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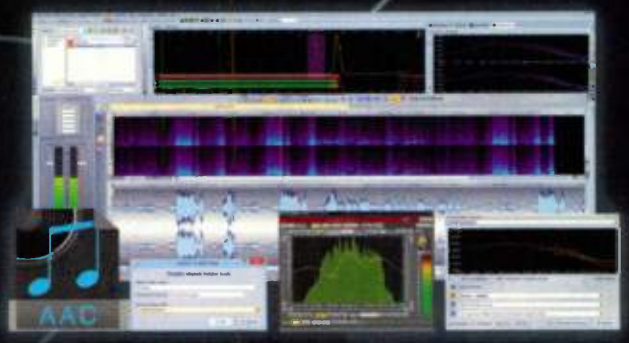

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06.14 Contents

Volume 38, Number 6

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FEATURES

MUSIC

MIX REGIONAL: CHICAGO

LIVE

DEPARTMENTS

TECH

On the Cover: Think Loud Studios in York, Pa., co-owned by the members of the band LIVE, was designed by Horacio Malvicino inside a 100-year-old landmark structure.
Photo: Lucia De Giovanni.

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From the Editor

MY KIND OF TOWN

It has been a lot of fun talking about Chicago this past month while putting together our Regional pages. The weekly editorial meetings were peppered with stories from Blair Jackson, who located and contacted Liz Phair for this month's Classic Track, along with references to Brad Wood, Brian Deck, Veruca Salt and the late great Idful Studios; from managing editor Lori Kennedy, who wrote up Sessions & Studio News from the likes of CRC and Pressure Point, both longtime Mix friends; from contributing editor Barbara Schultz, a Chicago native and diehard Bulls and Cubs fan, who, though tied up producing our Class of 2014 cover feature, still had time for a few Chicago stories.

For me, the Windy City, the City of Broad Shoulders, the City on the Make, has always been special. It's where my parents grew up (Sauganash), went to college (Loyola), and married (Queen of All Saints). It's where I went to my first zoo (Brookfield), museum (Science & Industry), baseball game (Wrigley) and concert (Asleep at the Wheel on Navy Pier, ChicagoFest 1979). It was my media market growing up; it was the first imprint in my brain of what a big city is.

Many years later, in my first company-expensed trip as a young professional, a semi-naïve assistant editor at Mix, I went to Chicago. I had my master's degree in journalism and had been paid to copyedit and proofread most of what I knew about the recording industry over the past two years. Chicago in 1990 was my on-the-ground and in-the-studio introduction to the real world. And it was fantastic.

On my first night there, after checking into the Hotel Nikko on the River, I had dinner and a few bottles of fine wine with the late, great Murray Allen and his wife. At the time, Allen was still head of Universal Recording, and I heard tales of Bill Putnam, Bruce Swedien, Duke Ellington, Quincy Jones and countless others, all legends, I would learn later.

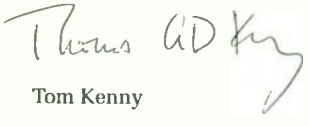
On that same trip I met Hank Neuberger at CRC, and we keep crossing paths and checking in these many years later, whether at the broadcast trucks for the Grammys or in the Webcast production trailers at Bonnaroo. At Chicago Trax I met Reid Hyams, whose enthusiasm for the local music community knew no bounds; we stayed in touch for years. And I met Jimmy Dolan at Streeterville, the hottest commercial post house/music studio in town at the time, with loads of AMS AudioFile DAWs. Chicago will forever be known as a blues town, but long before Pro Tools, it was also an AudioFile town.

On that same trip, I stopped by Skyview Film & Video, a commercial video post house that had put in an audio room, as was the trend at the time. All I remember, however, was the owner's office, where he showed me a new computer-based video editing system from "this new company called Avid." It was one of only ten such machines in the world at the time, he told me, as he dragged-and-dropped video clips from a Buick spot into a timeline. It was very, very new.

There have been subsequent memorable trips to Chicago, some personal, some professional, some both. There was the visit to longtime friend Dave Dakich, a great guitar player and writer, who introduced me to commercial music house Spank! Great custom music. I still have their Nerf basketball swag in my office.

There was another great trip in 2004, when Pressure Point Recording Studios opened in in the South Loop with a party to rival anything in L.A. or New York. There I met the wolfdog, Chris Schneider, studio manager at Pressure Point and ever-energetic booster of the Chicago music scene, in its many varied forms. He's remained a good friend.

There will be many more trips to come, I'm sure. That first one, to Chicago, was special.



Tom Kenny

Welcome to InfoComm!

InfoComm, the largest professional AV show in the world—drawing more than 35,000 attendees from more than 110 countries—returns to the Las Vegas Convention Center, with the conference taking place June 14-20 and exhibits set for June 18-20. More than 250 pro audio exhibitors offer solutions for both live events and fixed installations.

The Audio Pavilion on the show floor is sponsored by Harman, Renkus-Heinz and Xavatel and offers loudspeakers, amplifiers, mixers, microphones, headphones, headsets, signal processing, wireless equipment and sound reinforcement systems. Located in the North Hall, Audio Demo Rooms, now open on Tuesday, give attendees the opportunity to test drive the featured audio systems. Hands-on demonstrations will be held by Harman, d&b audiotechnik, DAS Audio of America, PreSonus, Coda Audio, Klipsch, Community, Danley Sound Labs, Bosch, Meyer Sound, TC Group Americas, Martin Audio, Renkus-Heinz, VUE Audiotechnik, The Music Group and RCF USA. Visit www.infocommshow.org for more information. ■

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PreSonus Opens A New Home

Louisiana Governor Bobby Jindal, surrounded by the executive team of PreSonus, at the opening of the company's new headquarters.

PreSonus has been good for Baton Rouge, and Baton Rouge—and by extension the state of Louisiana—has been good for PreSonus. The commitment from each to the other was readily apparent at the audio company's opening of its brand-new, ground-up, 44,000-square-foot headquarters on April 30, where the onstage display included a thank you to the Louisiana Economic Development office, and Governor Bobby Jindal himself showed up to thank the company for bringing tech and music and jobs to south-central Louisiana.

It's a perfect example of a civic-corporate partnership, one with deep roots. PreSonus was founded in a Baton Rouge garage 20 years ago by musician/producer and local LSU electrical engineering graduate Jim Odom, who worked with fellow LSU engineering grad Brian Smith on designing the DCP8, the first digitally controlled analog compressor. After running through an initial $30,000 investment, the two hooked up with local well-connected investor Kevin Couhig, today chairman of the board, who was looking for young, hungry, committed local talent to help bring industry and talent to Baton Rouge. Couhig stepped in with $300,000, and later the state of Louisiana would offer tax incentives. The company's growth has been impressive by any measure.

Back in 1995, PreSonus moved into the back half of a furniture store, then three years later into a space in a nearby business center/mall, before last month's move into the stylish new headquarters, designed by Ritter-Maher Architects. PreSonus, which has won numerous awards for its technology innovations over the years, estimates that over the next two years it will add 65 new jobs to the 80 that came over with the move.

The April 30 opening included speeches from Jindal, Odom, Smith and CEO Jim Mack, along with some props such as the poster of the DCP8 they brought to Winter NAMM in 1995. Then the outdoor stage was turned over to performances by the likes of Edwin McCain and Tab Benoit (with Odom sitting in on guitar with a backing band including members of LeRoux), and doors were opened to food (local Cajun catering), beverages (rosemary martinis and Abita beer) and tours through the open, airy, inspired facility.

Besides the open plan, glass offices and designed-for-collaboration meeting rooms, the walls peppered throughout by custom photos of live performances by some of the world's finest musicians, the facility includes a John Storyk-designed studio, tracking room, edit suite and custom live room with small stage. All were designed both to inspire employee creativity (everyone there plays an instrument) and contribute to R&D. ■

Free Webcast on Event Safety Guide on July 9

Take1 Insurance and the Event Safety Alliance (ESA) will take a look at how to best use the ESA *Event Safety Guide*. "The ABCs of the Event Safety Guide: A 60-Minute Primer on Putting the Event Safety Guide to Work for You" will take place on Wednesday, July 9, 2014, at 2 p.m. Eastern and once again be hosted by NewBay Media's *Rental & Staging News* and moderated by Editorial Director David Keene. In addition to Event Safety Alliance Executive Director Jim Digby, the July 2014 Webinar will feature Joseph Pred, founder and CEO of Mutual Aid Response Services (MARS), based in San Francisco. Pred will offer an overview of the Event Safety Guide, how it ties into existing standards such as the public safety incident command system, and how to use the guide in areas both familiar and unfamiliar to specific areas of expertise. The Webcast will conclude with a Q&A session. For more information, visit eventsafetyalliance.org and take1insurance.com. ■

Sweetwater Presents GearFest '14

Sweetwater will present GearFest '14 on Friday, June 6 from 9 a.m. to 6 p.m., and Saturday, June 7 from 9 a.m. to 5 p.m., at 5501 US Hwy 30 W, Fort Wayne, Indiana. GearFest is free and open to the public, offering a gear expo, entertainment events, flea market, and educational and musical demonstrations and workshops. Saturday's Producer's Panel will include Bruce Swedien, Bob Clearmountain, Ed Cherney, Mick Guzauski, Ross Hogarth, Richard Chycki, Bil VornDick and Fab Dupont. The panel will discuss a wide range of music recording and production topics moderated by Sweetwater's Editorial Director and noted author/journalist Mitch Gallagher. ■

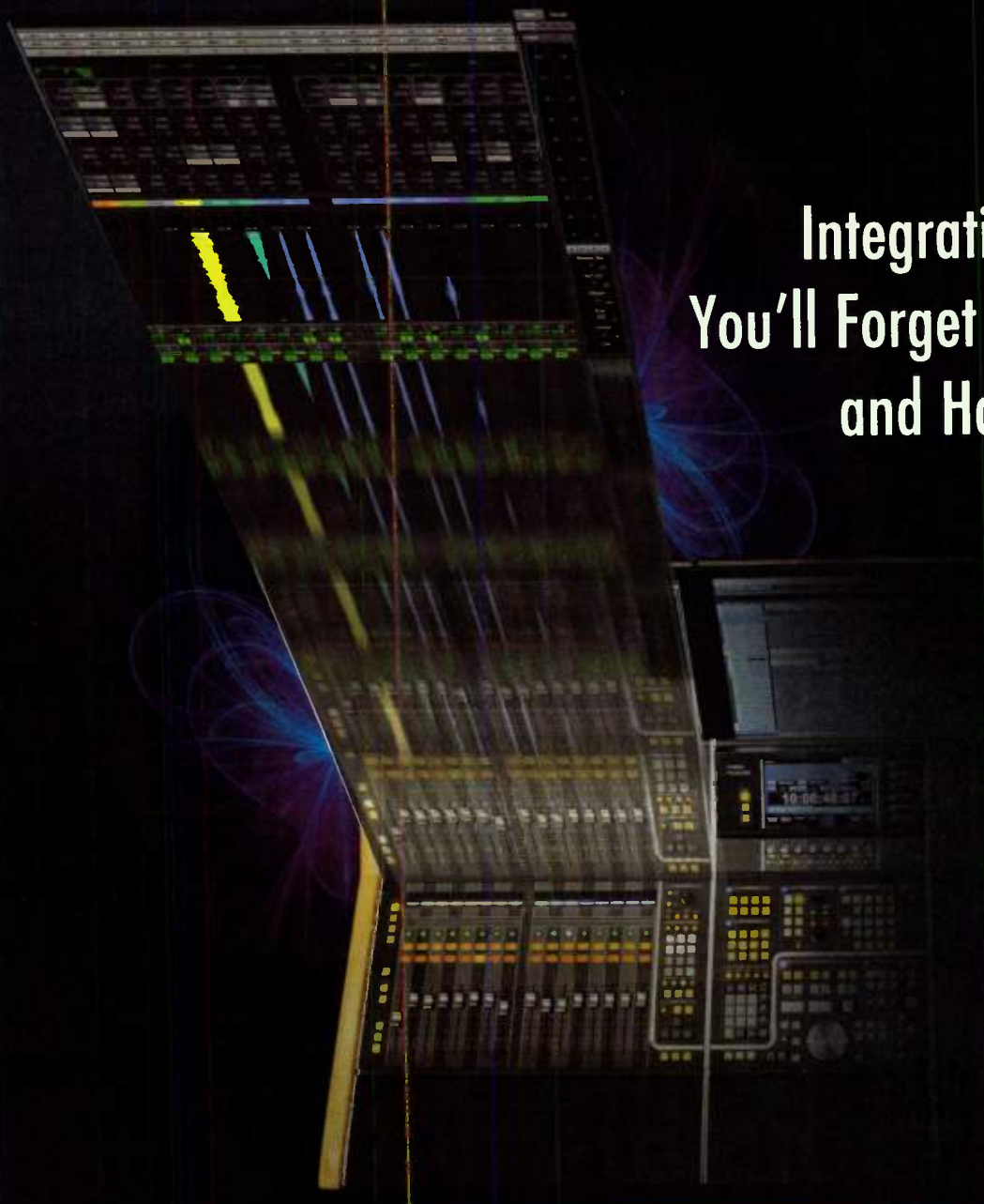
The Audio Expert: Everything You Need to Know About Audio

By Ethan Winer (Focal Press)

Ethan Winer knows how things work. From lawn mowers to ham radios to DOS BASIC compilers, to, well, seemingly everything related to audio. In his immense and detailed 2013 book *The Audio Expert*, which includes a bevy of associated sound files, videos and bonus text online, Winer covers the science and math of music and recording in a no-nonsense, authoritative manner.

Starting with chapters on audio basics, fidelity and measurement, and digital audio basics, he turns to analog and digital recording processes and techniques, processing, effects, microphones, monitors, room acoustics, electronics, and, ultimately, musical instruments. A common theme throughout, almost a corollary to his lifelong desire to disseminate knowledge, is his low tolerance for what he calls "audio myths." He has strong opinions on power, room acoustics, audible artifacts and whether a more expensive cable means it's a better cable, to name just a few examples. And he presents the science to back his claims. Much of the material in an early chapter was first presented at an AES panel called Audio Myths. It's on the Internet, and it's entertaining. Look it up.

Because Winer has strong opinions and little tolerance for what he considers misinformation, he will find those who disagree with him in some of what he talks about, especially considering the audibility of artifacts, which we have asked him to write about on page 46. As for theory and basics, his work is thorough and presented in a forthright, logical manner, with plenty of examples to illustrate his points. The author asks in his introduction if the world really needs another book about audio. Yes, it does. ■



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JOSEPH ARTHUR'S 'LOU'

Artist's Tribute to Unforgettable Songs

By Barbara Schultz

A couple of months after Lou Reed passed away, A&R rep/music producer Bill Bentley suggested that Joseph Arthur record a tribute to their mutual friend.

"I thought he meant, 'Pick a Lou song,' for a compilation with other artists. But he said, 'No, do a whole album of your interpretations of Lou's songs.' The idea came from Bill," Arthur explains. "I'm pretty sure it would never have occurred to me. I was interested and intrigued and flattered that he thought I could do it. But it seemed like an outlandish idea: Is it even okay to do that?"

Arthur considered the suggestion further while he toured promoting his own album *The Ballad of Boogie Christ* (2013). "Then I got home from the tour and it was winter, and I was snowed in, in my apartment in New York. At the end of a tour, you're sort of an emotional wreck. Even if you take care of yourself, it's draining and you're a little bit scattered. And then I was snowed in—and I have a recording studio where I live—and I remembered Bill said, 'When you try to do this, keep it simple.' That just gave me my way in on it.

"I was by myself," he continues. "And I just started. The first one I did was 'Coney Island Baby.' I put down acoustic guitar and piano and acoustic bass. I didn't plug anything in. I felt like I'd found an inroad. That simplicity gave the song something that was different from the original, but it was bound to the original and it honored the original."

For six days, when New York City was buried in snow, Arthur says, "I just lived with Lou. I spent all my time recording."

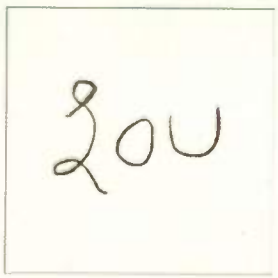
Arthur made *Lou*—a full album of spare, tender, haunting Reed covers—in less than a week. "People can undervalue something


Mastering engineer Gavin Lurssen

because it was quick, but it just flowed," Arthur says. "You can't take those times in the studio for granted, because it doesn't always happen like that."

Arthur used acoustic instruments and two microphones—a Coles ribbon and a Wunder CM67. On each song, he first cut his lead vocal and acoustic guitar together, then added piano, then bass, and finally his own backing vocals. "I'd just move the mics around," Arthur says. "I'd put the Coles on the guitar body and sing into the Wunder. I have a Steinway grand piano from 1912; I'd put one mic on the low end and the other high."

Arthur tracked to Pro Tools, running the Wunder through his Chandler Abbey Road TG2 mic pre and the Coles through a Summit pre. "No EQ on anything," he says. "I kept it really simple, and that's why it worked. It really put the focus on the song in a clear way, and I thought that was a valid thing to do."



Arthur created his own mixes, and sent the files to Gavin Lurssen in L.A. to be mastered. "Mastering sessions can be like when you turn your term paper in to the teacher. Usually you're going to get a couple of red marks and maybe even a slap on the wrist," Arthur says. "I thought for sure it would happen on this, because on some of the rough mixes, I hadn't even put a master fader on the Pro Tools session. I didn't know if those mixes might be clipping a little bit. I was nervous."

"Joseph was very close to this project," Lurssen says. "I realized he was worried about what sort of comments I'd send back, but I found it to be very special. What he captured with very minimal tools was a very organic and sweet-sounding."

Lurssen, who always masters in the analog domain, converted the files and brought to the project his usual philosophy of transparency. "There can never be a veil between the listener and the recording," Lurssen says. "The most successful I can be in my job is to make it sound like I was never there."

In the case of *Lou*, the most essential element to emphasize was Arthur's vocal and what Lurssen calls the artist's "quiet confidence," a quality that Reed possessed as well.

"These guys are both storytellers," Lurssen says. "We needed to make sure the listener focuses on the vocal performances, and the acoustic sounds supporting those vocals. That meant nothing oversaturated, nothing overcooked.

"Once we found a zone, we approached it song-by-song, but we also kept a global vision in mind as we got all the songs onto one canvas," Lurssen continues. "One of the key elements was a Fairchild 670 that belongs to a rental company called Design FX; they maintain it and it's completely dialed to integrate with our chain.

"I also used an EAR tube equalizer in combination with a GML 9000. So when I go for the solid-state EQ, I can get a little bit of lift into the music while having the tube saturation from the EAR, in addition to what the Fairchild gives me.

"At the end of the day, what's important to me is what's important for Joseph—to maintain best practices that give listeners a beautiful experience."

"For Gavin to give the album such a good sonic 'grade,' for lack of a better term, was inspiring to me," Arthur says. "It made me realize that when the material is as strong as Lou's songs are, you can keep it really simple. I think Lou was one of the greatest songwriters that we've had. When you keep it really simple, you accentuate that all the more." ■

MATISYAHU'S 'AKEDA'


Photo credit: Mark Squires

"When a performer forgets where they are and really puts it down the wires—that's what we try to preserve at all costs," says Joel Hamilton, who engineered and co-produced Matisyahu's latest, *Akeda*.

Hamilton ran the sessions in Studio G—the 5,000-square-foot Brooklyn, N.Y., facility he co-owns with musician/engineer Tony Maimone—along with co-producer/bassist Stuart Brooks of Dub Trio.

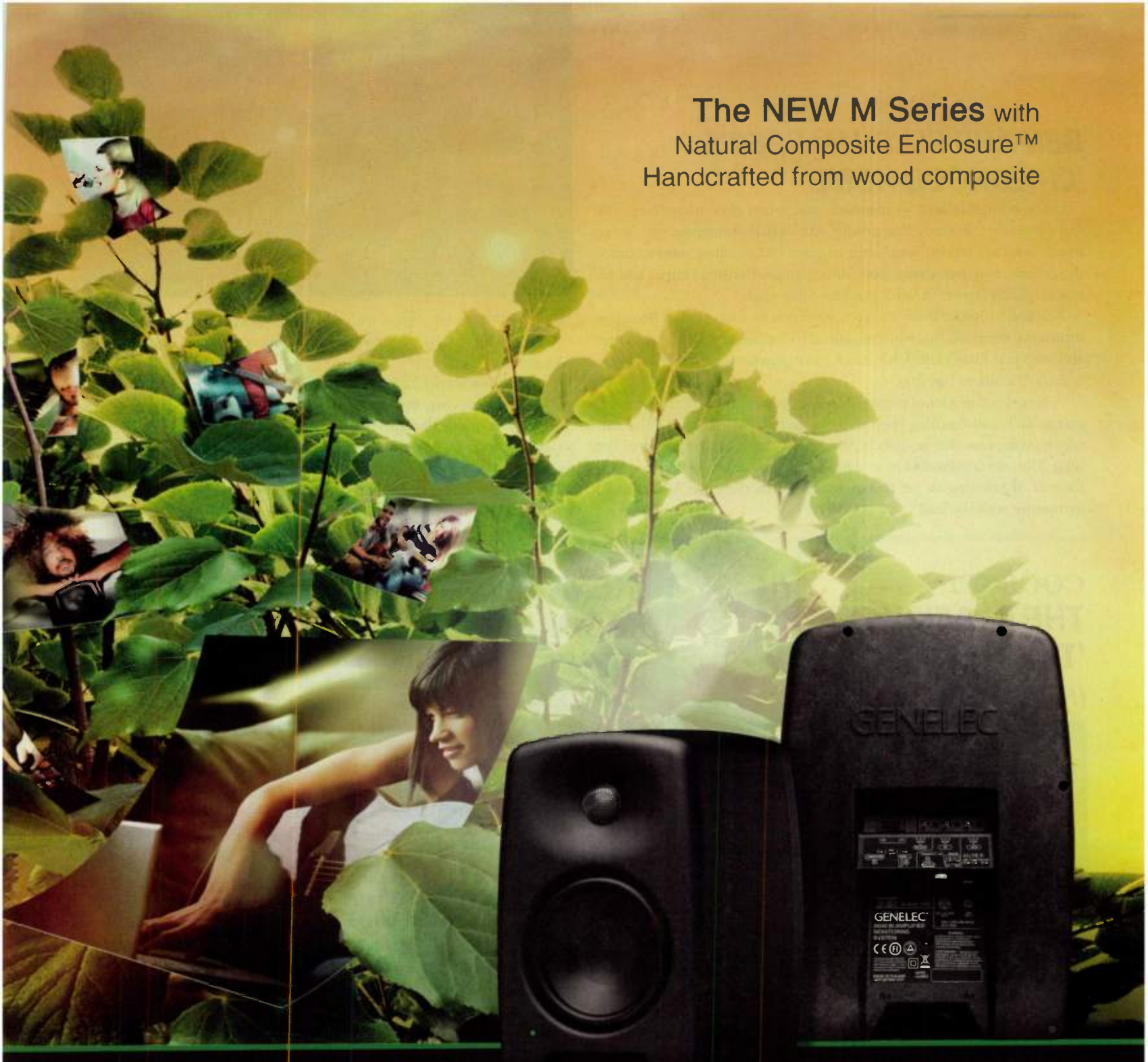
Arrangements on *Akeda* interweave pop, electronica and reggae with elements displaying the artist's essential connection to Judaism. Songs began with pre-production, where Brooks and Matisyahu developed electronic tracks that would guide the production.

