interconnects all of the rooms in the facility, including ancillary spaces, offices and a tape library. The facility also features extensive Pro Tools HD systems built into each room. Monitors are custom-designed Dynaudio systems.

Studio A features an SSL XL 9000 K Series 80-input console for 5.1 mixing, and the room is set up for mix-to-picture capabilities. The entire facility is networked via a Fibre Channel network by Studio Network Solutions, which Paragano says, "will improve performance, workflow and storage, as well as minimize down time for backups and restore."

"I spent a lot of time with cartage supervisors, engineers and assistant engineers, questioning them as to what would make their lives easier and help their sessions run more smoothly," Paragano says. "There were several instances where changes were made during the construction to accommodate a good idea."

In mid-April, Berger was a guest speaker at a local AES chapter "hard hat party" at the unfinished facility, where he conducted an animated "fly through" that played in the main room. For many, this was their first chance to get a sneak peek inside the new building and studios. By some accounts, it was one of the best turnouts for the local AES in a couple of years.

One of the three studios will not be open for commercial bookings because Paragano is retaining the right to use it as a private room to work on his clients' projects.

It's obvious, from looking at this substantial new construction on some of the most prime property in Tennessee, that Paragano has come a long way since his decision to move from New York. Up to 11,000 square feet of the structure has been designed as leaseable space for media-related tenants.

"I'd like to create a synergistic environment for everyone who uses this facility," says Paragano, who adds that he has already received significant interest in the available space.

During this year's Nashville NAMM show, Paragano is planning on throwing a grand opening party. Just like the studio, he seems to do everything with a distinctive twist. One of the highlights of this year's local AES golf tournament was the Paragon/Studio Network Solutions-sponsored sushi tent at the 15th hole. ■

Send your Nashville news to Mr Blurge@aol.com.

could run this console."

Since the installation of the MTP earlier this year at NBC, Vicari has mixed various shows, including *SNL*, MTV's *Total Request Live* and NBC's *The Colin Quinn Show*.

"I'm doing three, four shows at a time," he says. "Right after the board was put in, we hit the ground running and haven't stopped since."

HIT IT!

Hardly a month goes by without some big news from the Hit Factory. As one of the largest and most lavish studios in the world,

the New York powerhouse is in a better position than most of its competitors to test high-end, cutting-edge products.

Among the latest consoles that have made their way up the facility's storied freight elevator are two Solid State Logic XL 9000 K SuperAnalogue boards for its new Studio 6 and Studio 7, each equipped with 80 inputs and 5.1-channel capabilities.

"One of the reasons we purchased two consoles was to allow clients to go back and forth between the two rooms," says Hit Factory CEO Troy Germano. "This necessitated making both control rooms identical to accommodate our clients."

Other features of the XL 9000 K include an optimized signal path to address the needs of higher-sampled recordings, a new automation computer that offers an online mix-and-compare function and SSL's Advanced Photo-Realistic Total Recall.

SURROUNDED BY GLASS

Michael Riesman, the multifaceted musician/conductor/arranger/producer/engineer best known for his longstanding work with Philip Glass, is taking the composer's recorded works to the next sonic frontier: surround.

Riesman has been working on 5.1 mixes of several Glass works, including "La Belle et La Bete," a performance piece that Glass wrote a few years ago to accompany Jean Cocteau's 1946 film classic of the same name. Although Glass' score is not being released as the "main" soundtrack to the film because of French copyright laws that prohibit the alteration of recorded works, the DVD medium made it possible for the Glass piece to appear as an "alternate" soundtrack on the French-language disc.

"This film has elements that lent themselves to mixing the soundtrack in surround," observes Riesman, noting that the project was originally recorded on 48 tracks. "There's the beast's domain, which is a magical realm that we'd struggled to render in the 2-track mix. There are beasts roaring off-screen, disembodied voices and other special effects. There are also bells, celestes, triangles and glockenspiels, which we were able to put in the surround field around the listener."

Asked how he likes working in surround, Riesman says, "I love it. I wish I could do everything this way." ■

Send your NYC news to pverna@vernacularmusic.com.

—FROM PAGE 26, THREE'S COMPANY

cause they don't even know that anything is wrong in the first place.

WHO'S DRIVIN' THAT TRAIN, HIGH ON ROGAINE?

