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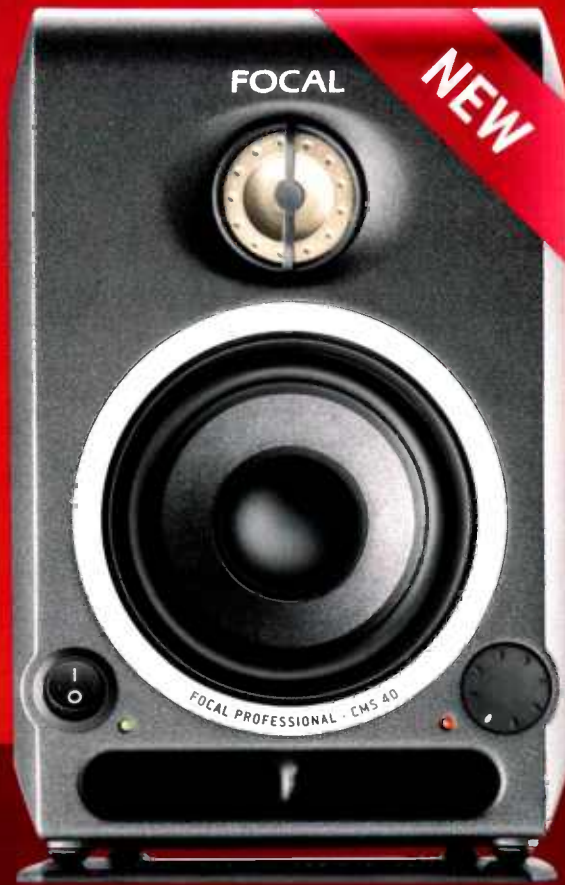
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New facilities for Universal Mastering Studios West were designed by Delta H Design Inc., using patented Zero Reflection technology. See story, p. 10. Photo: Jeffrey Katz. Inset Photo: Steve Jennings.



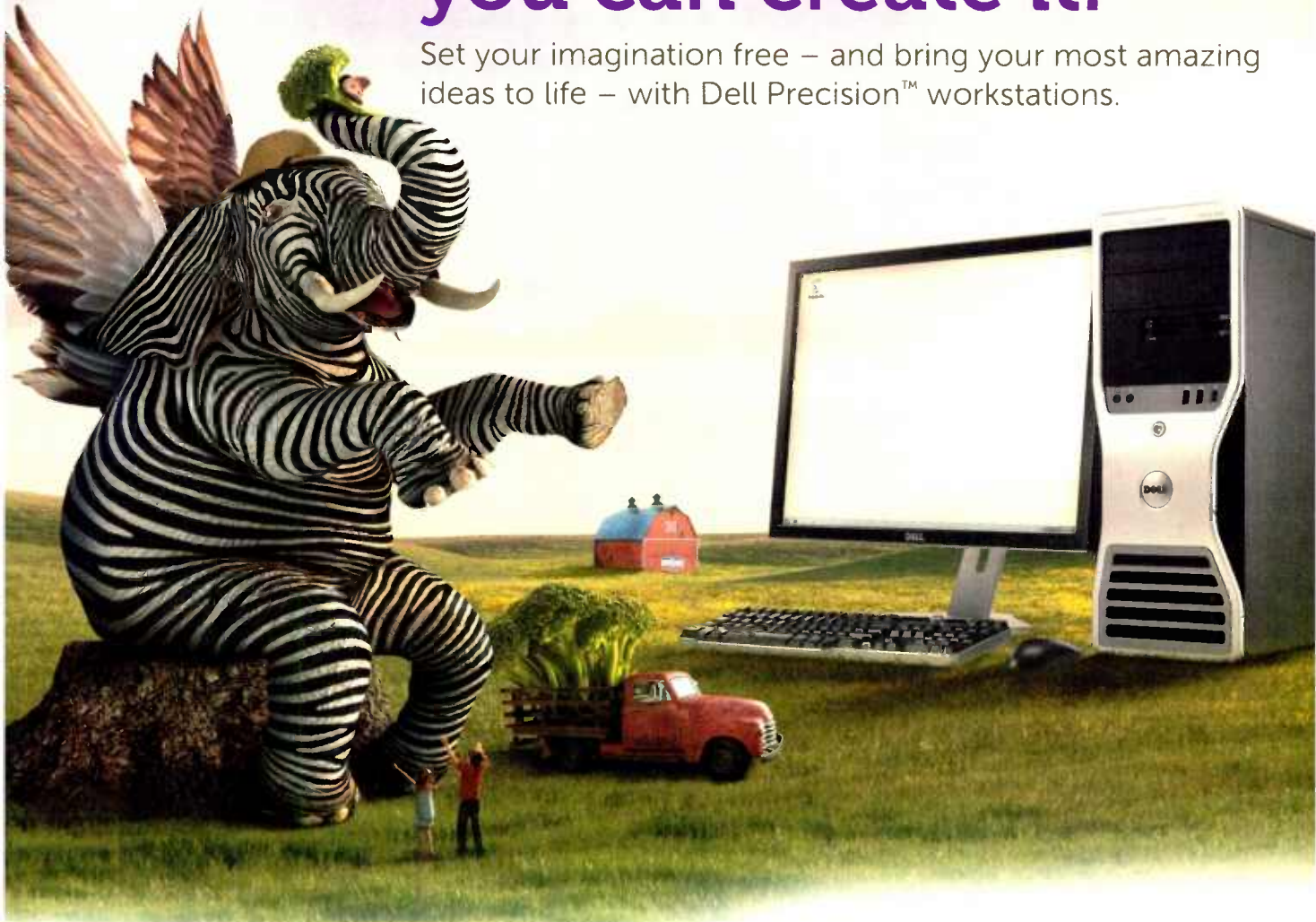
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## Mixing and Matching in L.A.

**T**hings really do come together in Los Angeles. New York has broadcast and Broadway and music and energy. Nashville has the players, the studios, the tradition and the soul. But Los Angeles has everything in entertainment like no other place on Earth. I was reminded of this on a recent trip to our cover facility, Universal Mastering Studios West, the same day I stopped by Sony Pictures Studios in Culver City for a visit with re-recording mixer Greg P. Russell. That's when it hit me.

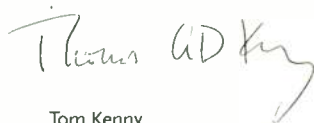
Greg is an extraordinary talent, with 13 Oscar nominations and a credit list that, while skewed toward big-budget action pictures in the past few years, reads like a snapshot of Hollywood over the past two decades. He did all the *Spiderman* films and is Michael Bay's go-to guy. He's also done *Memoirs of a Geisha* and *Cloudy With a Chance of Meatballs*, so the guy has range. I was there to talk about *Salt*, the Angelina Jolie-starring, Phillip Noyce-directed thriller, which you will read about next month. He and his mix partner, Jeff Haboush, were doing a first pass at backgrounds, with the final still a few weeks off. But it turns out that he had just finished a three-week mix on the Kenny Chesney concert film and he was jazzed. "It brought me back to my music roots," he told me, referring to his years at Evergreen and around Los Angeles in the 1980s. "I loved it!"

Chesney, apparently, had decided to take the summer off after 10 straight seasons on the road. He still wanted to have something for his fans in 2010, so during the summer 2009 tour, he shot multiple stadium shows in 3-D and brought multichannel sessions (60 tracks of 5.1 crowds) to the Cary Grant Theater this past spring for a full-blown theatrical mix. He had never been in a dub stage of that level; Russell had not mixed a concert film of that scope. It turned out marvelously.

"This was completely foreign to him," recalls Russell. "But he has an incredible ear and it was very clear that he wanted the audience to feel like they were at a concert—that energy. We used the surrounds a lot to push that crowd presence while maintaining clarity. We panned instruments left and right quite a bit. There are 22 songs, strong songs, intercut with voice-over and slideshows and backstage footage. Smoothing those transitions, with the crowd washing into the 'verbs, was probably the biggest challenge. Then you have those classic moments where the camera cuts to the B3 or the dueling guitars, and you pull that out. Classic film and music touches. And I have to say, the remote engineer, Frank Pappalardo, gave us some stellar tracks."

Live recording, big-time country music, full-blown 3-D film mixing (now on DVD)—it truly does combine the best of all worlds. Music mix engineers can mix concert films, no question, but when Sony paired one of its top artists with one of its top film mixers, they truly got the best of all worlds. And it all came together in Los Angeles.

P.S. From the small-world category: Hanson Hsu, who designed this month's cover facility, was once Russell's chief engineer at the Cary Grant Theater at Sony. You gotta love L.A.



Tom Kenny  
Editor

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## Kudos for Total Access Recording



I just wanted to say that I have been recording at Total Access Recording [profiled in the May 2010 issue "Sessions" section] with Wyn Davis for 20 years, and it is one of the great rooms in the Los Angeles area. The entire staff and facility is of the highest quality I have ever worked with. The sound of my drums coming out of there is equal to none. Wyn Davis has the ears that every artist wants and needs. Our band, Native Son, has just completed our debut CD, which was recorded at Total Access. Another nice perk is that it is right off the ocean in Redondo Beach, Calif. It doesn't get any better than Total Access Recording!

*John "JR" Robinson*

## Now Hear This

I enjoyed "Tech's Files: Do You Hear What I Hear" in the April edition of *Mix*. It brought to mind how radio and sound reproduction have changed over my lifetime. It doesn't matter much to me anymore because of the many years I spent listening to music in the upper decibels, which has left me with almost no ability to hear at all. That is something young engineers should give a lot of thought to, but they don't.

I grew up in the '30s and we listened to the radio, which had a 4-inch speaker cone activated by something that looked like the magnets and coils of an ear-telephone; there was no bass there at all, but it was, however, very intelligible. As years went by, we graduated to a 5-inch speaker with a voice coil and the sound became better. Much larger speakers were made with field coils to make an electro-magnet, with enormous windings powered by a few hundred volts. They were an improvement. Then somewhere along the way, the TRF [Tuned Radio Frequency] receiver changed to the Superheterodyne [circuit].

Field coils were replaced with Alnico permanent magnets, and companies like Zenith Radio put 12-inch speakers in its floor models that pushed bass [frequencies] and we headed toward hi-fi.

Soon, audiophiles discovered Edwin Armstrong's FM with no noise and a bandwidth out to 20k. David Sarnoff [president of RCA/NBC] wouldn't buy it because he had too much invested in Armstrong's earlier invention of the Superheterodyne. Armstrong then jumped off of the RCA building to his death, never to see his beloved FM become a reality. Then came World War II and all progress stopped until the late '40s. Amplifiers and speakers improved. The general public became aware of better sound: The LP with its micro-groove and stereo [capability], and the 45 [rpm vinyl record] adding a higher speed for better [audio] quality still.

We were jumping ahead fast and then something happened—the transistor radio—and we were back to the early '30s with tiny, tinny speakers. And even worse, we stuck speakers in our ears, like the miserable hearing aids I wear. Then came the CD with sampling rates that were too low to make even their synthetic sound equal to analog. Want more? How about MP3? Welcome to the 21st century.

I'm not going to jump off any buildings, but I am glad I'm not in the recording studio business anymore.

*David S. Gold*  
Gold Star Recording Studios

"Tech's Files" author *Eddie Ciletti* notes: "TRF was patented by *Ernst Alexanderson* in 1916 and was made obsolete by the mid-'30s once vacuum technology had advanced enough to make Superheterodyne practical. Superheterodyne was invented during World War I by *Edwin Armstrong*, who also invented FM."

## Songwriting School

Thank you for Gary Eskow's compelling piece on the recording of Stephen Bishop's "On and On" ["Classic Tracks," April 2010 issue]. The article details Stephen's time in a pair of songwriting classes at The Songwriting School of Los Angeles ([www.thesongwriting-school.com](http://www.thesongwriting-school.com)), which opened its doors in 2009. In the piece, the school is incorrectly named "The Songwriting Institute of Los Angeles."

The Songwriting School of Los Angeles is devoted to the artistry and industry of songwriting. We have a professional recording studio on-site, with a Steinway B grand piano in the live room. We feel especially humbled and grateful that writers of Stephen

Bishop's caliber and character have spent time and energy toiling at their art with us.

*Rob Seals*

*The Songwriting School of Los Angeles*

## Critical Listening, Plus Mastering

I was tempted to respond to that "eye-opening" editorial ("From the Editor: The Misunderstood Part of the Record Process," December 2009). I don't see anyone explaining why mastering engineers can hear so well. It's not in the equipment they use; it's in their training, preparation and knowledge of how to listen critically! This means listening intently with an empirical ear and coming to logical conclusions.

When it comes to macro-dynamics, atmosphere, finer details, soundstage depth, natural ambience and proper presentation of musical dynamics, the mastering engineer can show his/her broad musical background, deep scientific knowledge about physical processes, technical expertise and overall artistic taste.

Mastering at home? Then why not perform brain surgery at home? Many specialized schools and universities offer courses on critical listening (and some exist online). I believe that D.I.Y. home studio owners would greatly benefit.

I can't stop wondering why so many fellow musicians feel ashamed to seek a professional service and keep denying such obvious necessities.

*Borislav Dimitrov (aka Boro)*  
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## Universal Mastering Studios West

PHOTO: HECTOR SANTIZO

In the *Mix* December 2009 issue, our former L.A. editor, Bud Scoppa, dropped in on Universal Mastering Studios West in the old Hanna-Barbera building on Cahuenga. What he described for the two main rooms—the sound, the physics, the dimensions—sounded simply too good to be true: a spacious, rectangular room, with a client-friendly producers couch and unlimited listening spot. For mastering?

So in anticipation of this month's cover, UMSW Studio B, we flew down to Los Angeles for a listen with the Universal team and the facility designer, Hanson Hsu of Delta H Design Inc.

Avoiding the three main support beams in the core structure, Hsu proposed a doughnut model, with a central production space surrounded by administration and support offices. Studios A (32x21x11-foot ceiling) and B (28.5x21x11) form one side of a core, with high ceilings and floated floors. The other side houses five production rooms, where editors handle everything from quality assurance to sequencing of catalog material to the most robust metadata tagging that you might imagine from the world's largest music company. It's a space designed for workflow and critical listening, handling every format known to audio, with projects ranging from the 1930s to last week. It's both high-volume and highly detailed.

"We wanted a client-friendly space, one that was large enough for people to spread out and still be able to make critical mastering decisions," says director of studio operations Nick Dofflemyer. "We started with the type of work that the label needed. First, there is the restoration work—the removal of unwanted anomalies, the metadata tagging and the quality assurance. Then we have existing Universal and third-party label work for new material, both with clients and over the Internet. And finally, we've found a growing market in multitrack stem mixing/mastering for *Guitar Hero* and *Rock Band* [videogames]. That's become big, and it's one of the reasons why we built Studio A slightly larger."

Once Hsu submitted his initial plans based on his proprietary Zero Reflection (ZR) Acoustics®, the proposal started moving up the Universal chain. Dofflemyer shepherded the process through legal and the executive committee, eventually getting sign-off from Vinnie Freda. Part of that process involved sending engineers and execs to listen to other ZR rooms around town. The final acceptance came once mastering engineers Pete Doell and Er-



From left: Universal Mastering engineer Pete Doell, studio manager Nick Dofflemyer and Grammy-winning mastering engineer Erick Labson in the spacious—and rectangular—Studio 2, with Lipinski monitors in the background

ick Labson, and technical engineer Ed Abbott, gave an enthusiastic nod to the ZR concept.

"The ZR theory came out of a studio we designed for Mike Shipley in 2003," Hsu says. "Mike wanted to mix at home on an [Avid] ICON, but he didn't want to give up space with angled walls, floated floors and a dropped ceiling. So we literally went back to the drawing board and looked at the reasons why bass builds up in the corners, for instance, and we simply removed those reasons.

"It's applied physics, geometry and quasi-chaotic mathematics. Any more details, and you have to sign an NDA," he says, laughing.

During the next six years, Hsu built dozens of ZR rooms, each offering a generational change—not in the ZR principles, but rather with finessing and detail in the speaker interaction and room dimensions. He says that the concept works across all types of performance spaces and all sizes. UMSW is DHDI's first mastering client.

"UMSW's management made it clear they wanted no EQ in the room," Hsu says. "Translation issues were critical, from the production rooms to the mastering rooms, and from the mastering rooms to the world at large, meaning other studios and the consumer. Once we got up and running, the reaction was, 'How did you make three drastically different-sized rooms sound the same?'"

Studio B (pictured on the cover) is Labson's home. A 19-year veteran of Universal, Labson took home a Grammy this year for a Little Walter box set on Chess. He makes use of a Dangerous Audio

controller, SonicStudio 304 converter/cpu interface, SoundBlade DAW, and a lean but highly professional collection of outboard gear. After extensive listening tests, he settled on Lipinski 707A Signature Series monitoring, powered by Lipinski L-301V amps on the towers and L-300s on the subs.

Studio A is home to Pete Doell, who has been with Universal for six years and met Hsu when they were both over at Sony Pictures. He has the same workstation and monitor console, a similar collection of great processing gear, Pro Tools for mixing, Sonic Blade for mastering, and Dynaudio M3 monitors with custom amplification and cabling.

"The relationships we form are everything," says Dofflemyer. "Erick has enormous skills and brings a level of trust with the client and a demeanor that instills confidence. Pete with six years of mastering and extensive background in tracking and mixing, brings a flexibility that is so important. Plus, he's a musician and has a great sense of humor."

"When we set out to do this, we asked ourselves, 'What do these engineers need?'" concludes Hsu. "We decided the answer was to remove the room acoustics from the equation. Engineers have to translate content, transducers and room acoustics to achieve their final mix. We need to make their job easier so that they are completely free to listen to only content and transducers. No room. Zero Reflections. That's what a ZR Acoustics® room does."

For exclusive video interviews in the UMSW studios, visit [mixonline.com](http://mixonline.com). III





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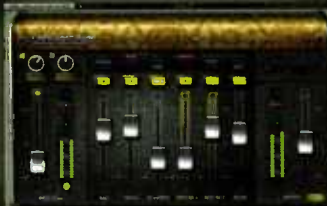
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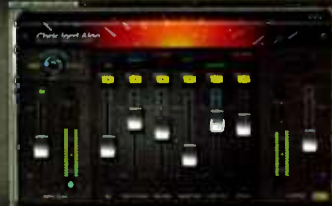
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## Dr. Fritz Sennheiser, 1912-2010

Dr. Fritz Sennheiser, the founder of Sennheiser Electronics, passed away just a few days after his 98th birthday in May. His years of innovation, combined with a warm sense of caring and creating a close-knit family atmosphere at work, live on in the company he started 65 years ago.

Born in Berlin on May 9, 1912, Sennheiser's father wanted him to study landscape architecture, but after the 1929 stock market crash, the 17-year-old saw little future in landscaping and instead entered the electrical engineering/telecommunications program at Berlin's Technical University. After attaining his Ph.D., World War II broke out and Sennheiser continued his research, heading the Institute for Radio Frequency Engineering and Electroacoustics in Hannover.

In 1945, post-war Germany was in shambles. In June of that year, Sennheiser founded "Laboratorium Wennebostel" with a staff of seven employees in an abandoned laboratory of Hannover's Technical University. German scientists were then prohibited from doing research in radio technology, so Sennheiser used his savings to create a business making millivoltmeters for Siemens.

"We had a stroke of luck," Sennheiser told *Mix* in 2005. "Siemens asked if we could make microphones for them." After building mics for Siemens, the team began designing its own mic and in 1947 debuted its MD 2, dynamic mic. The company grew and expanded into other products, such as amps, intercoms, transformers and headphone capsules. Based on a lab model developed in 1949, the company's 1956 MD 82 was the first shotgun mic. A move into wireless mic production followed a year later.

By 1958, the company had 450 employees and had changed its name to



Left: Dr. Fritz Sennheiser in 1935. Right: a photo of Dr. Fritz Sennheiser just a few years ago.

Sennheiser Electronic. Sales grew tenfold, but Sennheiser always returned to the community, splitting his time between running the company and teaching at Hannover Technical University—a tradition continued by his son, current company chairman, Prof. Dr. Jörg Sennheiser.

In 1982, on Dr. Fritz Sennheiser's 70th birthday, the management of the company was transferred from father to son, but this did not change Sennheiser Electronic's role as a technology leader. The company has received numerous accolades, including a 1987 award from the Academy of Motion Picture Arts & Sciences for the industry-standard MKH 816 shotgun mic and a 1996 Emmy for developments in RF wireless.

Sennheiser is successful, but the business integrity instilled by Dr. Fritz Sennheiser remains a priority. Son Jörg Sennheiser once refused a lucrative deal to produce some 200,000 weatherproof mic capsules when he realized they were to be used as land mine triggers. This concern for others has always been the company way, a policy dating back to the early days of Labor W, when Dr. Fritz Sennheiser invested his savings to create jobs for his co-workers.

Dr. Fritz Sennheiser leaves behind a vast legacy of innovations and many friends throughout the world. He will not be forgotten.

## Clinton Recording Closes 10th Avenue Studio

As of June 30, Clinton Recording (New York City) closed its doors to its location at 653 10th Ave. "Our intention is to continue operations at a new location in the near future, and we look forward to maintaining all of our valued relationships," said Ed Rak, studio president. For additional information, contact Tara Hemsey at 212-246-2444 or [clintonrecording@aol.com](mailto:clintonrecording@aol.com), or visit [www.clintonrecording.com](http://www.clintonrecording.com).