"Some of it was built in Ableton, some in Pro Tools," Hamilton says. "Even though there was laptop-y stuff in the writing process, [tracking] was much more organic.

"When the writing process is electronic, you rely on the snare timbre to establish the vibe," he explains. "It might be an 808-type snare; or a big bashy clap—a 'We Will Rock You' sound. We would prepare the acoustic drums to meet in the middle with the electronic, so for that dry, tight 808-type snare, we would use tons of duct tape and a towel over the snare, for example.

"I will overprint during basics for a record like that," Hamilton continues. "There might have been 15 mics on the kit, but then we'd use the four that matched the right era, place, time and technique."

Matisyahu's vocals were overdubbed in a booth assembled from gobos in the middle of Studio G's live room. "The vocal chain was primarily a Telefunken long-body 47 that has recorded singers from Mos Def to Dan Auerbach to Elvis Costello," Hamilton says. "I also put a Placid Audio Copperphone next to it; the Auratone of microphones: limited bandwidth, looks like a pipe bomb. It adds a mid character and a blown-out tweeter sound that's really fun."—*Barbara Schultz*



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BEN AND ELLEN HARPER'S 'CHILDHOOD HOME'

Photo: Danny Clinch

"They're both excellent wordsmiths, and when they harmonize, you can definitely tell there's that genetic vibration that happens only when people who are related sing," says engineer Ethan Allen, who recorded the delicate new folk album from singer/songwriter Ben Harper and his mother, Ellen Harper in Ben's Machine Shop studio.

Ben and his mom share a deep connection to roots music; Ben grew up around the musicians who frequent the Claremont Folk Music Center and shop that Ellen's family has run for two generations. *Childhood Home* is their first album together.

"There was also a lot of preparation—sitting around with two acoustic guitars and really crafting their vocals together," Allen says. "Their harmonies were recorded separately. We would start with the writer of the song. The lead vocal would be so emotive and raw, it would take a certain amount of tailoring to get that right, and then the other vocal would harmonize with the lead."

Allen came to the session with a pair of his own Neumann U 67s and a Retro 176 limiter. All of the vocals were recorded to a U 67 or an AEA R84, through the 176.

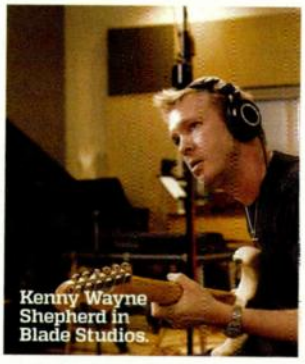
"Often, Ben would be playing acoustic guitar or a resonator guitar while he was singing, so the vocal mic is capturing both the vocal and the instrument equally, and I'm trying to get the right phase-coherent sound," Allen says. "We would find the right balance within the picture itself: never trying to be artificial in the blend or separate sources that were recorded, but maybe backing his mic up two feet, for example, just to make sure it's getting the right blend."—*Barbara Schultz*

COOL SPIN
THE BLACK KEYS 'TURN BLUE' (NONESUCH)

From the first gentle, languid guitar strums and shadowy keys, the new Black Keys album evokes the reaction: "Wow—very Pink Floyd." And that feeling grows as the arrangement of track one, "Weight of Love," unfolds in all its heavy, moody glory—even after Dan Auerbach's vocals emerge, more than a minute in. Auerbach has said in interviews about this album that he and bandmate Patrick Carney wanted to make a "headphones album," and *Blue* definitely has lots of grooves to get lost in. But there's also hook-y rock 'n' roll ear candy in equal measure, as on the soulful single "Fever," and the awesomely fuzzed-out "It's Up to You Now." And one of the purest pleasures on this record—or any record—is the Stones-meet-T. Rex glam finale, "Gotta Get Away." In other words, whatever you love about the Black Keys, it's all here.

Producers: Danger Mouse, the Black Keys (except tracks 7, 11: Black Keys). Recording engineer: Kennie Takahashi. Additional engineering: Geoff Neal, Bill Skibbe, Collin Dupuis. Studios: Sunset Sound, Hollywood; Key Club, Benton Harbor, MI; Easy Eye, Nashville. Mix engineer: Tchad Blake. Mastering: Brian Lucey/Magic Garden Mastering (L.A.).

KENNY WAYNE SHEPHERD, 'GOIN' HOME'



Kenny Wayne Shepherd in Blade Studios.

Guitar master Kenny Wayne Shepherd made his aptly named new release in his hometown of Shreveport, La., bringing his band—singer Noah Hunt, drummer Chris Layton, bassist Tony Franklin and keyboard player Riley Osbourn—into Blade Studios, where he co-produced with Bill Pfordresher and drummer/studio owner Brady Blade. The new album features classic blues songs made famous by greats Albert King, Bo Diddley, Muddy Waters, Stevie Ray Vaughan and others.

Staff engineer Chris Bell captured the band live in Blade's SSL Duality-equipped 1,350-square-foot Studio A. "They came in with just a great attitude and the intention of making a great record the way we used to make great records: with everyone in the same room together," says Bell, who tracked the band to Pro Tools via a Studer A27 machine and the studio's CLASP system.

Of the main attraction on any Kenny Wayne Shepherd album, Bell says, "Kenny probably had 20 guitars here. He also had several Dumble Fender modified amps. He would have at least two amps going at the same time; sometimes they'd run together, and sometimes he'd use them to switch off—rhythm or lead, depending on the song."

Bell miked each amp with a Royer R-121 and a Shure SM57. "And if it was an open-back cabinet, I might have a [Sennheiser] 421 on the rear. Sometimes the amps were out in the studio, but if they were in a booth, there would also be room mics—Royer 122s. We'd always run a DI, too, in case we wanted to re-amp anything."

The electrifying live band tracks were embellished with a few overdubbed vocals and solos, and then with contributions from guest stars, including Joe Walsh, Keb Mo, Robert Randolph, Ringo Starr and more. "Those were sent to us," Bell says. "We'd just edit in an extra 16 bars for a solo, or lengthen a track to fit in a vocal section."—*Barbara Schultz*

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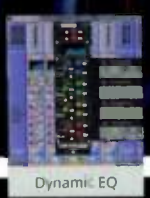
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Classic Tracks

By Blair Jackson

"SUPERNOVA"

Liz Phair

Chicago was a pretty happenin' rock town in the late '80s and early '90s, with a thriving club scene and a whole bunch of recording studios that catered to the many post-punk, alternative and industrial groups that sprang up in the area. One of the most popular studios to emerge in that era was Idful Music, in the affordable and ethnically diverse Wicker Park neighborhood (home to many a struggling musician). Idful was the brainchild of a pair of young local engineers, Brad Wood and Brian Deck, both of whom had studied music and recording at Northern Illinois University (in DeKalb, west of Chicago), and cut their teeth at various downtown studios, including the vaunted commercial facility, Chicago Recording Company. A third partner was bassist Dan Sonis, who played in a band with Deck and had a bit of money to put into the project.

"The three of us built the place for about $40,000, which included money for equipment," Wood says, "so we had a Tascam M520 console, which I still have, and a [Tascam] MS16 1-inch 16-track, with dbx and a bare minimum of outboard. Then, through our good fortune and dumb luck, we met James Bond, who is a film projectionist in Chicago and also a collector of amazing vintage microphones, and we started a relationship that lasted years—through the Engine Music Studios days [a bigger and more glamorous successor to Idful]. So, 20-plus years of allowing us to keep and maintain his microphones. We had these incredible mics that completely overwhelmed the mic preamps and outboard gear we had at the time—matched pairs of M50s, M49s, Fet47s, Beyer 160s, Altec 29s, Neumann 367s, 67s, U 47s, RCA 44s and 77s. That's what we cut our teeth on. It was a robust collection that kept growing." John Peluso, of the current microphone that bears his name, was chief tech at Idful for a while.

The trio built the studio from scratch "in the far end of a Jewel grocery store that had been vacated years ago, and the landlord had subdivided the space. Before we met him, he thought it was an un-rentable space because it had no daylight and poor access; it was way at the back of the parking lot with a little door to the foyer; no windows, no light at all. It had an entryway lounge/office area, with concrete gray floors and white walls; we put band artwork and fliers on the walls. We had a little kitchen area that we could never get it together to have hot running water, but we had cold running water. The lounge had some scrounge couches, which might have been a donation from the band Red Red Meat [Deck's band], a couple of throwaway chairs from CRC, a bad TV with no cable—just rabbit ears—and a VCR, and that space was both not heated and not air-conditioned for a long time.

"Then you opened the door to the control room and you had a live-end dead-end kind of room—very narrow and tight at the front—designed with help from my physics teacher at the time, and also some begrudging assistance from an acoustical designer in Evanston, who basically told us what not to do. We built our own diffusors for the back wall and did all the construction ourselves. The live room was a pretty vast L-shaped room with concrete floors and big windows looking into the control room. We had lots of rugs and curtains on the walls, but it was still a very live room. We also had a storage area for tapes and a shop."

Before she ever worked at Idful, singer-songwriter Liz Phair, who had gained a local reputation from a highly regarded 4-track cassette of a bunch of her idiosyncratic songs, dubbed Girly-Sound, "went in there socially because it was a small neighborhood and a lot of the music people hung out together, and Idful was just a snowy walk away," Phair says by phone from Huntington Beach, Calif., where she lives these days. "I think I first went there with John Henderson," of the Chicago indie label Feel Good All Over, who was the first person to express interest in making an album with her. "It had a really great live room, with all the guitars on the wall and a small control room, and then the outer room; it was really comfortable. A lot of people would stop by. It was funky, I

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guess, but it had good feng shui."

The sessions with Henderson did not ultimately work out, but Phair had a found a recording home at Idful, and in early 1992 started working on songs there with producer Wood and Idful engineer (and guitarist) Casey Rice, whom Phair says "had a raw, Detroit, guitar, punk-rock vibe." After Phair signed with indie label Matador Records, work began in earnest on what became a stunning 18-song opus called *Exile in Guyville*, which was Phair's deeply personal female "response" to the Rolling Stones' classic, macho *Exile on Main Street*. Like that Stones opus, Phair's was stylistically diverse, from unadorned lo-fi rock to early indie-folk numbers, to hook-filled pop. Besides Phair's dominant lead vocals and rhythm guitar lines, the other instruments were played by Wood and Rice, layered after Phair had laid down her basic scratch vocal-and-guitar track.

Phair recording vocals (and swigging rum!) at Compass Point.

Wood says, "It was classic singer-songwriter in the sense that the person arrives with their songs and a guitar—and a piano—and then whatever arrangements you hang on those songs happens then and there. I hadn't done a lot of that up to that point, but I was a trained musician, and I played bass pretty well at that time and I was getting better at playing drums from the other bands I had been in, and Liz wasn't really looking for a rock band and a full drum kit, per se. Some of it is just her voice and guitar or piano with minimal arrangements."

"I felt totally comfortable with Brad," Phair adds. "He gave me space to be myself, which was good because I was new to this and didn't really know what I was doing. He was very respectful, and I let him do what he wanted to do audio-wise, while I'd focus on my performances. All three of us came up with different arrangement ideas and we'd try them out."

Exile in Guyville was an unexpected sensation when it came out in 1993—a critical smash that was also controversial because of the frank sexuality expressed in a few songs (the leadoff track is titled "F— and Run") and the hint of nipple shown on the cover. It also had a radio single called "Never Said" that enjoyed a bit of mainstream popularity. To help promote the album, Wood put together a little quartet with himself on drums, Rice on guitar and Leroy Bach on bass behind Phair, who had no previous performing experience. "I didn't like being in a band," she says today. "I didn't like feeling inadequately prepared for live concerts. People were writing about me, and it was the first time I'd experienced that. A lot of people were kind of hostile, pointing out how inexperienced I was and how it totally showed."

The band in England, 1994. (L-R) Brad Wood, Casey Rice, Liz Phair, LeRoy Bach

Still, the band vibe carried over into the first sessions for Phair's second Matador album, Whip-Smart, which began in August 1993. In fact, this month's Classic Track, the catchy rocker "Supernova"—an ode to Phair's then-boyfriend—was a song that the band started to play live during the limited touring behind the first album. "That song was really fun to play," Wood says, "because it's got a nice big chorus where you stand on the guitar pedals and really rock out. It's a pretty standard song in terms of its structure, and it didn't have an elaborate arrangement, so that also allowed us to record it fairly quickly."

By this time, Idful had upgraded its control room with a 32-input Neotek Elan console and, Wood says, "a Studer A80 MKIII wide-body from Steve Albini, who had purchased it from Phil Ramone's studio, I believe. It was one of the machines that was around for a lot of the Billy Joel discography and John Lennon's solo stuff." Wood and Rice also built an iso booth in front of the control room.

Typically, Phair would play guitar and sing a scratch vocal to a combination of a click generated from a Yamaha RX-15 drum machine and some sort of hand percussion played by Wood or Rice "so it would have some feel to it," Wood says. "Her main guitar was the red [Fender] Mustang, and we always tracked her through at least two guitar amps with a delay pedal to give it a stereo effect, which was a huge part of her sound." One of the amps was usually a Peavey Backstage model she loved, in conjunction with another. For Rice's guitar part on "Supernova," added secondarily, he played a 1981 Les Paul Standard with a '70s Rat pedal and a DOD FX25B envelope filter pedal, through a Hiwatt SA112/50 Bulldog amp, captured with a Beyer M160 mic.

"As soon as the guitars were happening," Wood says, "then we'd do the drums and bass. I remember setting up the drums in the newly built iso booth, which was really kind of too small for a full-size drum kit; it was really better suited as a vocal booth. But I was tired of that big drum sound that was so popular. I wanted something drier. So I close-miked everything—no ambience, no room mics; just dry, dry, dry. I was playing my little 1961 Leedy jazz kit, which had an 18-inch kick drum, which was probably too small for that kind of song." Wood's Fender Jazz bass copy was DI'd.

Continued on p. 73

Dog & Pony Studios, Las Vegas

FROM GEORGE CARLIN TO ELLIOT SMITH, SKECHERS TO SLOT MACHINES

BY TOM KENNY

If you work in audio post in a mid-level market, chances are you work on a wide, wide, wide variety of projects. John McClain, the creative owner of Dog & Pony Studios in Las Vegas, knows this. He's built a business around it. Since opening a little more than ten years ago with mostly voice-over work and mixing commercials, he's worked on short films, webisodes, custom music, national and local TV spots, radio, specials (Emmy as part of HBO Sports Boxing Series), children's books, slot machines, casino promos, Grammy-winning comedy albums (George Carlin), cartoon shorts, documentaries...

During the same time he's moved Dog & Pony out of his tricked-out home to a one-room-turned-two-room facility on Dean Martin Drive, later into its current three-room space on Tompkins. He's graduated from a Pro Tools LE and Mackie monitors at home to a Nuendo/MC Pro combo on Dean Martin to a brand-new Yamaha/Steinberg Nuage-equipped 5.1 main room on Tompkins. The variety fueled the growth, and the growth has brought more variety, to the point that McClain, with three studios humming, has found the time to concentrate more on sound design and long-form, the reason he got into the business in the first place.

McClain was a military brat and moved around a lot. He cut his professional teeth in Detroit, picking up guitar at age 22 and finding his way to an assistant's job at Ron Rose Productions soon after, where he "swept floors and made dubs," then grew into mixing, mentored by Dean Mounts and learning the process, as well as how to behave with clients. He jokes today that he left Detroit with "a reel that Chevy built."

McClain landed in Las Vegas in 1996 and worked on the build-out, then seven years of engineering, at Studio Center, a voice-over shop. In 2003 he left and opened Dog & Pony at home—simple Pro Tools LE setup with keyboard controller, an ISDN line and a voice booth. He had clients and semi-steady commercial work. Within a couple of years he had switched to Steinberg Nuendo/Avid MC Pro, upgraded his entire setup and grown too big for the house.

In 2006 he began looking for space, and by late 2007 moved into a two-room facility, mostly hand-built and self-financed. It was a nerve-wracking time, he admits today. His wife was pregnant. And he had just spent his savings on a studio, with a lease. He did, however, have a plan.

"We had started getting calls from the UNLV Film School around 2006 to do audio for some short films," he recalls. "We picked up a couple that were fun to work on. We had also begun to pick up small slot machine jobs, sound effects work. That was the same point in time where I decided to see if we could spread the studio's wings a little further. But I was a bit scattershot. Around 2007, right before the move, I brought in David Braxton, and he is really amazing at his ability to understand what a slot machine engineer needs, and how the machines work. He was able to pick up and run with the game work. By picking him up, it allowed me to concentrate on the indie film work and the post clients.


John McClain at the Nuage

"There's a great quote from the book *The Artist's Way*: Leap and the net will appear. That was my mantra at the time," he laughs.

In 2011, McClain moved Dog & Pony to its current three-studio home. Earlier this year, having picked up more film work and with his best year yet under his belt, he replaced his own Nuendo/MC Pro system with Nuage.

"I would like to attract higher-end business, like the Elliot Smith documentary I just finished," McClain says of the decision. "Our MC Pros are 10 years old. When Steinberg and Yamaha announced the Nuage, I was blown away by what I could foresee. Then I spent a whole day on it at RSPE in L.A. and I was sold. I felt like I was back on a board with tape rolling and we were just listening and mixing. It all came flooding back. I can turn knobs and move faders—I can feel my old muscles creak. I think when you are doing that you are listening. My eyes are on the board. It's like my timing is back. I'm not looking for the breath coming up, or worrying about nudging the sound effect three frames up."

Heaven Adores You (An Elliot Smith Project), currently making the rounds at festivals, came to McClain through a pair of local executive producers whom he had worked with since their thesis film at UNLV. McClain can't say enough about the quality of the students he's seen come out of the still-new film department. At the same time he treasures his relationship with the talent behind the Skechers spots he's done, which led to a highly creative cartoon-short series called Shmitty McFunkle and Stump. Again, variety.

"We're in the process of mixing a live performance by a band put together by a classically trained opera singer, and the band does standards at a jazz cabaret at the Smith Center," McClain says. "Every day is a little different, and I love it." ■

NEW ORLEANS JAZZ & HERITAGE FESTIVAL

PHOTOS & TEXT BY DAVE VANN

The New Orleans Jazz and Heritage Festival, now in its 45th year, took place over two weekends in late-April, early May at the city's Fair Grounds Race Course, with concert sets on multiple stages. Huge numbers of people make it an annual tradition to converge on The Big Easy for this celebration of music and Southern culture, as crowds of up to 100,000 people attend the festival each day. While the weekend Jazz Fest at the Fair Grounds officially ends at 10 p.m. each day, the music goes all night—often until the sun comes up—at historic New Orleans music venues on Bourbon Street, in the French Quarter, and all over town.

Photographer Dave Vann attended the first weekend of Jazz Fest this year and documented music at the fairgrounds, as well as many of the late night shows, for *Mix*. Here are some of his exclusive photos with comments from a few of the front-of-house engineers who worked at Jazz Fest. To see more photos, go to mixonline.com.

The Avett Brothers' FOH engineer Justin Glanville: "The load-in and load-out were seamless thanks to the great stage management and all the seasoned stagehands. The P.A. tech helped me easily tilt my Midas Pro6 up and made the few small cuts I felt I needed to have a smooth start for when we hit the stage."

Anders Osborne FOH engineer John Hardee: "It's fun mixing a kick-ass rock show. The weather was great. The Clair Brothers i-5 rig with S4B subs and my choice of console—the Midas Heritage 4000—treated me, the band, and tens of thousands of music lovers, quite right."

FOH engineer James Burgoyne, pictured here at an Avid Venue Profile, mixed the concerts in the festival's Blues Tent during the first weekend. "I've been working at Jazz Fest for 16 years," Burgoyne says. "I used several Waves plug-ins. We used mainly Telefunken microphones [on instruments]. I had six JBL VerTec speakers per side and 10 VT4880 subs, VRX corner fills and delays. And we used an [Avid] SC48 for monitors."

The Stanton Moore Trio—Stanton Moore (drums), Will Bernard (guitar) and Robert Walter (organ)—appeared at the Blue Nile the night before the Jazz & Heritage Festival kicked off, on Thursday, April 24.

Jason Isbell and The 400 Unit performed on the festival's Samsung Galaxy stage on Friday, April 25.

The Infamous Stringdusters from Charlottesville, Va., stopped through on the Sheraton New Orleans Fais Do-Do stage on April 25 as part of their I'll Get Away tour in support of their new album, *Let It Go*.

Santana visited the Jazz & Heritage Festival's Acura Stage on April 25 as the band geared up for a summer tour in support of its May 6 release, Corazon.

Over the course of the festival's first weekend, the Congo Square Stage played host to Public Enemy, Robin Thicke, Charlie Wilson, and more.

The Avett Brothers headlined the Samsung Galaxy stage on April 25, in advance of a busy summer touring schedule, in which they will visit several festivals—including Bonnaroo and Lollapalooza.