Engineers...the actual magicians. They don't get what they *think* they want at all, but they get what they need (that's what Mick says, anyway).

Live sound engineers only have to get a good, stable mix sent to the house system in the most unstable, hostile recording environment known to man, while providing a useful monitor mix that lets every performer onstage hear himself as the leader with just enough band to stay in time and in tune.

Oh, yeah, as soon as it's balanced and right, the vocalist will put the mic in his mouth and keep it there for half a song while the rhythm guitarist will pull his ear monitors out because he can't hear his amp. Never mind that neither of these things happened in soundcheck or in any of the small venues you did leading up to this live TV broadcast.

Studio engineers are smashed between a rock and a hard roll, as well—saddled with the simple little job of making every person in the band happy with what they sound like, regardless of what they *sound like*, while silently and secretly changing EQs, levels, compression thresholds and reverb sends to make it work. And, of course, it's good if the producer's happy. In certain rare cases, it is suspected that there may even be a *dialog* between the engineer and producer, but this is, of course, undocumented.

Yes, only engineers can truly understand the magical powers that lie in knowing what to do on the foldback bus and what *not to do* in the real mix.

Only the engineer knows what to do when the talent gets all excited and flies into the control room saying he wants more, uh—more green, more wet, more honest, more raw, more throaty, more friendly, more intimate, or the well-known more balls.

The engineer knows to move the mic in a little closer to get the prox up a shade, drop a heavier pop down to keep it all from exploding, change the thresholds a bit to squeeze him just a little more, crack 10k up a hair to make up for the pop filter, maybe de-tune the ADT a bit more, increase the pre-delay on the reverb send a bit. And, of course, the secret is to let the talent watch all this excellent knob-turning. He also knows to keep the track he just printed *before* he did all this stuff, and last, but certainly far from least, to kick 130 Hz up 3 dB, bring up the reverb return 6 dB, and take the talent's overall level up another 6—*in the monitor mix*.

When all of this is done correctly, the talent gives the old thumbs up, the producer slyly and discretely nods down and up once with the edges of his mouth turned way down in that special "aawriight, I get it" way, then breaks out the good stuff, and finally a check comes in the mail.

Real engineers know more shit about more shit than it is possible to know about. They have to. They know that their cool British Wanker 200 Expressor has pins 1 and 3 reversed, and they know where the re-reversing adapter is. They know the Infernal EchoVerb gets crazy if somebody keys a Nextel, so it has to be in a grounded steel rack. Some have replaced every bypass and de-coupling cap in the console, and they know how to use what they gained from doing it. Hell, nobody but other engineers even *want* to know what they know.

A good engineer keeps the world from exploding. He lets the talent know that he knows everything, while hiding that fact from the producer. He is the glue, the conduit and the universal translator.

A PRIEST, A LAWYER AND A RABBI SIT DOWN AT A BAR...

Three vocations, each dependent on the other two to survive. And as different as they are, musicians, producers and engineers share something simple and wonderful that is nothing short of amazing. Many are far too crazy to even realize it, but it is true nonetheless. We, the Three Musketeers, are all doing what we want. We might even be doing what we *need*. Sounds obvious, but it is very, very rare. Almost nobody in this world is actually doing what they want to make a living. Pumping gas, driving a cab, dropping fries at FatBurger, ringing up pantyhose at Macy's, selling used Toyotas. Is this what they *want*? And these are *first-world* occupations.

We don't work. We *play*. We say we work, we think we work, and if we last more than a year or two, we must be talented. But if we stop to remember the jobs we had before we carved out our positions in this wonderful industry, we kind of have to face the fact that we play for a living now. And we do what very few can. Together, we create and capture living music using what the masses see as overwhelming, incomprehensible, alien technology.

I don't really know if we should feel great or guilty about this, but we are all lucky, as each of us in this industry is actually doing what everybody we knew said we couldn't do. I recently found out what these advisers from my past are doing now. I win.

What we do does actually set us apart, who we are sets us apart, and perhaps our deep desire to be set apart sets us apart the most.

In some way, each of us wields more power and control than normal earthlings, as each of us is involved in creating art that almost every person on the street enjoys, and maybe even needs. Ain't that a kick in the head! ■

SSC has matured somewhat and now recognizes that it is not really too cool to think of himself as superior because he is part of this industry. He no longer owns purple leather pants. The gold lamé underwear, however...