## Industry News

**PreSonus** (Baton Rouge, LA) news: **Stephen Fraser** was named COO, and **John Bastianelli**, executive VP of product management...**Pierre Laporte** fills the sales manager position at **Merging Technologies** (Switzerland)...**Alan French** returns to **CEDAR Audio** (Cambridge, UK) as a forensic specialist...News at **Mike Reagan Music** (LA.): **Brandon Violette**, VP, new business development; **Jenn Shundo**, manager, new business development; and **Gareth Coker**, assistant composer...**Harman** (Elkhart, IN, offices) appointed **Jim Garrett** to market manager for the company's Mark Levinson, Lexicon, Revel and JBL Synthesis brands...New K-Array and HHB product specialist at **Sennheiser** (Old Lyme, CT) is **Jake Carter**...**Auralex** (Indianapolis) adds these application specialists: **Paul Miller**, **Ryan Gibbons** and **Amy Claire**...New distribution deals: **JZ Microphones** (Riga, Latvia) appoints Finish distributor **Studiotec**; **One Systems** (Nashville) taps **Millar Electronics** for the Southeast; and **L-Acoustics** (Oxnard, CA) names **Lightone** as its rep in Israel.



Jim Garrett



**LEADER**  
Here and below: Some of the exhibits at the Musical Instrument Museum



## An Instrumental History Lesson

The recently opened Musical Instrument Museum (Phoenix, [themim.org](http://themim.org)) comprises a 190,000-square-foot building with two floors of galleries and a collection of more than 10,000 instruments and associated objects from around the world. The galleries feature advanced wireless technology and high-resolution video screens that allow patrons to see the instruments, hear their sounds and observe them being played in their original settings.



Each exhibit was assembled by five expert curators with consultation by ethnomusicologists, organologists and other field experts.

MIM's Artist Gallery features musical instruments linked to musicians and music innovators, as well as video of concert footage, photographs,

costumes and other special items. Highlights include the Steinway piano on which John Lennon composed "Imagine"; Carlos Santana's custom Yamaha guitar with Buddhist inlay motifs; Eric Clapton's "Brownie" Fender Stratocaster guitar played on the *Layla and Other Assorted Love Songs* album; George Benson's Gibson Johnny Smith model; and more.

Spanning the two floors of the museum is a 299-seat music theater that will host performances, films and seminars about musical traditions from around the world. An adjacent recording studio allows MIM to capture live recordings of those performances.

## Studio Unknown Update

In the new music industry, indie artists are at the helm of their own ships, taking on the responsibility of financing, recording and marketing their projects. That said, the name of the game has become finding innovative ways to save money. Aside from the whole D.I.Y. movement that we are all familiar with, there's another trend emerging, and it's one that keeps recording engineers in the equation—albeit outside of the studio.

## onthemove

**Who:** Jason Carson, Record Plant VP of operations

**Main responsibilities:** day-to-day operations, including technical, financial and engineer/running staff.

### Previous Lives

- 2005-2010, Record Plant chief engineer/technician
- 2003-2005, Record Plant staff engineer

**The oddest thing I've experienced while working at Record Plant was...**so many, it's hard to pick one; every day is a new adventure.

**If I could have been a fly on the wall for any recording session (real or imagined) it would be...**Derek & The Dominos' *Layla and Other Assorted Love Songs*. Hands-down, no question.

**What I'm currently listening to:** Patty Griffin's *Down-town Church*.

**When I'm not at work, you can find me...** at the nearest golf course.



## Mix Master Directory Spotlight

This month's featured listing from the new online-only Mix Master Directory ([directory.mix-online.com/mmd](http://directory.mix-online.com/mmd))

### Peabody Conservatory of The Johns Hopkins University

The Peabody Conservatory of The Johns Hopkins University, in conjunction with the G.W.C. Whiting School of Engineering at Hopkins, offers a unique double-degree program: the Bachelor of Music in Performance and Recording Arts and Sciences.

[peabody.jhu.edu/recordingarts](http://peabody.jhu.edu/recordingarts)

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## Cockroaches and SM58s

### CULT OF INDESTRUCTIBILITY

■ In order to survive in a post-apocalyptic world, you must be prepared. You must pack the essentials: water, matches and, of course, an SM58. Forget the Swiss Army knife. The Shure SM58 is a hammer, a weapon, a spoon, a pestle, a dildo, a scepter—and a damn good mic on just about everything.

After Armageddon, nothing will be left but cockroaches and SM58s. If you are not getting a signal out of the SM58, don't blame the mic. These mics are so rugged they rarely fail. The only time an SM58 has ever failed me was when we accidentally blasted one with a shotgun during the recording of Tool's *Undertow* album. We had miked up a couple of clunker upright pianos in the back garage at Hollywood's Grandmaster Recorders, then proceeded to shoot them and smash them apart with sledgehammers and axes while the tape rolled. After recording, we realized that one of our mics had unfortunately been placed in the line of fire. We were in complete disbelief that the SM58 was dead. So inspired and moved by its service, we gave it an honorable burial.

Shure unveiled the SM58 in 1966 to replace the Unidyne 565, a popular mic with a hinged base that screwed securely onto the mic stand. Creating a durable mic that could be easily unclipped and carried onstage revolutionized the performances of first-generation rockers, and the introduction of the new SM58 allowed legendary singers like Roger Daltrey and Mick Jagger to get up-close and personal with their audience. The Who onstage with Daltrey swinging that mic from the end of its cable and Townshend spinning windmills with his guitar became iconic images from the remarkable '60s rock era, made possible by the SM58.

### Shure's Dynamic Duo

The label "SM" in the SM58 and in the name of its streamlined twin, the SM57, stands for Studio Microphone. These two mics are literally identical except for the differences in the grille cover. The SM57 has a small, plastic vented cap, while the SM58 has a large, round steel-mesh cover for durability and to cut plosives and wind noise. There is a slight sonic difference between the two mics because of the shape of the caps, with the SM57 having a more pronounced low-end roll-off. The SM Series is still made today, and Shure also offers supercardioid versions with the Beta Series 57A and 58A. These are all dynamic



Silversun Pickups' Brian Aubert sings into an SM58 in concert.

mics needing no external power supply to operate. The price on the SM Series mics usually runs below a C-note, and because they last forever, they are often found used for half that. They are absolutely the most recognizable and most frequently imitated mics in the world. Are they also the most underappreciated mics in all of studio-dom?

Apparently, some studios are just too good to have either SM57s or SM58s. Once upon a time, Larrabee Sound in Los Angeles was such a place. Yes, they had AKG C 12s, Neumann U47s and U87s, and dozens of other fancy tube and condenser mics, but they were maybe just a little too snooty for these lowly Shure workhorses! So when Englishman Tim Palmer requested an SM57 for David Bowie's vocals during the production of the first *Tin Machine* album—and Larrabee did not have one—I graciously offered to rent him mine for the project. I still own that *Tin Machine* SM57 today, but its studio use is now restricted. The mic is kept in a special bag to prevent unauthorized engineers from compromising the Bowie DNA that most certainly has been retained in its grille cap.

Their legendary longevity has raised the SM57 and SM58 to nearly cult status, with Websites and videos created to celebrate their indestructibility. But their sonic performance onstage and in the studio is where these two mics really shine. I have learned to always rely on



Sylvia's "special" SM57, still retaining David Bowie's vocal spit from the *Tin Machine* sessions



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## GEAR STORIES

SM57s for a number of studio jobs. On drum kits, I'll often have one on the top of the snare and sometimes on a hi-hat to cool its attitude. On electric guitar speaker cabinets I'll use a Shure SM57 with a Sennheiser 421. I especially like the SM57 on acoustic guitar for a woody percussive rhythm sound. And, of course, the SM58 rules for vocals, especially on screaming and effect vocals where the singer cups his hand around the grille to give it an explosive sound. Very exciting!

The biggest SM58 studio revelation came to me from a Smashing Pumpkins session that I engineered with producer Rick Rubin during the *Adore* era. Rick requested we do a blind listen test to determine which mic was best suited for Billy Corgan's sometimes whiney vocals. We put up 14 microphones: Telefunken 251; Neumann U47, FET 47, M49, U67, U87; AKG C 12, C 12A, C 24, 414; Sennheiser 421; Oktava MK219; and a Shure SM57 and SM58. We recorded Billy singing the same verse in the song, one mic at a time. We then listened back without knowing which mic we were hearing. The unexpected winner was the SM58, followed closely by the Telefunken 251—\$35,000 worth of mics in the room, and the winner was the pedestrian SM58 microphone. Who figured the hot-turkey sandwich would satisfy such a refined palette? No capers! No reduction sauce! Please!

So how do you explain the popularity of the SM58? We sometimes forget that the musician's performance can be more important than the choice of equipment you are using to capture it. A recording microphone that is consistently good and time-tested will step out of your way as you record. The technical barriers between artist and listener become in-



PHOTO PAUL NAYKIN

Roger Daltrey and Pete Townsend of The Who—longtime SM58 users visible. Gear matters, but performance matters more. Stop thinking so hard! It's not about what is outside, but what is inside.

When the apocalypse comes and the dust settles, the only things left will be cockroaches, SM58s and now that I think about it, probably Keith Richards, too. The SM58s shall inherit the Earth. All hail your dynamic overlord! III

*Sylvia Massy is the unconventional producer and engineer of artists including Tool, System of a Down, Johnny Cash, Red Hot Chili Peppers, Tom Petty and Prince. She is a member of the NARAS PoE Wing Steering Committee and Advisory Boards, and is a resident producer at RadioStar Studios in Weed, Calif.*

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# Building Out A Powerhouse PC

COMPLEX SESSIONS, 64-BIT,  
FROM A SINGLE WORKSTATION



by Gary Eskow

The impact chassis was designed for the audio professional from the ground up by the engineers at PCAudioLabs.

**Thinking** about putting together a PC-based DAW? If so, what kind of numbers did you have in mind, and unless you're a geek, have you thought about where you'll go to have your workstation built? Questions surrounding the practicality of 64-bit DAWs and whether or not Windows 7 is ready for prime time abound. I went out and got some answers for you.

I won't, however, get into the Mac vs. PC slugfest. If you're dedicated exclusively to the Mac platform, this piece probably isn't for you. On the other hand, if you've used PC machines or are intrigued by Windows 7 and are looking to extend your network, you may find something of value in the research I conducted while deciding whether this was the time for me to discard the dual Opteron I've been using for the past five years. I did purchase a quad-core Windows 7 machine in December 2009, and the results have been extremely gratifying, though as you'll see, moving into the 64-bit world is not a trouble-free procedure.

Three major players in the digital audio workstation industry provided critical input as I researched this article. Why anyone would want to slog through the unavoidable hassles involved in integrating software from multiple companies with hardware and a new operating system is beyond me. Mark Nagata and Ryan Ouchida of VisionDAW ([www.visiondaw.com](http://www.visiondaw.com)), ADK Pro Audio's ([www.adkproaudio.com](http://www.adkproaudio.com)) Chris Lud-

wig and Tom Bolton of PCAudioLabs ([www.pcaudiolabs.com](http://www.pcaudiolabs.com)) were on top of every issue relating to the state of the DAW industry. The advice and post-purchase support you'll get from a respected vendor makes the margin they add to the ticket price well worth the investment.

I priced out three systems from each manufacturer. All of the companies' computers were in the same general price range, but there were differences in the cost structure. (We'll let you kick the tires for yourself when you're ready to make a purchase.) Most striking was how inexpensive the technology has become and how modest the difference in cost is between the beefiest computers (intended for the full-blown audio post composer in particular, who has high-res video requirements) and the more modest units, which also deliver performance radically superior to anything previously available.

The information I received from Vision DAW, ADK Pro Audio and PCAudioLabs was almost entirely synchronous. All were extremely helpful, and I thank them for participating. Please note that the pricing of these computers does not include a keyboard, mouse or monitors. (Full Disclosure: I purchased my computer from ADK Pro Audio based on the relationship I've had with this company over the years.)

## Look Before Leaping

Before you begin pricing systems, are you even sure you need a new



# Dynamic Duo



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PC? In my case, I should note that mine was one of the earlier 2.1GHz dual Opteron. Sixty-four-bit operating systems like Windows 7 allow you to load as much memory inside an application as you have in your computer, but adding RAM to take advantage of this was not an option because the processors inside vintage dual Opterons can't handle the cycles. However, if you purchased a dual Opteron in the past year or two, throwing in a total of 8, 16 or even 24 gigs of RAM, updating the driver on your audio interface and getting the 64-bit applications of your favorite software (which are becoming more available all the time) might make a lot of sense. Even my antiquated computer had no problem loading multiple soft synths, including all of the Native Instruments modules that are a staple in the Complete 6 bundle that many composers rely on. (It did creak when I loaded bulked-up products like Omnisphere.) The point is, you may be able to make a minimal investment and garner the advantages of working in the 64-bit realm.

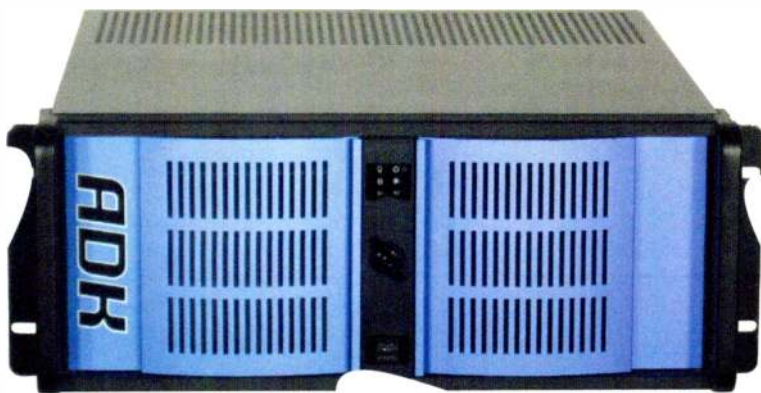
If you're a composer who works in the film and television world, do you use a balanced mixture of soft synths and samples, or is your template heavily weighted toward orchestral samples—including large libraries like the Vienna Symphonic Library Cube and East West's PLAY Engine-based products? If you fall into the latter category, you'll want to take advantage of the fact that hard drives have dropped dramatically in price. The rule of thumb today is that it's best to leave at least a third of any given hard drive empty. Spreading your large libraries across multiple drives that haven't been saturated with samples yields the best streaming and I/O performance.

Thinking ahead is always a good idea. Ryan Ouchida of VisionDAW says, "Ninety percent of our clients find the need to add additional workstations to their studio." If you're purchasing a new interface rather than porting over one you already own, make sure it has I/O capacity that will allow you to expand easily in the future. You may even want to turn your current computer into a strictly mixing environment; that way, software like the Waves line, which is not yet available in a 64-bit format, will remain inline.

## System One (\$2,000 to \$2,500)

You get a lot more for this amount of money than ever before, as I can readily attest. Expect to cop an Intel Core i7 860 2.8GHz processor,





The ADK Quad Xtreme features a 6 Core i7 Extreme, an Intel X58 chipset USB 3 and SATA 600.

eight gigs of RAM, a couple of 500-gig SATA drives, Windows 7 Pro 64-bit OEM (some manufacturers distinguish their systems in part by those including only the 32-bit version of Win 7), a DVD burner and a hard disk management system—all loaded into a tower or rackmounted box that is much quieter than the one you may currently own. Because I don't have film producer clients walking into my home studio, I saved about \$150 by going with a garden-variety video card. Check out the warranty that comes with your system, in particular the length of time that you're entitled to phone tech support.

By the way, there's no need to get overly obsessed in trying to compare processor speeds from machines built in different eras. I was surprised to learn that a quad core like the one I eventually bought (running with a 2.8GHz processor) would allow me to do up to 10 times more work than the 2.1GHz machine I previously owned, but Ludwig says it's possible to overvalue this spec. "Actually, the processor speed has never been the most critical factor compared to the memory and chip set speed and efficiency," he explains. "When AMD was in the lead, they had a slower CPU speed but a faster memory and chip set technology. Intel recently improved the speed of the underlying chip set, memory controllers and overall bus communication. As a result, clock speed doesn't have to be cranked up so high, which, among other things, adds to the heat that the computer generates."

I used to create full-blown orchestral scores using instruments from VSL Cube, East West's Symphonic Orchestra and the SONiVOX Symphonic Instruments collection. It's hard to believe, but I'd load one VSL patch (from the double basses up) at a time—maybe

two—record a section of eight bars or so as discrete audio tracks, build up from there and move on to the next section.

I was in the middle of writing a woodwind quintet when my new computer arrived, and I loaded up VSL Level Two presets of all of these instruments into a Cubase 5 64-bit project. Level Two presets include lots of samples I don't use (scalar runs, for example), but I wanted to see how many I'd be able to load into my machine, which I purchased with eight gigs of RAM. Why not 12, 16 or 24 gigs? RAM buying is essentially a futures market. Right now, it's fairly expensive. I'm betting that it will drop in the future, at which time I'll add more.

After loading up all five instruments, plus one instance of Altiverb 6 (to which Cubase 5 gains access through its own bit bridge because Altiverb currently exists only in 32-bit format), I checked the Win 7 RAM meters (little icons that model old European-style automobile gauges) and found that I was using less than 60 percent of my RAM and my processor was taking less than a 20-percent hit. Wow, what an improvement!

### System Two (Around \$3,200)

Start climbing up the price scale, and your Intel Core i7 860 processor gets swapped out for a 950 running at 2.8 GHz. How much difference will this make?

Back in the Stone Age, if you bought a synthesizer or an early synth/sample playback unit like the Korg M-1 or Roland D50, you knew exactly what you were getting in terms of memory and the number of sounds that could be loaded at one time. Today, none of the sample manufacturers will go on record making recommendations with respect to any one computer nor tell you precisely how much RAM is required

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to use their products because each musician creates his/her own workflow, which is impossible to predict. The ratio between CPU cycles, RAM and even the answer to the gold-plated question—whether we've finally arrived at the point where a single DAW is sufficient—is to a large degree dependent on what libraries you use.

"Depending on your configuration, 24 Gigabytes in a single DAW may be the way to go," says VisionDAW's Nagata. "Your system will not be processor-bound because of the efficiency of the VI sample engine, for example, if that's the sound set you primarily rely on. If you're like David Newman and have a sound set dedicated to one sample engine [PLAY, in his case], then we can configure a system to load that template onto one machine and play it all with some overhead—processor, audio interface and OS tweaks. But, say you have PLAY orchestra with all the keyswitched patches, VI, NI and Aria all loaded with orchestral libraries. In this scenario, you'll more than likely become processor-bound extremely quickly. In this case, all the loading into memory capability won't help because you are out of CPU cycles. You would be better off with multiple

sampler workstations, dividing the load without trying to load up a single massively configured workstation."

### System Three (\$3,800 to \$4,400)

At this point, you're most likely going to own a dual Intel quad-core Xeon E5520 processor-centered machine running at 2.26 GHz. This will effectively give you 16 CPU cores using Intel's hyperthreading technology. Major audio programs such as Cubase 4/5, Nuendo 4 and SONAR will all take advantage of Xeon's multithreading. You now have at least 16 Gigabytes of RAM loaded into your box, a higher-res video card and the ability to load and organize up to four screens at one point.

These are theoretical models, but the distinctions blur once you begin to tailor a computer to your needs. For example, you may not need the fastest processor but will require extra drives. Mixing and matching components to taste is the key.

### Is 64-Bit Ready for Everyday Use?

Getting closer, and not soon enough. I had no problem finding 64-bit drivers for my



The new Windows 7 operating system

RME Fireface 800 interface and MOTU MIDI Timepiece. Many companies—Spectrasonics, VSL and East West among them—offer both 32- and 64-bit drivers for their products, but be careful because some companies (though none of those I just mentioned) are less clear about driver installation than they should be. While installing products from several companies that to date only of-

# Beauty. Art. Soul.

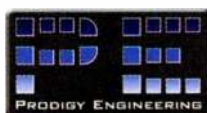
## Anima

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fer 32-bit versions of their material. I made the error of placing the .dlls into Steinberg's 64-bit VST plug-in folder, making a copy of these .dlls and dropping them in the 32-bit VST plug-in folders. A no-no, according to Chris Ludwig, who took a look at my system via a remote-control session several weeks after I bought the computer.

"Many of these manufacturers assume that the customer has knowledge he shouldn't be expected to have," Ludwig says. "This is a good example. Putting 32-bit .dlls in Steinberg's 64-bit VST plug-in folder may work, but in the long run, it will bog down the system and lead to instability." Ludwig helped me out of another deep hole. The CD Burn function of WaveLab 6 wasn't working, and Steinberg tech support simply told me that WaveLab 6 doesn't support Windows 7. During our remote session, Ludwig navigated his way to Steinberg's FTP site and downloaded a component that rectified the problem.

"I would like to see the end of 32-bit operating systems altogether," adds PCAudio-Labs' Tom Bolton. "It's time that we move on to 64-bit computing completely. Offering 32-bit versions of new operating systems such as Windows 7 allows the audio hardware and software industry to drag its feet on releasing 64-bit versions of their products, which is seriously stifling innovation. By continuing to offer 32-bit operating systems, the move to 64-bit is optional and therefore tends to be considered unnecessary."

What if you want to make the move to the 64-bit universe but need to access some of your 32-bit plug-ins? Your main sequencer may, like Cubase 5, have its own method of addressing them, but there are other options. If you rely heavily on VSL products, you may want to check out Ensemble Pro, VSL's hosting and mixing environment. This app lets you load up VSL products and those from many other manufacturers. I created a template that included Absynth 4, Stylus RMX and Omnisphere—all 64-bit plug-ins. Side-by-side with the 64-bit version of Ensemble Pro, you can run a 32-bit instance to shelter all of your 32-bit plug-ins. Ensemble Pro acts like a wrapper within your host, giving even a 32-bit digital sequencer the ability to use 64-bit plug-ins. Best of all, you can invoke the Preserve function and move between projects without having to reload the samples that form your template, even if they're residing in a network comprising

multiple computers.

### The Time Is Now

There is value to mining deeper into the science and theory that girds computer technology. It can help you decide whether you want to build a computer with 7,200 rpm SATA drives or climb up to the 10,000 rpm level. But before you make a decision, you should do some research, ask the experts a few questions and make a purchase based on confidence and price—and have someone to yell at if things don't work out!