The Sheraton New Orleans Fais Do-Do stage hosted Keb' Mo', Terrance Simeon & The Zydeco Experience, John Hiatt, and C.J. Chenier & the Red Hot Louisiana Band during the festival's first weekend.

In addition to Santana (pictured in performance here), the Acura stage saw festival headliners Phish and Eric Clapton during the first weekend.

Roosevelt Collier, Nikki Glaspi and Nick Daniels appeared at The Howlin' Wolf in New Orleans' Warehouse District on April 25.

Dumpstaphunk, which appeared on the festival's Acura stage on May 4, is seen here playing Led Zeppelin covers at The Howlin' Wolf in New Orleans' Warehouse District on April 25.

New Orleans funk band Galactic appeared at Jazz Fest on April 27, and is seen here performing at Tipitina's on April 25, with guest vocalist Maggie Koerner.

The M&Ms, a superstar band featuring John Medeski (keyboards), Papa Mali (guitar), Robert Mercurio (bass), and Stanton Moore (drums), played to a sold-out Tipitina's crowd on April 26.

Electro/hip-hop/soul music artist Pretty Lights (aka Derek Vincent Smith) and his band teamed up with Talib Kweli on April 26 at the Jazzfest By Nite event at Champions Square in New Orleans.

Rock/blues artist Anders Osborne (at right, with bassist Carl Dufrene), who recently released an album titled Peace, played the Acura stage on April 26.

New Orleans–based trumpeter Jeremy Davenport and his band played in Zatarain's WWOZ Jazz Tent on April 26.

Phish (from left: Page McConnell, Jon Fishman, Trey Anastasio and Mike Gordon) headlined the Acura stage on April 26. The band's new album, *Fuego*, releases on June 24.

Page McConnell & The Meter Men—Zigaboo Modeliste, George Porter Jr. and Leo Nocentelli—headlined Republic New Orleans on April 26 as part of the third annual Nolafunk Jazz Fest Series.

The Preservation Hall Jazz Band lit up the Blues Tent on Sunday, April 27.

John Hiatt and The Combo appeared at the Sheraton New Orleans Fais Do-Do stage on Sunday, April 27.

Vampire Weekend headlined the Samsung Galaxy stage on Sunday, April 27.

An early morning set at New Orleans' Maple Leaf Bar on April 27 with the band Funk n' Stay Up Y'all.

Darkwave—a trio comprising keyboardist John Medeski, saxophonist Skerik, and drummer Adam Deitch—played a late night/early morning set on April 28 at The Maison as part of "Jazz Fest 2014 Late Night."

Context Killer is described as "a musical chaos free-form collaboration from the mind of New Orleans drummer Simon Lott." Here, Lott is pictured with saxophonist Skerik on April 28 at Little Gem Saloon.

The Fantastic Four—Eric Krasno, Robert Walter, Adam Deitch, Chris Stillwell and The Shady Horns (Ryan Zoidis and Eric Benny Bloom) appeared at Little Gem Saloon on April 28.

2014 BILLBOARD LATIN MUSIC AWARDS

PWS' Helical Antennas and Domed Helical Antennas were on-site at the Bank United Center, both inside and out throughout the full-day event.

Professional Wireless Systems was on-site on April 24 at the Bank United Center at the University of Miami to support Telemundo's live broadcast of the Billboard Latin Music Awards. This marks the 16th year that PWS provided wireless solutions and equipment for the show, which honors the most popular albums, songs and performers in Latin music as determined by data from *Billboard*'s weekly charts.

For the main show, PWS employed 12 channels of the Shure Axient wireless microphone system along with the Shure PSM1000 personal monitor system. Four channels of Sennheiser wireless (3732-II receivers with 5200-II handhelds) were used for the main talent, including Marc Anthony, Enrique Iglesias, Ricky Martin and Andrea Bocelli. Laura Pausini used a Sennheiser SKM2000 handheld outfitted with a 935 capsule. Nine Telex BTR 800s and 10 Shure UHF-R wireless microphones were also used, and Masque Sound's headphone monitor system was deployed to ensure that all microphones were interference-free before hitting the stage.

PWS provided its GX-4 and GX-8 Series Combiners, as well as the RAD TX-8 Transmitter Combiner. Several PWS DB Series Multicouplers were used for the microphone receivers and intercoms. PWS Helical Antennas and Domed Helical Antennas were also on-site, both inside and out, throughout the event.

"Our receiver antenna position was behind the stage, which placed all of the live music artists' microphones and hosts on the other side of the lighting wall," says James Stoffo, the main RF coordinator. "In addition, the overall frequency count was the largest it's ever been, with more wireless positions than we have ever had, including two media centers operating inside of the venue. The PWS team ensured that everything came together seamlessly." ■

DIERKS BENTLEY'S WHISKEY ROW

Sam Ash's Jason Goldin decided to configure the JBL loudspeakers in Dierks' Bentley's Whiskey Row as three stereo systems working together to create the desired coverage.

A restaurant and sports bar in Scottsdale, Ariz., Dierks Bentley's Whiskey Row offers live music Thursday and Friday nights on an elevated stage. The venue's management company, Riot Hospitality Group, asked Jason Goldin, general manager of Sam Ash in Glendale, Ariz., to help design a streamlined club/live sound rig that could integrate into the venue's video-rich environment. Goldin collaborated with HP Marketing Company's Andy Connors for additional design input.

The audio system features six JBL STX835 loudspeakers, four STX828 subwoofers and six JBL PRX612M stage monitors. The loudspeakers for the stage above the bar, including the stage monitors, are suspended from the ceiling, and the loudspeakers for the main stage are hung from the bottom of the stage itself. In addition, two JBL PRX415 loudspeakers serve the outdoor patio. The loudspeakers are powered by a combination of three Crown Macro Tech 12000i, two Macro Tech 5000i and an XTi 2 Series 4002 amplifier. A Soundcraft Si Expression 2 24-channel digital console with Compact Stagebox and MADI digital snake, controlled wirelessly through Soundcraft's ViSi iPad app, handle the live sound mix. A dbx ZonePro 1260 12x6 digital zone processor handles the audio signal processing and distributed audio to additional speakers throughout the club. ■

MORCHEEBA VISITS U.S. CLUBS

Photo: Todd Berkowitz

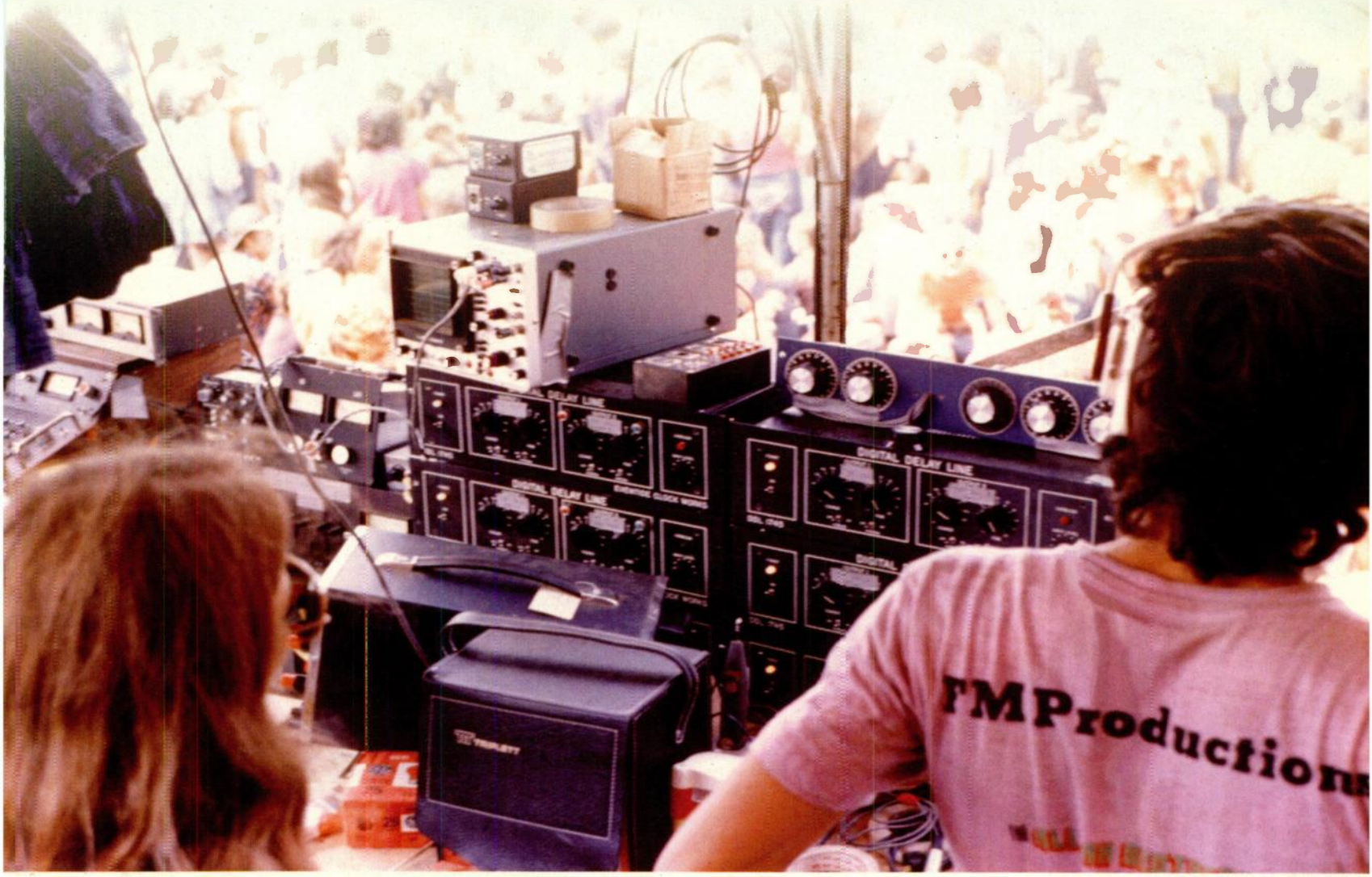
Morcheeba at Irving Plaza in New York City in May 2014

UK-based trip-hop trio Morcheeba, comprising Skye Edwards, Paul Godfrey and Ross Godfrey, crafted their October 2013 release *Head Up High* using vintage and boutique audio gear in their studio in France. Morcheeba is touring behind this release with a lineup comprising Edwards (vocals), Ross Godfrey (guitar), Steve Gordon (bass), Richard Milner (keys), Martin Carling (drums) and James Anthony (turntables). *Mix* caught the group at New York City's Irving Plaza in May.

Nick Ingram is working on this tour at front-of-house. According to production manager Mark Jones, Ingram mixes on an Avid Profile console with a d&b audiotechnik J Series P.A. system. Edwards sings into a Shure Beta 58A microphone. "It's the one that works best with the nuances of her vocal," Jones says. "We have tried various others but always come back to this one." Jones adds that Edwards' vocal needs to be mixed "over the top" of the band, and that Ingram uses an XTA D2 Stereo Dynamic EQ on her vocal. "[We] tend not to use a lot of reverb, just a short plate," Jones says.

Stewart Kennett mixes monitors on a Yamaha PM5D-RH console using four d&b audiotechnik M4 wedges for Ross Godfrey, Milner and Gordon, who is "about to switch to in-ears for the next tour," Kennett says. "Martin the drummer is on a Shure hardwired in-ear pack, as is James, the DJ. Skye is using a Sennheiser G3 in-ear system with Ultimate Ears 11 [Pro Custom In-Ear Monitors]." ■

In 1973, at Watkins Glen, live sound went just a bit digital.



"In the beginning, audio was analog.
And, almost anything was possible."

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DDL·500

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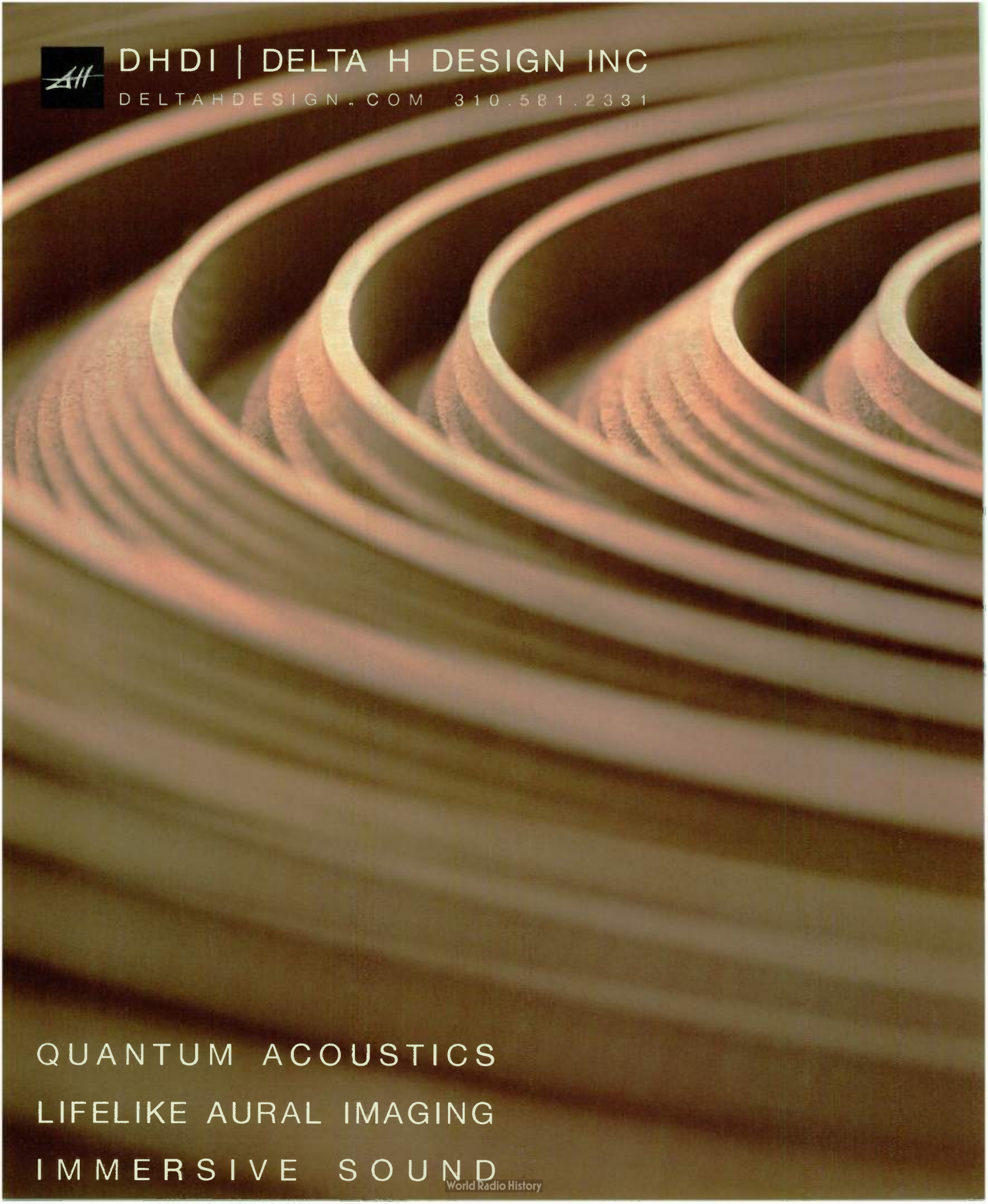
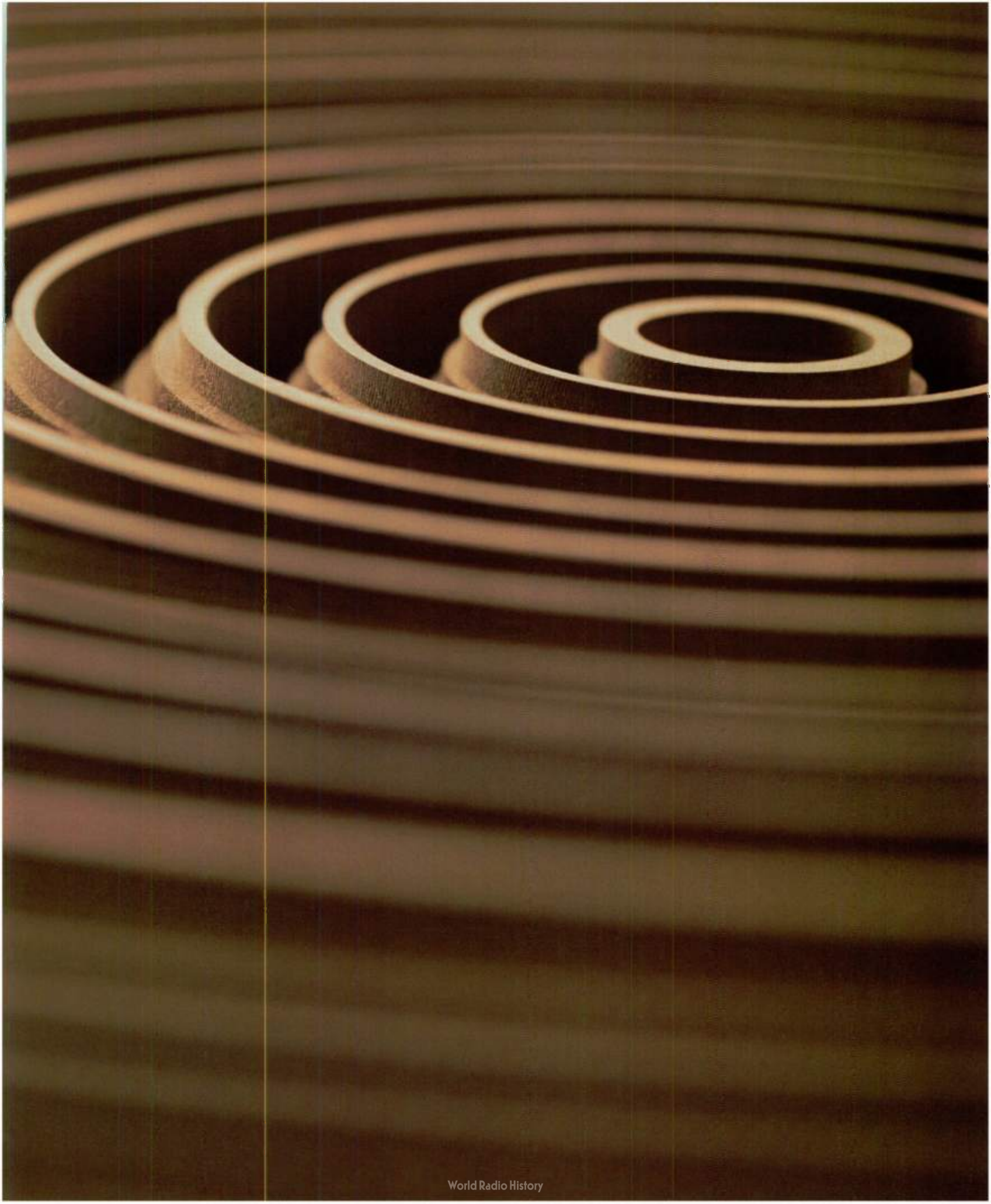




CLASS OF 2014

A COLLECTION OF THIS YEAR'S HOTTEST NEW STUDIOS

BY BARBARA SCHULTZ

Photo: Lucia De Giovanni for Think Loud Studios

On the Cover: Think Loud Studios, York, Pa.

"As a lifelong musician, producer and engineer, I have to say, Think Loud Studios is the ultimate reward for all those years of hard work and dedication," says Chad Taylor, best known as the lead guitarist for the band LIVE. Taylor and bandmates Patrick Dahlheimer (bass), Chad Gracey (drums) and Chris Shinn (vocals) co-own this creative, multi-use showplace, which was built into a 100-plus-year-old landmark building full of vintage touches and natural light.

The landmark status of the structure, a former printing house, created some obstacles for Horacio Malvicino, whose Malvicino Design Group provided the acoustical and spatial design for the facility. "We had to keep the structure and existing windows as they were," Malvicino explains. "But there are train tracks 100 feet away, and an SPL reading in the room showed the locomotive horns at 95 dB."

Anderson Windows created custom double-paned windows for the exterior of the existing ones, and Soundproof Doors manufactured 5-inch-thick windows for the interior side. "The city approved the design, but they wanted us to be able to open them, so Randy Brown from Soundproof Doors engineered a special hinge system so they would open but not cave with the weight."

Malvicino balanced all that reflective glass with movable panels and clouds that offer variable acoustics in the main tracking room and Studio B, which doubles as a rehearsal space. The treatments were manufactured by Veronica Bernal for TADI.

City requirements may have proved challenging for the

Baum Haus Studios, Houston, Texas

Photo: Skip Burrows

Acoustical and architectural design for this ground-up facility were created by Martin Pilchner of Pilchner Schoustal International, with engineering/technical infrastructure by Skip Burrows of Sunrise Recording Services. Included are a large control room and live room, three isolation booths with varying acoustics, machine room and numerous client amenities. Among the inventive acoustical treatments is the elaborate organic tree branch diffusor that Pilchner designed for the rear wall of the control room. The tracking room offers flexible acoustic elements that vary decay times by more than a second. Featured equipment at Baum Haus includes a 48-channel Wunder console and a CLASP system.

acoustician, but Taylor says local government is a big reason his "ultimate reward" got built. "Our governor, Tom Corbett, and his wife, Susan, stand up for the arts in a way that I've hardly seen," Taylor says. "The arts initiative our state government has set up [with tax incentives and benefits] for artists allowed LIVE to come back to our hometown of York."

All of the audio equipment in LIVE's new studio was provided by GC Pro, whose account manager Billy Walker provided on-site support during the installation, while system integration was done by MDG's Inaki Prades Cardenas. Control room A offers an SSL Duality, Pro Tools HDX 3 and Ocean Way main monitors; the B room includes an Avid Control Surface, Pro Tools HDX 2 and Ocean Way AS-1 mains.

The building also houses a studio kitchen, lounge, offices, residential accommodations, gym and spa, a private theater and a rooftop deck.

"We told Horacio that the view from Studio A, overlooking the rooftops and church steeples of York, inspires us as artists," Taylor says. "The vaulted ceilings in these rooms inspire us. We gave him some challenges on the architectural side and the audio side, but he was able to give us everything we asked for, and we were able to get brilliant sounds right off the bat."