—FROM PAGE 30, DUMBING DOWN THE DIAL

where the short RF waves play pinball among the steel skyscrapers. So not long ago, I got in touch with Moates and asked him, "How do you keep the transmitters from clobbering each other?" His reply was, "We don't. They do."

If WUMB hadn't grabbed those licenses, however, someone else would have, sooner or later, snatched them up. Moates explained, "While commercial FMs are assigned on a 'spacing'-only basis, noncommercials are assigned on a 'contour' basis." Determining where a transmitter can be located involves plotting signal-strength contours on every channel within 600 kHz of the desired one, as well as plus or minus 10.6 and 10.8 MHz—the value of the Intermediate Frequency in superheterodyne FM receiver designs. (You see, I retained *something* from those days!) "A new station can then be dropped in, as long as its contours don't touch similar contours of any other station in a way that's prohibited by FCC rules," he says.

"The Falmouth and Worcester signals were 'holes' on our frequency near Boston that *somebody* was eventually going to file for, and then their signals and our signal would interfere badly in the overlap areas. So we filed for and got these two stations as a pre-emptive strike."

WUMB's three 91.9MHz transmitters, it turns out, are not *exactly* on the same frequency. "The FCC allows you to be up to 2,000 Hz off-channel," explained Moates. "One is at 91.900088, and another is at 91.899986. If you drive through the overlap area, your radio is receiving both signals, but they're almost never at the same level. So, your radio constantly jumps, and every time it jumps, you hear a little 'phht' of noise. It sounds like multipath, and it is, but instead of multiple reflections, it's caused by multiple transmitters. It's the 'cellular' approach to broadcasting."

Even more interesting is how they get the audio on the different transmitters to line up, so that when your radio goes from one "cell" to another, the music doesn't skip a beat. "We send the program audio to the transmitters as MPEG-2 on a pair of 56k dedicated phone lines," he told me. "The phone company doesn't offer anything between a 56k and a T1 service, which would cost us $2,000 a month and we can't afford that. They may give lines to some noncommercial stations for free in exchange for promotional announcements, but we're not big enough for them to do that. So the processing delay through the MPEG encoders and down those lines is about a quarter-second.

"Eventide Clockworks developed a special stereo delay for us, which was based on their profanity delay. It doesn't use bit-rate reduction, like most profanity delays, because we didn't want to do that twice. They modified it [from a typical five or 10 seconds] so that it could go down in increments of half a cycle at 8 kHz. We can set it up to match the line delay so that the audio to all of the transmitters is phased within 25 or 30 degrees of each other at 5 kHz."

Despite its low power, WUMB has loyal listeners, like me, all over eastern Massachusetts. I live on a hill about 12 miles northeast of the transmitter: With a good telescope, I could probably see it. And, up until about a year ago, I could listen to it on an old Sony cassette boombox while I made breakfast. Upstairs in my studio, it's always been nothing but hum and noise, but I've attributed that to

—CONTINUED ON PAGE 200

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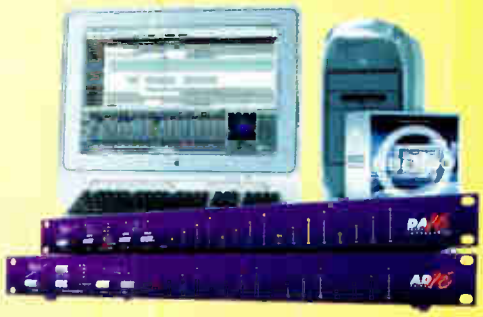

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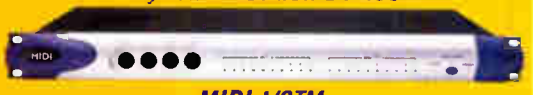

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—FROM PAGE 191, DUMBING DOWN THE DIAL

the enormous amount of RF junk my computers and audio gear generates. (Instead, when I'm working, I listen to it on the Web. It isn't pretty, but it's better than the beer and junk food commercials on the stations that *do* make it through the noise.)