Having tried to create complex sampled scores on single-computer DAWs for years, I can report that we have finally arrived at the point (notwithstanding the advantages of multicomputer networks that Nagata mentioned) where a single computer can handle enough detailed sample sets in real time and with effects to make that dream a present-day reality—even if you choose to purchase the least expensive computer designed for sample-based compositions. ■■

Gary Eskow is a contributing editor to Mix.

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# COOL SOFTWARE, HOT SOUNDS

By George Petersen

## TOP NEW STUDIO PLUG-INS

TO SAY THAT RECENT YEARS HAVE BROUGHT AN EXPLOSION of third-party DSP plug-ins is an understatement. A range of companies both new and old have released dozens of products, feeding the industry's unquenchable thirst for new sounds and effects. At the same time, the number of high-quality plug-ins bundled with DAWs continues to rise. As the new saying goes, "You can never have too many plug-ins."

With this in mind, we went through this surge of products that debuted or began shipping in the past year and whittled the list down to the fave new plugs we'd want to add to our virtual racks. Prices range from free to thousands of dollars, so there's something for everyone's taste and budget. If you're interested in checking these out for yourself, most companies offer time-limited or demo versions of their products to audition and evaluate on your own system.



### 2CAudio Aether (\$249.95)

Version 1.5 of the Aether self-modulating algorithmic reverb from 2CAudio ([www.2caudio.com](http://www.2caudio.com)) features a revamped GUI, 2x and 4x oversampling, 64-bit DSP, band-limited interpolation, variable-quality modes, mid/side modes, complex stereo modes and more. Two \$24.95 options are the Aether Integrity Expansion, with an additional 160 presets of realistic spaces, such as rooms, churches, halls and chambers; and the Aether Creativity Expansion, with 150 thematic presets, huge spaces and effects. It's available for Windows VST hosts (32- or 64-bit) for XP/Vista/Win 7 and 32-bit VST or AU for Intel-based Macs OS X 4.11 and higher; an RTAS version is planned.



### BIAS SoundSoap Pro 2 (\$599)

SoundSoap Pro 2 ([www.bias-inc.com](http://www.bias-inc.com)) offers super-intelligent adaptive noise-reduction with four restoration tools in a single plug-in—including new Adaptive technology for automated broadband noise removal—with advanced controls for removing unwanted hiss, room noise, electrical hum, rumble, clicks, crackles and broadband noise with minimal artifacts. SoundSoap Pro 2 is designed for AU, RTAS/AudioSuite and VST formats for use with Mac (OS 10.3.9 and higher) and Windows (XP/Vista/Win 7) hosts.



### CEDAR DNS One (\$3,750)

DNS One, CEDAR's ([cedaraudio.com](http://cedaraudio.com)) first software-based dialog noise-suppression plug-in, is available in RTAS format for Pro Tools HD and LE (Mac OS X and Windows). It offers the same audio quality and performance as the company's DNS1500, DNS2000 and DNS3000. A DNS Control System GUI lets users control as many instances of DNS One as the user's host system can support, plus up to 126 instances of DNS2000 and DNS3000. It is fully integrated with Pro Tools' automation and hardware control surfaces, such as the ICON, D-Control and D-Command.



### Celemony Melodyne Editor (\$346)

Able to operate as a plug-in or stand-alone, Melodyne Editor is intended for tweaking wayward notes up or down microscopically in pitch without affecting the rest of the performance. Previously, pitch correction was only practical with monophonic music tracks, but with Celemony's ([www.celemony.com](http://www.celemony.com)) DNA (Direct Note Access) technology, users can virtually reach into a chord and nudge a single note up or down in pitch, adjust its start time or amplitude, or mute it entirely. Melodyne Editor runs with most—though not all—recent Mac/PC DAWs that support VST, AU or RTAS.



changing of mic positions, while its open architecture lets users add more packages as needed, including AmpliTube Fender and Ampeg SVX. Other improvements include 70 reworked models within the AmpliTube Metal and AmpliTube Jimi Hendrix package, a new collection of bass gear models and an improved preset-management/keyword system.

### Lexicon PCM Native Reverb Bundle (\$1,899)

This collection provides seven Lexicon ([www.lexiconpro.com](http://www.lexiconpro.com)) reverb algorithms designed to deliver the highest level of sonic quality and function while offering all the flexibility of native plug-ins. Reverbs include Vintage Plate, Plate, Hall, Room, Random Hall, Concert Hall and Chamber, and the bundle ships with some 950 versatile studio presets. This cross-platform native plug-in is compatible with Windows XP/Vista/Win 7, as well as Mac PPC/Intel OS 10.4 or higher.

### Elysia Niveau Filter (Free)

Designed for tweaking a signal's overall sonic character, Niveau is the filter section of Elysia's mpressor plug-in. It's intended for applications where a shelving filter is too limited and a fully parametric EQ is too much, and simultaneously boosts a signal's HF component while attenuating the low frequencies (or vice versa) around a user-specified center point. The plug-in is available in RTAS, VST and AU formats with installers for Mac OS and Windows. It's a free download from [www.elysia.com](http://www.elysia.com).



### Focusrite Scarlett (\$99)

This pro software suite provides compression, gating, EQ and reverb plug-ins for tracking and mixing. Scarlett's user interface features the red-anodized look of Focusrite's ([www.focusrite.com](http://www.focusrite.com)) famed Red Series processors. Each plug-in in the suite has fast and easy-to-use presets, providing a great starting point for tweaking everything from vocals and guitars to synth, bass and percussion. In addition, every plug-in parameter can be finely tuned to achieve the desired sound. Scarlett works under VST, AU and RTAS hosts, and runs on Macs and PCs.



### IK Multimedia AmpliTube 3 (\$349)

AmpliTube ([www.amplitude.com](http://www.amplitude.com)) is a next-gen release offering more than 160 pieces of gear, including 51 stomp boxes and effects, 31 amplifier/preamp/power sections, 46 speaker cabinet models, 15 high-end stage and studio mics, and 17 post-amp rack effects. A slick GUI upgrade allows simple drag-and-drop



### Intelligent Devices Marshall Time Modulator (\$149)

This software version of the classic Time Modulator Model 5402 (designed by the late pro audio legend Stephen St. Croix; [www.proaudio.intdevices.com](http://www.proaudio.intdevices.com)) pushes modulation effects far beyond their original intent. The plug-in provides two separate delay lines with their own volume, phase, pan and a joint feedback control—all processed with analog-modeling algorithms to capture the sound of the original. Once modulation is added, the delays can be continuously swept from minimum to maximum time over the LFO rate and—unlike the mono original—can create complex stereo effects. It's available in VST versions for Mac/PC; an AU version is in beta testing at press time.

### iZotope Alloy (\$249)

Alloy ([www.izotope.com](http://www.izotope.com)) is a completely configurable and self-contained plug-in suite with six essential sound-shaping effects: equalizer, exciter, transient, dynamics, de-esser and limiter. Alloy provides these useful dynamics and sound-shaping effects in a self-contained, completely configurable interface. More than 150 macro-presets handle specific mix situations, and a Multiband mode can apply processing independently in up to three frequency bands. An uncluttered GUI adds to the appeal of this cross-platform Mac/PC plug-in, available in AU, RTAS, AudioSuite, VST, MAS and DirectX formats.

## NEW PLUG-INS



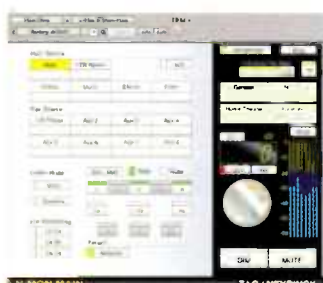
### McDSP 6030 Ultimate Compressor (\$449)

Offering a software-equivalent of the popular 500 Series analog module format, the 6030 Ultimate Compressor builds on McDSP's ([www.mcdsp.com](http://www.mcdsp.com)) algorithm code base with this collection of 10 compressors; some are new while others are emulations of existing gear with unique variations created by McDSP. From tube emulation to edgy solid-state designs, the 6030 is one plug-in with 10 distinct models. It supports TDM and RTAS formats, with AU support coming soon. The 6030 is available as a separate bundle and will be added to McDSP's Emerald Pack, and is also offered as an upgrade to Emerald Pack 4 customers as an upgrade.



### Slate Digital Trigger Platinum (\$299)

Trigger Platinum, Steven Slate's ([www.slatedigital.com](http://www.slatedigital.com)) new advanced PC/Mac drum replacement plug-in for VST, RTAS and AU formats, includes all Steven Slate Drums Platinum Samples, along with two kicks and two snares from the upcoming deluxe edition of his virtual drum software. It offers phase-accurate replacement without delays or flamm-ing, and features six stereo sample layers per instance of the plug-in, each with individual volume, pan, tune, at-tack, sustain, dynamic percentage and velocity controls.

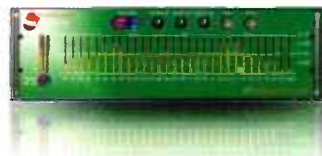


### Neyrinck V-Mon Version 2 (\$599)

Now shipping, Neyrinck's ([www.neyrinck.com](http://www.neyrinck.com)) V-Mon Version 2 is a comprehensive surround monitoring plug-in system for Pro Tools HD Accel systems, with monitoring and metering for up to 10 5.1 stem (or six 7.1) inputs, eight stereo aux inputs, four talkback inputs and two listen-back inputs. V-Mon provides calibrated output control for up to four 7.1 speaker systems, one stereo downmix, eight cues, stereo and stem metering for external hardware, and a surround send/return plug-in that allows inserting external processing—such as Dolby's DMU or DP750—into the monitor chain. The system integrates with TAC Systems' VMC-101 remote controller (\$1,795) for hands-on control of the V-Mon system. Version 2 also adds support for Windows- and Mac-based Pro Tools systems.

### Universal Audio Massive Passive EQ Plug-In (\$299)

New for the UAD-2 platform (it requires a UAD-2 DSP accelerator card), the Manley Massive Passive plug-in is a virtual version of Manley's 2-channel, 4-band equalizer that uses design strengths from choice console, graphic, parametric and Pultec EQs, and can provide radical tonal shaping, delicate vocal shading or subtle mastering enhancement. It is available as part of the new Universal Audio ([www.uaudio.com](http://www.uaudio.com)) UAD Software V. 5.6 release, which also includes the EMT 140 Plate Reverb and the Precision Enhancer Hz plug-ins. UAD-2 is Mac/PC-compatible, supporting VST/RTAS and AU formats.

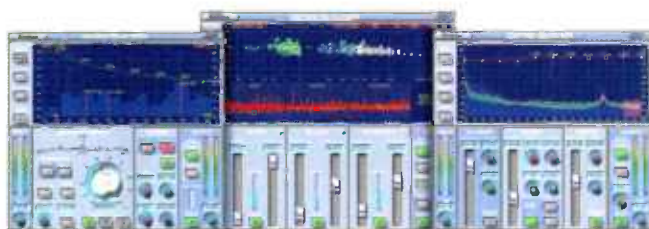


### Starplugs MEQ Analysis (Free)

MEQ Analysis from Starplugs ([www.starplugs.com](http://www.starplugs.com)) is a high-precision, 30-band, frequency-analysis and level-meter VST plug-in for Windows XP. It's intended to be used with the company's high-end Master EQ but can also be used with any available EQ. Features include RMS and peak meters with hold, fast 30-band analysis, a Meter Freeze function and adjustable decay time on the peak/peak-hold meters.

### Sonnox Restore (\$1,995)

Sonnox ([www.sonnoxplugins.com](http://www.sonnoxplugins.com)) Restore plug-ins (Oxford DeBuzzer, Oxford DeClicker and Oxford DeNoiser) feature advanced algorithms for fast, effective removal of pops, clicks, crackles, scratches, hum, buzzes and extraneous background noise. Each plug-in in this Native suite uses a two-step approach, where a detection section pinpoints unwanted noise followed by a removal section that determines the desired level of repair while minimizing collateral damage to the original audio. Supported formats include RTAS, AU and VST platforms.







### SPL DrumXchanger (\$449)

DrumXchanger is just what its name implies: a drum replacement plug-in that can substitute drum sounds in multitrack sessions regardless of the level they were originally recorded at. DrumXchanger uses SPL's ([www.spl.info](http://www.spl.info)) Transient Designer technology for drum-hit recognition and includes a library of 24-bit/96kHz samples and drum sounds that can be replaced entirely or mixed with the original tracks—all in real time with phase-accurate precision. Users can also load in their own WAV samples. This Mac/PC Native version supports RTAS, VST and AU formats.



### Waves Vocal Rider (\$415)

Vocal Rider automatically matches a track's vocal level with the rest of the song by busing an instrumental mix into the sidechain. As a plus, this plug from Waves ([www.waves.com](http://www.waves.com)) also writes an editable automation track for fine-tuning, and provides the feel of a veteran studio engineer providing a little gentle "finger-limiting" as the vocal plays. It supports Mac and PC DAWs in VST, RTAS and AU hosts.

### SoundToys Decapitator (\$349, TDM; \$179, Native)

After analyzing vintage and modern classics from Neve, API, Ampex, EMI, Thermionic Culture and more to create accurate models of high-end studio gear, SoundToys ([www.soundtoys.com](http://www.soundtoys.com)) created its Decapitator analog saturator modeler plug-in, which models the saturation or distortion created when driving professional analog studio equipment. In addition to its drive, low/high cut, tone and output controls, Decapitator also features a Punish button that adds an extra bit of edge when you want to push a track over the limit. It's offered for Mac or PC in TDM/RTAS/AudioSuite/VST/AU formats, and also in SoundToys' TDM Effects and Native Effects bundles. III



Mix executive editor George Petersen also runs a small record label at [www.jenpet.com](http://www.jenpet.com).



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# Christopher Nolan's 'Inception'

PHOTO: MELISSA MOLETER

By Blair Jackson

Joseph Gordon Levitt as Arthur in Warner Bros. Pictures and Legendary Pictures' sci-fi action film *Inception*.

**Because** of the overwhelming success of *Batman Begins* and *The Dark Knight*, Christopher Nolan is viewed in popular circles as a premier "popcorn movie" director, delivering crowd-pleasing action flicks for summer crowds. But even the least discerning movie-goers can't miss the darkness and weirdness that courses through both of those films (especially the latter), as well other Nolan works, including *The Prestige*, *Insomnia* and especially his brain-twisting early masterpiece, *Memento*. Nolan has become a brilliant visual artist, but he has also always been skilled at depicting the strange interiors of the human psyche, and that would seem to be his main motive for making the films he does.

In Nolan's latest thriller, *Inception*, he gets to delve into the human mind in a different way: The contemporary sci-fi story—details of which have been closely guarded prior to the film's July 16 release—revolves around a character (played by Leonardo DiCaprio) who is adept at entering, sharing and even manipulating other people's dreams, and then extracting information from those deep subconscious states for nefarious commercial exploitation. In Nolan's inimitable way, he blurs the line between dreams and reality, memory and imagination. The film contains a number of depictions of often fantastical dreams (aided by a combination of CGI and some

specially designed sets), which Nolan treats as current reality rather than as strange, hazy, barely recollected visions we faintly recall the next morning.

"You don't question the reality of a dream while you're in it," explains supervising sound editor and sound designer Richard King, who is making his third film with Nolan after *The Prestige* and *The Dark Knight* (for which he was awarded a Sound Editing Oscar). "So that's how we approached the soundtrack. You don't always want to point out the fact that they're in a dream while still being true to the story that's unfolding and the visuals we're seeing. A slight shifting of reality is appropriate, but we didn't want to make it too obvious."

When we spoke in May, King was in his cutting room at Warner Bros. Studios, about to begin a seven-week final on the film at the enormous Stage 9, with re-recording mixers Lora Hirschberg (FX and music) and Gary Rizzo (dialog, Foley and backgrounds), who go back to *Batman Begins* with Nolan.

"We are actually quite far into the mix already," King says. "Chris [Nolan] came away from *The Dark Knight* feeling strongly that it didn't seem right to put a huge amount of effort into temp mixes, then basically throw all that work away and start over again with the predubs. So he challenged us to develop a procedure to begin the final mix where the temp left off



and move forward from there. Lora, Gary, Tony Pilkington [WB engineer], Andrew Bock [first assistant sound editor] and myself put our heads together and came up with a plan—and we certainly didn't invent this, but it's the first time I've done it on this scale—that all the sounds remain virtual throughout the mix. The temp dub was first [virtually] predubbed in Pro Tools by Mike Babcock and myself, then we had an eight-day temp mix in late March with Lora and Gary, and since then we've been conforming those virtual mixes as the picture and visual effects evolve, only rendering a print master as needed for screenings. So as we move into the final, everything will essentially have been predubbed in the box, and the first day of mixing will be like the next day of the temp. We'll be starting at a place where we know the movie sounds great and Chris is happy, and then have seven weeks to really hone in and perfect it.

"So far we've done two temp updates and all the automation conforms worked fine. Lora and Gary did some of their mixing on Stage 9's [AMS Neve] DFC and some on an [Avid] ICON—we brought two ICONs on the stage for them and I have an [Avid] ProControl surface that I use to fly in sound design elements. During the temps, Lora and Gary wrote as much automation as possible to the Pro Tools sessions rather than on the DFC so we'd have more control over the automation conforms.

"Warner Bros. engineering, particularly Tony Pilkington, built this very complicated machine that gave us the creative tools we needed to meet Chris' expectations. Additional IO cards were installed in the DFC, and the Pro Tools machines were all upgraded with Intel computers. There are seven Pro Tools rigs playing back sound effects and backgrounds, one for dialog, one for Foley and a dedicated Altiverb machine to offload our reverbs from the playback machines. We had a total of 28 5.0 sound effects predubs playing back around 1,000 tracks for every reel. There are five reverb sends and one LFE send per machine. The 5.0 predubs and returns show up at the DFC on predub return faders. The music is submixed in Pro Tools and is playing back off one system. Music editors Alex Gibson and Ryan Rubin will always have the temp material available while we're finaling so Chris can reference it if necessary. It's absolutely the way to work because you're always going in a linear forward motion rather taking little side trips."

According to King, Nolan is "totally into the visceral—he wants the movie to be powerful in every moment on every level and utilize every tool he has to get there." How does that translate

into what sounds you provide for him? "Well with weapons, for instance, there's no attempt to be particularly accurate about matching the sound of a gun to the actual weapon the character is using. It's about coming up with the coolest sounds we can. We amp it up a notch for Chris; there's usually a lot of other sounds and music going on, too, so there's lots of competition. Chris is very interested in what sound can bring to the table and very open to new ideas; very collaborative." Although King was able to use some of his own sound library material to cover certain needs, he says, "I think I did more recording for *Inception* than any movie I've ever worked on."

Among those aiding King in his pursuit of original material were location recording stalwarts John Fasal and Eric Potter ("They're still running around doing little things for me on this," King says admiringly at the start of the final) and FX editor Michael Mitchell, whom he describes as "my main effects guy." King notes that he "also had contacts in the major locales—Paris, East Africa, Sydney—so I hired a recordist in each location to spend four or five days walking around recording the ambiances I needed, and they did a great job. We really wanted to make the locations sound as varied and as rich as possible." Christopher Flick supervised the Foley, which was performed by John Roesch and Alyson Dee Moore. Ed Novick, who is part of Nolan's regular audio retinue, spearheaded the production sound. King also worked closely with film editor Lee Smith, "an old friend who was a sound editor before he was a picture editor, and has terrific sound sense—he always comes up with original ideas," King says. "I provide Lee and Chris with

mixes of key sequences as the picture editing progresses so I can get feedback."

Certainly, there was no shortage of sound challenges in this film, between the abundance of action episodes—chases, fights, multiple explosions, an avalanche, buildings collapsing, etc.—and the occasionally hallucinatory aspects of some of the dream sequences. For instance, in one very unusual scene (which is shown in the trailers and commercials) an entire neighborhood in Paris appears to rise up and curl onto itself as if it's being peeled off the earth's surface—something we've definitely never seen or heard before. "That sequence could sound like anything," King offers. "It could be a very sci-fi, synth-y, smooth sound. The shot could totally rely upon music. It could be very frightening or awe-inspiring. Chris' direction was that he wanted it to sound like massive machinery, like a huge watch mechanism—again, using a relatable sound for an image we've never seen.

"Imagine a machine that would be massive enough to move a city like that. That's the sound that I tried to make. I actually made the sound for that when I was in Australia last fall working on *The Way Back* [Peter Weir's next film; King previously won an Oscar for work on Weir's *Master and Commander*]. What you hear in the film is composed of all kinds of different sounds: It's big metal groans and giant, heavy machinery moving, pivoting, clattering. I tried to create a little [sound] suite that would progress as the city rises and folds over.

"Reverb was really important. I think that reverb is sort of the magic ingredient that can make the most surreal sound feel real and of



Director Christopher Nolan (foreground) with Leonardo Di Caprio on the set of *Inception*

PHOTO: MELISSA MOSELEY

## 'Inception'

this world—if you put a totally crazy, off-the-wall sound in the right reverb space in a sequence, you can believe that it's there. It's the 'China girl' [an image used for color timing] of sound: When it's the correct treatment, you're less likely to question the appropriateness of the sound. I love the natural feeling of Altiverb, so Eric Potter's been recording a lot of impulse responses for me in exterior spaces—firing a starter pistol up in the mountains or on a city street and from that creating an impulse response. For instance, in the sequence where the city folds in on itself, Chris wanted to hear this huge echoing sound from the end of the street between the buildings—he wanted a very real-sounding echo, and it's really hard to create that artificially. Most reverb programs are made for music and there aren't a lot that are specifically tailored for post-production, and I suppose things like echoes are quite hard to write the algorithms for—not only does the sound repeat, but it's a multilevel treatment so it changes EQ and frequency during the course of the subsequent repeats. When you go out in the field and record an impulse response, you get a lot of that real decay, and if you're starting with something that's pretty close, then you modify it within the program and dial it in a little more to really nail it."