Windmark Studios, Santa Monica, Calif.

Photo: Juergen Nogai Photography

After acquiring Windmark Studios, musician/composer Michael Marquart brought in Peter Grueneisen of studio bau:ton and nonzero\ architecture to design a new recording suite comprising a control room, large tracking room and vocal booth. Wood and fabric finishes, and color-changing LED lighting were used in this vintage-inspired space, which includes one of four existing Neve A4310-12 CBS Sony custom consoles in the world, an Ampex 16-track 2-inch machine formerly owned by Les Paul, and a prized collection of outboard gear and mics.

Forward Studios, Grottaferrata, Italy

Francis Manzella redesigned the control room of the flagship Caesar Studio in this three-studio complex just outside of Rome. Acoustical renovations included adding extensive tuned low-frequency trapping, and new reflection-control and rear-wall diffusive treatments. The rooms are refinished with a new fabric skin, woodwork and a new RGB LED lighting system. Equipment includes a 72-input Neve 88R console, Studer A820 machine, Genelec 1035B mains, and a range of analog and digital processing.

Photo: Massimo Scarparo

Photo: Andrea Hallgren

Columbia Studio A, Nashville, Tenn.

Belmont University's Mike Curb College of Entertainment and Music Business renovated this historic Music Row studio with an acoustical design by Dave Rochester of Technical Audio Services. The facility is used for classes, seminars and recording sessions. Refurbishments include the addition of custom maple paneling and absorptive treatments, including TAS-designed bass trapping in the studio and control room. The control room features a 1972 API split-monitor console formerly owned by Wally Heider, JBL M2 monitoring system, a Studer A827 tape machine and Pro Tools 10.

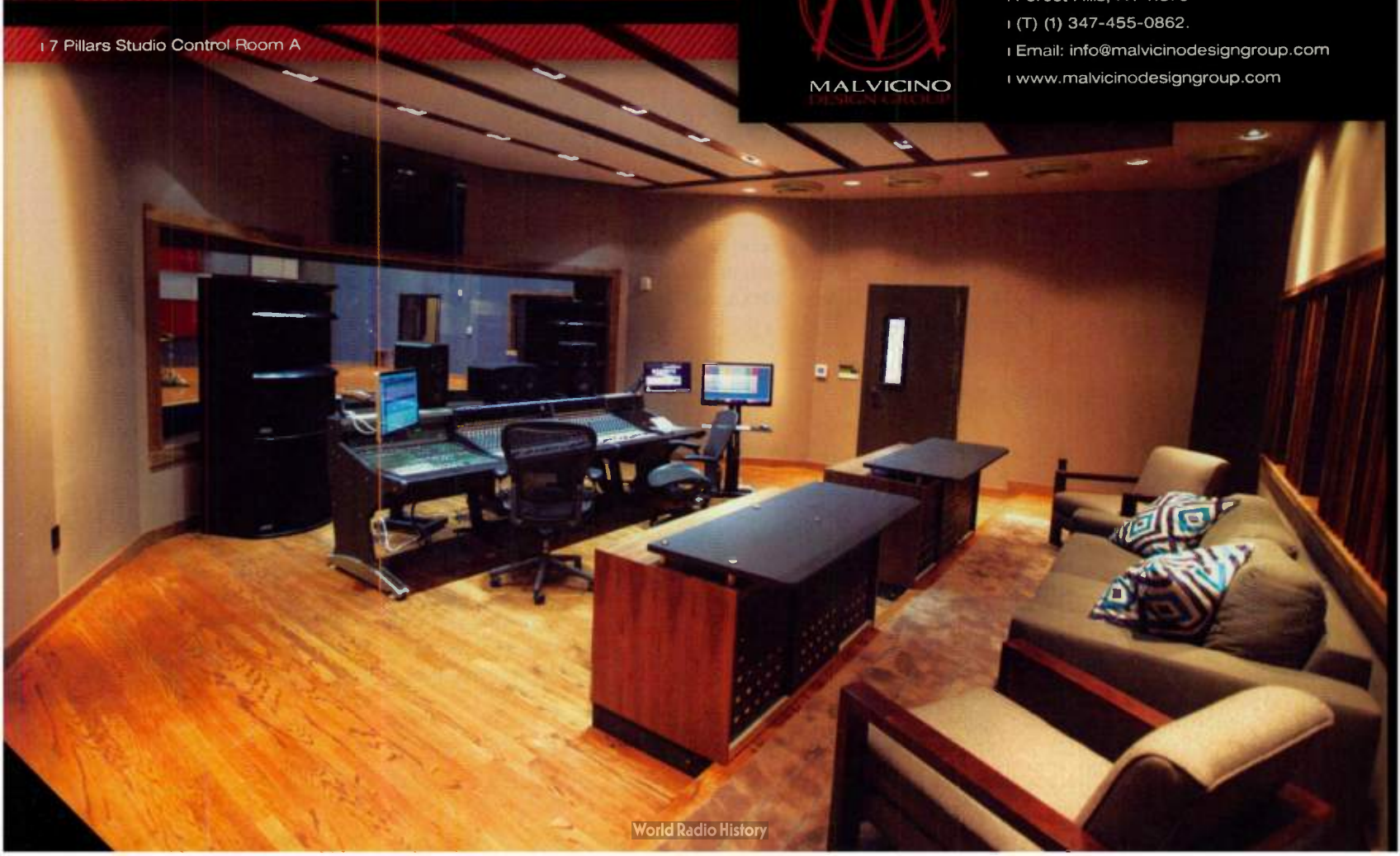
Electric Tree House, Bedford, Mass.

Lou Clark of Sonic Space designed this new studio for engineer Alec Francesconi. In the control room are deep side-wall bass traps on each side of the Dynaudio monitors, three feet of trapping in the ceiling with custom-built wood grid floating in the center of wall-mounted soffitts, and a rear-wall bass trap with flush-mounted Acoustic Ramp diffusors by XIX Acoustics. The console area has a raised floor between the speakers and listener to remove floor-reflected energy, while the live room features a variable-acoustic gobo system and a large cylindrical ceiling diffusor. Francesconi works mainly in Pro Tools, using a range of outboard pre's, processing and plug-ins. Interior design was by Michelle Puntillo.

Photo: Tim Gaudreau

ı 7 Pillars Studios - Cisco, TX

ı 7 Pillars Studio Control Room A



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Quad Recording Studios, New York City

Quad's Q1 control room was redesigned by the Walters-Storyk Design Group for studio owners Ricky Hosn and Alessio Casalini. The studio was originally built in 2010 around a large rack that doubled as a production desk. The goal of the redesign was to create more leg room in the 320-square-foot space, and generally upgrade the sonics and aesthetics. Existing Augspurger mains were upgraded with custom digital amps and an integrated DSP processor, the tweeters were replaced with new Beryllium diaphragms, and two 18-inch subwoofers were added. The studio also includes a 32-channel Avid Icon console, Pro Tools HD4, an SSL X Logic 16-channel summing mixer, and a Chandler 16x2 Minirack mixer.

Photo: Ricky Hosn

Photo: Lou Johnson

Fly by West, Nashville, Tenn.

The second studio that Carl Tatz designed for engineer/producer Derek West, Fly by West, is built into a former boathouse. The CTD MixRoom includes Tatz's Signature Series acoustic modules by Auralex, and Dynaudio BM6A Professional monitoring augmented by the designer's proprietary PhantomFocus System. The adjacent tracking room has 20-foot ceilings and includes a multi-use loft.

Hybrid Studios, Santa Ana, Calif.

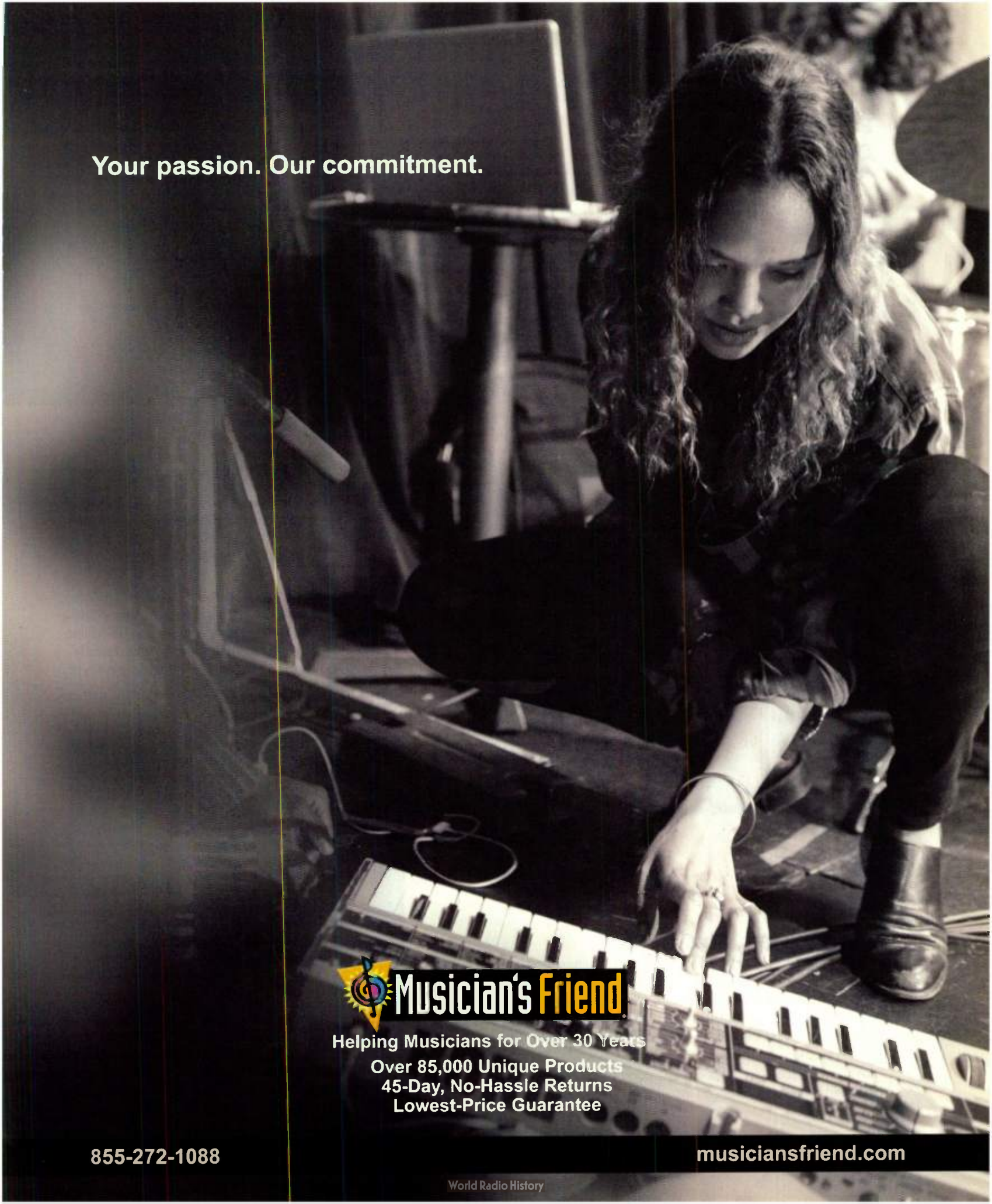
Delta H Design's project Hybrid Studios employs a variety of designer Hanson Hsu's unique approaches to acoustic design. The ZR Acoustics Prefab control room and surface-treated live room are designed to require no bass traps or room EQ. The ZR Micro and Sample Rate 8-bit acoustical art panels, designed to create lifelike aural imaging, line the walls of the live room pictured here. Hybrid features an SSL 4064 G-Plus console, Pro Tools 10/11 and Genelec 1032A, ADAM S3A, and Yamaha NS-10 monitoring.

Photo: Scott Chebegia

Photo: Harrison Funk

Orb Recording Studios, Austin, Texas

Designed by Mark Genfan, Orb is a brand-new 5,600-square-foot ground-up facility in the Texas hill country. The large, versatile recording and mixing rooms include natural wood and stone finishes, as well as custom RPG Wave Gaussian and Acoustic Geometry Curve diffusors that add control and color to the room tone. The new studio is equipped with an SSL G Plus console, Ampex ATR-102 tape machine, Ocean Way HR2 mains, Chris Pelonis Signature PSS110 monitors, and a 1938 Steinway grand piano.



Fox River Studios, De Pere, Wisc.

This private residential studio is built into a detached boathouse/garage that was split in two: One half for music; the other a photography studio. Gavin Haverstick from Haverstick Designs developed the recording side, which includes a 215-square-foot control room, 268-square-foot live room, and a 37-square-foot vocal booth. A room-within-a-room design and doors from IsoStore were used to isolate the studio from a nearby busy waterway. Also featured are custom bass trapping and absorptive treatments, and diffusors from RPG and Kinetics Noise Control. Fox River is equipped with Pro Tools and Digital Performer, and Focal SM9 and Avantone monitors.

Photo: Loanne Haddad/Clicks for a Cause

Photo: Espen Lind

Norsk Innspillingsbyra AS, Oslo, Norway

Jeff Hedback of HD Acoustics designed this production and mixing studio for songwriter/producer Espen Lind. The facility comprises a 900-square-foot multifunction space plus an iso booth with 16-foot ceilings and an upper coupled space/chamber. Hedback's design implements acoustical products from ASC Attack Wall, GIK Acoustics, RealTraps, Auralex and Resonator Stockholm Optiffusers. Espen's equipment includes an Avid D-Command, Pro Tools HDX, Guzauski-Swist GS3A monitors and an EMT 140 stereo plate reverb.

Photo: Jay Kaufman

Ninja Tracks, Encino, Calif.

Kaveh Cohen and Michael Nielsen's new production facility was designed by Jay Kaufman with efficiency and creative freedom in mind. It houses two production studios, an iso room and machine room, as well as office and kitchen facilities, and a living room that doubles as a reverberant live room when needed. Kaufman designed custom acoustical treatments for each space. Key equipment includes Mac Pro workstations running Logic Pro and 128 channels of Apogee Symphony, Barefoot MicroMain 27 monitors, and processing from API, Manley, Neve, Overstayer and more.

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Bunkersound, Chapel Hill, N.C.

This facility's reflection-free-zone control room employs RPG diffusors and diffsorptive side wall treatments designed to help extend the sweet spot into the rear of the room. Tracking room treatments also include a complement of RPG diffusion, absorption and bass trapping. Bunkersound was designed by the Wes Lachot Design Group. Equipment includes a Neve Genesys console, Pro Tools HDX system with Apogee Symphony converters, and ATC SCM 110ASL main monitors.

Photo: Wes Lachot

Photo: Andy Hutchinson

Zelig Studio, London

Award-winning designer Steve Durr collaborated with UK-based designer Chris Walls and DDC construction to create this warm, flexible personal studio for producer/composer Mark Ronson (Amy Winehouse, Rufus Wainwright, Kaiser Chiefs, etc.). This unique room design incorporates both the vibe for capturing live music and the flexibility for creating a performance. The studio is situated in London's Tileyard studio complex and features a 32-input MCI 528 console refurbished by Malcolm Atkin, Studer A800 tape machine, Scully 8-track recorder, and a wide selection of vintage outboard gear.

Sony PlayStation Recording Studios, San Mateo, Calif.

The game giant's new audio facility, designed by Chris Pelonis, opened last August and appeared on *Mix*'s cover the following month. Nineteen studios were constructed in a 25,000-square-foot complex that accommodates an extensive range of audio disciplines. Pelonis' unique approach to design provides variable acoustics to support an unlimited array of recording palettes. All rooms are designed and optimized for stereo to 7.1 playback. A 1,500-square-foot live recording suite is equipped with an API 1608 and Avid D-Command hybrid console, and a 7.1 post/game-mix stage featuring an Avid System 5 Fusion. All rooms feature Pelonis Signature Series speaker systems.

Photo: Marc Senasac

Photo: Russ Berger Design Group

HEARby Sound, Seattle, Wash.

Studio owners John and Nannette Buroker worked with the Russ Berger Design Group to transform a storefront into this busy facility, where they provide sound design, audio post and custom music services. RBDG's acoustical design isolates the control room, studio and support spaces from nearby streets. The studio was designed to provide client comfort and freedom from the typical studio "box," with a sophisticated vibe. Featured equipment includes top-quality vocal microphones, preamps from API, Wunder, Helios, and Chandler Limited, and a Genelec 8050 5.1 system. ■

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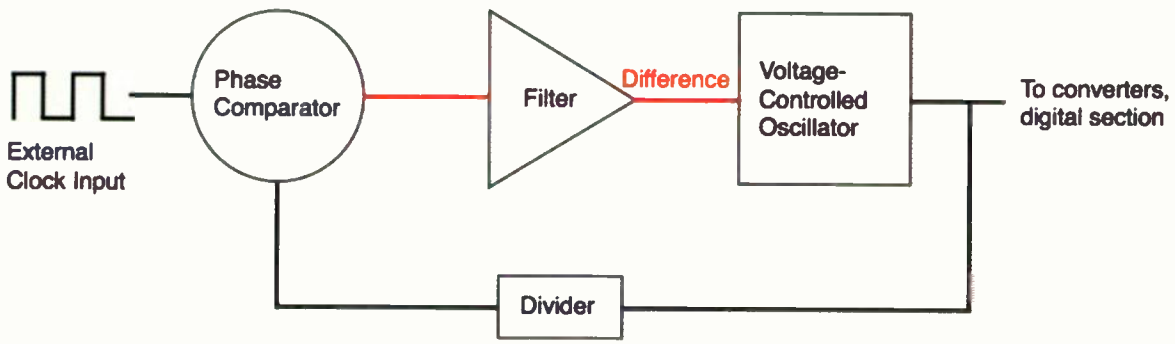
SAMSON

DIGITAL AUDIO CLOCKS

HOW THEY WORK AND WHY YOU NEED THEM

BY MICHAEL COOPER



Courtesy of Apogee Electronics

Fig. 1: The block diagram for a traditional phase-locked loop circuit, or PLL.

Good timing is the difference between salad and compost. As in most things in life, timing is critical to success. In digital audio systems, it's what makes audio sound pristine instead of like garbage. Multiple pieces of interconnected digital gear must operate in perfect synchrony to produce great results.

This month, Mix looks at the linchpins for synchronizing digital-audio systems for music production: master clocks and clock-distribution boxes. We'll discuss what these devices do and how they (sometimes) differ. We'll examine why rock-solid clocking is so crucial to producing high-quality sound and how manufacturers incorporate innovative designs to improve the quality and reliability of their clocks. Our journey begins with a look at the heart of most digital clocks: the humble crystal.

GOOD VIBRATIONS

In order to transduce and transmit audio properly, a digital audio device uses an internal clock that regulates the rate of flow—the sampling frequency—of digital 1s and 0s in its bitstream. The clock typically uses a crystal that physically vibrates when excited by an electric current. At the factory that supplies pro-audio manufacturers with these crystals, the size and shape of each is tweaked to make it oscillate at a very specific frequency. Interestingly, this frequency is way higher than what is ultimately desired for use in digital audio; a multiplier divides it to yield one of the nominal sampling frequencies used in production.

For example, converters made by Lynx Studio Technology include crystals that oscillate at 11.2896 MHz, which rate is then divided by 256 to achieve the nominal sampling rate of 44.1 kHz. Crystal-based clocks that operate at various sampling frequencies need a separate crystal oscillator for each base frequency: 44.1 kHz and 48 kHz. The crystals do double-duty to also produce sampling frequencies that are multiples of 44.1 and 48 kHz.

The rate at which these crystals vibrate is quite precise, although not exactly the same from one crystal to another. Bob Bauman, cofounder and chief hardware engineer for Lynx, elaborates: "Crystal oscillators are spec'd for drift over temperature and time. You can get very accurate oscillators that will drift over 0 to 70 degrees Celsius only five parts per million or lower." To further increase the stability of their crystal-based clocks, some manufacturers use an oven to keep the crystal heated to a constant temperature. "Oven-controlled oscillators are the most accurate," says Bauman. "By maintaining the [crystal's] temperature, you maintain the [clock's] frequency to phenomenal tolerance."

Phenomenal, but not zero. Every clock is subject to some drift away from its nominal frequency due to aging of the crystal and other factors. This causes huge problems when you hook up multiple digital audio boxes together and attempt to operate them all using their internal clocks, none of which exactly match the others in frequency. All the pieces in a digital-audio system—stand-alone A/D and D/A converters, I/O boxes, mixers, signal processors and so on—must operate at exactly the same sampling frequency from moment to moment, or the

system will quickly fail to pass audio. (The time to failure depends on the quality of each clock.)

In addition to frequency drift, every clock is subject to some amount of jitter, or short-term deviations from the nominal sampling frequency. Put another way, jitter is fluctuation in the time interval between successive pairs of samples in the bitstream. The inconsistency in sampling intervals causes distortion in the shape of the resulting waveform.

High amounts of jitter can cause audible clicks and pops in the audio path. But even a tiny amount of jitter affects audio quality: The soundstage for stereo tracks narrows, localization in the stereo field becomes vague, bass instruments sound flabby and unfocused, high frequencies sound harsh and glassy, and the overall sound becomes slightly veiled. As jitter is reduced, clarity improves, highs sound sweeter, the bottom end tightens up, the soundstage widens and imaging trends toward pinpoint accuracy.

TRADITIONAL SOLUTIONS

To reduce jitter and prevent loss of lock due to clock-frequency drift, every digital audio device in an integrated system should synchronize its internal clock to the same reference—a master clock. The master clock can be generated by any box (such as an A/D converter) in your system, but you must designate one and only one clock as master in order for the system to work. It pays to select the master clock wisely. The less jitter the master clock produces, the better the sound quality will be for your productions.

The way in which the master clock is distributed throughout your digital-audio system also affects the amount of jitter generated. The flakiest setup is to use the word clock output—or alternatively an unused AES/EBU or S/PDIF output—on your designated master device to route clock from one digital box to another in series throughout your system. (AES/EBU and S/PDIF bitstreams contain word clock embedded in their audio data; their interfaces can use the embedded clock just like dedicated word-clock connections do to synchronize another digital device, even when outputting only digital black [no audio].)