Last year, however, the cassette mechanism in the Sony bit the dust. I replaced the boom-box with one of those snazzy, feature-filled Cambridge Soundworks CD/FM two-tweeters-and-a-sub systems. It sounded great on the commercial band and on the big educational stations, but WUMB nearly disappeared altogether. When I tried to listen to it, I'd get occasional little wisps of guitar or hammer dulcimer, which were quickly buried by distortion and hash. Vowing to reclaim my family's right to listen to Arlo Guthrie and John Gorka over our morning coffee, I put up a rooftop antenna, and with a map and a compass, I pointed it right at the Quincy transmitter. The noise just got louder. My wife demanded that we bring back the Sony, broken tape player or no.

It wasn't the three transmitters that were conspiring against me—I'm far enough from Worcester and Falmouth so that they aren't a factor. And there's nothing particularly powerful that's close to 91.9 on the dial that might be blowing it away, so I couldn't blame it on the new radio's presumably better sensitivity.

Moates straightened it out for me. In between me and WUMB's tower, directly in the line of sight, are the two biggest transmitter sites in town: the Prudential Center and the John Hancock building. They are pumping out so much FM, TV (including one almost-unwatched station with a million watts ERP), microwave, taxicab calls and God knows what other kind of electromagnetic energy that the tuner in this fancy radio literally can't pick out that tiny little 660-watt signal from the others—no matter how far away in the spectrum they are.

"All that RF energy is causing intermodulation products," Moates explained. "When two or more stations have transmitter sites near each other, they can mix together and create additional signals on other frequencies that shouldn't exist. By FCC rules, those products are supposed to be at least 80 dB below the main signal [about .01% of the power of the station or less]. But when you've got ERPs like 50,000 watts, even 80 dB down is still a considerable amount of energy, when you compare it to our 660-watt signal after it's traveled 10 miles or more. [You can read the actual wording of the rule, if you're really interested, on mixonline.com.]

"Intermodulation can also happen in receivers," Moates continues. "Digital tuners, especially the cheap ones that they use in these mini-systems, have varactor diodes in the front-end circuitry, which tune the radio when a DC reverse-bias voltage is varied by a microprocessor. When you tune the radio, you're just changing this DC voltage.

"But these diodes are easily overloaded, and when they are, they start conducting forward on the high-RF energy, causing the radio to create its own 'intermodulation' products. And that's why you get all that interference.

"It's a kind of 'dumbing-down' of consumer electronics. The manufacturers don't want to let you adjust anything. They've even taken out the Mono switch, which you used to be able to use to help receive difficult stations. They've replaced it with an automatic circuit that blends the highs progressively as the signal weakens. What you end up with is a mono signal, but you don't know that because the 'stereo' light is still on!"

That's also why the old Sony boombox's tuner worked: It was analog. It is why the $600 over-powered, over-featured digital receiver in my studio can't pick up the station. And, it's why the ancient Onkyo receiver in my bedroom *can* get WUMB most of the time: It's analog, too, and it has a really helpful Mono button.

The manager of the Cambridge Soundworks store who sold me the radio admitted that people don't buy it for the tuner: "They just buy it for the CD." Another company that produces a high-end tabletop radio has, said Moates, "this beautiful $300 box, which they put a $9.95 tuner in." Moates wouldn't let me quote him saying the name of the company because of their propensity for taking legal action against their critics. (Another source I talked to said he was once quoted in an article referring to the company as "litigious," and immediately got a call from their lawyer demanding a retraction.)

So where besides at an antique store can you get an analog FM radio that can pull in these valuable and underpowered stations in this digital age? Therein lies another tale, which is going to have to wait until next month. ■

Paul Lehrman, like a vintage tube, is just getting warmed up. View his latest projects at www.paul-lehrman.com.

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BY ERIK HAWKINS

MOTU Digital Performer

Getting Loopy With Polar

Polar is Digital Performer's RAM-based loop recording tool.

Have you ever wished for a way to record takes without cluttering up your hard drive with files? Many of today's best digital audio sequencers have some sort of "take" function that lets you record multiple passes on one track without erasing the previous passes by saving each one as a layer for that track. (The layers are often referred to as virtual tracks.) However, once you decide on the take that you want to keep, all of the other unused takes are still eating up hard drive space.