King and his team also had to get creative when it came to sculpting the sound of the transitions from sleep to dreams—"a little bit of an audible cue that we're transitioning somewhere," King says. "We hooked two oscillators to a couple of giant subwoofers in a few different locations and recorded the result. We used Hennessy Street, which is a [Warner Bros.] back-lot street, to get a sense of an urban locale; inside one of the big WB soundstages; and also in a canyon in the mountains north of L.A.

Then, using the oscillator, we dialed it from 10 or 12 Hz up into the audible hearing range—and not only does it start to activate and shake and rattle things in the interior spaces, but you hear this wave of sound that comes from nowhere that becomes quite massive as the sound comes up into 18, 20, 25Hz range. Eric and I found we could almost play the oscillators like a musical instrument.

"We had two oscillators and two subwoofers, and we recorded the result [to a Sound Devices 744] with a variety of mics placed from 50 to 100 feet away so we'd hear the full propagation of the long, low wave. Using the two oscillators, we were also able to beat frequencies against one another—one's at 21 Hz and another's at 22—and then we brought them back into sync and swept them apart again so we get really interesting acoustic anomalies that are almost like flanging, but with the natural acoustics of the environment in which we recorded. Then we'd vary the elements of the [sound] from transition to transition and location to location—for instance, with the exterior versions, you totally buy that it's on a street even though you're hearing this completely unnatural sound because it's recorded 'in situ.' It's a great effect because it doesn't sound like something that's being added on after the fact. I then used Melodyne [plug-in] to create chords from this material so when we need it to, it can evolve into a more complex sound.

"We also utilized 'worldizing' on a great, old mono recording that [composer] Hans Zimmer deconstructed, pitching and stretching different frequencies to varying degrees. We re-recorded it on a street, in a building and a soundstage on the WB lot, and in a canyon to give it a natural, lifelike feeling. It's an otherworldly sound, but

sounds like it's existing in the world the characters are inhabiting. It's quite strange, but cool."

In fact "strange but cool" sounds like a good way to describe a lot of what goes on in *Inception*, where scenes "run the gamut from the nearly normal to the extremely surreal," King says with a laugh. "Enough of it is reality to make it recognizable, but then something very odd is happening—the physical behavior of something may not seem quite right or things aren't moving at the right speed."

Naturally, the sound has to mirror the action onscreen to a degree so if, for example, an explosion near a Paris café slows down visually, "the debris field becomes a more important element and you're seeing more detail," King says. "So you want to make it sound as lethal and scary as possible; things are flying by us and you want to give that some definition. We recorded a lot of objects being shot by a microphone; these are carefully placed and, as mentioned before, put in a 'realistic'-sounding environment. To be real and truly threatening, it has to be believable."

Hans Zimmer contributed a typically engaging and propulsive score that combines orchestral music, percussion, sampled material and loops. "We're always very much aware of what each other is doing," King comments, "and shape what we're doing accordingly. The great thing about the way Chris works is he likes to get temp versions of the score from Hans early on so there never is a temp mix using cues from other movies. Instead, I can hear the evolution of the score and Hans can hear the evolution of the sound effects as the track evolves. We maintain an ongoing dialog, and when we see each other at screenings and so on, we share our thoughts. I think his score for *Inception* is really powerful. He's very bold in his approach; I admire him a lot. And he has a true collaborator in music editor Alex Gibson, the 'man on the ground' as it were."

For his part, Nolan knows what he wants, but he gives his crew the latitude to be creative in helping him achieve his singular vision. "Chris wants the audience to be excited and moved," King says. "He's making these elaborate, thoughtful, complex movies, but they also absolutely work on an action-movie level.

"He's a very challenging director who never stops pushing, thinking, trying different approaches—he never stops trying to make the movie better. As hard as all of us who are working on the film are striving for perfection, he's working harder than all of us." ■



PHOTO: ANDREW BOCK

Larry Zanoff captures bullet impacts in the field for the *Inception* soundtrack.

Blair Jackson is the senior editor of Mix.



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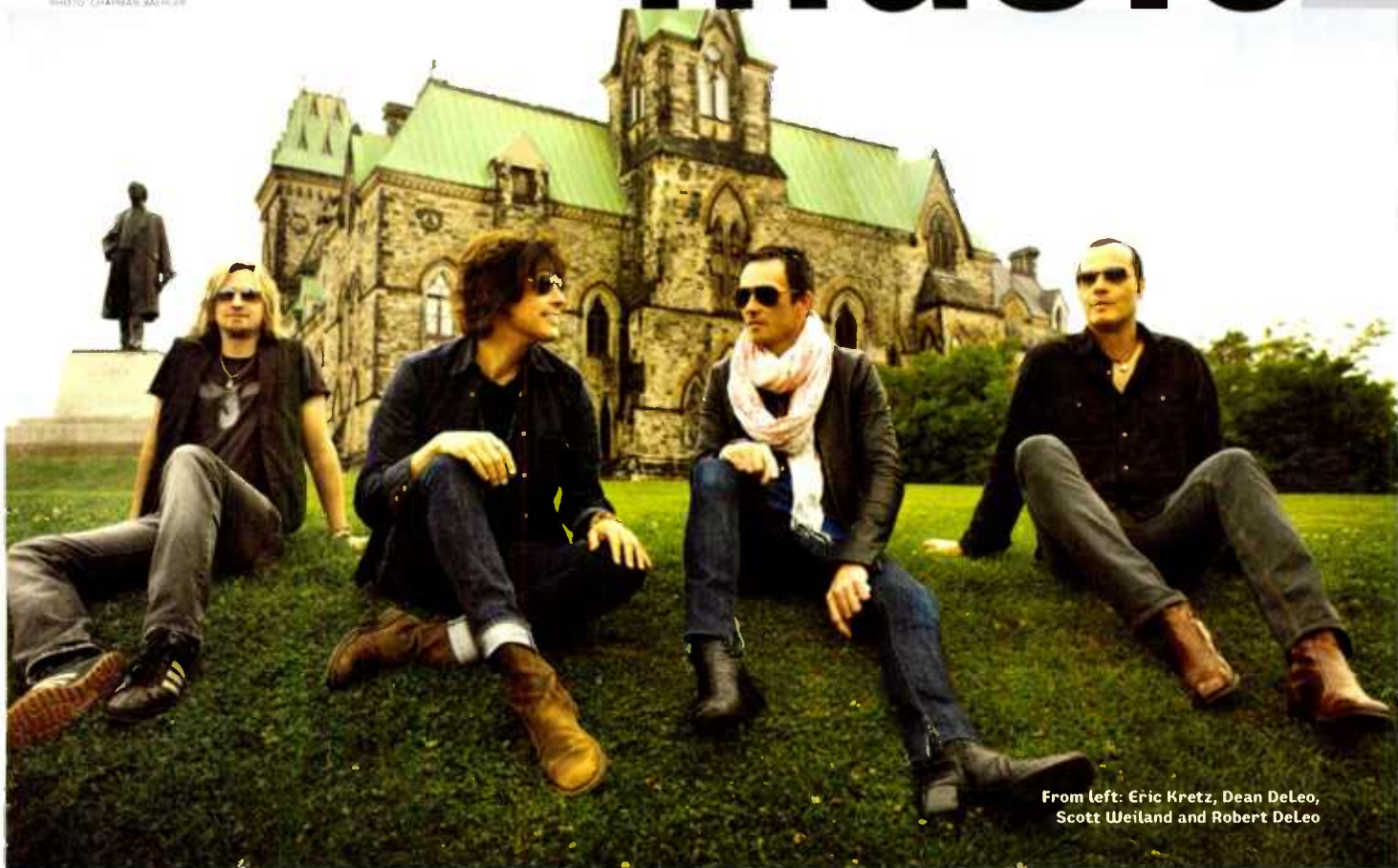
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# music

PHOTO: CHARMAH BAIHLE



From left: Eric Kretz, Dean DeLeo, Scott Weiland and Robert DeLeo

By Sarah Benzuly

## Stone Temple Pilots

### TAKING THE REINS

In 2003, most Stone Temple Pilots fans thought the band was kaput: Lead singer Scott Weiland continued to battle his heroin addiction and took center stage with super-group Velvet Revolver, while the rest of the bandmembers continued to make music under the name Army of Anyone. Then, in 2008, the band reunited and embarked on a U.S. tour, re-igniting that special spark that these bandmates have had for almost 17 years.

"I think the first step for us was to get together and re-acquaint ourselves with each other and the mu-

sic, and I think the best way to do that was to get into the songs that are familiar to us—the older material—and what that does is it brings back a lot of memories of being with the people you're making music with," says bassist Robert DeLeo, who talked to *Mix* just a few days after the band's appearance at SXSW. "Once we brought that back out on the road, I think it was just the natural progression for us to think about making a new record, which we haven't done in nine years! [Laughs] Time flies."

The band took a leap in not only

trusting each other again as musicians, but in relying on each other to self-produce; for all previous efforts, STP worked hand-in-hand with producer Brendan O'Brien. "I was the cheerleader holding the pom-poms to make this happen," DeLeo says. "I just thought that many years had gone by and I learned a lot from Brendan—made great records with him and had a great time doing so. I just thought it was time for us [to produce an album], and we're all very capable of doing this as a band. I'm very proud of it."

Tracking for the self-titled release

commenced at drummer Eric Kretz's personal studio in downtown L.A., where STP (sans Weiland) started pre-production and demo'ing. Songwriting was handled by DeLeo and his brother, guitarist Dean DeLeo; they compiled both old and new material, working mostly in Kretz's place.

As the group got closer to laying down tracks, Weiland—who had set up camp at his studio, Lavish, with Don Was—would receive material and track vocals. "Don Was came in and went over vocals with Scott and gave Scott some guidance on where to go with the songs," DeLeo says. "Don also brought Scott over and got us all together on the same page as far as keys of songs, melodic ideas. Sometimes you need an outside person to do that. So as one of the producers of the record, it was kind of interesting to try to put a record together in separate places, as you can imagine.

"We just got together, played the songs and quickly put them down to see what we had. It was more of a monitoring/demo kind of thing. We didn't record together. We just took all of our ideas, put them together, sat back and listened and had some melody, vocal and arrangement ideas that we went over. Then we took what we had there and went our separate ways again. It was an interesting way to make a record.

"We've been making records since '92 and we've learned an awful lot and we know each other musically where we're going to go with the songs," DeLeo adds. "And nine out of 10 times, when we pinpointed what we were going to put on the record, there were a couple of things missing to us, and I think it was more of the upbeat stuff. The first single, 'Between the Lines,' that's a song I wrote as a fill-in-the-blank to round out the record. 'Cinnamon' was the same deal. We tracked those at my home studio, Homefry Studio."

Not only were the tracks being worked on in different spaces, but also on different gear. Robert DeLeo's space features a restored '71 Neve 8014 console. ("I really love that board. It sounds really warm and fat," DeLeo says.) Kretz's room is centered on an SSL. Both places have Yamaha NS-10 monitors; DeLeo also uses a pair of ADAM speakers. "But the majority of it was on NS-10s and Eric's also got a set of vintage Auratones that we were playing through once in a while, and they were very helpful in getting everything together."

As for mics, DeLeo responds, "Where do we start! I've been collecting mics since the early '90s and it's one of my passions. My favorite kick drum mic is an AKG D20 and I managed

to pick up a couple of those over the years. I've actually acquired some from the '60s, dead stock, still in the box. [We placed a] D20 on the outside and then a 421 on the inside of the kick; 57 on the snare with a 414 underneath the snare. [We used] 57s and KM84 for hi-hats and C12As for overheads. The C12As have a nice depth to them. Royer 122s phantom-powered for overheads; U47s out front and RCA 44 for over the drum set. I kinda look at mics like painting a picture: whatever's going to work for that space. Used an old Coles ribbon for out front—whatever worked."

Weiland sang through a U47, which DeLeo recalls as the first mic the band bought in the '90s.

DeLeo's bass was split into three channels: an early vintage '61 Bassman A/B'd into an Ampeg VT22 combo, using only the power section of that. "And I run that out into a very rare—I think they only made them for three years, but I found one—1970 Marshall 8x10 cabinet. And then I run that into a Demeter mic direct box. I split those [three channels] up into the Marshall giving me the distortion, the Bassman giving me that roundness and the direct punch of the direct sound. I blend those together into three different channels and adjust according to the song. That's what I've been doing for the past three or four records."

The one constant in this record-making equation is that all the tracks were loaded onto Pro Tools, and after all the back-and-forth (individual tracking at a personal studio, coming back together to discuss further direction, back to a personal studio, etc.), the final songs were sent to mixer Chris Lord-Alge at his room in Mix LA place (formerly Studio B in Can-Am Studios). Lord-Alge had mixed STP's "All in the Suit That You Wear" for the *Transformers* soundtrack, and the bandmembers were intimately aware of, and keen on, his mixing style.

"Back in January [2010], they gave me the test drive," Lord-Alge recalls. "They gave me the first song, and if they liked it, they said, 'Okay, let's keep going.' We would get two or three tracks at a time to prepare because my staff preps the tracks for me. We like to have plenty of time ahead; it's not like the file shows up in the morning, we plug it in and go. Plus there's last-minute vocal edits that are getting e-mailed to us. There have been times when



Hangin' at Chris Lord-Alge's place (with a massive amount of out-board gear), from left: Dean DeLeo, Robert DeLeo, Scott Weiland, Chris Lord-Alge and Eric Kretz

there are vocal issues dropping in before the band shows up and I quickly insert it."

As for bringing tracks from three separate locations and making it sound as if the band recorded together in one room, Lord-Alge replies: "For us, that's just normal operation, because the way records are made now who knows where they came from? The thing with STP is, when you hear the songs, you think, 'This is *exactly* what it should be and you just get it there'—just from knowing what the band should sound like. For me, they're more of a Led Zeppelin three-piece than anything because of Dean; he's more of a Jimmy Page for our times. All I was thinking about was Led Zeppelin and how I would mix Led Zeppelin: Make it a little less polished and more about the riff than the melody. The guitars and vocals had to be 50/50. A lot of times, the song just dictates that you make it more of a vocal-heavy mix because of the song's structure."

Lord-Alge mixed on his SSL 4k 72-channel console ("this is what makes rock 'n' roll"), monitoring through Yamaha NS-10Ms, Infinity subwoofer and M&K powered speakers. "More important is the boom box, which is a Sony ZS-M1 MiniDisc player," Lord-Alge adds. "That's what the band tends to like best because that's like your computer speakers, but not that crappy. The most important thing is



to hear how it's going to show up on a smaller medium because 90 percent of the people are going to hear it on a small medium: ear buds, computer speakers, car stereos. Not to say that we're making it lo-fi; we're just making sure the balances are there."

The mixer also made use of his arsenal of outboard gear: Pultecs, 1176s, etc. For their "larger, bigger, better and louder" mantra, Lord-Alge selected choice pieces from his "700U" of outboard. "All my plug-ins are installed with a power screwdriver. The thing with STP, I'm using vintage reverb, vintage analog delay. All original 224 reverb from the '70s, original Marshall slap tape delay, a Rev-1 reverb, the original EMT 246 from the late '70s. All stuff with character. Even an Ursa Major Space Station. Just using those flavors, you can't re-create that in the box."

Dean DeLeo and Kretz were involved in the mix; Robert DeLeo chose to stay at home and have the tracks e-mailed to him. "I think what I've learned over the years is to not tweak my own music," he explains. "And for me, it was better if I was down at my house and I had the mixes sent to me. I was in an environment that I was used to. I think that when you get into a mixing studio, it's supposed to sound good, so I get a little fooled by being in a foreign place and listening to it because I've been in the situation before where it's like, 'This sounds great,' but when I get it back to my house, it didn't sound as good as I thought it did. And that's the beauty of the technology. You can actually get something sent to you over the Internet and sit in the comfort of your own home or go out in your car and check it out. Listen to it on your home stereo."

Once final mixes were approved (total mixing took about nine days), tracks were sent to Ted Jensen at Sterling Sound, whom Lord-Alge uses for all of his projects.

Reflecting on the final product, which was released in late May, Robert DeLeo sums it up: "I think ultimately we've been conscious of making a great record, a great listening experience from top to bottom. I think producing is many, many different facets, and I think producing is ultimately getting to what you call a finished product. Dean and I were hard at work getting this finished! I like doing things quickly and getting them out and getting a performance. I never took myself out of the ear of the listener. I think I'll always be a fan of listening to music, so if I can incorporate the 'listening to the music' facet in the music that I make, I think it makes great music." III



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Bobby McFerrin (left) with  
composer/producer Roger Treece

Bobby McFerrin

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with roger treece

# Bobby McFerrin

## VOCABULARIES BREAKS NEW GROUND FOR VERSATILE SINGER

By Blair Jackson

Where do you go artistically as a singer when you've seemingly covered every base there is, from solo voice to intricate vocal ensembles, jazz to pop to classical, and earned 10 Grammys and a *Billboard* Number One single along the way? If you're virtuosic vocal chameleon Bobby McFerrin, the answer is you expand your music in *many* directions at once, as he does on his impressive, genre-defying new album, *VOCAbuLarieS*.

The album includes just seven compositions, ranging from six-and-a-half to 11-and-a-half minutes in length—all co-written by McFerrin and noted composer/arranger/musician/singer/producer Roger Treece (with lyric contributions by Don Rosler)—sung by a remarkable, ever-shifting ensemble of voices, many singing several parts that have been further multiplied in the studio by Treece to create a “choir” unlike any other. The music is all over the map—literally. There are African-inspired tunes and grooves, bits of jazz mingling with classical touches, Middle Eastern and Indian musings, silky R&B, hints of both Gregorian and Tibetan chant, a dollop of doo-wop and smooth chorales that recall everything from Ladysmith Black Mambazo to the Swingle Singers to the Beach Boys. The words come from many languages—including McFerrin-invented ones—but just as often, the singing soars on wordless flights of melodic invention. With every song a multitextured journey in itself and vocal tracks numbering into the hundreds, it's a long, *long* way from the simple layering

of eight “Bobbys” for McFerrin's 1988 chart-topper, “Don't Worry, Be Happy” (see “Classic Tracks” on page 40).

The concept for the album came from McFerrin's longtime manager and producer, Linda Goldstein, who in early 2001 drafted Treece to write a number of pieces based in part around some of McFerrin's remarkable vocal improvisations. Though Treece is perhaps best known for his work with Manhattan Transfer, Goldstein says, “That was a starting place in terms of harmonic sophistication and development, but I felt that no one entered into this territory of really trying to capture the nuance and characteristics that Bobby has mastered and invented. It can't just be the notes, but how are the notes conveyed and how are they phrased? Even technique-wise, is it the head voice, the chest voice, the throat voice? So Roger and I collaborated on this thing that is really an homage to Bobby in a way. I felt Roger had the sophistication to be able to do it, but he still needed his education in the ‘Bobbyisms.’” [Laughs]

Adds Treece, “What I understood at the beginning was it was going to be developmental work on Bobby's stuff from a compositional level. Linda said, ‘What would Bobby do if he were a composer?’ So I was going to channel Bobby as the composer. Then, on a technical level, we knew that we wanted to record this music and it was all about vocals and voices and choral singing. At first, I didn't want to do a lot of overdubs with every voice, but as the process went on, I found out it was okay to do that and it actually

made a very rich sound.”

Treece says it took most of 2001 to write the songs at his Manhattan studio/workspace, Audible Art, and the initial vision after that was to have McFerrin come in and lay down template tracks for the whole album. Some of that did occur, “but as Roger began to delve more deeply into the through-composed aspect of it,” Goldstein says, “he ended up making templates himself [using piano mostly] and then we had Bobby come back in and sing the notes that were composed by Roger, so then Bobby was an interpreter. And then we did a lot of the overdubbing of the other voices on top of that, mostly one at a time, but Roger also brought in small groups.”

Goldstein says that “casting” the voices was surprisingly difficult because of the nature of the material. “There was an enormous amount of trial and error. There were pronunciation issues—some of the singers, great as they were, enunciated too much. In some sections we needed an R&B singer with classical chops, or someone with more guttural chops like the Bulgarian Women's choir. There are all these nuances that Bobby just so freely and instinctively borrows from. You can be too in-tune; sometimes you need to funk it up a little—muss it up so it's not quite so perfect.”

“After a while,” Treece adds, “it became clear what we were looking for on most of the songs, and I would bring in singers whose voices I knew would work and we'd have everything laid out. We had percussion, all of the voice tracks being played by piano parts, the whole



thing measure by measure, tempo all mapped and ready to go. Then I would simply put things on a loop for a singer. We would rehearse how it would go, they would sing eight bars or whatever, over and over again until they basically had it memorized, and then I would loop them until I had 10 or 15 tracks of them, then I'd edit that down to six to eight tracks of, for instance, Janis Siegel of the Manhattan Transfer singing an alto part to something. There's at least six tracks of every singer on each tune. I calculated in my head, if I have 150 to 200 tracks a song of finished voices, that means I recorded at least twice as many tracks, so I recorded each song at least 300 to 400 times." The song "Messages" alone "has roughly 190 vocal tracks and about 30 percussion tracks and probably six miscellaneous synth tracks here and there—effects and such," Treece says.

Treece, who engineered the album, says his fourth-floor writing and recording space is "just a room; not a real studio. But it has high ceilings and a nice liveness to it." He used a single Neumann M147 tube condenser mic recording to Digital Performer "because the MIDI implementation works so well, and since I was working so much MIDI in this because of the samplers and doing all the percussion stuff—90 percent of the [instrumental tracks on the] record is either me playing percussion or me playing samples—tabla parts off the keyboard and such."