Daisychaining word clock from one device to another causes a progressive accumulation of jitter with each box the clock signal passes through. A better solution is to use a clock-distribution box—a master clock with multiple outputs powered by built-in distribution amps—to deliver clock signals directly and discretely to each box in the system in a star configuration. Antelope Audio, Apogee Electronics, Black Lion Audio and Drawmer are a few of the companies that make clock distributors.

Each box in a digital audio system synchronizes to

The C777 clock in Apogee's Big Ben Master Digital Clock executes many of the traditional PLL's functions in DSP, attenuating jitter and increasing tolerance of clock-frequency drift.

the master clock using an ingenious circuit variously called a phase-locked loop or phase lock loop (PLL; see Fig. 1). Inside the PLL, a voltage-controlled oscillator supersedes the crystal in generating clock signal whenever the box is switched to external sync; the VCO-generated clock drives the box's internal digital circuitry and converters. The VCO tries to match its clock's phase to that of the incoming master clock by locking to every edge of the word clock's square wave. It does this by looping its output back to a phase comparator that's placed before the VCO in the PLL circuit.

According to Roger Robindoré, Director of Product Evangelism at Apogee Electronics, the PLL's phase comparator "creates a voltage based on the phase and frequency difference between the oscillator's looped-back output and the external clock input." This so-called difference voltage tells the VCO whether to speed up or slow down on an ongoing basis in order to minimize the phase difference between the clock it generates and incoming master clock. But there's a twist: In order to keep the VCO from reproducing and thereby propagating any jitter in this difference voltage, traditional PLLs use a lowpass filter to slow down the rate of voltage change. While this VCO design effectively attenuates jitter, it's also less capable of locking to an external clock that deviates a lot from the nominal sampling rate, either due to quality degradation or practical applications such as varispeed or video pull-up/pull-down. Loss of lock can cause audible dropouts.

NEW DESIGNS

To address the traditional PLL's tradeoff between jitter attenuation and the ability to lock to a wide range of external clock frequencies, Apogee dreamt up an innovative clock design.

The Apogee C777 clock—used in the company's Big Ben, X-Series and Symphony I/O—substitutes a Direct Digital Synthesizer for the traditional PLL's analog VCO. The DDS constructs a sine wave in the digital domain, basing its frequency on that for an external clock signal; the DDS can accept a wide range of sampling rates. A crystal governs the rate at which this sine wave is assembled and then converted to the ana-

log square wave needed for clocking; since a crystal controls this process, the result is a low-jitter clock. Apogee states that because the DDS is a digital circuit, there is "no analog over/under-shoot or settling time, no component aging or temperature drift."

The C777 clock also uses Apogee's DSP-based Adaptive Loop Filter, which dynamically adapts to external clock in the digital domain. Unlike with an analog LPF, the ALF can loosen its action to maintain lock when the quality of inputted external clock is degraded. Afterward, when the external clock's quality improves, the ALF can tighten its action to keep jitter to a minimum. In this way, the C777 dynamically addresses both jitter and clock-frequency tolerance.

Antelope Audio takes a very different tack in addressing both clock-frequency drift and jitter. Their Isochrone 10M Rubidium Atomic Reference Generator serves as an uber-master for their crystal oscillator-based master clocks (which include the company's OCX, Trinity, Eclipse and Orion). According to Marcel James, Antelope's North American Dealer Representative, the 10M's purpose is "to give you an ultra-stable source rate for our other (crystal-based) clocking products that overrides (their) crystals." James contends that even the very best crystal oscillators (including oven-controlled ones) will drift by one sample per second. Two synchronized atomic clocks, on the other hand, "will remain sample-accurate for eight days," he says. "It's a hundred-thousand times more stable." All of Antelope's crystal-based clocks can connect to the 10M, and their crystals are oven-controlled.

Instead of exciting a crystal, the 10M resonates rubidium gas, an atomic element, with a radio frequency operating at a 10MHz rate. James says the 10MHz rate is used because it is easily divisible when converting to one of the nominal sampling rates used for digital audio. He casts the 10M as an optional upgrade to Antelope's master clocks and converters, which many users operate without the 10M. He maintains that all clocks should ideally include an atomic clock circuit, but he recognizes its high cost is prohibitive for many users.

The 10M's matching transformer extends the maximum cable run for word clock roughly ten-fold—to around 150 feet—using standard word-clock cable. That makes the 10M a compelling solution for synchronizing master clocks and converters throughout a multi-room facility.

Antelope also differentiates their products by deliberately incorporating random jitter in their core technology. "Some jitter is good," James asserts. "We like some distortion in our audio. Once we remove the jitter, we actually induce small amounts of controlled jitter in our jitter-management module that resides

To reduce jitter and prevent loss of lock due to clock-frequency drift, every digital audio device in an integrated system should synchronize its internal clock to the same reference—a master clock.

in our crystal-based clock. We're talking about really carefully calculated, randomized jitter. This is done to humanize the digital chips used for the conversion process, to make them sound more natural."

NOT EVERYONE AGREES

From Lynx's perspective, companies that use atomic clocks in their designs place undue emphasis on controlling frequency drift over the long haul, when they should be concerned about how much drift there is from sample to sample. "Atomic clocks are very good at long-term accuracy," Lynx's Bauman allows. "The problem is they're not very good at sample-rate period time. They don't have great jitter specs. In clocking in A/D and D/A converters, the most important thing is we want as low jitter as possible to reduce artifacts in the conversion process. You don't have to have that good a clock [simply] to lock a bunch of equipment together."

Bauman also disputes that using an external master clock to synchronize converters will necessarily make them sound better. "If that's the case," Bauman asserts, "the clock-generation system inside the A/D or D/A converter was not designed correctly in the first place. A [external] clock can change the sound of your converter, but in our case it always makes it worse, in terms of accuracy of conversion. You are adding distortion artifacts, some non-harmonic. But I don't discount the fact that some people may like that [sound] better."

Antelope's James rebuts Bauman's argument that an internal clock will outperform one driven externally. He attributes this to the box not being able to properly follow external sync: "The benefit of a very well-designed clock outweighs the disadvantages of having to clock externally, in most cases. There's one main caveat: Does the re-synthesis of the [slave's] circuit itself ignore a jitter imprint? There are some converters that de-jitter anything coming in, which can ignore some of the benefits that our clocking has."

Bauman also questions the accuracy of Apogee's DDS. (Lynx uses in all their recent products an analog PLL for very fast locking, followed by a hybrid PLL scheme called SynchroLock that generates a low-jitter

All current Lynx converters use a hybrid PLL circuit called SynchroLock, together with an analog PLL, to reduce jitter in external clock signals. The Lynx Hilo converter is shown here.

clock.) He argues that because DDS synthesizes the different nominal sampling rates, arithmetic errors in that process—along with jitter inherent in the attendant crystal oscillator—create greater total jitter than what a crystal would produce on its own. Apogee's Robindoré acknowledges the theoretical potential for arithmetic errors to occur in digital synthesis but asserts the C777's rigorous engineering precludes them from arising.

HEAR FOR YOURSELF

Detractors of synching externally to a master clock maintain that attempting to generate phase-locked clock signal using the VCO in a PLL will always create more jitter than using an internal crystal would. And, they argue, the PLL will filter out any benefit bestowed by a superior external clock in the first place.

But let's face it, if you have multiple digital devices in your system, all but one must be externally synched to a designated master in order for the system to work. And not all converters—especially those used in garden-variety I/O boxes—sound good even when using their internal clock. In many cases, a rock-solid clock distributor can make a dramatic improvement in the sound of a digital system. I've heard it.

There are many other factors besides what's been presented here that go into making a terrific-sounding master clock, including the device's analog circuitry and power supply. In the end, the best strategy for potential buyers is to set up a blindfold-listening test of clocks made by different manufacturers—including boxes you already own—and select which one sounds best. Let your ears be your guide. ■

Mix contributing editor Michael Cooper is a recording, mix, mastering and post-production engineer and the owner of Michael Cooper Recording in Sisters, Ore.

Antelope Audio's Isochrone 10M Rubidium Atomic Reference Generator is an optional master synchronizer for the company's crystal oscillator-based master clocks.

ARTIFACT AUDIBILITY

BY ETHAN WINER

As professional recording engineers, our job is to capture musical performances as clearly and accurately as possible, especially acoustic music. Sure, when mixing pop and rock tunes, we often mangle sounds to make them more interesting. Creative use of EQ, compression, distortion and other effects is an important part of the job. But once a mix has been honed and approved, we aim to maintain the same tonality and clarity through to the listener's loudspeakers.

Two things conspire to degrade quality and clarity: frequency response errors, and various distortions and noises that I call, collectively, "artifacts." These include harmonic and intermodulation distortion, tape hiss, AC power hum and buzz, jitter noise, and other unwanted sounds. The most important property of an artifact is how loud it is. With practice we can learn to identify some types of artifacts at a fairly low volume, though at some level they'll be too soft to hear at all, even to the most well-trained ears.

Besides the overall volume of artifacts in relation to the music, two other factors affect their audibility: their frequency content and the masking effect. The equal loudness curves developed by Fletcher and Munson in the 1930s show that our ears are more sensitive to some frequencies than to others, depending on their loudness. In short, our hearing is most sensitive at frequencies around 2 to 4 kHz, and much less so at low frequencies. So artifacts containing treble frequencies are more audible than low-frequency rumble.

The masking effect is equally important because it determines how well we hear one sound in the presence of another. When standing next to a loud jackhammer, you won't hear someone talking softly 10 feet away. Masking is strongest when both sounds have similar frequency ranges. Therefore, when playing a cassette tape you might hear tape hiss during a bass solo, but not when cymbals or violins are prominent. Likewise, you'll easily hear low-frequency hum when only a tambourine plays, but maybe not during a floor tom solo. Note that masking affects only our ears. Spectrum analyzers can easily identify any frequency in the presence of any other frequency, even when one is 100 dB softer.

Earlier I mentioned that jitter manifests as noise, though it may or may not be random like tape hiss. Depending on its cause, jitter may appear as FM sidebands, which is more like IM distortion or digital aliasing. But jitter is still an artifact, and as such its audibility can be assessed like any other artifact. Some people believe jitter narrows the stereo width and harms bass response, though I've never witnessed compelling proof from a proper blind test. Similarly, truncation distortion occurs when reducing 24-bit audio files to 16 bits when dither is not applied, and some people believe this too affects fullness and imaging. However, fullness is a function of frequency response that's easily measured. And good imaging is related more to room acoustics and untamed reflections than low-level distortions and noise. Jitter artifacts are typically 100 dB or more below the music, and they simply can't have that effect.

A few years ago I experimented to learn at what level distortion and other artifacts are audible. I created a 100Hz sine wave in Sony Sound Forge, then added a 3kHz tone at various levels below the 100Hz tone. I picked those two frequencies because they're far apart to minimize masking, and our ears are most sensitive around 3 kHz. I inserted the 3kHz tone as a series of pulses that turn on and off once per second, making it even easier to spot. Tests like this are simple to do, and I urge everyone to experiment.

Note that when playing high-frequency sine waves through loudspeakers, you should move your head slightly while you listen. This avoids missing a high frequency that's present, but in an acoustic null. Even when a room is acoustically treated, nulls at high frequencies can exist every few inches, especially when playing a mono source through two loudspeakers at once. You can easily hear this by playing a 3kHz tone by itself, then moving your head a few inches in any direction. I also created a special noise file you can loop and insert at various levels behind music:

http://www.ethanwiner.com/noise.wav

This noise contains treble frequencies where our ears are most sensitive, so it's biased to favor those who believe very soft artifacts such as jitter are audible. If you can't hear it mixed under music at -70 dB, it's unlikely that jitter, which is much softer, will have any effect. Note that this file peaks at -20 dBFS because it's very irritating to hear at a normal volume. So when you mix it with music, it's actually 20 dB softer than the level control indicates.

I'm convinced that some people believe jitter affects fullness and imaging because of peaks and nulls in their listening room. Even in a well-treated room the response varies substantially at all frequencies over small distances. I've measured differences greater than 12 dB at 70 Hz in locations only four inches apart. At higher frequencies the level differences are even larger. So when switching your converter's clock, unless you keep your head in the exact same place within half an inch, the fullness or clarity really can vary, but not because the amount of jitter changed! ■

Ethan Winer has been an audio engineer and professional musician for more than 40 years. His new book, The Audio Expert, *is published by Focal Press.*

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PRODUCER/ ENGINEER/ MUSICIAN BRYAN BELL

Making a Laptop/Studio Hybrid Work

BY BLAIR JACKSON

If you've never heard of Nestler & Hawtin, a pair of soulful young singer-songwriters from Oregon, don't fret. They've barely ventured outside of their native Pacific Northwest during their time together. But the story of how their excellent first album, *Duality*, came together is a fascinating and instructive saga that says much about independent recording in this era of small budgets, but expanded opportunities to work in inexpensive and creative ways.

Okay, so not every act is going to be able to snag the likes of guitarist Ray Parker Jr., bassist Freddie Washington (Herbie Hancock, Steely Dan), keyboardist David K. Mathews (Santana), percussionist Karl Perazzo (Santana), guitarist Todd Carver (Tony Williams) and backup singer extraordinaire Vicki Randle, among others, nor hire mixer Niko Bolas and mastering ace Richard Dodd. Those folks ended up working on *Duality* because the album's versatile producer/mastermind, Bryan Bell, has built an incredible network of connections in more than 40 years in the music business. Bell's stamp is all over the album, and it is his ingenuity and studio know-how that allowed the album to be made the way it was without breaking the bank.

Nate Hawtin, Bryan Bell and Greg Netler at Falcon West Studios in Portland, Ore.

Bell has enjoyed an amazingly rich career in music. A fine guitarist and keyboardist, with a deep understanding of audio from a young age, he got his first big break when he met the great fusion guitarist John McLaughlin and was hired to mix front-of-house (and play some keyboards) for the third version of McLaughlin's Mahavishnu Orchestra in the mid-'70s. From there, Bell went to work for Herbie Hancock, for whom he also mixed FOH and worked as a keyboard tech and helped develop/invent systems and methodologies to better integrate Hancock's massive arsenal of synths and other keys—including a remarkable pre-MIDI setup—both onstage and in the studio.

His years with Hancock included the latter-day Headhunters and the all-star VSOP group, among many projects. He did mixing and tech for Santana for a period, then moved on to a stint working on computers (and playing keys on a few songs) with Neil Young and Crazy Horse. For the past 27 years, he has volunteered for the Bridge School, including the Technology Advisory Board and the Board of Directors.

He helped design and equip the studio for *The Tonight Show with Jay Leno* (through his connection to bandleader Branford Marsalis), and he has also spent decades developing his umbrella business, Synth-Bank, which includes everything from music production to audio engineering to consulting on technology for large and small companies—many not even involved with music. Bell's Synth-Bank pioneered the sales of sounds and music online in the 1980s. These days he does much of his work out of his "very ambitious project studio" in Gig Harbor, Wash. (near Seattle), although the *Duality* project would take him to many locales on the West Coast.

One could say that Bell's involvement with Greg Nestler (guitar and vo-

"Once you try the Audix i5 there's no turning back."

Richard 'Dickie' Chappell, Music Engineer - Peter Gabriel

Here's what engineers are saying about the i5:

"I have been using the I5 on snare (top and bottom) for five years, and it's become one of my favorites. This microphone has an incredible SPL response with a smooth low end, and is durable enough to stand up to all the abuse from touring."

Stephen Shaw - Front of House Engineer, Buckcherry

"When JD Blair is out with us, I use only Audix mics on his kit. I have also used them for Derico Watson (Victor Wooten Band) for years. For full clarity, body, and accurate snare reproduction, I trust only the i5. Audix has never let me down!"

Jack Trifiro - Front of House Engineer, Victor Wooten Band

"The best thing to happen to snare drums since Charlie Watts!"

Paul Hager - Front of House Engineer, Miley Cyrus

"The Audix i5 is a workhorse and is one of the most durable mics I own. It can adapt to most situations, but I prefer it on snare because it doesn't color the natural tone of the drum."

Joe Amato - Front of House Engineer, The Gaslight Anthem

"On the road you need three things: WD-40, gaffer tape, and an Audix i5. Use the first if it won't move, the second so it doesn't move, and use the i5 when it has to sound good. The Audix i5 is the thinking man's standard for an all-purpose snare mic."

Howard Burke - Front of House Engineer, Little Feat

"Thanks to the Audix i5, getting a great snare drum sound is something that I take for granted. The i5 is what style of music. It is equally outstanding on stage and in the studio. The i5 keeps everyone happy: drummers, engineers, producers, and the audience."

Charles A Martinez - Front of House Engineer, Steely Dan

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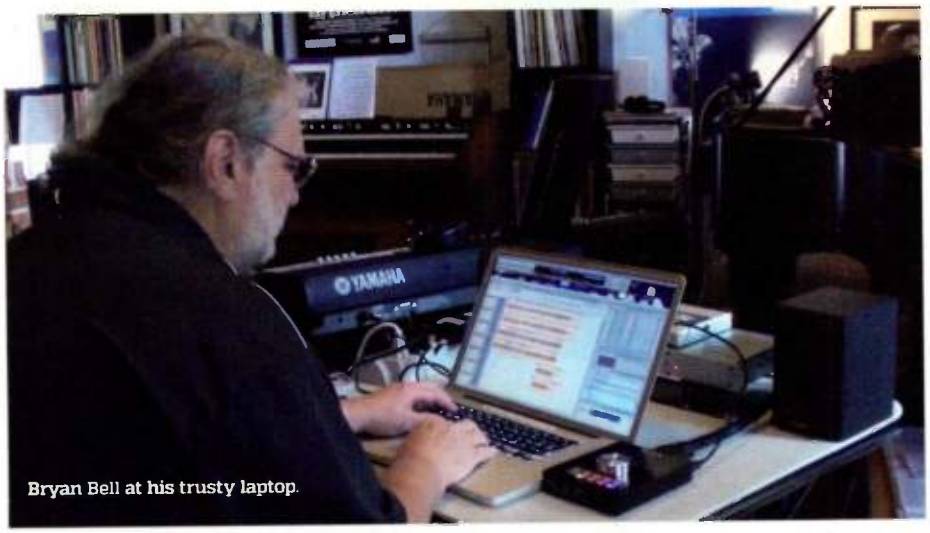
cals) and Nate Hawtin (guitar, cello, keyboards and vocals) was years in the making. "Greg was a family friend," Bell relates. "His grandmother is friends with my mother. So his mother used to come to my parents' Christmas parties [in Portland, where Bell partly grew up] and bring her kid in tow, when he was 11, 12, 13 years old. And he'd always hear the great exploits of Bryan Bell's touring life. It was like, 'Where's Bryan this year?' So this kid heard a lot about me growing up, and at some point he decided he wanted to write music. He started sending me demos at the age of 14. I'd say, 'This sucks, but keep going.' Fifteen: 'This sucks, keep going.' Same at 16. And by the time he was about 23, he sent me a demo that had 15 great songs, so I said, 'Okay, now let's make a record,'" he laughs. By that time, Nestler and Hawtin were out of college and playing as a duo, their voices blending beautifully, and crafting original tunes that moved from folk-ish numbers to R&B-flavored tunes and even some out-and-out rockers.

Hawtin and Nestler singing background vocals at Falcon West.

Bell immediately saw the potential to make an album that extended their sound from their acoustic base to something much deeper and more developed, with both jazz and rock shadings, or as Bell put it, "I wanted it to have some Steely Dan feel, or Paul Simon back when he used Steve Gadd and Richard Tee." In short, breezy and intelligent with solid grooves.

The challenges started immediately. "The problem was," Bell says, "we didn't have a budget, I was working a day job, and they lived in Oregon, so we had this distance problem—it was a five-hour drive to Eugene. So what we did is use WebEx software, which is like Skype—you can do video conferencing and screen sharing, and you can also do remote control, which means I can drive the other guy's computer. The one thing you can't do in WebEx is sync the audio properly, so the way we got around that later is we set up weekly video conferences, and we used email and Dropbox to move files. So, they'd start writing in Ga-



Bryan Bell at his trusty laptop.

rageBand and they'd record a piece of the song—a verse and a chorus, a bridge, something—and then we'd have this conference and we could email ideas back and forth.

"I was able to say, 'Try a counter-melody here,' or 'Let's make the chorus twice as long,' or 'Let's move the bridge to the front,' and because of WebEx, I could actually edit on their computer—I could reach into their screen and cut their GarageBand files. Or I might write a melody and say, 'How about this for the cello part?' and they'd record it in GarageBand and we'd go over it the next week.' It really was almost like we were sitting there together."

Once the songs were ship-shape lyrically and musically, Nestler and Hawtin went up to Bell's studio "and started working in Digital Performer, which is my favorite tool for both recording and editing. We rehearsed for a few days, we got the tempos perfect, we got the scratch guitar and scratch vocal at the right tempo and the right feel for all the tracks. We were recording in high resolution—96k—using groovy, expensive microphones and expensive preamps, so we're getting these first four to six tracks pristine in my home studio.

"Then we bought Digital Performer for their laptop, and from that point forward, we could use Dropbox. I'd say, 'I've written this part.' Or. 'Here's a new keyboard part,' and we would sync them using Dropbox. If they wrote a new cello part that was good, I could bring it into their master and into my master in sync."

During this initial recording stage the threesome concentrated on

Continued on p. 80

MIX REGIONAL: CHICAGO


Alex Vassiliades

CRC LIVE, FROM THE STUDIO

Chicago Recording Company recently started a project called CRC Live, which takes a close and personal look at music and the stories behind it. Filmed and recorded at CRC, the series is the brainchild of Producer Matthew Boll and director Michael Azzato, who came up with the idea while interns at the studio; it became a reality with the help of CRC general manager Chris Shepard. Each session is designed around the sound and look of the artist performing, featuring a set of songs (usually from the artist's new record), along with in-depth interviews on the stories behind the music.

So far, bands that have participated include Belfry Hollers, The Kickback, Future Monarchs and Alex Vassiliades. You can check out the latest CRC Live episodes at the studio website.