Some programs can perform a special "save as" and create a duplicate project folder that contains only the used audio files. However, if you're running low on hard drive space and the project is really big, then this may not be a viable option. The alternative is to go into the project's Audio Files folder and erase the unused files. But this can be a dangerous operation, opening yourself up to the possibility that you might accidentally delete something crucial.

Polar is a feature in Digital Performer that solves this problem. It's a RAM-based loop recording tool first introduced in Digital Performer Version 2.6. Given its own dedicated window and unique modular appearance (similar to a plug-in), its controls are very easy to learn. Using Polar, you can quickly record a bunch of loops into your computer's RAM and then save just the "keepers" to your hard drive. Playback follows Digital Performer's main transport so that you can jam along with the session's tracks as you record.

FAST AND FURIOUS

To get the most recording time possible when working in Polar, your computer should be loaded with as much RAM as it can hold. Running Digital Performer on a minimum of system memory (by setting its memory allocation to a reasonable amount) and with a bare-bones system extension set also helps to free up RAM resources. Polar depends on the MAS engine, so I suggest running it with a MOTU audio interface (such as the 828 or 896 FireWire units) for best results.

Recording with Polar is relatively simple. Open Polar's window and assign input record and output monitor sources. The input source can be mono or stereo, and there's a level control for the output. Polar's recording can be set to automatically start at sound input, or you can press its Record button to manually begin each new pass. In the Automatic mode, a gate lets you adjust for triggering sensitivity, and each new pass is automatically incremented. In the Manual mode, a pass is continually recorded (over and over, for a cumulative effect) until you press the New Pass button or stop recording. Loop duration is easily adjusted using the repeat bar lines, which become visible in the Tracks window when Memory Cycle is enabled.

With several passes recorded, you can write these to your hard drive by pressing Polar's Print button. If the passes are short, then the process of writing them to your drive is almost immediate. You can choose to have the passes automatically added to your Tracks window, which is very convenient, or just put in the session's Soundbites' pool to drag into your arrangement later. Polar's passes can be printed individually or comped together as a single take. (Each pass has its own level and pan, so you can get quality control of the mix.) There's no need to decide right away which of the passes you want to print either, because you can save your entire Polar session as an independent file, and even open it in an entirely different Digital Performer session.

POLAR PATTERNS

Song sections are often looped while working parts out, and Polar is the perfect companion for this process. With my reference drum tracks laid down, I can loop a song's section, open up Polar and start recording. It's possible to work through each of the song's sections, looping them as I go, while recording many different parts into a single Polar session. Because Polar's input can be switched on-the-fly, I can have different instruments and mics set up and ready to grab. After recording all the parts that I can think of, I select the ones I like and print them. All that's left then to complete the song's initial tracks is to arrange the saved loops in the Tracks window.

A song section is usually composed of several musical loops, which are often of different lengths. Polar will let you create loops of different lengths (and even different meters, if you want) in the same session. The trick to getting Polar to record loops of different lengths is to use a different Group assignment for passes of different lengths. Group assignments can be created manually by entering the Group number you want for each new pass, or automatically by pressing the Auto-Increment Group key. When you are ready to record a pass of a new length, simply set the repeat bar lines for the new loop and press the New key. All the loops, regardless of their Group number (length or meter), play back continuously from end to end at the project's master tempo.

Today's crop of "do-it-all" digital audio sequencers is amazing, but sometimes their sheer power can confound our creative flow. There's nothing quite like Polar; it's only available in Digital Performer, and once you use it, it becomes obvious that it was created by recording musicians for recording musicians. ■

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).*

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They Might Be Giants
2002 Grammy Award winners for 'Boss of Me'
Theme for 'Malcolm in the Middle' (FOX)

Photo: © Gavin Grethers

"They Might Be Giants has been relying on the power of Performer since Version 1.0. Now, as our work branches out into film, television and beyond, Digital Performer has become even more integral to our creative output. From MIDI sketches, all the way to locking to picture in studio sessions, Digital Performer is rock solid, fast and easy. Its versatility seems boundless, and the interface is elegant. We just received our first GRAMMY for 'Boss of Me'. The whole track was put together on Digital Performer. I can't even tell you how much we owe to MOTU, because I'm afraid they're going to want a piece of it." — *John Flansburgh*

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