Did Digital Performer have any problem working with so many tracks at one time? "Yes, it had a lot of problems," he says with a laugh. "It wouldn't be very friendly about playing more than 60 tracks back at one time. It wasn't until 2004 or 2005 that I actually heard all the tunes the whole way through with all the voices on them." Along the way, Treece did his own sub-mixes of the vocal material—stereo pairs for each part (soprano, second soprano, alto, etc.)—"and then there was usually about 20 solo tracks per song: Bobby and other people doing miscellaneous parts; things I wanted to keep in mono." Among the singers featured in addition to McFerrin and Siegel are Lisa Fischer and Luciana Souza. Treece sang bass and tenor on most tunes.

Treece's rough mixes were then used as a guide for the final mixdown, which was done at Record One in L.A. by Treece and Allen Sides (plus engineers Steve Miller on two songs and Bo Joe on one). What did the other mixers bring to the party? "They brought their knowledge of effects for one thing, how to bring things out here and there to punch up

the mixes," Treece says. "For instance, Allen, because he's mixed so much pop stuff, had an idea of me bringing out the percussion a little bit more on a few things. Allen's thing was a real audio approach—really taking time to EQ everything right. The assistant [Bo Joe] and I would get up a mix and work on it for basically a day; we'd get it laid out. Then Allen would come in and do some basic EQs on everything, and we'd work with the panning a bit. Then [Bo and I] would work on it for another day, getting all of the balances right. I'd sit there at the computer and run things over and over again, mix-

ing it in the computer. Then Allen would come in again after that process and we'd spend another day finishing it.

"Linda also had tremendous creative input on the mix. She really hasn't received one percent of the credit she should have for this thing because she thought of it and she could always see what it was supposed to be. She was the keeper of the flame in terms of making it kind of cool and hip—anything but normal classical-sounding stuff. Our little catchphrase during the project was, 'What would Brian Eno do?'" III

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# SESSIONS

## Tim Palmer Moves 62 Studios From L.A. to Austin

Producer/engineer Tim Palmer ([www.timpalmer.com](http://www.timpalmer.com))—well-known for his work with Robert Plant, Bowie's Tin Machine, Tears for Fears, Pearl Jam, H.I.M. and many others—recently relocated from L.A. to Austin. Looking for the right balance of music town and family life, he found his new home base in the Texas countryside; included on the property was a three-car garage, which Palmer and Mark Genfan of Acoustic Spaces



([www.acousticspaces.com](http://www.acousticspaces.com)) turned into a mix/overdub studio.

"He said, 'My needs are modest, but I really want to work at home,'" Genfan recalls. The new 62 Studios is approximately 750 square feet, with 20-foot ceilings,

custom-built acoustical treatments and a picture window that lets in natural light and looks out onto green hills. As it was in L.A., Palmer's workflow is centered around Pro Tools and racks of Tonelux modules.

"I wanted the best of the analog and the digital worlds," Palmer explains. "I had a demo of the Tonelux modular system, and it was exactly what I was looking for. I wanted to embrace the old sound and have the flexibility of the new. The Tonelux system lets me keep a traditional analog signal path but with the control of the digital world." Palmer's monitors of choice are Genelec 1031As.

Now, Palmer can visit larger rooms in Austin or L.A. to track his clients if needed, but mixing and overdubs happen on his own terms. "I basically wanted a mix room, but I added an extra overdub room that I knew would be useful further down the line," Palmer says. "At the moment, I use that space as a prep room for my assistant to set up sessions [and get them] ready to mix. It is all wired up and ready to go to use for vocals and basic guitar overdubs."



Palmer says he thoroughly enjoyed the process of working with Genfan to design and construct his new workspace. "Mark was very easy to work with, and the team he assembled to build the room was amazing," Palmer says. "Believe it or not, we were sad when the crew actually was not part of our world anymore."

Of late, Palmer has been mixing projects for a number of international clients—the Internet being another great facilitator of his new setup. "So far, fingers crossed, it has been going really well," he says. "I just finished mixing tracks for the new album from Tarja from Finland, Midnight Youth from New Zealand and a great new band from Washington, D.C., called the Dance Party. I am going to produce a local band next that I am very excited about: Blue October."

—Barbara Schultz

## Q&A

### John Greenham



John Greenham pictured in his mastering room at 1340 Mission with his Magix Sequoia workstation and Barefoot Mastering Stack

PHOTO: MARIANA FROVING

San Francisco-based mastering engineer John Greenham ([www.johngreenham.com](http://www.johngreenham.com)) has quietly amassed a wealth of album credits for artists in numerous musical genres. He earned Grammy recognition in 2006 and 2007 for his mastering work with Mexico's Los Tigres Del Norte (Best Norteño Albums) and mixing work on Peruvian singer Pamela Rodriguez's *Peru Blue*, for which she received a 2006 Grammy nomination as Best New Latin Artist. In 2009, Greenham moved his operations from The Annex in Menlo Park, Calif., to San Francisco's 1340 Mission studio complex. *Mix* visited with Greenham in April as he was preparing to launch the next phase of his business.

#### How did you come to join 1340 Mission?

This room became available again, and this is my second tour of duty here. I've always loved working in this room. I was here in 2000. Paul Stubblebine, Michael Romanowski and I built these two mastering rooms. We were all associated with Rocket Lab in the late '80s—that's the common thread. The room was designed by [acoustical consultant] Bob Hodas, so it's properly built. It's fun to work in. A lot of big records have been made in this building. It has a good feeling about it.

#### How does your business fit into the complex?

I'm actually putting together a Website called Essential Mastering [along] with Robert Cross,



## ⌘ New Label, New Album for Social Distortion

L.A. punk band Social Distortion announced a new deal with Epitaph and a new album-in-the-making in the same breath this summer. The forthcoming sixth release will be the band's first studio

with just Mike and drums. There's no one set formula.

"We're tracking to Pro Tools and analog, to a Studer A800 machine, and we've A/B'd the analog with Pro Tools; so far, analog is winning. But we're recording the analog, then taking it off the repro head and dumping it into Pro Tools, which we'll use to mix."

Barron is also making use of the Neve console and Ocean Studios' (Burbank, Calif.) extensive collection of classic outboard equipment: "Everything goes through the Neve,"

he says. "I'm also using eight Pultecs on guitars, kick and snare. All the guitars go through the Fairchilds. With snare drums, I like to use the RCA BA6A combined with the original tone along with an Altec compressor.

"We're doing some rough mixes as we go. We're getting a feel for it. Things are coming back really nice."

—Barbara Schultz



PHOTO: CHRISTINE MARRE

From left: assistant engineer Albert Mata, engineer Duane Barron and Social Distortion frontman/producer Mike Ness at the Neve console in Ocean Studios (Burbank, Calif.)

album in six years, and engineer Duane Barron (Mötley Crüe, Ozzy Osbourne, Alice Cooper) took a break from vocal tracking to talk to *Mix*:

"Social D is a blues-based punk band. [Frontman/producer] Mike Ness wants this to sound like it was recorded in 2010, but still have that vintage feel. Some of the tracks have been recorded live, the whole band, and some have [started

## Daywood Drive Records ⌘

Brian McKenna, formerly of Sony Studio, N.Y., has partnered with his childhood friend, James Miceli, a graphic artist, to form jazz label Daywood Drive Records. Their mission: combine the best of traditional marketing with social media and high-res digital delivery. The emphasis is on the music experience, with album art, session photos, behind-the-scenes video and an easily assembled bundled package available with each download.

"We're not reinventing anything here," says McKenna. "The pop world has embraced this new model. But in the jazz world, you still have people who opt for the CD because it sounds better. And they're willing to pay more for that quality."

Daywood Drive launched in late spring with two initial artists, Dan Willis and Sandro Albert, and a host of distribution deals for other artists. Phase two, about to launch, brings in the new, with blogs, streams,



James Miceli and Brian McKenna at Hal Winer's BiCoastal Music (Ossining, N.Y.)

PHOTO: GREGORY MULLER

newsletter, video, Twitter—and an increase in quality download. "We record everything at 24-bit, 88.2," McKenna says. "And we know the storefront is crucial. We will have a large education initiative on the site so that consumers can hear the difference between an MP3 and an 88.2 WAV file.

"We'll have free downloads as a sample so consumers can download the high-res file and get used to the fact that it will take a little longer," Miceli adds. "But we want them to play it against the MP3 that's downloaded at the same time and do their own comparison." —Tom Kenny

Send "Sessions" news to [bschultz@mixonline.com](mailto:bschultz@mixonline.com)

by Matt Gallagher

a young engineer whose work I like. With all the [projects that are] being done in garages and living rooms nowadays, more than ever there is a need for an accurate monitoring environment to finish projects in. This is the best rig I've ever used for mastering. The stuff's coming out great and I want more people to know we're here.

### What is your take on the loudness wars?

I try to discourage people to just go for loudness. But at the same time, people on the sales end want it to be aggressive. Also, I have two teenage daughters—who, to me, represent the record-buying public—and I see what happens with them: If the music doesn't get their attention in some way

within the first 10 seconds, it's gone! It has to have impact right away; otherwise, not only are they not going to listen to it, they're going to hit the Delete button! [Laughs] Part of the reason for that is loudness. So my job is to not let that happen to the artist if I can. Like anything else, [loudness is] an art form. The technology has gotten better, I think, over the last 10 years or so. As Chuck Prophet said when he was here recently, "We have to be competitive, but responsible."

### Is it now easier to keep tracks sounding good while applying compression?

I think digital devices have improved. Very often, my method involves using tape, which deals with

the transients in a very musical way. Basically I get the analog flavor in everything and then I make fine adjustments with the plug-ins. Digital audio is in fact far more difficult to get right than analog because it's so completely unforgiving.

### What have you learned as a mastering engineer?

Making a record is a constant learning process. Every piece of music has some beauty in it—that's what I learned from [composer/pianist/percussionist] Omar Sosa. And there's beauty in ugliness, too, if that's what the idea is. As a mastering engineer, you've got to give it some love, allow it to speak to people, and get all the technical stuff out of the way. III

# CLASSIC TRACKS



SIMPLE PLEASURES

## Bobby McFerrin

### “DON'T WORRY BE HAPPY”

By Blair Jackson

In the context of what usually gets played on the radio and goes on to become a hit, Bobby McFerrin's 1988 smash, “Don't Worry Be Happy” is definitely an anomaly; even, dare we use the word, a “novelty.” After all, it's one singer, performing all the parts a cappella, on a lilting, vaguely Caribbean-sounding song with an uplifting message as simple as its title. Yet something about that song captured the imagination of millions of people around the world: Maybe it was its relaxed optimism and the fact that you practically had to sing along with it, whether you took the lead vocal, the falsetto backups, the cool bass part or just attempted the infectious whistle. The song shot to Number One on the *Billboard* singles chart for two weeks—September 24 and October 1, 1988—and earned Grammys for Song of the Year, Record of the Year and Best Pop Vocal Performance.

For McFerrin, there was nothing particularly unusual about the song or the recording. It was one of several he wrote for his Elektra album *Simple Pleasures*, on which he also covered a handful of rock classics—all constructed from multiple a

cappella overdubs—including “Sunshine of Your Love,” “Good Lovin'” and “Drive My Car.” By this point, McFerrin had already established himself as a unique vocal talent with an incredible range and an uncanny gift for both improvisation and interpretation. His critically hailed 1984 breakthrough album (his second), *The Voice*, consisted entirely of solo vocal performances (no overdubs at all).

But on *Simple Pleasures*, through the miracle of overdubbing, McFerrin became a one-man band. The project began in the fall of '87 at Power Station in New York. Though McFerrin lived in the San Francisco Bay Area, Linda Goldstein, his manager and producer since '79, lived in Manhattan, and shortly before this the singer had cut the theme song for *The Cosby Show* at Power Station with engineer Chris Tergesen using the multiple overdub method. Some of *Simple Pleasures* was cut there, but “Don't Worry Be Happy” was among the tracks recorded at Fantasy Studios in Berkeley, Calif., in the winter of '88.

As for the origin of the song, according to Goldstein, “We had just seen the movie *The Three*

*Amigos* and we were all doing the bad Spanish accents from that film. We [McFerrin, Goldstein and Tergesen] were just cracking each other up, and we were making all sorts of stupid jokes, like, ‘It takes Juan to know Juan.’ We arrived at Fantasy and the entrance to one door said ‘STU’ and the other ‘DIOS,’ and we thought that was hilarious, so we kept going with Spanish accents. Bobby went to the piano in the midst of all this and started playing this tune, and I said, ‘Why don't you sit down and write some lyrics to that?’ And Bobby wouldn't stop doing this character, which is funny because to this day people think it's Bob Marley or some Jamaican guy. But it's not. That's how bad his Spanish accent is!” The title came from the best-known saying of the Indian mystic Meher Baba.

For recording multiple parts, Tergesen says, “Bobby used to go out there and start with what he called the basic track, which was a rhythm bass-y part. He would do his trademark thing of slapping his chest as he sang the bass part and it would also create little transients and percussive sounds coming out of his voice. Sometimes he would double it, and then he would do harmonies after that, and somewhere along the line he would come up with the melody and play with that for a while. Last would be the lead vocal. The mic I always used on Bobby was a Neumann tube U47.” Tergesen and Goldstein would then assemble a master composite from a combination of takes and punch-ins, doing a rough mix along the way.

He describes Fantasy Studio A as “a medium to big-sized room. You could get 40 to 50 guys in there. But wherever we went, we would put him in the main recording space so he wouldn't sound like he was in a phone booth and feel claustrophobic singing into a wall.” The control room had an SSL console and Mitsubishi 1-inch, 32-track digital recorder, though only eight tracks were needed for “Don't Worry.” Tergesen notes, “I used a Neve pre-amp and probably a UREI 1176 compressor with a very low compression ratio—4:1.” The album was mixed on an SSL at Power Station.

Actually, it was the appearance of “Don't Worry Be Happy” on the soundtrack of the Tom Cruise film *Cocktail* in the summer of '88 that brought it to the mass public. Why was it a hit? “I think we captured this unpretentious pure joy that is part of Bobby,” Goldstein says. “Everyone expected him to take the route of self-promotion that is sort of required by the industry, but that's not Bobby. He basically decided to stay home. That song had its own wings.” And it still does—popping up regularly in films, on TV and on endless compilations. ■■■



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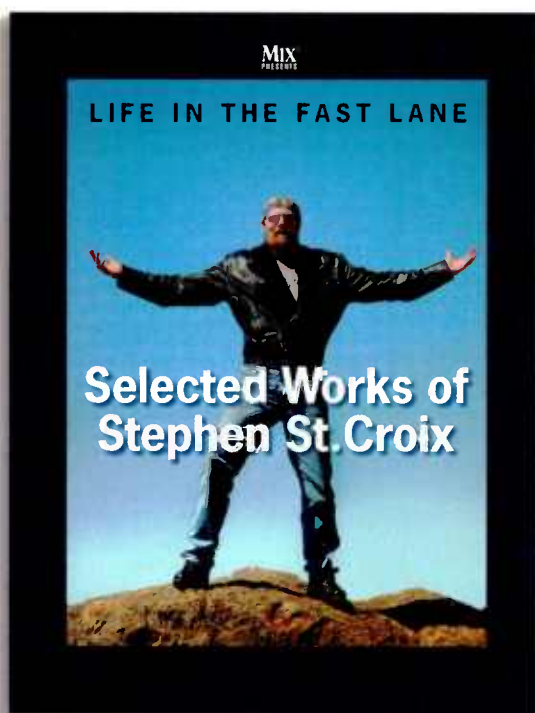
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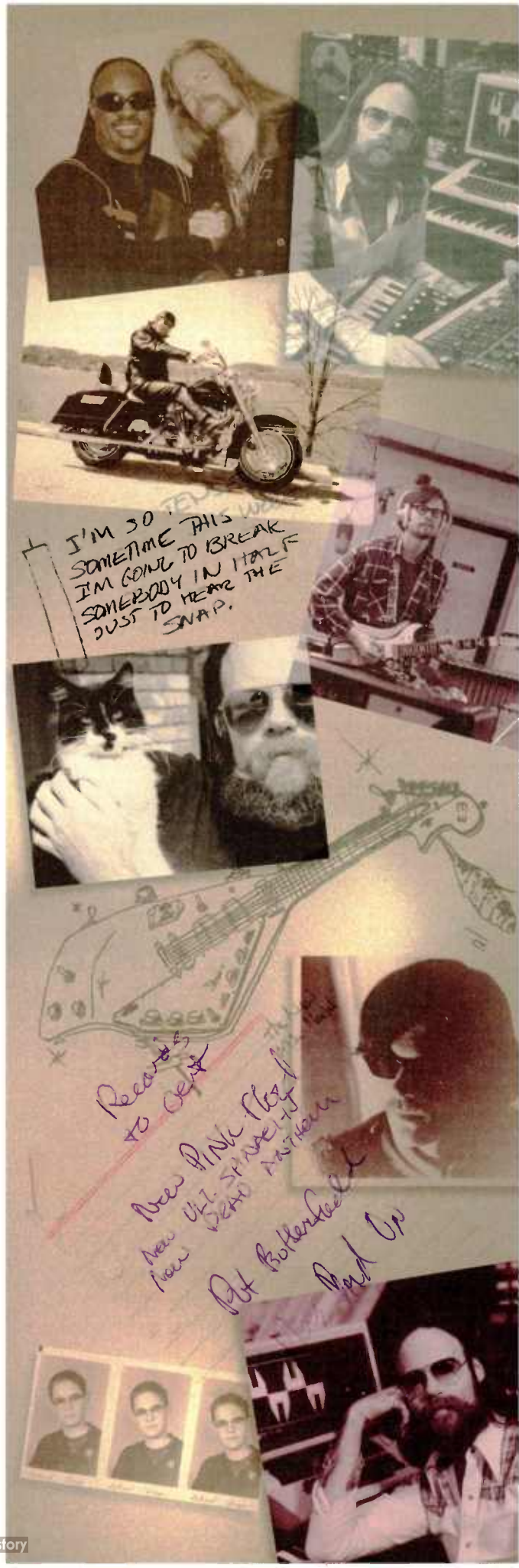
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**MIXBOOKS**







By Sarah Benzuly

## Vampire Weekend

STUDIO SOUND GIVEN A LIVE BOOST

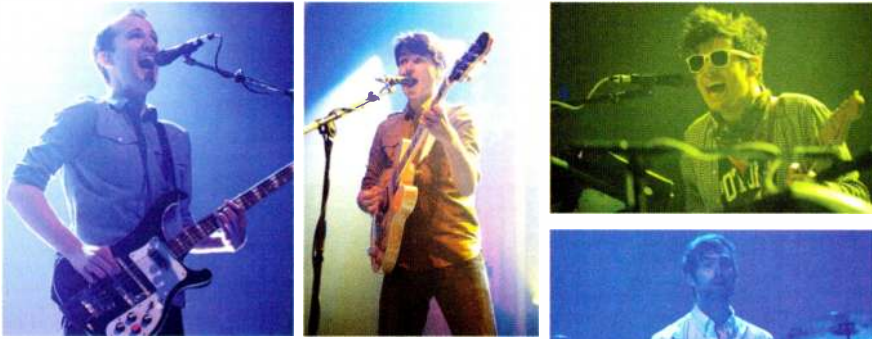
Considering the band's calypso-esque, Afro-Cuban leanings, it was a bit odd to hear DJ Kool's "Let Me Clear My Throat" played as background music as Vampire Weekend walked onstage at Oakland, Calif.'s Paramount Theater—but that's exactly what the band and the sold-out crowd did. Despite being considered an overnight success with the release of its latest, *Contra*, Vampire Weekend took to the stage like old hands. With intelligent guitar hooks, pop-centric vocals and a progressive synth accentuating the bombastic drumming, the band and crew set out to re-create as much of the album as

possible.

"I try to faithfully and dynamically reproduce the record in a live environment," offers front-of-house engineer Neil Heal. "A lot of people don't appreciate the effort that goes into making a record and just 'make it louder.' I know months of work have gone into [making the album] and I only get one chance to re-create that. I might like a certain way something sounds, but if it's unrepresentative of the record, it's just massaging my ego and that's not why I'm here. Some of what I do and how I do it enhances the band's live sound, but it nev-

er strays too far from or dramatically changes the original intentions."

That being said, Vampire Weekend is a band that likes to experiment with its sound—bringing in different textures, tempos and the like to give the audience something just a bit more to gnaw on. "Occasionally, they want to try mixing things up a bit and when they do, Rostam [Batmanglij, synth; also producer/engineer on *Contra*] normally comes out front with me and we'll listen to the rest of the band and try different things," Heal says. "Pretty much it's trusted to me to make sure it's right."



Clockwise, from left: bassist Chris Baio, vocalist Ezra Koenig, Rostam Batmanglij (synth) and drummer Chris Tomson

Key to making sure that everything sounds the way it should is the Soundcraft Vi6 board at FOH. Heal chose this console as it "sounds great and is the most 'analog' of all the digital desks I've used. More importantly, I can do four things at the same time and see all of my channels right there; I'm not scrolling through menus or wondering what 'XXX' flavor-of-the-month plug-in may or may not be doing. I can concentrate on the mix and not worry about the technology."

Heal uses a Distressor over Ezra Koenig's main vocal and a Yamaha SPX2000 for vocal

distortion on one song, which bumps his channel count to 56. "I have no idea how that happened!" Heal enthuses. "With that desk, it's just so easy to add things and experiment with new ways to re-create the album's production."

Monitor engineer Chris Moon is also taking the digital route, manning an Avid Profile. He opted for this console because its snapshots are user-friendly. "I have snapshots on every song saved, which puts me at a good starting point," Moon says. "I still have little cues to do within the song, though. The snapshots save

me from cycling through multiple pages on the fly. Ezra relies mainly on his guitar for pitching: It varies from song to song for each member, hence all the snapshots. I also chose the board because it's easily available around the world. So for the shows when we are not traveling with production, it's usually not a problem to have one on-site." Moon is not carrying any outboard gear, instead making use of such onboard plug-ins as Crane Song Phoenix on some of his inputs and outputs.