In other news at CRC, artist/actress Jennifer Hudson has been recording vocals and piano using CRC's 64-channel SSL console and Sony C-800 mic in Studio 5, with producer Harvey Mason and engineers Andrew Hey, Mat Lejeune and Austin Thompson; Chance the Rapper and singer-songwriter Elle Varner collaborated on a new song in Studio 5 with veteran engineer Jeff Lane; engineer Jon Zacks has been working with hip-hop artist Common on a new song and video intro in Studio 4; engineer Stan Oda has been recording VO in Studio 6 for two major video games slated to be released later this year and in early 2015; director Lee Daniels and the filming crew for the new Fox show Empire shot scenes in Studio 4 and Studio 3; engineer Danny Leake tracked a five-piece band for pop singer-songwriter/actress Katharine McPhee in Studio 5; and engineer Mat Lejeune spent a couple days with David Calson recording a five-piece rock band and 30-piece orchestra in Studio 4.

International Mix at Gravity Studios

Gravity Studios played host to an international mixing session for the touring British rock band, Anathema, during the band's two-day stop in Chicago before a performance at the House of Blues. This mix session gave Anathema the opportunity to simultaneously tour the States while working on their album. Anathema used Studio A at Gravity to monitor real-time audio sent from producer Christer Cederberg's studio in Norway; video conferencing to provide communication for mix adjustments between the band in Chicago, Cederberg in Norway, and a session guitarist in Liverpool; and screen-sharing for the band to view the Pro Tools session from Cederberg's studio as he made changes.

Cederberg set up a streaming Internet radio station that the band could access at Gravity. "We ran through our HD hardware in Studio A, which allowed the band to monitor their session through our ATC SCM25A and Yamaha NS-10 monitors," says Tim Yamaya, studio manager/producer/engineer. "The screen sharing was set up via Skype, and it allowed the connection of multiple screens and users to one video-conferencing session at once. This was the first time that we had done this at Gravity."

Meanwhile, in other studio news, the Silversun Pickups recorded new material, produced by Doug McBride; and Mike Penny recorded new tracks by OAR, mixed by McBride. The studio also hosted the Alabama Shakes while the band was in town.

SESSIONS: CHICAGO

RAX TRAX

Sertab Erener and Demir Demirkan of jazz/rock/fusion duo Painted on Water recorded their EP *Chicago Issue* in Studio A with Andy Shoemaker and mixed in studio B by Rick Barnes...Engineer Noam Wallenberg wrapped up tracking and mixing *The Near Future*, a full-length album for rock band I Fight Dragons, as well as singer-songwriter John Splithoff's EP *The Move*. Wallenberg is also in mid-production on Jennifer Hall's upcoming EP.

Marty Casey

STONECUTTER RECORDING STUDIOS

Tony Magee, founder of Lagunitas Brewing Company, is working on the debut album for his band Alice Drinks the Kool-Aid. Magee is working on the project with producer/engineer/mixer/Stonecutter studio owner Chris Steinmetz...Marty Casey, lead singer/guitarist for the alt-rock band Lovehammers and runner-up on the show *Rock Star: INXS* is working on new songs for a debut solo project, with Steinmetz producing.

The Neighbourhood in Soundscape Studios

SOUNDSCAPE STUDIOS

The Neighbourhood recently tracked "Let It Go" for *The Amazing Spider-Man 2* soundtrack, engineered by studio owner Michael Kolar and produced by The Neighbourhood in Studio A...Tinashe recorded a new record for an upcoming Dr Pepper compilation, engineered by Kolar in Studio A and produced by The Hood Internet...Chance the Rapper and Jeremih linked up with Purity Ring to work on a new record for Chance's upcoming album, *Social Experiment*. Jabari Rayford and Kolar engineered the project in Studio B, with Purity Ring producing.

Brian Cabby and Kendrick Lamar in Studio A

PRESSURE POINT

Hip-hop artist Kendrick Lamar worked on new tracks with producer Boi-1da, engineered by Brian Cabby...Future stopped by for an intimate Q&A and played his newly released record as part of a radio promotional tour...Other recent sessions—all engineered by Cabby—include Lil Durk, Tink, YG, Lil Herb, Chicago House legend Steve Hurly and Sharon Pass, and jazz/rap-hip-hop group Zaramela put the final touches on their latest album, *Gumbo*.

Photo by Xavier Williams

The Lipstiks William Neylon (standing), Matt Lavelle and Mitt Miles with engineer Brad McGrath.

BIG RIVER RECORDING

The Lipstiks were at the studio tracking and mixing their second album, *Afternoon Delights*, produced by The Lipstiks and Brad McGrath (McGrath also engineered)...Shift was at the studio tracking and mixing their third album, *Black Business Socks*, produced by Joe Hibbs and Mitt Miles, engineered by McGrath...Old Grand Dad was tracking and mixing their first album, produced by Dan Beasley, Cody Siragusa and Colin Brennan, engineered by McGrath... Count Rugen are tracking and mixing their second album, *Chapter 2*, produced by B. J. Gerk and engineered by McGrath.

Engineer Kris Anderson (left) and artist Reno Chinati.

STUDIO 11

Rapper Rockie Fresh recently finished up another release with producer The Gift and Studio 11 house engineers in Studio B...Reno Chinati completed his self-produced single "You Know" with engineer Kris Anderson on the board in Studio B...Chicago techno label Linear was in Studio A with mix engineer Alex Gross working on a remix collection of previous releases...Chicago house music group South Of Roosevelt put the finishing touches on their upcoming release *The Fresh Start* EP with engineer Dan Zorn in Studio A and Studio B.

CARTERCO RECORDING

West African guitarist Tal National worked on his second album for FatCat Records with producer Issoufou Hamadal Moumine and recording and mix engineer Jamie Carter, assisted by Shawn Wilson...Lil Durk worked on new material with producers Young Chop, Chase David, C-Sick and Paris Beuller, with Rich Laurel engineering...ProbCause worked on *WAVES* with producers Drew Mantia, EXMAG, Two Fresh, The Hood Internet, Wes P, Cofresi and Fortified Sounds, with Mantia engineering.

JoyRide Studio, From Devon Allman to Muddy Waters

(L to R) Blaise Barton, Tom Hambridge, Devon Allman, Marty Sammon, and Felton Crews

Now celebrating its 10th anniversary, JoyRide recently had a visit from Devon Allman—Gregg Allman's son—to track a new record to be released later this year. Producer/composer/drummer Tom Hambridge flew up from Nashville to produce the project from behind the drum kit.

"It was Devon's concept to record in Chicago to impart a gritty, blues-ier quality to the record," says JoyRide owner/engineer Blaise Barton. "Though it's not a blues record, per se, Tom asked me to recommend some Chicago blues musicians to flesh out the rhythm tracks, so I gave him bassist Felton Crews and guitar man Giles Corey, who both really delivered on Devon's record." Hambridge also invited Buddy Guy's keyboard player, Marty Sammon, with whom he worked producing Guy's past four records. Hambridge composed roughly half the songs on Devon's new record.

Also in production at JoyRide is the 100-year anniversary tribute album to blues legend Muddy Waters. The record features a who's who of Muddy's band mates from past years, including Johnny Winter, Muddy's harpist James Cotton, guitar players Bob Margolin and John Primer, and on drums the son of Willie "Big Eyes" Smith, Kenny Smith. Barton is again manning the boards and was reunited with friend and producer Larry Skoller. As a duo, Barton and Skoller have garnered two Grammy nominations from past collaborations at JoyRide.

"This is definitely not some tired old remake of Muddy's great discography," Barton says. "No one can make better recordings than Muddy did, and that's not what we're going for here. We've had the luxury of experimenting with new sounds for this blues record, including layered drum loops, Brazilian percussion and synth effects." The record is scheduled for release in September.

CHICAGO PRODUCER BRIAN DECK

BY BLAIR JACKSON

Brian Deck has been a leading light of the Chicago music scene for going on three decades now, one of those classic multi-hyphenates: musician-engineer-producer- studio owner, often all at the same time. As a musician, he has toured and recorded with such groups as Red Red Meat and Ugly Casanova, and also played on many of the albums he's produced (mostly, but not exclusively, drums/percussion and keyboards). He and producer Brad Wood opened the popular Wicker Park (Chicago) studio Idful Music in the late '80s, which hosted scads of mostly local indie bands. Then, Deck branched off and, with Red Red Meat and Califone percussionist Ben Massarella, started Clava Studios, where he worked with Modest Mouse and others. He was also a regular at Engine Studios up until it closed a couple of years ago.

His lengthy production/engineering credits include several albums with Iron & Wine (Sam Beam), Gomez, Califone, Secret Machines, John Cale, Langhorne Slim, The Shins, Ugly Casanova, Modest Mouse and Counting Crows. In fact, those last two, with whom he's worked on multiple projects through the years, are recent repeat customers: "I spent about five months in Portland last year working with Modest Mouse at their studio, and I just finished a Counting Crows record where I spent two months in San Francisco [actually, Berkeley's Fantasy Studios] and a couple of weeks in New York [mixing at the Magic Shop]," Deck says.

Growing up in the Chicago suburb of Crystal Lake, he aspired to play in rock bands in high school. "I graduated in '82, but it seems as though the music culture in our high school was very '60s-oriented; Doors and Zeppelin-centric," Deck says from his Chicago home studio. "I was in a Hendrix cover band, but in college was in new wave bands."

Deck attended Northern Illinois University, where he earned a degree in percussion performance. It was at NIU that he met Brad Wood (in the music program as a saxophonist), and the two first hatched schemes about working in recording, in part to support their playing. After interning and working at various downtown studios—including the top local jingle house, CRC—Deck, along with Wood and a third partner, Dan Sonis (who played with Deck in Lucky Mud), built Idful Music in 1989 and remained there until 1992, when the demands of playing music overwhelmed his studio life for a period.

"When I declared myself competent and started asking for people's money to make their records, I had a lot of confidence in my own aesthetic, which was heavily influenced by the bands I was in and the bands I was listening to," he says. "And all I was interested in doing at the time was becoming an extra member of the band while I was working on a project. I would play frequently, I would sing frequently, and that's a young man's approach to the job, and I know that alienated some people and some folks really liked it. I had some repeat clients back then, as well, but after a while you start to learn that if you want to continue to work in this field, you have to accommodate the people you're working for, so I started to understand that I needed to listen more to their explanations of what their artistic inspirations were and put the emphasis on making that the important thing. That being said, I think I went a little too far in that direction for several years and kind of lost myself. I learned I have to find that balance. For me, to be happy doing this thing, I have to be in some way expressing my own aesthetic and instincts, as well."

Does he think he has a "sound?" "I think everyone has a sound," Deck says. "No one is so versatile that they can just do anything and not adhere fairly closely to what they know how to do. I don't try to have a sound, but I'm absolutely sure that I have a sound and people come to me for what they think is my sound, and I think I've had different sounds over the years. For a while, people were attracted to the Red Red Meat sounds, and the Califone sound, and for the past few years people have been attracted to the Iron & Wine sound. That covers a lot of different sounds just within those."

He says his production influences "are probably all the same people that everyone else says. I loved the classics—love The Beatles, love the Stones, love Led Zeppelin. But through the Red Red Meat period we also went through a long time being influenced by the Folkways recordings and field records of early American music, and also by what Tom Waits was doing at the time on records like *Swordfish Trombones* and *Rain Dogs*—using a lot of room ambience that gives a place instant context."

He admits to missing Engine Studios, which drew many clients to him in Chicago for about a dozen years, but notes, "Since the demise of Engine, I work a bunch at Soma [Electronic Music Studios], John McEntire's place, and at Minbal, Benjamin Balcolm's studio. I've worked a little at Electrical [Audio], Steve Albini's place; I enjoyed that. Manny Sanchez just moved I.V. Lab to a new, bigger space and I want to check that out. I need to find more places in town to work since I don't have Engine anymore."

The good news is the acts still come to him, famous ones and unknowns, and he's fine with working outside Chicago, too. "I get a lot of repeat business," he says, "so I must be doing something right."

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COLUMBIA COLLEGE, CHICAGO

BY TOM KENNY

Colleges, especially long-established ones, tend to develop their own cultures. For Columbia College, founded as and Oratory School in 1890 and today a four-year liberal arts institution, that culture runs deep and is rooted in Chicago itself. Downtown. The Loop. The El and the energy. The arts, the music, the food, the performances. A city very much alive and vibrant, with an arts and media college right in the heart of it. If you've ever been on Michigan Avenue, you can almost picture the sidewalks.

Within Columbia College, within the School of Media Arts, is the equally vibrant and active department of Audio Arts & Acoustics, which over the past few years has refined its core curriculum by incorporating hearing physiology, psychoacoustics and more acoustics; created cross-disciplinary links to the Music, Business & Entrepreneurship, Cinema Art + Science, TV, theater and game programs within the college; and established three distinct degrees—B.A. in Audio Design & Production, B.A. in Live and Installed Sound, and a B.S. in Acoustics.

"One of the essences of Audio Arts & Acoustics, one that we are really proud of, is that we've created a department that addresses the widest range of opportunities for people interested in studying sound, music, acoustics and hearing," says Benj Kanters, associate chairman of the department and a professor there since 1993, this following graduation from Northwestern in Radio and TV, a live sound/club career (Amazing Grace) in the '70s, and a studio owner/engineer career (Studio Media in Evanston, still open, with three rooms) in the '80s. In the early '90s, looking for a life with more normal family hours, he went to part-time engineering and began teaching at Columbia. He went back and got his master's at Northwestern, and for the past decade has focused on hearing education and research.

"We all credit Doug Jones and Howard Sandroff for really envisioning the department as it is today," he continues. "Doug was the one who brought me here, and he was chairman until 2009. We had acoustics courses back then. We had sound system design courses—even back in the early 1990s we were looking at this very broad range of opportunities. Then Pantelis has come in and taken that concept to a whole new level."

When Dr. Pantelis Vassilakis, chairman of the department since 2009, came over from nearby DePaul in 2007 to teach part-time, he found, he says, "a macrocosm of what I've done all my life. I saw a collection of individuals who are all passionate about sound, and they have deep expertise in all the areas I've dabbled in all my professional life, whether it's studio recording or sound system design, live sound, research in hearing, timbre and perception, sound for picture. All of them in one department! To me it was Disneyland!"

Vassilakis is one of those rare individuals who lives very comfortably in a fluid left-brain/right-brain world. He studied electrical engineering in Greece, got a B.A. in Music Composition and Technology from Kingston University in England, and M.A. and Ph.D. degrees in Ethnomusicology from UCLA, with emphasis on perception, acoustics and aesthetics, as well as a post-doc certificate in Auditory Science.

"No matter what sound is—the sound of an 8-track cassette or the sound of a Harley Davidson—no matter what I am trying to control, I have to understand sound as a physical entity," he says. "That's acoustics, a very broad field, based on physics and math. Then I need to understand how the ear works, the last filter before sound goes to the brain. Finally, I have to understand how the two interact to give rise to sound perception, i.e., psychoacoustics. I, the student, now have the key ingredients to systematically control how sounds sound."

Students in Control B, the in-the-box studio with faders and a quality analog front end.

Photo: Benj Kanters

"We have a few core principles, and one of them is that audio is science," adds Kanters. "Audio is also hearing and perception. And all are supported by math. Those are three key food groups in an audio education. And they make up a core of four courses every student takes in audio theory and hearing. Then there is a four-course production sequence that is tools, techniques and aesthetic-based. Those two cores run in parallel, so as they progress through the program, they have a steady diet of theory and practice."

Still, it's not all science and math. The "practice" takes place in the API Legacy/ATC monitor-equipped Control A, where traditions and foundations are emphasized; and Control B, converted to an all-in-the box studio, with fader control and a sweet collection of front-end gear, including two pairs of UA pre's, a Hardy M1, some Focusrite and GML, an API Lunchbox and Distressors and 1176s. "We invested in solid analog gear that will never grow old," Kanters says. "Then once you're in the interface, you're in the digital world."

From that core curriculum and core facility, students then pick Audio Design & Production, Live and Installed Sound, or Acoustics as a major, with required side trips into the Music and Business & Entrepreneurship departments, and highly encouraged forays into cross-disciplinary coursework in cinema sound, TV, interactive/game sound and theater—all the benefits of studying sound in a culturally rich, inner-city arts and media college.

"The competition to be a recording engineer is incredibly stiff ," Kanters concludes. "But if you love audio, there are a lot of wonderful options out there."

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RobairReport

IN THE KNOW

By Gino Robair

This fact seems obvious, yet it surprises many when they hear it: In the beginning, people who wanted to make recordings built their own gear to meet their needs.

I was reminded of this while reading Sir George Martin's frank autobiography *All You Need Is Ears* (St. Martin's Griffin). Early on, he introduces Oscar Preuss, the head of Parlophone in the early '50s, as someone who started his career as a teenage apprentice engineer, making "diaphragms and needles for the early types of phonograph, including the old cylinder machines, because in those days the engineer who did the actual recording used to make his own machinery."

Clearly, knowing how your gear works increases your chances of getting the best results. Am I stating the obvious? How many drummers have you recorded who know how to tune their drums?

The topic of, "What does this thing actually do?" comes to a head at the end of every semester when I discuss the concepts of mixing and mastering with my students as they finish their final projects. They often have a difficult time wrapping their heads around the difference between the two processes—"Why can't I just put Maxim on the mix bus and call it a day?" So we step back and review the tortured progression of recording technology and why this division of labor currently exists.

CONTEXT IS KING

Even within an Introduction to Pro Tools class, which would typically only cover the main features of the program and its keyboard shortcuts, there has be some historical perspective given; students cannot effectively use the product unless they have an understanding of why we do things a certain way. They need context.

So, we look at examples of how instruments were balanced since the dawn of the recording age, and how, over time, the componentry gradually evolved in such a way that we could capture and play back the full frequency spectrum and dynamic range of sound.

As a demonstration of acoustical playback (and to reinforce Sir George's quote), I conduct a simple experiment using a turntable and a handful of old records. I take an ordinary sheet of paper from the laser printer and place one of its corners into the groove of a spinning disc: Instant speaker! It's a crude example, but it gives the students an idea of the physicality of the technology.

From monaural recording and playback, we move to stereo and examine how engineers explored the concept early on. This leads to a discussion of the limitations of playback formats and the kinds of compromises you have to make to accommodate them.

WHO KNEW?

Remarkably, these topics aren't just for beginners. I recently attended a Recording Academy event at Michael Romanowski Mastering, where several dozen professional musicians came to find out what mastering engineers actually do. It was a real eye-opener.

People in all aspects of the music biz have surprisingly little knowledge about anything that happens to music after it has been recorded. One could argue that this is the reason so much modern music sounds the way it does, despite the best intentions of mixing and mastering engineers.

Knowing what to listen for on the technical side is a critical skill that all musicians should have. If they don't know what the mastering engineer is doing to their music, how are they going to know what questions to ask, what to listen for and, ultimately, figure out how they want the final product to sound?

In fact, one of the revelations that I heard attendees mention was that it was okay to ask questions about the results of the mastering job. Once they find out that it's not "magic" and "voodoo" but about subtle adjustments, they realize that they can have a say in it, once they know what to listen for.

Although you probably don't want your artists looking over your shoulder while you work and asking you to add 2 dB at 4 kHz, you do want them to care enough about the music to carefully audition the results on reliable playback devices so they can make informed decisions about the project at every stage.

PRIORITIES

I'm not advocating that all musicians need to acquire the skills and equipment to record, mix and master their own music. As with publishing and copyright, these are aspects of the profession they need to understand in order to see through the BS and to protect themselves. Ultimately, technology shouldn't get in the way, but it is interesting to see how priorities can be misplaced.

I recently overheard a discussion between a well-known producer and younger engineer about the former's use of active monitors. The producer liked these particular speakers because they were portable and provided a consistent sound when visiting various studios. The engineer, clearly eager to impress, outlined the number of compromises in sound quality that have to be made when an amp is enclosed in a speaker cabinet.

Unfazed, the producer simply pointed out that the fact that the monitors were internally powered didn't stop his artists from recording great music. ■

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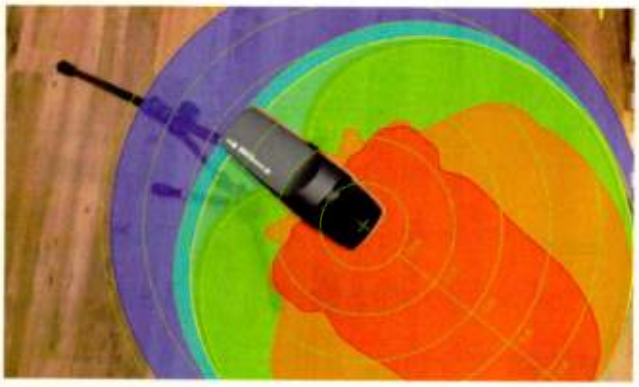


ARATECHLABS ARAPOLARMIC

Mic Directivity Monitor for iPad

Arapolarmic ($170) is a professional audio software tool for visually monitoring the directivity of microphones. With the technical data of each microphone modeled, the tool monitors the scene in real time, tracking the microphone's position while displaying its directivity onscreen. Current microphones supported include models from Lewitt Audio, Audix, Schoeps, Beyerdynamic, Violet Microphones, Mojave and DPA Microphones.

NEUMANN KH 120 D DIGITAL STUDIO MONITORS

Analog, AES and S/PDIF Inputs

The KH 120 D promises to set a new standard of sonic quality and price versus performance ratio in a compact near-field monitor. Features include an additional BNC input for AES/EBU or S/PDIF formats (24-bit/192 kHz) and digital delay (400ms max) for both analog and digital inputs, enabling the monitor to be used for workflows requiring time alignment, such as audio/video sync. Other features include a Mathematically Modeled Dispersion waveguide, flexible acoustical controls, analog Class-A/B amplifiers, and an extensive range of mounting hardware.

TASCAM CLOCK GENERATORS

Timekeepers for Broadcast, Post, Recording

The CG-2000, CG-1800 and CG-1000 clock generators from Tascam were specifically designed for broadcast, post-production and professional recording workflows. Equipped with high-precision internal OCXO (Oven Controlled Xtal Oscillator) clocks, each unit is said to offer users a much more accurate system compared to rubidium or GPS 10MHz clocks. The three units each excel in jitter management and glitch-free relocking. CG-2000 features two power supplies and is designed for broadcast, the CG-1800 for audio post supports NTSC, PAL, S/PDIF for audio and HD Tri-level for video, word and AES 3/11. The CG-1000 for recording studios offers a supremely accurate clock with external inputs that support up to 10MHz.

CHANDLER TG2-500

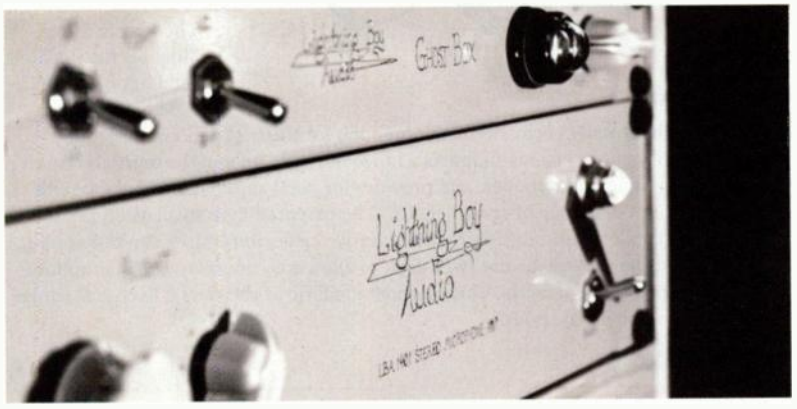
500 Series Pre With History

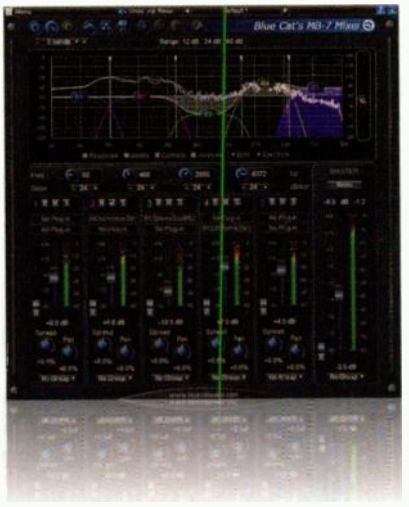
Chandler Limited's TG2-500 preamp ($995) delivers the classic sound of the EMI TG12428 preamp in a 500 Series module. Features include the identical TG2 circuit, transistors and transformers, with 60 dB of gain and a coarse and fine gain control as found on EMI consoles. Sonically, the TG2-500 has the same high-frequency bump and mid-forward tone that users enjoy with the TG2, along with the warmth-inducing distortion that contributes to its sound.

LIGHTNING BOY 1401 PREAMP AND GHOST BOX

Stereo Tube Gain Plus P48 Supply

The Lightning Boy 1401 Preamp ($1,799.99) and separate P48 power supply ($699) features NOS paper in oil capacitors, NOS tubes, Carnhill iron and the careful layout of point-to-point wiring. The 1401 front panel features gain and passive treble controls for two channels. The Ghost Box provides phantom power, phase invert switches and passive low cut switches for each channel. The Ghost Box offers a new take on phantom power, using a 6X4WA Rectifier tube to create 48-volt DC and an NE-16 Neon Regulator tube to regulate the voltage.





BLUE CAT PATCH-WORK

Breakthrough Plug-in Manager

Blue Cat's Patch-Work ($79) can be described as a "universal plug-ins patchbay." It can host up to 64 VST plug-ins in any DAW. With Patch-Work, it is possible to chain effects in series or create up to eight parallel chains that can be activated independently, plus create many effects or instruments configurations within the plug-in without the need for multiple buses. These configurations can be saved as presets and recalled instantly, or shared with multiple DAWs, using any plug-in format. For each plug-in slot, latency compensation, presets management, undo/redo integration, and individual plug-in bypass are included for optimal operation. Additionally, plug-in layout is restored with the session or saved with presets.

UNIVERSAL AUDIO NEVE 1073 PLUG-IN COLLECTION

Classic Vibe For Your DAW

Billed as a true end-to-end circuit emulation of the original Neve 1073 channel amplifier, the latest offering from Universal Audio brings the 1073 classic vibe to UAD Powered Plug-ins and Apollo interfaces. The collection features presets from famous Neve 1073 users, including Joe Chiccarelli, Ed Cherney, Jacquire King, Ryan Hewitt, and more. The Neve 1073 Preamp & EQ Collection includes the legacy Neve 1073 and 1073SE "DSP light" plug-ins. The price is $299 ($149 for owners of the legacy Neve 1073/1073SE Classic Console EQ plug-ins).

EAR TRUMPET LABS MABEL

Mic With An Attitude

Mabel from Ear Trumpet Labs ($1,000) is a hand-built multipattern condenser microphone using two cardioid medium-large diaphragm (26mm) capsules. Mabel features a unique copper-ringed head basket with brass grille work, held in a pivoting mount in a stainless-steel yoke, and a copper-and-brass body. The pivoting head makes for easy positioning adjustments. The capsules are a pair of fixed-cardioid electret condensers, individually tested and selected to match each other. The circuit is a transformerless FET with fully balanced output, incorporating thorough EMI protection. Other electrical components in the signal path are of the highest-quality metal film resistors, polypropylene and polystyrene capacitors, and individually tested, hand-matched and biased transistors and JFETs.

New Sound Reinforcement Products

SHURE SM35 PERFORMANCE HEADSET

Affordable, High-Quality Headworn Mic

The Shure SM35 headset ($99) is constructed to provide a secure, comfortable fit via an adjustable and sturdy harness. It features a condenser cartridge with cardioid polar pattern available in wired XLR or wireless TQG version. The SM35 is offered for use with the BLX Wireless System, GLX-D Digital Wireless System, and ULX-D Digital Wireless System.

RYCOTE SUPER-SHIELD

Versatile Mic Enclosure

The Rycote Super-Shield is the updated version of Rycote's rigid basket windshield that totally encloses the microphone for the best wind noise reduction. The central chassis supports a range of "pods" in lengths to fit almost all location-style microphones, and provides for good aerodynamic balance and adjustment of center-of-mass balance. The patented Lyre suspension isolates the microphone, and together with a captive cable, minimizes handling noise. The pods have a fast-to-use twist-lock to allow easy access to the microphone. The Super-Shield uses the same laminated fabric as the classic Rycote Modular System to cover the pods.

DPA D:SCREET OMNIDIRECTIONAL MINIATURE NECKLACE MICROPHONE

Easy Mounting, High Quality

The DPA d:screet Omni necklace microphone ($650) is perfect for collecting production audio and other settings where the mic's presence is not a problem audio engineers don't have to worry about how to attach it to clothing. It features DPA's legendary d:screet 4061 Omnidirectional Miniature Capsule in a soft rubber necklace, the mic offers fast, repeatable, "do-it-yourself" mounting and can be mounted on non-technicial personnel. The d:screet Necklace Mic comes in black, white and brown and in lengths of either 18.3 or 20.9 inches.

GRUND GA-2021 LINE ARRAY

Better Setup Precision and Storage

The GA-2021 line array ($3,679) has been updated with revised flyware and a new transport case ($1,599). The revisions focus on an increase in the amount of angles that can be defined for the GA-2021 enclosures. The pinouts now cover a range from 1 degree to 10 degrees—facilitating greater variety in the number of line array curves available. Other features include a new pin storage arrangement, and the enclosures themselves offer a new exterior finish. Pin storage is now located on the front of the enclosure—resulting in fast access when rigging the system.

By Barry Rudolph

Q2 AUDIO ADR COMPEX LIMITER F760X-RS

Faithful Reissue of 1960s Classic

The F760X-RS can be ordered with balanced IO via the transformer option.

The history of the ADR Compex Limiter F760X RS goes back to the late '60s in England when Audio & Design Recording made the single-knob F600 compressor module. It used a diode bridge gain changing circuit and had fixed attack and release times. Later on, the single-channel F760X-N compressor module used an FET gain cell, had variable attack, release and ratio controls, and also included a peak limiter and expander/gate. In 1973, ADR came out with a stand-alone three-rackspace, 2-channel version that was subsequently repackaged into a two-rackspace unit and badged as the Compex Limiter F760X-RS.

The reissued F760X-RS, made by Q2 Audio in the U.S., is built in an all-steel two-rackspace cabinet with an internal linear world power supply and maintains exactly the same design, sound and many of the operational quirks as the 2-channel models sold in 1980. Modern updates include component upgrades that address reliability and long-term gain-staging stability—issues that plagued the original units. Changes include rear panel TRS sidechain jacks for either the compressor or the gate via an internal jumper, an input/output transformer option, and faster Simpson 2121 gain reduction meters.

VARILOSS FET-CONTROLLED AMPLIFIER

The Compex's compressor, limiter and expander/gate sections each produce independent control voltages that are scaled and summed together and then applied to a single, "variloss" FET-controlled amplifier gain cell. The inherent fidelity loss, noise buildup and interaction problems when chaining together separate analog processors is avoided by using a common gain changing cell.

There are 18 control knobs and 12 toggle switches on the Compex's front panel. Exactly the same as the original units from the psychedelic '60s, the control knobs have yellow collar pointers and are color-coded by function. The front-panel silk screening is color-coded by processor section, although it does not make reading them easier, especially the green color used on the Expander/Gate section.

There are separate in/out bypass switches and input and output trim controls for channels 1 and 2. The master stereo input and output pots control in/out levels for both channels at the same time. The two channels' compressor and expander/gate sections can be stereo-coupled; however, the limiter section always remains independent. The manual states, "Momentary attenuation of transients will not be appreciably noticeable with regard to image shift."

The limiter has a fixed 250µs attack time, 250ms release and a ratio of 100:1. The Pre.Emp position toggles in a passive, high-frequency boost circuit into the limiter's sidechain. A holdover from the original unit's use in broadcast audio chains, Pre.Emp mode tends to flatten out the transmitter's fixed 50µs pre-emphasis curve (by limiting more in the high frequencies) to achieve full modulation without overmodulating the high frequencies. In the recording studio, Pre.Emp mode can function as a subtle de-essser.

Two red LEDs (one for each channel) flash instantaneously whenever the limiter threshold is crossed as determined by the input level control(s); the limiter threshold can be anywhere below and up to +14 dBu. The unit's maximum output level is +18 dBu. The Jensen input and output transformer option allows for +22dBu maximum output and fully balanced I/O operation.

TRY THIS

You can use the Compex Limiter F760X-RS as a parallel processor by sending the same audio signal to both channels at the same time and processing each in a different way, and then playing each channel out on separate faders in your DAW mixer. This works great for snare, kicks, lead vocals and synths.

PRODUCT *SUMMARY*

COMPANY: Audio Design Recording
PRODUCT: Compex Limiter F760X-RS Reissue by Q2 Audio
WEBSITE: www.q2audio.com
PRICE: $2,750; transformer option $400
PROS: Awesome and colorful '60s processor updated for modern times.
CONS: Hard to read front panel silkscreen; meters need lights.

The Compex's compressor is a soft-knee type with a toggle switch for three attack time choices: 2.5 ms, 25 ms and super-fast 250 µs. A gold-plated Elma rotary switch selects among nine different release times between 25 ms and 3.2 seconds, plus Auto—a two-stage program-dependent release. Rotary switches are used for setting both Threshold—ranging from -20 dB to 0 dB in 11 steps and Ratio between 1:1, 2:1, 3:1, 5:1, 10:1 and 20:1.

The expander/gate section has three attack time choices: 2 ms, 40 ms and 20 µs. Expansion ratio is fixed at 1:2. Release time is a pot labeled F for fast to S for slow, while the expansion Range control varies from 20 dB to 0 dB. The Threshold knob goes from Hi (or least sensitive) to Lo. A toggle switch changes this section between off, expansion or gate when the ratio goes to 1:20. Two green LEDs (one for each channel) flash when the expander/gate is operating.

The poorly written, terse manual has a procedure for the unit's initial setup and calibration that should be followed. I used a 1kHz tone to verify that both channels were identically matched and passing audio at unity without any processing switched in. Unlike the limiter and expander/gate, the compressor has no bypass switch, so I set its ratio to 1:1. I also initially set the compressor's release to Auto; the best working auto release I've ever used—it is very fast during the initial recovery of 5dB of gain reduction then slows down after that—brilliant especially for the massive and deep compression effects possible with the Compex.

LET THERE BE DRUMS!

In Pro Tools I used hardware insert paths with delay compensation to route an in-the-box mix of 20 tracks of recorded drums to and from the Compex. I re-balanced the kit with more emphasis on the ambient room mics and overheads.

The stereo master input knob should start at about midway with the individual input trim controls wide open and the stereo master output knob nearly fully up, assuming proper input levels coming to and from your Pro Tools I/O; mine are standard calibration at -18 dB. Once I started lowering the threshold of the compressors and advancing the input level, the meters were deflecting between 8 and 16dB of gain reduction with the red limiter LEDs lighting up on every snare and kick hit. With the meters deflecting and the flashing red and green LEDS (if you are also expanding), you'll have quite a light show in your outboard rack.

The unlit Simpson meters stay at full-scale reading 0 dB, deflecting only with gain reduction and/or expander/gate action. But they are hard to see in dark control rooms and do not have input/output source switching.

Compressor ratios can be from 2:1 to 5:1 for variation but this sound is all about the compressor's threshold setting—I had it set anywhere from -4 to -18 dB. During extreme limiting, the Pre.Emp mode caused more gain reduction for cymbal crashes but would "punch" holes in the overall sound with each kick drum hit if I wanted.

Compressor attack and release time settings are very important. I tried many release time settings but I kept coming back to Auto for this application. Attack time was either the 25ms or 2.5ms, which kept the drums bright without stealing too much of their thunder and making them small-sounding. The resultant drum sound is punchy, dense and violent.

The back panel of the F760X-RS includes XLR in/outs and ¼-inch sidechain inputs.

I found the Compex capable of many different variations of snare drum smashing. On the snare track of the same kit, it was easy to dial in impressive-sounding gated snare effects and parallel processing. The settings remained very stable for a '60s vintage analog design.

Setting the compressor and gate together can be a bit of a juggling act, but having preset attack time switches for both is a great idea! It allowed me to experiment trading off between gate and compressor attack times easily and quickly. I used the 2.5ms attack on the compressor and the 250µs attack time on the gate for snare drum gating effects.

PIANOS, SYNTHS AND VOCALS

Sometimes, I found that using the expander/gate in expand mode yielded a smoother and more musical fade of sustaining chords while also suppressing leakage. Here, the meters are useful for "visualizing" and setting expander/gate release timing precisely.

A stereo grand piano takes on a decidedly rock sound as the Compex is not a super-clean and transparent dynamics processor—it will add a grainy texture to harmonically rich sources like pianos. I used a 2:1 or 3:1 ratio, 25ms attack with the limiter either off or set so the LEDs only occasionally lit; this kept the sound bright and the level consistent within a guitar heavy track. I used the expander set to a low threshold and medium-fast release. I always left the Range control set to 20 dB.

A dynamically out-of-control Minimoog solo became a mixing nightmare to get it to "lay in" at a steady and hearable level. I set the Compex to 5:1 ratio and either Auto or 3.2-second release time with slowest attack. This worked like a leveling amp where the signal is under constant gain reduction, removing all dynamics and making it even. This colorful-sounding "brute force" dynamic wrangling also fixed an unruly guitar track.

I used the Compex on a stereo lead vocal stem, six tracks that included doubles, harmony tracks and all effect returns. I wanted a cohesive sound and used a 3:1 ratio, high threshold and slow attack on the compressor. To hush six tracks of headphone spill in between words and phrases, I used the gate set to: slowest attack time, fast release, threshold set midway, and 20dB range. With a high threshold set for the compressor section, I could simply turn up the stereo input control to add more limiting. The Compex scores big here with an "in your face" vocal sound that no backing track can cover up.

AN ENGINEER'S PROCESSOR

The F760X-RS is an advanced analog processor that will increase apparent loudness/record audio levels yet provide reliable overload protection. Successful use of the Compex Limiter demands a deep understanding of dynamic processing and its signal chain operation. Compex processing is addictive: the more compression/limiting I heaped on revealed the unit's true personality as an aggressive and colorful-sounding FET-based limiter/compressor. After getting used to its quirks, I found its time-proven design along with modern updating made it irresistible. I highly recommend it. ■

Barry Rudolph is an L.A.-based recording engineer. Visit him at www.barryrudolph.com.

From the editors of PRO SOUND NEWS and PRO AUDIO REVIEW

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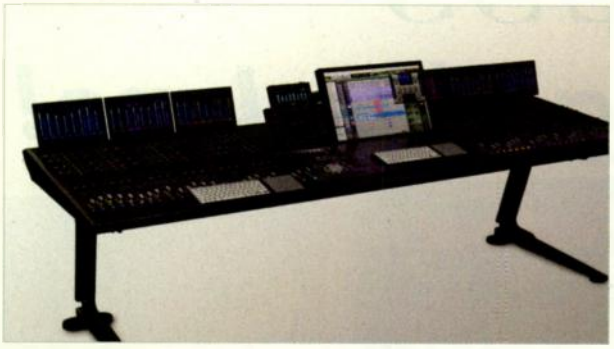

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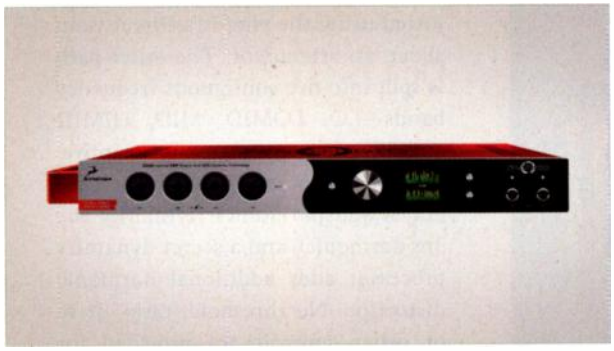

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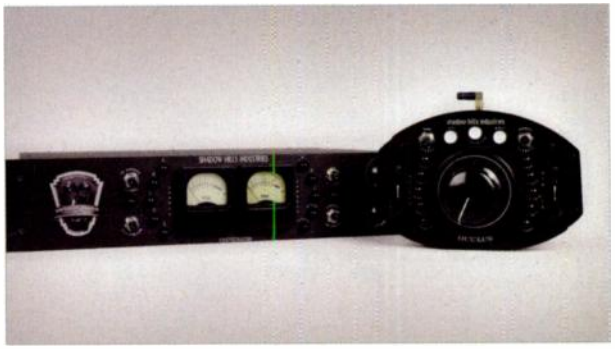

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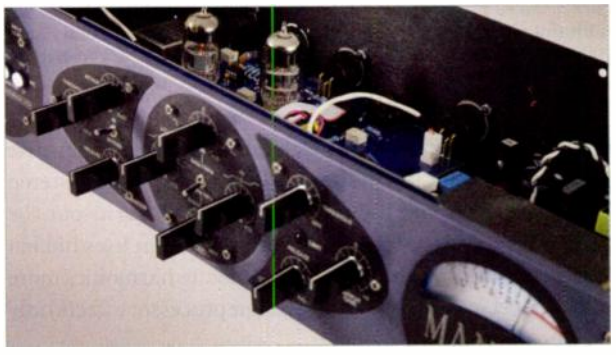

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By Michael Cooper

WAVES VITAMIN SONIC ENHANCER

Multiband Plug-In Adds Clarity, Punch and More

Waves Vitamin Sonic Enhancer uses multiband processing to add harmonics, adjust stereo imaging and brighten transients. Example settings for use on stereo acoustic guitar are shown here.

A glance at Vitamin's GUI initially led me to surmise the plug-in combines a harmonic exciter, stereo imager and transient shaper. But it turns out the inside story is a bit different. Vitamin uses hidden multiband compressors and clippers to generate harmonics more subtly than most exciters, and its transient processor affects only that portion of processed signal.

The cross-platform plug-in is available for both SoundGrid and Native systems in Audio Units, AAX Native 64-bit, TDM, RTAS, AudioSuite, VST and VST3 formats. (SoundGrid is a low-latency, DSP-based platform that runs off Waves' Intel-based servers.) Mono and stereo configurations are included. I reviewed the Native AU version of Vitamin in Digital Performer Version 8.06 on an 8-core Mac Pro running OS X 10.8.5.

SECRET AFFAIR

Waves was understandably circumspect in giving me the full particulars of their proprietary processing, but here's the gist:

Vitamin splits input audio into two parallel paths. One path is home to the dry input signal; its gain is adjusted using the plug-in's Direct Gain slider, an attenuator. The other path is split into five contiguous frequency bands—LO, LOMID, MID, HIMID and HI—that are treated by adaptive, nonlinear processing: a clipper generates odd harmonics (primarily the 3rd harmonic), and a secret dynamics processor adds additional harmonic distortion. No threshold, ratio, drive or other controls are provided for these unseen dynamics processors; the depth of processing and amount of harmonic coloration they add are virtually constant in each band, irrespective of applied gain. Five sliders situated in the center of the GUI adjust the gain—from 0 to 48 dB—of the harmonically enhanced signal in Vitamin's five bands. Think of the five bands as containers for secret sauce and their gain sliders as spigots for adding more or less (or, at 0dB setting, none) of the sauce to the dry signal. To hear Vitamin's wet signal in isolation, lower the Direct Gain slider all the way.

Once you've established the desired relative balance of the five bands' gain sliders, you can raise or lower them together using a master control that preserves their offsets. Each band can be independently soloed or bypassed (or soloed and bypassed; see the "Try This" sidebar). When you solo a band, you hear both the dry and wet signal components in that band. Bypass a band to mute its wet signal component. Crossovers for Vitamin's five bands are adjusted much like with other

TRY THIS

When setting the crossovers for one of Vitamin's five bands, it's helpful to hear only its direct (dry) signal component. To accomplish this, activate both the solo and bypass buttons for the band. You can also toggle the bypass button off and on (while the solo button is activated) to alternately hear the band-limited dry signal with and without the band's processing, respectively. This is a great way to gauge how much processing you're adding in a specific band, relative to its dry signal.

multiband Waves plug-ins (such as C4 and C6), using controls situated above and between each band's gain slider. A global Punch control adds presence to transients in the harmonically enhanced signal when set to a value above 0 (its lowest possible setting); Waves is hush-hush about exactly how it does this.