Moon is taking 41 inputs from the stage, including the bandmembers' mixes. "All the guys seem to take their instruments and vocals the loudest," Moon says. "Then everything fills in around them. Chris Tomson's [drums] mix comprises a lot of drums, bass and then all the other inputs. The same goes for Chris Baio's [bass] mix: bass and drums. Ezra's mix is based on his vocals and guitar, and then just a couple things here and there. Rostam takes all the keys, along with his guitar. During the show, depending what song is being played, I am having to turn inputs on and off for the guys. There are many changes that are made to their mixes throughout the course of the show. I'm pretty much always in communication with the band. They don't ask for much, but when they do I'm there for them.

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**e:** FOH engineer Neil Heal at the Soundcraft Vi6 board.  
**u:** Monitor engineer Chris Moon at an Avid Profile.



The most important part of my mix is to know that the band is having a good time onstage. It all starts with them, so keeping them happy with what they need to hear is going to reflect on their performance."

The band is on in-ears: Koenig and Batmanglij use Ultimate Ears UE 10s; Baio and Tomson are on UE 7s with the ambient option. All in-ears are run on Sennheiser G3 Series hardware. Moon also employs Meyer MJF-212 wedges lining the stage for the rhythm section. "There are a lot of drums and bass going through [the Meyer wedges]," Moon says. "They handle the low end very well—nice and punchy."

### P.A. Du Jour

Another important factor that helps re-create the album sound is having the same gear night after night. With the exception of local racks, stages and mics, all equipment is provided by Thunder Audio—with whom Heal had previously worked on tours for the White Stripes and Raconteurs—including mics. Every onstage mic is part of the Sennheiser's e900 range: e945s on vocals, 901/902 on kick, 905s on snare, 904s on toms, 906s on the guitars; Heal is a Sennheiser endorser. All DIs are Radial, the best Heal says he's come across. Batmanglij's keyboard setup is also DI'd: a Korg SV1 piano,

a few vintage keys and a variety of sounds coming from his laptop. "I have five Radial DIs for him and he plays through a [Roland] JC-120 that I mike up," Heal adds.

As for the "flavor of the day" P.A., the tour has been seeing either V-DOSC, d&b J Series or Meyer Sound's MILO. Neal says that the fall leg of the tour will see full production, and he believes that the MILO will be selected. Normal system setup comprises 12 on each side with nine subs per side, four front-fills and side hangs when needed. And with any tour—whether carrying full P.A. or relying on house-

provided—Heal tunes the system each day. "I pink-noise the P.A., run an oscillator sweep or two and then voice the system," Neal explains. "Then I have a few tracks that I play through, including a few Vampire Weekend tracks—after all, that's what's playing through the P.A. at show time!"

"This is definitely one of the best tours I've been on," Heal continues. "Every crew member could have their own stand-up comedy show. Everybody gets on really well." ■

*Sarah Benzuly is Mix's managing editor.*



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**NEUTRIK**

# SOUNDCHECK

## Meyer Believes in Linux

Meyer Sound has joined the Linux Foundation, a nonprofit organization dedicated to accelerating the growth of Linux. Meyer currently uses embedded Linux in the development of the D-Mitri digital audio platform and Galileo loudspeaker-management system.



John McMahon began using Linux in 1993.

"I started using Linux in 1994, right after college," says Perrin Meyer. "At the time, Sun or HP Unix workstations cost about \$100,000, and after I graduated, I no longer had access to Columbia's computers. So [by] using my own computer with Linux, I was able to keep the same advanced programming environment I had in school. MS-DOS and Windows were very painful for computational

acoustics or digital signal processing research since Windows was still 16-bit while Linux was already 32-bit. While in graduate school at NYU, I used my home Linux machines with the Sun servers. Linux liberated me from the 'dark basement computer room.' By the time I graduated in 2001, Linux had become more sophisticated than Sun or Silicon Graphics workstations. By 2005, Linux had become the dominant platform for scientific computing."

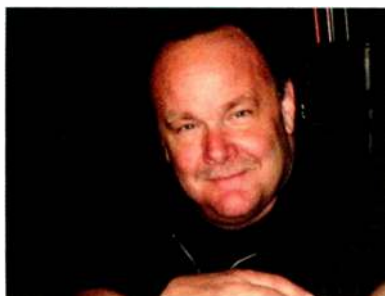
Asked why Linux is important to Meyer, Perrin Meyer (senior DSP engineer) and John McMahon (executive director, digital products) respond: "We use embedded Linux in our LCS line of audio processors. Having access to the source code and being able to modify it if necessary, we can make sure we're using hardware to its maximum potential. Also, embedded Linux lets us determine when to upgrade or not. We develop powerful software applications that depend on feature-rich development environments and run-time systems. Linux offers an open-source platform that isn't dependent on closed-source limitations or encumbered by complex and often expensive licensing agreements.

"Linux is now the dominant platform used by scientists worldwide, so when we collaborate with universities for research, Linux is the natural computing platform to use. For example, Meyer Sound recently sponsored some software research from the Courant Institute of Mathematical Sciences at NYU. The goal is to develop better algorithms for computational acoustics. And the platform they use at Courant is Linux."

## fix it

### Penn & Teller FOH Engineer Wayne Willard

Even though we have only two cast members, one of whom [Teller] never speaks, we engage 20 mic/receiver sets over three band splits. Penn Jillette is double-miked with one transmitter in a low-band split and one transmitter in a high-band split. Penn plays a double-miked upright bass and Teller plays a set of vibes outfitted with a wireless transmitter. The show also uses five handheld wireless mics for audience interaction and a handheld mic for the pianist, Mike Jones. Our original gear had pretty much reached the end of its shelf life. I was very concerned about the RF mysteries posed by the White Spaces debacle, particularly because free spectrum in Vegas is extremely limited. We were immediately impressed with the PWS DB-16. It's made a huge difference in the security of our transmissions. The internal filters protect us from undesirable signals from other sources within our spectrum. We've experienced no frequency interruption and zero intermods by other sources, even when we had the political conventions next door. The box worked and continues to work flawlessly since Day One. We feel totally protected.

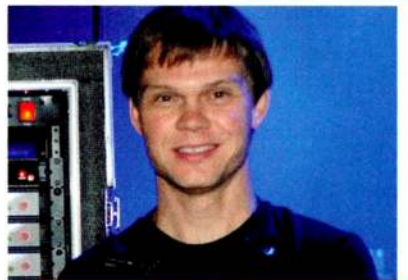


## tour log



PHOTO: BILLY CROFTON

Gaelic Storm performing live



Front-of-house engineer Pete Wildermuth

## Gaelic Storm

Gaelic Storm is out in support of their release *Cabbage (Lost Again)*. Mix caught up with FOH engineer/production manager Pete Wildermuth.

### How much gear are you carrying?

The band doesn't need amps and loads of equipment onstage to make the big sound that accompanies the high-spirited atmosphere of their live shows. The few racks of gear we carry have essential signal processing and our wireless system.

### So you're mainly using house-provided gear.

I will encounter a wide array of analog and digital desks, and it's an excellent way to stay sharp and to use my troubleshooting skills when I encounter the system that is out of phase, the bad insert cable or a channel strip that's on the fritz. We are able to maintain a consistent sound because we have control over what's happening onstage.

### What is the most important part of your mix?

With the combination of instruments in the band, the most challenging thing is to make the mix sound full. There is an abundance of upper-midrange frequencies that require some careful notch filtering. I find that cutting 4 kHz and 8 kHz on the bagpipes really helps to soften it up. I also find myself boosting a bit of low-mid with the pipes. With no bass guitar in the band, I compensate for that by keeping the bottom end of the guitar as prominent as I can, while being careful to cut just a bit of where it can get muddy, usually around 160 cycles.



# Mixing With SAC

Composer Michel Legrand was recently honored in a star-studded tribute held at the MGM Grand Garden Arena (Las Vegas). The event was filmed for a PBS concert special and featured a 66-piece orchestra, as well as performances by Dionne Warwick, George Benson, Melissa Manchester, Frank

provided the engine for both the FOH and monitor mixes; FOH was controlled via a remote computer. The FOH position also used a 16-channel fader "surface" for hands-on adjustments. In addition to the myriad zones, mixes and feeds from FOH and monitors, SAC also facilitated 62-track recording of rehearsals.

The ability to play back rehearsal recordings as a virtual orchestra allowed Pepper and Bob Lentini, SAC company founder and monitor mixer for this event, to walk the room with a wireless Netbook and tweak the house mix after the orchestra and other performers left. Lentini was also able to mix down a rehearsal segment and provide an audio mix that was used for

the show's opening video segment. Using the Netbook, Lentini was able to sit next to Legrand at his piano and make real-time adjustments to the monitors per his suggestions and needs. "Being able to freely roam the stage with my Netbook was a great advantage in setting the monitors. Standing side-by-side with the stars of the show was awesome for me," Lentini says.

Sinatra Jr., Andy Williams, Jerry Lewis and others. Engineer Lee Pepper and his company, RRS Audio, were contracted to provide the live sound system design, which included a d&b audiotechnik J Series rig (main L/R/C, "outer" left and right, subs, front-fills) from Las Vegas-based 3G Productions.

The SAC virtual mixing, software-based system was in a host computer located backstage. This

Lee Pepper at the SAC



## load in



Installed by ITI Audio Inc. and consultant Brian Miller of Edit Design, U Street Music Hall's (Washington, D.C.) sound system comprises four Martin Audio H3 speakers, two H3H speakers, two F15 DJ monitors and five WS 218X subwoofers. Power is via 12 Crown Macrotech amps paired with three Crown CDi Install Series speakers.

Seasoned FOH engineer David Morgan is using Earthworks DFK1 Drum Fullkit mics on the current Carole King and James Taylor *Troubadour* reunion tour: "When I first heard the Earthworks mics through the P.A., I thought, 'My God, we just lost the box and we are listening to drums.' I believe that will be the first reaction of any engineer who hears these mics."...Front-of-house engineer David "Milky" Millward is manning an Allen & Heath iLive digital mixing system for indie rockers *Tindersticks'* European tour...The new sound system at the *Palace Theater* (Cleveland) includes a *Nexo* sound system and *Yamaha* digital consoles; the system was designed/installed by *NAC Technologies*...Canadian rock four-piece *Marianas Trench* recently used an *APB-DynaSonics* ProRack console for their wireless IEM system.

## road-worthy gear

### Soundcraft Vi1 Digital Console

Priced from \$22k, the Vi1™ features a wide-screen Vistronics interface, 32x27 analog I/O, six digital inputs, four stereo FX returns and six digital outs in a 3-foot chassis. Features include 46-channel mix capacity (expandable to 64 by adding a stagebox), 16 motorized faders, eight output/VCA faders, two master faders, four stereo Lexicon effects engines, BSS graphic EQs on all output buses and integral dynamics on all channels.

[www.soundcraft.com](http://www.soundcraft.com)



### Mackie SRM1801 Powered Sub

Designed specifically for use with Mackie's SRM450 v2, the SRM1801 has an 18-inch woofer driven by a 1,000W Class-D amp via onboard 125Hz crossover, tuning filters, and stereo highpass and full-range outputs for single or double-sub use. The robust, solid-plywood enclosure is lightweight (73 pounds), covered with textured black paint and has an integrated pole mount that supports any portable full-range loudspeaker. Retail is \$879.

[www.mackie.com](http://www.mackie.com)



### Ashly Audio PEMA

Intended to simplify small-to-medium business installs, PEMA (Protea Equipped Media Amplifier) merges Ashly DSP with four or eight amp channels (125w and 250w) in a two-space unit. It offers feedback suppression, automatic mixer, filters, EQs and delays, as well as DSP control of bridge mode, constant voltage system HPF settings, ducking priorities, remote gain, etc. Setup is via 10/100 Ethernet protocol and Ashly's Protea-NE PC software. I/Os are balanced mic/line and/or CobraNet and EtherSound digital.

[www.ashlv.com](http://www.ashlv.com)



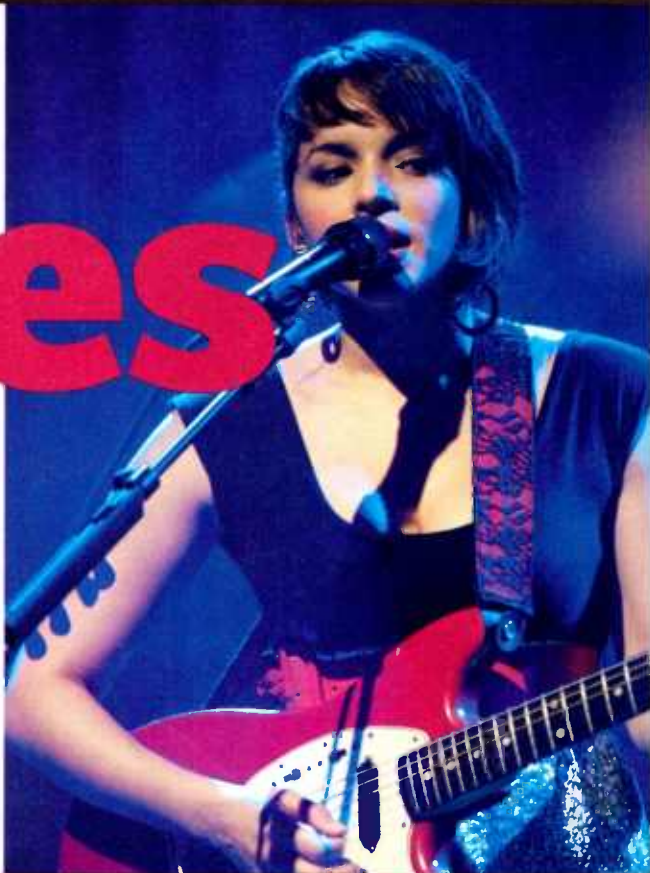


# ALL ACCESS

Photos and text by Steve Jennings

# Norah Jones

Grammy-winning singer/songwriter Norah Jones is back on the road to support *The Fall*. Accompanied by a stellar backing band, this usually mellow artist brought an energetic, riveting and incredible-sounding show to San Francisco's Fillmore.



Front-of-house engineer Brett Dicus mans a 48-channel Avid D-Show Profile configured with five DSP cards, HDx and ECx. "I chose this desk because of its reliability, automation, plug-ins and the very useful and utilized feature of it being a VNC server, which provides control from any of my computers or tablet computers. We use every channel, plus I have a few pre's for additional channels of audience mics." Onboard plug-ins include Waves C4 (vocals/bass), McDSP, Elysia, Crane Song and Flux. "These give me the control I need to consistently adapt to the wide range of rooms we are playing," Dicus explains.



Four members of the band do a little jam at the end of the show surrounding a Neumann TLM103 mic. Dicus has a Waves Q10 inserted on the channel, as well as the strip EQ to help eliminate feedback and then to contour the tone.




The Audio Analysts-supplied Meyer Sound P.A. comprises 24 MICA line array boxes, six HP700 subs, 12 CQ-2s for near- and side-fills, and six M1Ds as front-fills. According to systems engineer Spencer Ellis (left), "We are feeding all of the separate zones via AES into two Galileo 616s [main and spare] with a backup analog feed coming from monitor world." At FOH, Ellis' workstation includes two Apple Mac Minis running Windows: Computer A has Smaart

and Meyer Sound's RMS; Computer B runs Meyer Sound's Compass, which he uses for system EQ and delaying zones. He sends two RTA mics to Smaart via Sound Devices' USBPre: one hardwired and one via Lectrosonics wireless.




According to tech Kelly Macaulay (left, with stage manager John Hoffman), Jones also plays a Wurlitzer 200 that is run through a Sans Amp Classic to get the overdriven sound into a Keeley-modified Ibanez analog delay pedal into her Vox Pathfinder 15R amp.






Smokey Hormel's (below) guitar runs through about 14 pedals, including a Full-tone wah, Hot Cake and analog delays. That signal is driven by two amps: a '63 Fender Deluxe with a Shure SM7 mic and a '73 Fender Twin with a Shure SM7 mic.




Jones uses two Vox Pathfinder 15R amps: one at the guitar position (miked with a TLM103) and the other at the Wurlitzer position amp (Shure KSM32). These are mounted to the amp with a custom Audio Analysts Z-bar. Vocal mic is a Neumann KMS104.



John Kirby plays six keyboards, in addition to the Harmonium and Marimba. (The Harmonium is miked with a KSM32 while Marimba takes two Sennheiser e 904s that are "V'd" together to capture all of the notes to be available in one mono input.) According to


keys/guitar/drum tech Futz (above right, with guitar/bass tech Brian Gibney), "Most of John's sounds come from two mid-'80s Casio sampling keyboards [SK-1 and SK-5]. The SK-1 runs through an Electro Harmonix Holy Grail Reverb and then to a Radial JDI passive direct box. The output of the SK-5 is sent to a Danelectro Dan-Echo Analog Echo, then to an Ernie Ball Mono Volume Pedal, followed by a Behringer mixer with built-in effects that sends the signal to a Trek II UC-1A footswitched preamp that drives a Leslie 147 rotary speaker cabinet."

The organ is a '60s Realistic Musideck that is sent through an Ernie Ball Mono Volume Pedal, then through the mixer where the signal splits to the Leslie and to one side of a '70s Fender Bassman Amplifier (for solo parts). On top of the Musideck is a Roland JX-3P keyboard that runs through another Holy Grail Reverb and then to a second Radial JDI passive direct box. "We also have a stock '70s Wurlitzer 200A electric piano going through a Boss BD-2 Blues Driver (for extra crunch) and an Ibanez AD-9 analog delay before going to the bass input of the Fender Bassman," says Futz.




Bassist Gus Seyffert plays an Electric Sunn 1200 with 1x15 cab and miked with a 421. His upright is a Sunn 2000s with 2x15 cab miked with a Shure SM7.

Sasha Dobson's Gibson ES-125T electric guitar runs through a Boss Digital Delay into a Fender Deluxe Reverb amplifier. Her acoustic Martin runs through a SansAmp parametric DI. Banjo is a Deering 6-string that goes through a second parametric DI. Percussion is a soya bean oil can mounted on a DW 6000 Series snare stand and a "kit" comprising a 16-inch paunshop floor tom and a CB 14-inch chrome snare covered with black cloth to deaden them.



Monitor engineer John "Boo" Bruey mixed on a 48-channel Avid D-Show Profile using only one instantiation of a noise generator to help test the system. "This show, mostly with [Audio Analysts SLP] wedges in use, does not require much beyond what the channels strip has to offer," Bruey says. "Every bandmember has a wedge mix; however, the vocalists have in-ears available that occasionally get used for TV and arena dates. The band is set up very close together onstage so they can hear each other and the house. This works out well for me because our stage levels end up being lower with a more controlled monitor mix."



The Yamaha Spinnet Piano comprises five inputs and some compression. Dicus uses two KM184s inside to capture the natural tone and noises around the hammers and strings. Inside is an installed Helpinstill Upright pickup. On the back of the piano are two Barcus Berry B4000XL-P planar wave pickups (pictured). "The Helpinstill pickup was added later in the tour to help give monitors a consistent mono input that contains all of the piano notes," Dicus explains. "The pickups and the mics work very well; however, the Helpinstill helps capture the low-mid of the piano. At FOH, I have all of this bused to a stereo group that is then processed with a [Waves] C4, Q6 and Rcomp."





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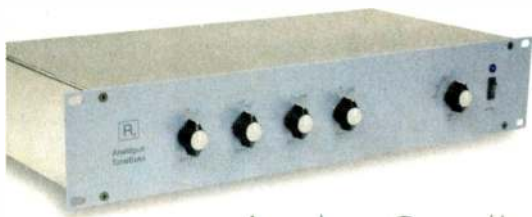
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# Tech

## NEW PRODUCTS



### Analog Excellence

#### **Rascal Audio** Analogue ToneBuss

The Analogue ToneBuss (price TBA) from Rascal Audio ([www.rascalaudio.com](http://www.rascalaudio.com)) uses all-discrete, Class-A circuitry (no ICs) with custom-wound I/O transformers. Front panel controls include pan switches for channels 1 to 4 and switchable direct throughputs for channels 5 and 6. These give users without a patchbay the ability to hardwire their favorite outboard processors to their D/A outputs. When editing, simply switch to the DIR position, process and re-record the audio, and then switch back to L/R when it's time for mixdown. Other features include balanced in/outs on DB-25 connectors, and main and monitor L/R outputs.



### From a Scream to a Whisper

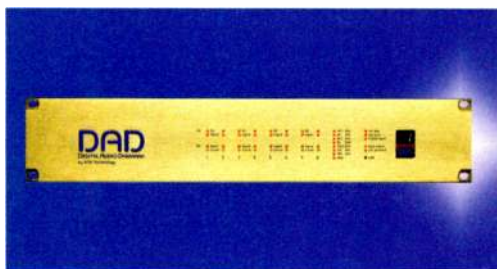
#### **VocalBooth.com** VB Amp Enclosure

The VB Amp Enclosure™ ([www.vocalbooth.com](http://www.vocalbooth.com)) lets users record amplified instruments without sacrificing volume. Each enclosure has a convoluted foam interior, heavy fabric exterior, cable porting and the VB Iso Pad. VB Amp Enclosures are available in four sizes in two different series. The VB Amp Box™ includes ventilation and is recommended for combo amps. The VB Speaker Box™ does not include ventilation and is recommended for speaker cabinets only. Prices start at \$995.

### High-End I/O for Pro Tools

#### **NTP Technology** DAD AX24 192 PHD Interface

NTP Technology's ([www.digitalaudio.dk](http://www.digitalaudio.dk)) DAD AX24 192 PHD (price TBA) is a new version of the AX24 8-channel, high-end AD/DA audio converter that comes complete with an interface card connecting it directly to Avid's Pro Tools. The AX24 192 PHD supports sampling rates from 44.1 up to 192 kHz, and offers an optional high-quality mic preamp. The unit can be configured with eight analog inputs or eight analog outs, or both. It is operated via the DADman control application, which is capable of handling 128 channels and can be automated from Pro Tools (emulating the Avid Pro Tools PRE) or via EuCon for operation from Euphonix's MC-Pro and 5-MC hardware controllers.



### Disaster-Ready

#### **ioSafe** Solo SSD Hard Drive

Billed as the world's first solid-state, disaster-proof external hard drive, the Solo SSD hard drive from ioSafe ([www.ioSAFE.com](http://www.ioSAFE.com)) has a ¼-inch-thick, military-grade steel-drive casing with a rated crush load of 5,000 pounds. It can stand a 1,000g shock for 1 millisecond, can be exposed to 1,550°F for 30 minutes (while not in operation) and can be fully immersed at 30 feet for 30 days with no data loss. The unit stores 256 GB; has eSATA and USB 2 interfaces; is compatible with Windows, Linux and Mac; and weighs 20 pounds. Prices start at \$495 and include a one-year data-recovery service.







## Money-Saving Alignment Tool

### **Synchro Arts** VocAlign Project 3 VST 3 Plug-In

Synchro Arts' ([www.synchroarts.com](http://www.synchroarts.com)) VocAlign Project 3 VST 3 plug-in (\$325 electronic delivery; \$99 upgrade) integrates with Steinberg's Cubase 4 and 5, as well as Nuendo 4 and 5. At the touch of a button, VocAlign automatically synchronizes two audio signals. For cost-conscious studio owners, VocAlign Project 3 multiplatform licenses are delivered on iLok. By purchasing one multiplatform license, the user can run VocAlign Project 3 as a VST 3 version, an AU version for Logic and an Audio Suite version for Pro Tools. Owners of a VocAlign Project 3 license will be able to run the VST 3 version at no further cost. Demos of the plug-in that last for two weeks are available for download.



## The Oxford Oracle

### **Sonnox** iPhone App

Curious iPhone owners will want to download this free app from Sonnox ([www.sonnoxplugins.com](http://www.sonnoxplugins.com)) featuring demos, tutorials and other info related to Sonnox Oxford Plug-Ins. The app allows the user to view Sonnox tutorial videos on the entire range of Oxford Plug-Ins, plus a collection of informative, entertaining demos by such celebrated producer/mixers as Fab Dupont, Nils Hahman and many others.

## Have Your Bass Your Way

### **Blue Sky** SAT 6.5 EXR Monitors

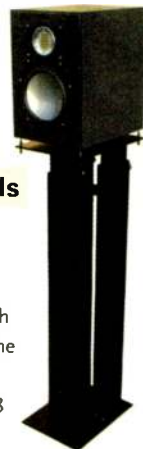
Blue Sky's ([www.abluesky.com](http://www.abluesky.com)) first monitor designed to be used with or without a subwoofer, the two-way, bi-amplified, near-field SAT 6.5 EXR (\$949 each) has dual 100-watt amplifiers and two independent XLR balanced inputs—one for full-range operation, the other with an 80Hz highpass filter for use with Blue Sky's SUB 12, SUB 212 and SUB 15 Universal. The monitor's 6.5-inch cast-aluminum frame woofer has a hemispherical-shaped, mica-filled polypropylene cone with rubber surround paired with a 1-inch dual-ring radiator tweeter with integral waveguide.



## Adjustable, Solid Sonic Platform

### **Unity Audio** Monolith Speaker Stands

Made of heavy-gauge, 5mm steel stock finished in a black-powder coat, the 80-plus-pound Monolith (\$430 each) speaker stands from Unity Audio ([www.unityaudio.co.uk](http://www.unityaudio.co.uk)) come in single- and triple-leg designs. Each leg is drilled with a number of equally spaced holes and locking pins that fix the legs to the desired height. Both top and bottom plates are drilled and tapped with M8 threads to accept heavy-duty M8 knurled spikes to decouple the speaker from the floor. The stand height adjusts from 32 inches to 54 inches. III



## DPA 5100 Mobile Surround Microphone

### 5.1 Recording Solution With Quality Sound, Easy Setup/Placement

New from DPA Microphones is the 5100 Mobile Surround Microphone, a multicapsule, self-contained mic for surround recording. The 5100 has five 48-volt, phantom-powered microphone elements in a handsome (yet vaguely bicycle seat-shaped) array: L/C/R and Ls/Rs, along with a sixth output for the subwoofer channel that is derived by summing the left and right front microphone channels with a 10dB/octave roll-off. It's truly plug-and-play, lightweight (176 ounces) and discrete; no other processing is required for basic surround recording and mixing.

The five capsules are pre-polarized omnidirectional condenser elements, and directionality is achieved using DPA's proprietary DiPMic™ (Directional Pressure Microphone) technology. Mounted between the front L/C/R capsules are interference tubes and acoustic baffles to increase directionality. With a wide dynamic range and low sensitivity to wind noise, the 5100 is well suited for a variety of surround pickup environments, indoors and outdoors. Fans of the versatile (but somewhat noisier) DPA 406x miniature capsule series will be pleasantly surprised to find that the five individual capsules in the 5100 have a noise floor that is lower by 5 dB, which is a critical improvement that allows for more serious recordings.

The 5100 includes standard Euro-style 3/8-inch sockets on both its top and bottom, along with a U.S.-standard 5/8-inch threaded adapter for attaching the mic to camcorder brackets, mic stands or stereo mic bars, and suspension mounts of your own choice. However you mount it, there's virtually no handling noise and the 5100 becomes a very quiet and stealthy-

looking "ear in the sky."

Using Windtex fabric technology, the unit's smooth black casing feels like sleek tennis-shoe material: slightly padded in the right places, but not wobbly or flimsy. The 5100's array is solidly built.

Rounding out the package, a detachable Mogami breakout cable (Lemo multipin to six individual male XLRs) adds flexibility and offers easier hanging options. The unit comes standard with a 16.4-foot cable, but DPA offers other lengths that would prove handy in very large spaces, such as when suspended from the ceiling. Other options include the Windjammer WJ5100, which easily fits on the 5100 and gives you an additional 15 dB of attenuation in seriously noisy environments at 100 Hz.

#### Round and Round

For fast, easy 5.1 capture, you can mount the 5100 directly on a camcorder or nearby stand. I couldn't resist setting it up in my driveway for doing drive-bys with my car, letting the dogs run around the mic while chasing each other and squirrels, and listening to a morning symphony of bird calls, cicadas and bees—all of which the mic reproduced in lovely surround sound. Videographers and sound designers will love the 5100's ease of use for capturing live dialog, room tone and outdoor events in dead-on accurate surround without having to fuss with mic position or mess with tangled cables. Grab your favorite multichannel audio recorder, and you're set.

Moving on to more serious pursuits, the 5100 really turned heads (and ears) in more demanding environs, specifically two concert halls at the Kimmel Center in Philadelphia, where I often record. Thanks to an adroit IATSE crew

headed by lead sound tech Dave Connor, we first flew the 5100 in the more intimate 650-seat Perelman Theater for a handful of multitracked shows, including live jazz with singer Claudia Acuña and her trio; classical music with the final appearance of Ignat Solzhenitsyn as music director of the Chamber Orchestra of Philadelphia; and finally a double-bill of avant-garde music with Brooklyn Rider and special guest 2 Foot Yard.

For the jazz and avant-garde performances,



The DPA 5100 can be mounted on a stand or a camera, or flown in a venue.



Placement of the DPA 5100 at the 3,200-seat Verizon Hall at the Kimmel Center in Philadelphia

#### PRODUCT SUMMARY

**COMPANY:** DPA Microphones  
**PRODUCT:** 5100 Mobile Surround Microphone  
**WEBSITE:** [dpamicrophones.com](http://dpamicrophones.com)  
**PRICE:** \$3,699

**PROS:** Mounts from top or bottom. Weighs only 17.6 ounces. Unobtrusive appearance. Sonically excellent.

**CONS:** Tricky to hang, even with specialized hardware.



the 5100 provided a solid and smooth “overlay” of surround/live ambience whenever needed in the mix. Acuña’s show, which had a front-of-house P.A. system in place, rendered most of the sound from the 5100’s front mic moot, but its two rear-surround mics handled ambience and applause superbly. On the other hand, I captured a dramatic, living, breathing 5.1-surround performance of classical music with the 5100, including violin soloist Soovin Kim performing with the Chamber Orchestra.

To hedge my bets, I still hung my standard DPA 4006 stereo spaced omni pair array, and compared the two systems later in stereo mix-down. The 5100 more than held its own when used as a two-point stereo pickup system. The results were a bit different, but not better or worse, and are entirely useful for serious listening and broadcast.

Somewhere in-between the two concerts, I captured a wonderful, wildly divergent set of material from new music pioneers Brooklyn Rider and 2 Foot Yard. My mixdown of that performance contains a blend of everything: 5.1 ambient sound from the hall and direct mics on the musicians. The flexibility available in a set-up like this was priceless.

### But Wait, There’s More

The real acid test came while using the 5100 as the main array for a live recording in the 3,200-seat Verizon Hall of the Academy of Vocal Arts’ 75th-anniversary concert, produced for radio broadcast and subsequent DVD. Due to the limited availability of ceiling drops and cable restrictions, the 5100 provided our only main pickup of the hall and orchestra. We used spot mics for vocalists and multiple tracks for some orchestral parts, but for the recording’s real core, we relied heavily on the 5100. Thanks to the optional 65-foot cable and a resourceful crew, we were able to fly the 5100—literally in plain sight of everyone—directly over the conductor’s head at a height of about 20 feet. Its “stealth” look rendered it mostly invisible to almost everyone present.

The mic provided a superb downmix for the stereo radio broadcast and rock-solid 5.1 imaging for the DVD soundtrack. During the mix, I slightly delayed the rear two channels to spread out the applause and ambience beds. The unaltered mix was fine as-is, but adding a little depth seemed to enhance the sound further. Although my tests never got close to the 5100’s maximum

stated handling level of 132dB SPL, I have no doubt that the mic effortlessly handled transients and the occasionally seriously loud passages. As expected with DPA, the 5100 offers one smooth, silky-sounding array that can handle anything you put in front of it.

### Able-Bodied Surround Solution

At \$3,699, the 5100 is a welcome addition to the field of “point-and-shoot” surround recording

options. As long as you have enough available tracks and are prepared to go the extra distance in deploying the unit from a ceiling or tall stand, the 5100 works wonderfully well in a variety of applications. Whether indoors or out, rain or shine, songbirds or opera stars—you can capture it all with the 5100. III

*Joe Hannigan’s company, Weston Sound, is in its 21st year of production.*

**“I lean on Sonnox Plug-Ins”**

EARLY REFLECTIONS: POSITION (FRONT, BACK), SIZE (10.7 m), WIDTH (0 %), TAPE FEED (5), FEED LONG (37.9 %), FEEDBACK ABS (PHASE SELECT)

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## Little Labs VOG Bass Resonance Tool

### Simple-to-Use, Precise Low-Frequency Booster

Jonathan Little, the brains behind Little Labs, has a knack for creating sonic tools that solve problems in unique ways—such as his IBP Phase-Alignment Tool, the PCP Instrument Distro and the Linnopre mic preamp—and provide engineers with better ways of doing high-quality work. The VOG Bass Resonance Tool, Little Labs' latest creation and the company's first 50 Series rack unit, was unveiled at this past fall's AES show and is now shipping.

VOG's creation stems from Little's fascination with design errors in circuits and transformers. For example, when winding step-up transformers, he found—by accident—that he would occasionally encounter one that exhibited a very deep and narrow notch in the frequency response. He discovered the VOG in a similar way, and it's very good at what it does. Its sole purpose is simple: to beautify the bottom end of selected instruments by letting you dial in clean, musical gain in a narrow resonant peak at your choice of frequencies between 20 and 300 Hz. At the same time, anything below that peak value is rolled off at a steep -24dB per octave to reduce low-end mush.

#### Little Voice

The front panel knobs and buttons are solid and clearly laid out, making it easy to get a grasp on the VOG's operation. The rotary Amplitude knob offers gain control from no gain (0) to +18 dB (10). There is a relay at the "10" position that offers the last bit of gain up to maximum. The Frequency knob provides variable frequency control, which at its "5"

position is aligned with the three center position switches. For instance, if you push the 40 button, the center frequency at "5" on the Frequency knob is 40 Hz, and so on. The first two buttons represent 40 Hz, 100 Hz and 200 Hz (both down). The last button is marked Flat. This soft bypass allows you to audition the effect of the unit without a change in gain.

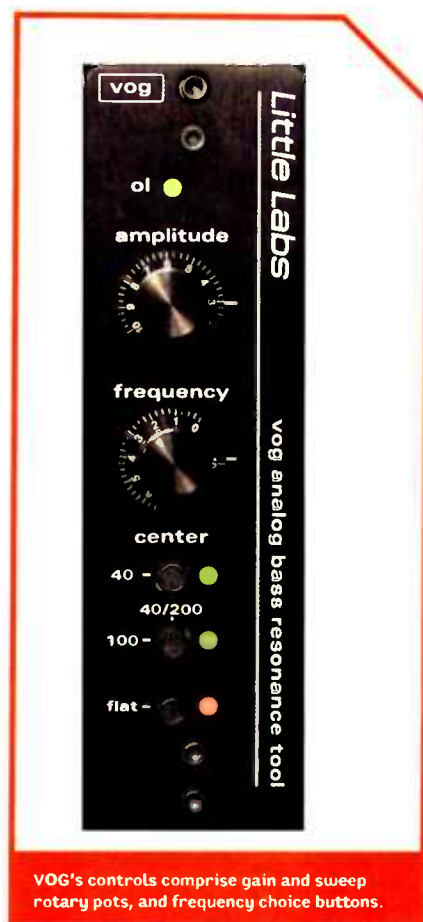
The VOG runs balanced signal through-out, which not only offers sonic advantages over a balanced/unbalanced/balanced internal signal path, but also allows the unit to be used in mono (balanced) or stereo (unbalanced). Stereo operation is accomplished by wiring pin 1 to ground, pin 2 left and pin 3 right on the XLRs. Although I never used it in this fashion, this handy tip gives this pony an added trick.

I used VOG on a variety of sessions, both on kick drum and bass with great results. Operation is incredibly simple and you have to hear this thing to grasp how brilliant it is. Dialing in the body in a kick—even a drab one—is as easy as selecting the 40 button, boosting gain to 10 and tuning in the booty with the frequency control. It's just as good on bass. I pressed the 100 button and used the same method to bring the bass right out of the mud and into the mix.

Even at maximum gain, the way the VOG boosts and cuts frequencies is very musical. Below the boost frequency, the gain falls off drastically at 24dB per octave. Above the boost frequency, the fall-off is more gradual and then razor-flat. We ran a number of bench tests including boosting the gain until the red overload light was lit. Even then, the distortion numbers were still amazingly low. This box offers a ton of headroom and sounded clean no matter where we used it. (For more info, be sure to check out the APx515 bench test of the VOG in the "Mix Media" section at [www.mixonline.com](http://www.mixonline.com).)

#### VOG Is Good

On bass and low drums, the VOG is brilliant. The unit's layout couldn't be easier. The buttons are well marked, making it easy to choose



VOG's controls comprise gain and sweep rotary pots, and frequency choice buttons.

your frequency range broadly, and then use the top knob for gain and the bottom for tuning in the frequency you want to boost. The only thing I didn't like? The frequency control seems counterintuitive, with the higher frequencies represented by the lower-numbered, counter-clockwise turn of the dial, and vice versa for the lower tones. To put it in Spinal Tap terms, 11 is lower, which seemed strange to me. That, however, is easy to get used to because the VOG works best when you don't think about its operation, but instead use your ears to find the tone you're looking for. It is mindlessly intuitive and keeps your ears on the audio. Highly recommended. III

Kevin Becka is Mix's technical editor.

#### PRODUCT SUMMARY

**COMPANY:** Little Labs  
**PRODUCT:** VOG (Voice of God) Bass Resonance Tool  
**WEBSITE:** [www.littlelabs.com](http://www.littlelabs.com)  
**PRICE:** \$420

**PROS:** Superclean gain boost, intuitive interface, mono (balanced) or stereo (unbalanced) operation.  
**CONS:** Rotary frequency control is configured oddly: up for lower values, down for higher values.



# "I did it myself... ...Primacoustic made it easy!"

A conversation with jazz/blues guitar legend **Scott Henderson**

(Tribal Tech, Chick Corea, Jean Luc Ponty, Joe Zawinul, Jeff Berlin, Victor Wooten)

**Scott, tell us about your studio.**

It's a two room overdub studio - a control room and a room to mic guitar cabs, horn players, singers, etc...

**What do you do there as opposed to in commercial studios?**

I use commercial studios when there's a drummer involved, but I get the best guitar tones at home.

**What were some of the problems you noticed with the acoustics?**

Actually I never thought there were any problems, until I A/B'd the Primacoustic Broadway panels with what I was using before.

**What type of panels did you have?**

I had a popular brand of foam and needed to take it down because after 3 years it started to crumble and fall apart.

**Did you do the set up yourself?**

I did it all myself. Primacoustic made it easy and fast. Believe me, if I can do it, anyone can. All you need is a drill, screws and a level.

**How did you configure the panels?**

In the control room, because there's a lot of gear to work around, I just put them where they fit. The mic'ing room was just bare walls so it required planning. I configured them randomly to cover about 30% of the walls.

**What improvements did you hear?**

A big difference! Tighter low end with more of it, plus a sweeter top end and a clearer, open sound.

**How would you compare it to foam?**

The foam gave the guitar a bit of a nasal sound - more emphasis on mid frequencies, and not good tones in my case.

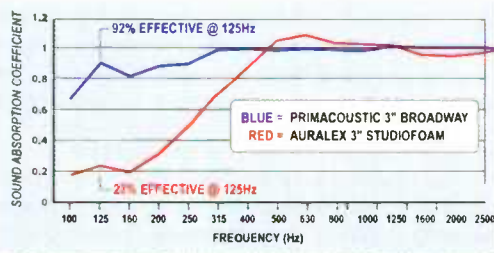
**What would you tell someone thinking about acoustic treatment?**

Whatever you do, don't use foam, especially attached with glue. The foam turns into dust after a while and is a total mess. Even worse is trying to get the glue residue off your walls. Mine had to be completely sanded and re-painted. Plus foam doesn't sound nearly as good as the Broadway acoustic panels.



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Tests performed by Riverbank Labs on 3" Primacoustic Broadway panels and common acoustic foam. Both absorb high frequencies but as sound shifts to bass, the foam stops working.



Installation is easy: unlike foam that ruins your walls, Broadway panels hang like pictures. They take no time to put up and look terrific! Each panel features resin hardened edges and is individually fabric wrapped in a choice of three architecturally neutral colors.

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World Radio History

## Mackie Onyx 1640i

### Analog Mixer With FireWire, Pro Tools Connectivity

Last fall, Mackie created a stir by announcing that its Onyx 820i console could interface with Pro Tools M-Powered 8 software via a simple driver download. Since then, the entire line of Onyx-i consoles is shipping; Avid and Mackie have formalized a licensing deal; and the PT MP-8 driver is offered as a free download to Onyx-i owners. Mackie also provides a free universal driver for using Onyx-i mixers with PC-based DAWs such as SONAR or Cubase; no driver is needed with Mac-based systems (Logic, Digital Performer, etc.) using Apple's Core Audio driver.

I own a large Pro Tools TDM system, but what excited me about using the 1640i was the ease of doing live location recordings captured direct to Pro Tools. The 1640i's 16 high-quality Onyx mic pre's can hold their own against many outboard units, and combining these with the console's 16-in/16-out FireWire I/O with high-performance Cirrus converters creates a powerful, portable 24-bit/96kHz, 16-channel recording rig.

#### The Analog Side

After five years, the original Onyx 1640 is proven in the field, and one of the joys of using the new Onyx 1640i is its analog character. There are no menus, sub pages, etc.—nor automation, on-board DSP or presets—but this 16x4x2 (plus four stereo return) board is straightforward in design and easy to use. The aluminum/steel chassis is rock-solid, and with its onboard converters, it weighs a hefty 39 pounds. It offers real XLR inputs (no "sharing" or TRS adapters on upper channels), individual channel phantom switches and (other than the TRS input jacks) all 1/4-inch connections—line inputs, bus outputs, aux sends/returns, control room outs—are balanced

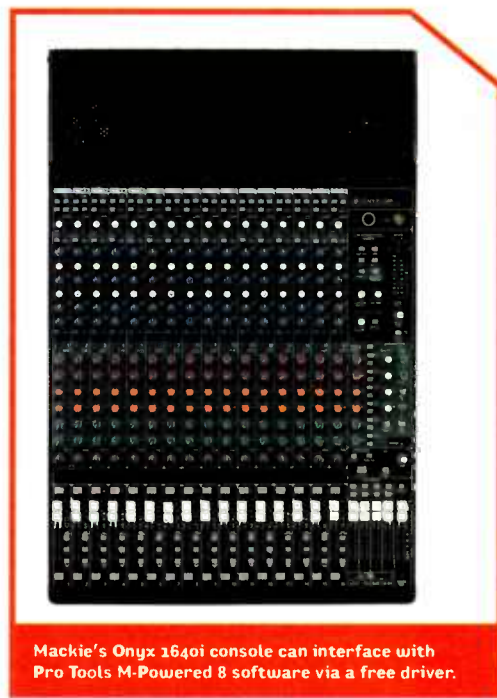
lines. Channels 1 and 2 have switchable DI inputs and all faders are 60 mm. Two D25 ports carry balanced pre-insert analog outs for the 16 input channels. The connector panel can be rotated for top/front/back access. I wish Mackie would differentiate the control room volume knob; its placement is not obvious and it's the same size/color as adjacent pots.

#### Going Digital

I tested the 1640i tracking directly to Logic Studio on a PowerBook (Snow Leopard). No drivers are required (thanks to Apple's Core Audio) and Logic immediately recognized the digital feed from the Mackie. However, the jump to M-Powered 8 involves a few hoops. The driver is authorized for use with a single Onyx-i mixer, so if you own several Onyx-i units, you'll need several drivers, although the same driver can install on multiple computers. The process starts with registering your mixer on [mymackie.com](http://mymackie.com). You're prompted via e-mail to download a driver/authorization package. After you enter your mixer's serial number, it generates a 20-digit license number and then a 32-digit authorization code. Then it asks for a "license key" number. After 20 minutes of entering various combinations, I find out that "license key" is actually the authorization code.

With the Mackie driver installed and after the M-Powered 8 install, I was ready to go. I loaded in a simple cappella-plus-percussion session and it came right up. I tweaked the output assignments in Pro Tools to one bus per track, switched the mixer inputs to FireWire and immediately I had a complete analog mix up on the 1640i. Minutes later, I was doing overdubs. There were no monitoring latency issues, and the combination of the nice preamps, Perkins EQ and familiar work surface for quickly setting up cue mixes and control room playback amenities made workflow a breeze.

The Cal Perkins-designed 4-band, sweepable-midrange input EQ is sweet and musical and can be switched into the channel FireWire send or be hardware-bypassed. The flexibility of the



Mackie's Onyx 1640i console can interface with Pro Tools M-Powered 8 software via a free driver.

1640i's analog design allows for various hardware mods, such as permanently routing the channel FireWire sends post-insert (these are normally pre-insert) or post-channel fader, if desired. In place of channel FireWire sends, the six aux sends, main stereo outs and four subgroups can be switched to route directly to the DAW. Combine these with multisource control room/headphone selection, and the 1640i is capable of all sorts of slick tricks, including track bouncing of DAW feeds to a stereo stem, analog summing and more.

Taking the 1640i out for live recording was a pleasure. The 16 FireWire sends handled eight tracks of drums, two guitars, bass, stereo keys and three vocal channels, plus I had the option of sending the direct line outs (over D25) to the house system or doing an FOH and/or monitor mix right from the 1640i, with all tracks going simultaneously to Pro Tools for transfer/late tweaking.

This console is equally at home on the road, in the studio or permanently placed. Add in the Pro Tools M-Powered 8 software, and the result is a monster DAW package, whether used alone or with a larger Pro Tools rig. III

#### PRODUCT SUMMARY

**COMPANY:** Mackie  
**PRODUCT:** Onyx 1640i  
**WEBSITE:** [mackie.com](http://mackie.com)  
**PRICE:** \$1,699 street

**PROS:** Interfaces well with Pro Tools MP-8; flexible routing; clean preamps; 24-bit/96kHz converters.

**CONS:** Convoluted authorization process; heavy.

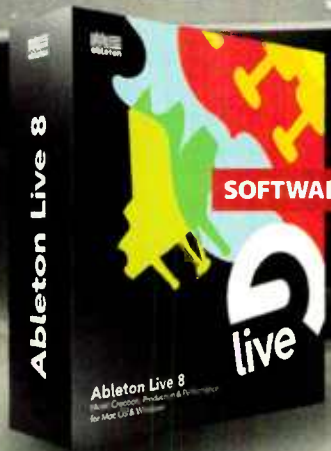




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## QSC K Series Loudspeakers

**P.A. System That's Compact, Loud and Versatile**

I've used QSC's HPR 122i powered speakers for several years in portable P.A. applications and have been impressed with their performance. So last year, when QSC debuted its K Series lightweight powered speakers, I was curious to hear them.

The K Series is offered as DSP-driven, powered two-way systems with 8, 10 or 12-inch woofers, 1.75-inch compression drivers on axis-symmetrical waveguides and 500+500 watts of Class-D amplification. Other than increased bass response from the larger woofers and a 2dB overall SPL output change, the main difference in each is dispersion angle: K8, 105 degrees; K10, 90 degrees; and K12, 75 degrees. The two-way cabs are molded ABS with steel grilles, multiple M10 fly points, recessed aluminum handles and Tilt-Direct™ pole sockets that adjust for a 0- or 75-degree downward tilt. The optional KSub powered subwoofer has two 500-watt amps driving dual transverse 12-inch drivers in a compact, fourth-order band-pass birch plywood enclosure.

Onboard DSP on all systems provides GuardRail™ driver/amp protection, precision crossover action, DEEP™ (Digital Extension and Excursion Processing) LF transient control, and complex FIR and IIR filters with time/frequency/amplitude optimization.

### On the Road

I tested a system with two K10s and the KSub. The K10 has a flexible input panel and can mix two input sources (one switchable XLR combo mic/line input and a line input with combo XLR and RCA jacks) via two recessed gain pots and a post-gain line out for feeding the KSub or



The K Series line offers three main cabinets and an optional sub.

a second K10. A series of arrows silkscreened on the panel is designed to make this easier to understand, but it left me (and several other people who used the system) more confused. A couple typos in the manual—referring to “female direct output XLRs” when they’re actually male—didn’t help either. It all became clear a couple minutes later. Ironically, most users will never use the onboard mix functions anyway, although they’re nice to have just in case. (Note: QSC has since changed the panel to make them more clear.)

I first used the two K10s alone (no sub) for vocal reinforcement for a band in a fairly live medium-sized room. Volume-wise, the K10s had no problem keeping up. I was surprised by the output of these little (20.4x12.6x11.8-inch) 32-pound boxes. Kicking in the DEEP switch offered a nice bit of bass extension, and the 90-degree dispersion was even and smooth, with no off-axis roughness. Using the 75-degree downward tilt on the pole mounts kept the sound where I wanted it. The K10s have no locking screw to keep the speakers from rotating on the pole mount, but a little duct tape on the pole took care of that—not exactly elegant, but it worked.

Next up was checking out the full system with the KSub. Tilt the KSub back and it moves easily on its large casters. An included pole threads securely into the sub to support a two-way box. Plug in a locking (or standard) AC cable, switch the K10 to “external sub” (100Hz highpass crossover), run an XLR cable between the two, and you’re ready to go. The KSub has switches for a DEEP circuit and polarity reverse for tweaking phase. If I were impressed with the K10s alone, adding the KSub created a monster, with huge—yet damped and controlled—bass. It’s hard to believe this much LF can emanate from a 26x14x28-inch, 74-pound enclosure. A friend of mine later tried the system for a portable DJ gig and was totally hooked.

### Give It a Go?

Overall, the K system is a winner. The versatile top boxes easily handle smaller events alone or bring in a sub (or subs) for larger shows, and the axisymmetrical waveguides make the K10s ideal for doubling as stage wedges. Setup is fast, and they’re loud, with an even, flat response throughout the listening area. Thumbs up on this one! III

### PRODUCT SUMMARY

**COMPANY:** QSC  
**PRODUCT:** K Series  
**WEBSITE:** QSC.com  
**PRICE:** K8, \$759; K10, \$899; K12, \$999; KSub, \$1,200 (MSRPs)

**PROS:** Lightweight, compact, fast setup, natural sound, smooth coverage.  
**CONS:** Confusing input panel, no lock screw on pole-mount socket.



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## Need Tubes?

### Advice of a Thermionic Nature

Tube replacement is so physically easy that it's often the first solution when something goes wrong. If a new tube doesn't improve the sound, reduce the noise or eliminate the funky distortion, you'll know to dig deeper into the circuitry—or have someone with experience do the digging. While externally friendly, safe and “warm,” tube circuits have some seriously high voltages (300V and higher) and multiple power supplies on the inside, so be careful when digging.

In a condenser mic, the “head amp” tube has to be quiet; microphonics (the term used to describe a tube's mechanical sensitivity) are far less important than in a combo guitar amp (a single cabinet that contains amp and speaker), but all of this comes before sonic qualities. Having tested at least 1,000 tubes for microphone applications, I am surprised by the number that are microphonic almost as much as you might be surprised that a newly made EH6072 could be quieter than a GE 5-star version. Nothing is forever in tubeville.

That said, I built a simple “evaluator” (see Fig. 1) that allows me to scrutinize head amp tubes more closely. While inspired by the need to audition subminiature tubes (AC701, 5703) outside of the narrow confines of some condenser mics, I also added sockets to test most varieties—from the venerable EF- and VF-14 to the 7-pin miniatures, as well as the 6072 and EF86. I have yet to find a non-microphonic EF86—NOS or new—but there's still time.

### Where and What to Buy

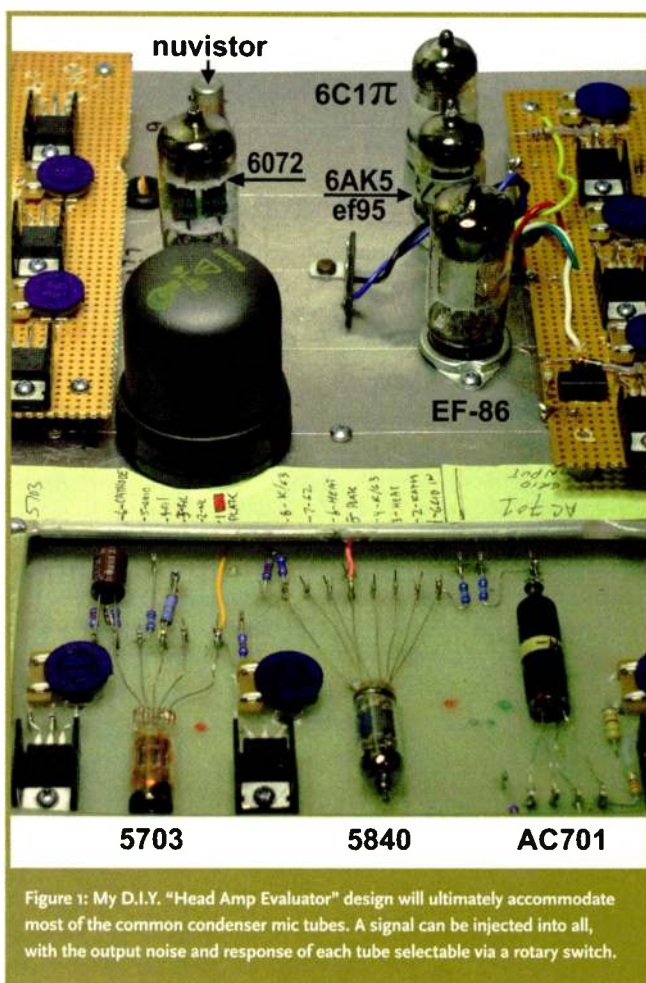
Buying a vacuum tube is not as easy as buying an iPhone—although the process can be similarly spendy. Before finding a good match, musicians audition several instruments; the same is true for vacuum tubes, which are available for purchase all over the Web at widely variable prices. Plain-vanilla sites will simply list the tubes and prices; others will provide more detailed descriptions. Most are selling the same newly manufactured tubes from Russia (Sovtek, Electro-Harmonix, Svetlana, Mullard, Tung-Sol, Genalex), the Slovak Republic (JJ) and China (Shuguang, Valve Art).

NOS tubes are genuinely in short supply, some shorter than others as reflected by their prices. Some sellers practice all sorts of voodoo, such as freezing NOS tubes to realign all the metal parts. Others are simply re-branding some of the previously mentioned “parts.” I'd like to think that re-branding came after the tubes were tested and met a certain standard.

The services you want to pay for are matching (for power tubes) and, while rarely available, noise and microphonics testing. Microphonics are not a number, but simply the results of a go/no-go tapping test. Low microphonics are especially critical when high-gain circuits meet combo amps.

A vacuum tube's Mean Time Before Failure (MTBF) is short compared to a transistor or IC. That said, a quality re-seller should guarantee functionality and performance, and provide a replacement or your money back—assuming the problem is discovered within the seller's very limited time window (and this may be further limited to preamp tubes only). So if you buy spare tubes in advance, test them right away.

Testing for noise and microphonics is the easiest D.I.Y. process; the main prerequisite is having multiple tubes from which to choose. My money is on



buying more than what is needed. The degree to which the end-user can further analyze a vacuum tube is pretty much limited to the one-at-a-time auditioning process, which, unless you've got an A/B switch, will only reveal the most obvious sonic differences.

The next step is test equipment. Tube testers essentially offer a more sophisticated go/no-go test. An oscillator and oscilloscope will reveal basic in-circuit performance. A dB meter and distortion analyzer will assist in quantifying what you hear. Beyond that, the one luxury all tube geeks would love to have is a curve tracer, a device that can reveal a tube's full performance capabilities in such detail as to allow (with sufficient quantities) a perfect match to be found.

### What Manufacturers Do

We all know that buying in quantity can reduce per-unit cost. When combined with the need for consistent performance (and the luxury of time), the lot can be sorted, graded and even matched. Geeks need quantifiable evidence, hence the need for test equipment. In some cases, it's even necessary to build custom test fixtures. This is especially true for vacuum tubes because test equipment manufacturers don't see “tube users” as a viable market.

For mission-critical tubes, people like Oliver Archut of TAB Funkenworks will tell you that no modern tube can match NOS, and this may be especially true for the tubes required by the V72-style preamps that his company manufactures. Larry Janus of Tube Equipment Corporation relies on



a quartet of tightly matched NOS 6BA6 tubes to replace the two 6386 tubes (per channel) in his Fairchild 670 re-creation, the SR-71.

In both cases, being a geek on a mission requires some prescient urge to hunt and gather, plus a lifelong research quest for documentation, NOS alternatives, custom-made parts and the ability, desire and tenacity to D.I.Y. on a grand scale. Archut learned to make/rewire transformers while Janus modified/augmented a tube tester to improve the speed and quality of the matching process. (See Fig. 2.)

Tube matching is essential in Fairchild-type compressor designs. "In remote-cut-off [variable Mu-style] compression circuits, there's a need to match tubes at multiple bias points," Janus explains. "Any imbalance between the tubes allows the control voltage to leak into the audio, which reveals itself as 'thumping' during gain reduction. Unlike a fixed-bias circuit [such as a power amp], the remote cut-off stage is shifting bias during gain reduction and the pair of tubes needs to track at many bias points. In addition, both channels of a stereo remote cut-off compressor must track equally well, or image shift will occur during gain reduction."

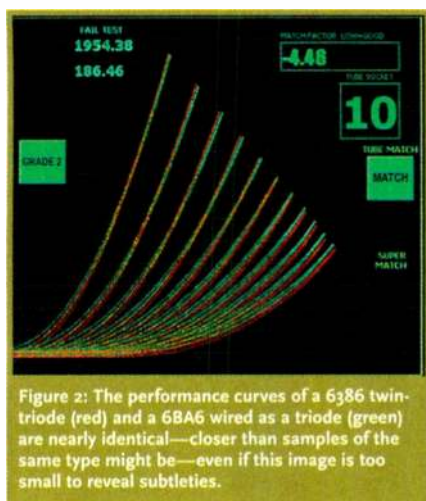


Figure 2: The performance curves of a 6386 twin-triode (red) and a 6BA6 wired as a triode (green) are nearly identical—closer than samples of the same type might be—even if this image is too small to reveal subtleties.

Although their products are very different, EveAnna Manley (Manley Labs) and Mike Spitz (ATR Magnetics) have similar D.I.Y. stories. "We have loads of experience with specific tube types—especially brands and lots that work exceptionally well in our circuits," states Manley in her Website's FAQ. "We have thousands of them in stock so that, after testing, we get a good enough yield to be able to sustain production for many, many years to come. Not all tubes are created equal. You can get a 1,000-piece lot of 1960s Phillips 12AT7s

that are absolute trash. Brand-new Eİs from Yugoslavia will whoop 'em performance-wise and sonically." Manley also cautions against shopping for "highly prized" tubes on eBay, instead recommending [www.upscaleaudio.com](http://www.upscaleaudio.com) for pre-tested replacement tubes. Upscale's site also contains a lot of useful general information on tube technology.

### The Humble Service Bench

When a tube is not the problem, a tired, old

carbon resistor or capacitor might be. If a high-gain circuit is noisy, then the plate resistor is suspect and should be replaced. If the sound is thin or oddly distorted, the coupling capacitor between stages—from plate to grid—may be the culprit and should be changed. III

For more fun with Eddie Ciletti, visit [www.tangible-technology.com](http://www.tangible-technology.com).

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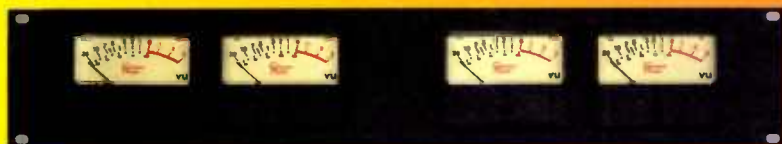
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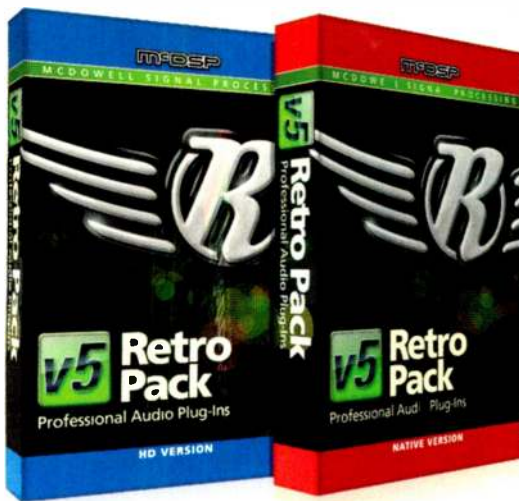
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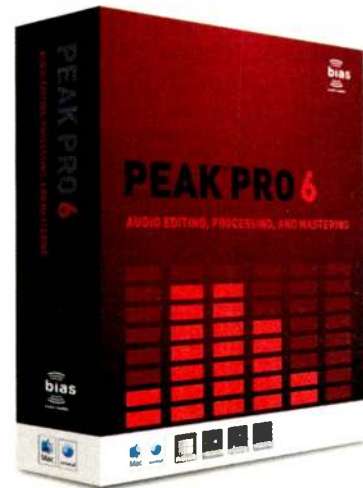
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World Radio History

## Bil VornDICK

Bluegrass recording legend offers an engineer's view of the Nashville floods and recovery.

### **How were you personally affected by the floods?**

I was speaking at Merlefest that weekend and D'Addario, one of the vendors, was tied to the Internet, and I saw pictures of the houses floating by and the trucks stopped on Interstate 24. When I came home, there was no power, and my exit—exit 199 on the west side of Nashville—that was it. Nothing was going west on Interstate 40, nothing was going north or south on Interstate 24 or 65. There were 18-wheelers everywhere. They couldn't go any farther. It was a couple days before the water had receded enough to open the Interstates.

### **When you returned home, what did you see as far as damage in the recording community?**

There are artists who lost the majority of their instruments, which were stored at a [rehearsal/storage/rental facility] called Soundcheck. Instruments and the equipment from a lot of major artists and touring groups was under water. Some of the historical facilities like Opryland and the Grand Ole Opry were flooded. The Opryland Hotel is probably not going to be back online until October, so the Opry is moving from venue to venue right now. They have shows Tuesday, Friday and Saturday nights. That's amazing, with the logistics of moving the sound crew and recording equipment and putting the Opry live on the radio each night in different venues; that's a job.

I have a lot of artist friends whose instruments and studios were severely damaged. Just for example, 6,000 homes on the west side of town were flooded. That means there were quite a few home studios—mastering and recording studios—that were flooded. One of the hardest things was dealing with sessions that were booked right after the flood. A lot of the musicians had their equipment in storage where the facilities flooded, and the musicians had to scramble because they couldn't get their equip-

ment or it was damaged.

### **Can you give me any examples of studios that you know were damaged?**

I don't want to mention names because then people will say, "Oh, that place was flooded; I'm not going to book time there." I don't want to encourage that mentality. But there was five or six feet of water in some studios. And artists whose road crews stored consoles in their basements—just destroyed.

### **How are people coming back from this?**

Right now, six weeks after the flood, Downtown is back together and CMA week is going on with 50,000 or 60,000 people here. And Bonnaroo is coming off without a hitch. So that's a good sign.

One of the reasons Nashville didn't really hit the national news is because there wasn't any looting going on here or any big crime wave after the flood. A slogan came out, "We are Nashville," and you saw this on TV: Church groups and different organizations and corporations having their employees take off to join teams in different parts of the city and the surrounding counties. They helped victims move possessions out of their homes, take the wallboard out up to the level where the water was and strip out the floors because the sewers overflowed, so it was brown water.

The teams were made up of all beliefs, all religions, all kinds of people, and there wasn't any strife like there could have been in other parts of the world. Different churches brought in members from different parts of the country. Some of those groups are still here. I don't know anywhere else in the world where you would have this.

Luthiers have come in from all over the state to help repair instruments. They're starting on the historical instruments that were in different exhibits and the ones at Soundcheck that were vintage



instruments.

### **What has been the AES and NARAS' part in helping musicians and engineers recover?**

MusiCares is here, and they've stepped up big-time. AES Nashville has gotten a lot of calls, and the Nashville Engineers Relief Fund, which the Audio Masters [golf tournament] supports, are helping some people. The Nashville Musicians Union also has a fund to help musicians.

### **What about some of the artist-driven assistance? We've heard the story about Keith Urban offering to come with a broom to help with the cleanup.**

Immediately within a couple days of the flood, Vince Gill had a telethon on WSM, the NBC affiliate here, and all kinds of artists came and performed and answered the phones, raising millions of dollars. There have also been many other benefit concerts, as well. Dolly Parton gave \$250,000.

### **What else do you want the community outside to know about how the recovery is going and what's needed?**

Nashville is taking care of itself. Musicians are helping musicians. But there's still a lot to do. III

*Help members of the recording community affected by the floods in Tennessee, or apply for aid: [www2.grammy.com/MusiCares/NashvilleFloodRelief](http://www2.grammy.com/MusiCares/NashvilleFloodRelief).*



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