Vitamin's stereo configuration also offers a continuously variable stereo-width control for each of its five bands, along with a Width Master control that executes their simultaneous adjustment. The stereo-width controls affect both the dry and wet signal components for their respective bands. Unfortunately, these controls are completely disabled when their respective bands' bypass buttons are engaged; I found myself wishing I could adjust the stereo imaging for the dry signal with harmonics processing bypassed. At their extreme settings, the stereo-width controls can collapse a band's image to mono or widen the stereo field considerably.

Vitamin also provides global input- and output-gain controls—each affording up to 18 dB boost or cut—and associated L/R level meters. Use the plug-in's trim control to counter digital overs and optimize output levels with one click. All gain, imaging and crossover controls provide numerical readouts, as do the meters and singular trim and punch controls.

Indicators atop the I/O meters light red when the input or output exceeds 0 dBFS. But because Vitamin processes and outputs 32-bit floating-point audio, the plug-in's output doesn't clip at 0 dBFS. Vitamin's generous headroom provides a convenient failsafe, as any plug-in that adds harmonics has a propensity to produce "overs." Another comfort: The plug-in's processing produces zero latency, making Vitamin suitable for use in both studio and live situations.

As with all Waves plug-ins, the WaveSystem Toolbar is included; it provides 32 levels of Undo and Redo, A and B workspaces and preset-management facilities.

PRODUCT SUMMARY

COMPANY: Waves
PRODUCT: Vitamin Sonic Enhancer
WEBSITE: waves.com
PRICES: SoundGrid platform (includes Native licenses): $300 ($149 introductory sale price); Native: $200 ($99 sale price).
PROS: Unique. Clarifies and enriches muddy- and clinical-sounding tracks.
CONS: Getting great sounds can take some trial and error. Stereo-width and band-gain controls share bypasses. Punch control only affects harmonics-enhanced signal. Master controls can't lower slaves if one is bottomed out.

FEEDING TRACKS

I got great results using Vitamin on a clinical, mid-range-y kick drum track. I raised the LO band's gain slider to around 19 dB, set its crossover to 55 Hz and raised the Punch value to 2.1. The result was punchier, fuller and richer-sounding. You may wonder how harmonics generated in a sub-bass band can make a track sound richer. But when adjusting Vitamin's crossovers, it's important to realize that the 3rd harmonics generated from fundamentals at the high end of the band will be an octave plus perfect fifth higher in frequency than the crossover itself. My 55Hz crossover setting resulted in adding 3rd harmonics as high as 165 Hz to the track.

Next up was a top-miked snare drum track that sounded too much like a muffled bongo. Cranking the HI band's gain almost to the max and goosing the Punch control gave the track sorely needed snap but made it sound too thin and brittle. Adding generous amounts of LOMID, MID and HIMID gain balanced the tone beautifully. That said, I could simulate much greater snare sizzle using distortion plug-ins or a Lexicon resonant-chords effect.

While Vitamin made bass guitar sound richer, I had more latitude to produce monster tones using EQ, distortion and limiting. Vitamin's harmonics enhancement tended to make male lead vocals (recorded using a high-end tube mic) sound a little less smooth and nuanced, but it must be said this track sounded lush and tonally balanced to begin with. Sometimes it's best to leave well enough alone.

Happily, Vitamin's processing greatly improved a muddy-sounding, strummed acoustic guitar track on an up-tempo, rock-tinged country

number. Applying around 24 dB of gain in the HIMID band (with crossovers set to 463 and 9,310 Hz) tightened and clarified the sound in a way my best plug-ins that emulate passive equalization could not. Goosing the Punch control a little enhanced the track's flattering percussive quality. Using the bands' stereo-width controls, I widened the spectrum above 463 Hz and collapsed frequencies below 122 Hz to mono to create a beautiful stereo spread. The processed track's timbre sounded a tad edgy when soloed but excellent when folded into the mix. Isn't that often the case when mixing?

I wasn't impressed overall with using Vitamin on full mixes. The harmonic enhancement was not discriminating enough in its effect for me to feel like I could use it without incurring collateral damage. However, I liked using the stereo-width controls to focus the bass and widen highs (similar to what I did on acoustic guitar). On a practical note, I was mildly disappointed that the master gain control wouldn't lower any raised band-gain sliders if one was already bottomed out. (The workaround was to temporarily raise the bottomed-out fader.) The master width control exhibited the same behavior.

> I got great results using Vitamin on a clinical, midrange-y kick drum track. I raised the LO band's gain slider to around 19 dB, set its crossover to 55 Hz and raised the Punch value to 2.1. The result was punchier, fuller and richer sounding.

NICHE PERFORMER

Vitamin is not a distortion plug-in, per se. It takes a heavy hand to add grit, and even then it's relatively subtle. Due to its additive processing, using Vitamin to sculpt the tone of tracks is not always an intuitive process. Especially where excess energy in a particular frequency band needs to be attenuated, it can take a bit of trial and error adding harmonic enhancement in different bands to achieve the desired spectral balance.

Vitamin's forte—in addition to enhancing transients and stereo imaging—is clarifying muddy-sounding tracks and enriching those that sound sterile and starved of harmonics. It's not something I would slap on every track, but it's useful for getting unique timbres not achievable using EQ plug-ins.

Bottom line: If you've already got your plug-in pantry fully stocked with the essentials and are looking for a secret sauce to jack up your arsenal, Vitamin is worth considering. ■

Mix contributing editor Michael Cooper is a recording, mix, mastering and post-production engineer and the owner of Michael Cooper Recording (www.myspace.com/michaelcooperrecording) in Sisters, Ore.

Continued from p. 21

Once the instrumental tracks for the songs for the *Whip-Smart* album had been completed, Wood says, "I remember Liz coming in one day and saying, 'We have all these vocals to record, and it's February and it's really cold. Is there any way we can go someplace warm?'" Or, in Phair's telling, "There was crappy weather and everyone was grumpy, so I wanted to get out of Chicago, get us out of our funk and change it up." So, about a week later, Phair, Wood and Rice found themselves at Compass Point Studios in the Bahamas, drinking a lot of rum, hanging out at the beach and, oh, yes, recording vocals for the album in a lovely seaside studio equipped with a Neve VR console. "It was awesome, it was luxurious, it was the height of indulgence," Wood says.

"My recollection of the vocals," Rice writes from Melbourne, Australia, where he has lived since 2002, "is we tried a few different things, but generally always ended up using a Sony C-37P, as it really suited her voice." Wood also recalls bringing one of James Bond's Neumann M367s to the Bahamas and using it on Phair. "There were two vibes going on that record," Phair says. "One is that sort of angular, Chicago, lightly punkish feeling, and then you've got this island breeze on some songs, like 'Nashville.'"

Although there was originally some talk about mixing at Compass Point, after two weeks the sun-baked trio returned to frigid Chicago. "I mixed it at Idful on the Elan to my then-new Telefunken M21 half-inch, which I still have," Wood says. "I also mixed to DAT.

"I know for 'Supernova' we cut six lead vocals, and then I was going to comp them down to make a lead vocal and a double. But when it came time to mix, I put up all six, I lined them up, and ran the full takes for the entire song. It sounded so cool, we kept that." The primary reverb was an EMT plate "we got from a Universal Audio auction a few years earlier. I also liked the [Yamaha] SPX-90, the Boss SE-70 multi-effects unit, [Roland] RE-201 Space Echo and PCM 60s for drums, short room setting."

Whip-Smart came out in September 1994, just 14 months after *Exile in Guyville*, and whereas the first album had caught critics and fans alike pleasantly off-guard, this time there was considerable anticipation leading up to its release. Phair landed on the cover of *Rolling Stone*'s October 6 issue ("A Rock & Roll Star Is Born") and the album was widely reviewed—favorably for the most part, though certainly not with the rabid praise *Guyville* elicited from so many critics; that was a classic "tough act to follow."

But radio jumped all over "Supernova"—which required a brief edit to clean up the immortal line "And you f— like a volcano." It jumped into the Top 10 of *Billboard*'s Modern Rock Tracks chart, and pushed its way up to Number 78 on the singles chart—quite a feat for an indie/alternative artist. Phair herself directed the popular video for the song, which showed her and her band mates playing and comically dealing with some supernatural goings-on. The song earned a Grammy nomination for Best Female Rock Performance at the 1995 Grammy Awards. The *Whip-Smart* album sold more than 500,000 copies, also impressive.

Whip-Smart might have done even better had Phair toured behind the album. Instead, she broke up her quartet after an appearance on the *Late Show with David Letterman* (where they performed "Supernova" and the title cut). "It was a cool band; cooler than I knew at the time," she reflects. "I was restless. I was sort of self-sabotaging in a funny way, but I can't tell you why. I remember Casey was getting kind of intense with me, because he knew what an opportunity had come my way, and I did not. I did not appreciate what was going on; I mostly just felt overwhelmed."

Whip-Smart was one of several albums by Chicago acts Wood worked on during this period that gained national traction. He also engineered Veruca Salt's first album, *American Thighs*, which was released a week after *Whip-Smart* (and went Gold), and Tortoise's all-instrumental self-titled debut. Idful closed in 1997, and two years later Wood moved to Los Angeles, while continuing to work in Chicago occasionally. Phair has recorded sporadically since her mid-'90s peak, and says she hopes to get into the studio again soon. When Wood and I spoke in early May, he was working with the reunited Veruca Salt for the first time in 20 years. ■

By Brandon T. Hickey

SPL CRIMSON INTERFACE

6x6 USB I/O, Monitor Control, Great Sound

The SPL Crimson offers USB, MIDI and S/PDIF, plus balanced and unbalanced analog I/O.

When SPL unveils a new product, it is often built around a one-of-a-kind new circuit. The company is probably best known for its Transient Designer, which allows the manipulation of attack and sustain in ways that sound and behave very differently than a traditional compressor does. Other patented processors like the Vitalizer, a tool for adding loudness and clarity, exhibit similar thinking. Meanwhile, when SPL steps into the arena of building more traditional circuits like mic preamps and EQs, they seem to apply their knack for creativity and still come up with an entirely new approach to a classic idea. The Crimson is an audio interface/monitor controller that echoes innovations from earlier SPL products, but combines them together in a single powerhouse of convenience.

AUDIO INTERFACE

The audio interface portion of the Crimson is recognized by DAWs as a 6-input/6-output device. Neither Windows nor Mac OS X require the installation of an additional driver for operation, though driver installation on Mac OS X circumvents the Mac Core Audio Driver whose maximum sample rate is 96 kHz, and allows high sample rates of 176.4 kHz and 192 kHz. Along with the higher sample rates, the alternative HAL driver uses the Crimson's clock, rather than the Mac's internal clock, to time samples. Using either driver, there is no software control panel for the Crimson, as the integrated monitor controller carries out all monitoring considerations.

The audio interface can record signals from up to four analog inputs, which can accept signal from a variety of different connection and signal types. On the back panel, there are four balanced TRS inputs, each of which can feed the A/D converter to the DAW. These inputs have no additional controls for level adjustment or filtering, so those considerations must be made prior to feeding signal to these connectors. Either or both of the third and fourth A/D converter inputs can be repurposed to accept instruments connected to the pair of front panel ¼-inch jacks. Each jack has an associated gain control on the top panel of the unit. When an instrument is connected, the Crimson automatically switches from line input to the instrument input.

Crimson's connections allowed me to connect instruments with low-output pickups and add gain to them up to healthy signal strength without adding noticeable noise. Likewise, I could attach guitars with hot or active pickups and there was always enough headroom.

TRY THIS

Try using the Crimson for mastering with the bx_control plug-in as an M/S encoder/decoder. On the plug-in, set "In" to "L/R" and "Out" to "M/S." Send the track to outputs 3-4. Turn on Artist Mode to feed this to the second pair of balanced outputs. Use a more severe compressor on the left channel to crush the vocals, kick and snare, while taking it easier on the right, containing wider stereo signals. Return through line inputs to a track feeding outputs 1-2 with the opposite settings enabled on another bx_control plug-in then listen to the result through the main monitor output.

PRODUCT SUMMARY

COMPANY: SPL
PRODUCT: Crimson
WEBSITE: www.spl-usa.com
PRICE: approximately $675 street
PROS: Tons of features, especially for the price.
CONS: Monitor controller doesn't offer surround sound.

It's quite stifling to the creative process and damaging to tone when devices have instrument inputs that don't provide enough headroom and frequently distort, need padding; or require backing off the instrument's level controls. You spend more time managing levels than actually recording. This couldn't have been further from the case with the Crimson.

While the last two inputs trade between instrument and line connectors, the first two toggle between line and mic. The preamps are similar to the SPL GainStation in that they feature a discrete design with a single transistor per channel, rather than a cheap, typical, integrated circuit. While the GainStation's preamps operate on SPL's high-powered 60-volt rail, the Crimson's pre's feature a dialed-back 34V (±17V) rail. This is on par with well-respected high-end mic preamps, and unheard of in desktop audio interfaces. The benefit of running at a higher voltage is that the internal electronics exhibit more headroom, allowing even hot signals to stay as clean as possible before A/D conversion.

The Crimson offers a pair of S/PDIF digital inputs and a pair of S/PDIF outputs through RCA-type connectors. I didn't have the proper adapters to test this, but they are said to be compatible with AES3 signals in addition to S/PDIF signals. While the third stereo output pair in a DAW or AMS is routed directly to the digital output, the four D/A-converted outputs return to the monitor controller and can be routed to physical connectors from there.

ADVANCED MONITOR CONTROL

Typically, when doing tracking sessions requiring much processing power, it becomes necessary to increase the buffers for A/D and D/A conversion. When this happens, the artists will hear themselves at a delay in their headphones. This is particularly evident when working with USB and FireWire interfaces, and even more so when working with the Core Audio driver on the Mac OS. Each step of the signal chain—from an analog connector to the DAW and then back to an analog jack—takes some amount of processing, and thus incurs some amount of delay.

To avoid this, some USB interfaces have a simplistic blend control to determine how much pre-converted immediate analog input signal versus how much software return will feed the headphone jack. Other USB interfaces feature more complicated software mixers to build balances of input signals and various software returns. The problem with these software mixers is that they usually use a large window that occupies a lot of on-screen real estate, and toggling in and out of your DAW to make changes is a little clunky. Also, they are summing signals in the digital domain, which can impose limitations in headroom and fidel-

ity. The Crimson's monitor controller employs a colorless analog circuit path for building headphone mixes, not to mention that you rarely will find the number of physical controls to build these mixes that you find on the Crimson. Ergonomically, this made such a huge difference, making everything quicker and keeping sessions from ever breaking pace.

VERSATILE UI

What's great about the Crimson's monitor controller is that it doesn't lock the user into one particular workflow. Some devices have more of a 1:1 ratio of functions to connectors. Here, SPL seemed to try to serve musicians, DJs and audio engineers alike. The manual provides detailed setup diagrams for tracking, mixing, mastering and connecting various outboard devices.

Looking at the back panel, you see plenty of I/O, including a pair of balanced ¼-inch connectors, a pair of unbalanced RCA-type connectors, and an unbalanced stereo ⅛-inch mini jack. The balanced connectors can accept stereo signals, but if only the left one is connected, the signal is fed to the monitors in redundant mono. The left balanced input can alternatively be used for a talkback to the artist monitor path. There is no mic preamp in this circuit, so the mic must be preamplified externally.

Outputs include a balanced stereo pair of XLRs and another balanced pair of ¼-inch TRS connections. An "A to B" button takes the main mix and plays it through the secondary speakers instead of the primaries. Meanwhile, an "Artist Mode" button sends an entirely different mix to this pair of outputs to be used when connecting to an external headphone amp to feed multiple artists.

In Artist Mode, the first two outputs of the D/A converter feed the main monitors. The secondary monitor mix is fed by outputs 3 and 4 of the D/A converter, which can be carrying a unique mix from the DAW, plus a combination of other signals. Any or all of the four recordable inputs, plus any of the external sources can be added to the D/A-converted DAW returns through an analog bus. On top of that, the digital input can be D/A-converted by the Crimson and added to the analog mix feeding the secondary output. I found the lack of bleed when the switches for each of these signals were disengaged to be very impressive. In addition to those switches, there is a knob to adjust the blend of the recording inputs versus the software and hardware returns.

The two onboard headphone jacks can be fed different mixes and each has its own level control. All of this switching made building artist headphone mixes very simple. If Artist Mode is disengaged, all of the selector switches and blend control build the mix to feed the main monitors. That way, you could hear the artist mix through your headphones or monitors, make changes, and then feed it back to them. SPL also outlines a lot of creative ways to use the Artist Mode to send alternate signals to outboard devices and return them to hardware inputs. Aside from being stereo-only, I can't imagine anything more that I would ask from a monitor controller than what is provided here.

IN USE

Before using the Crimson for any kind of recording, I spent some time with it as a monitor controller. I cabled it into my monitors and Mac and tried to avoid referencing the manual, just to get a sense of how intuitive it would be. I spent a good amount of time hitting buttons before I heard anything, and it wasn't until I looked at the manual that I was really able to wrap my head around the wealth of functionality. Once I understood just how many options for signal flow were offered, I came to appreciate the layout and could certainly justify the labeling and controls provided.

I really liked the feel of the big volume knob, but what I liked even more was that it was very accurately labeled in increments of 1 dB or less throughout the typical operating range. For calibration purposes, this was fantastic. I was really impressed by the overall sound of the D/A converters. They were clean, quiet and transparent, and the gain control was equally clean and colorless. I plugged in a guitar, and when combining the input signal with a DAW return everything remained very clean and clear, suggesting that the analog summing amplifiers were offering an appropriate amount of headroom.

After stopping playback, I noticed how great the instrument input sounded. The highs had a good amount of detail without seeming hyped and unnatural. The lows were big and tight, and at high or low gain settings they sounded equally present. Some circuits tend to make bass sound a little weak when dialed back too much, but this was not the case with the Crimson. There was also an incredibly low noise floor. This made me want to try out the mic preamps recording quieter instruments, which had forced signal-to-noise battles in the past. I got to work recording ukulele and was really amazed, in the first place with how much gain was available at the pre, but in the second with how quiet the pre's remained even with a great deal of gain applied.

I had a similar experience when recording flute. I got everything set up and cabled in, made tracks in Pro Tools, and then started turning up the pre's and heard nothing. I thought something was set incorrectly and then the flutist moved her music stand and I heard it loud and clear. The pre's were just so quiet that it sounded like they were muted. Not only that, but the recordings were so real and true-to-life. I was truly shocked when I finally looked at the price tag. These pre's sound like they should cost more than the entire unit does.

WORTH THE WAIT?

The monitor controller is fantastic, and could easily fill the needs of anyone tracking, mixing or mastering in stereo. The preamps could easily be my favorite that I've heard on any desktop interface. If you're in the market, you could spend a little less on a 6x6 audio interface, but the quality will definitely suffer. You won't find anything so carefully designed for the serious professional at a lower price tag. If you're shopping for an interface with a few choice inputs and a clean way to monitor, this should be high on your list. ■

Brandon Hickey is an audio pro and rabid Blackhawks fan.

By Tim Dolbear

sE ELECTRONICS SE5 CONDENSER MIC

Affordable, Versatile Fixed-Cardioid Transducer

The sE5 features switchable pads (-10dB/-20dB), and a highpass filter set at 100 Hz.

I use small-diaphragm condenser microphones everywhere—as room microphones, as overheads for drums, next to a dynamic to add that special snap, crackle and pop to a snare drum, and to capture a string quartet by way of one of the many stereo array techniques. sE Electronics has built a solid reputation for beautifully crafted products that can excel in most situations. Its newest small-diaphragm condenser is the sE5, which the company positions between its standard sE1a and the high-end RN17 that it designed in collaboration with Rupert Neve. Each microphone is designed and built in-house, and the capsules are all handmade.

The fixed-cardioid sE5 boasts a silky top, accurate transient handling, low noise floor and max SPL of 150 dB with only 0.5% THD. Throughout my testing, I found that the sE5's fixed pattern was not a limitation. It was perfect for work in all applications in which I tried it, sounding clear and open.

The shock-mount that comes with the single sE5 was easy to set up and use; I did not come across any issues with rumble finding its way into my takes. The stereo pair comes with a hard case and stereo array bracket. The sE5 is also finished in black, an oft-requested change from sE's user base wanting a dark body color for live use.

MAKE A JOYFUL NOISE

For my tests, I ran the sE5s through a modified 8-channel Altec preamp, circa 1979, into Magix Sequoia by way of Apogee A/D converters. All monitoring is done through Mytek D/A converters into Neumann K&H Series monitors.

I first used the microphones as drum overheads. Mounting the sE5s into the supplied shock-mount was simple and it felt secure. However, hanging these mics over a drum kit presented problems when I tried to use the mic's selection switches because the shock-mount blocks the switches. Sliding the mic forward lets you get to them, but when the mic is held in place, this can be a challenge to work with.

That said, these microphones are a joy to hear. The high-end bump in response, centered at 10k, gives the sE5 a modern sound, exactly what I look for in an overhead—a mic that is clean, clear, tight, quick and responsive. The sE5s sound bright without exhibiting harshness, and full, but not muddy or woofy. The

TRY THIS

Place your favorite microphone in a room with any instrument or voice. Does the microphone capture the room as you hear it? How is the frequency response? How well does the microphone focus in on the sound source verses the room?

mic's transient response was realistic and clear. Compared to a set of AT4050s, the sE5s sounded more focused and even across the bottom end. The high-end bump also seemed to be located in a more desirable range. sE5s sounded more natural and open, and contained none of the brittleness of a set of AKG C 414 B-ULS mics set to cardioid. I also tested and compared Shure SM81s and KSM27s, and again the sE5 excelled.

MORE TESTS

Next, I used the mics as a pair to capture the room while tracking electric guitars. I loved the open and natural stereo field the sE5s captured. Using the highpass filter coupled with the microphone's frequency response gave me perfect results without further need for EQ. While mounting the pair in the stereo bar, I found myself wishing sE had put markings on the bar to help with angling the microphones. It was easy enough to eyeball them to 90 degrees and then open the angle up slightly to achieve the desired 110 degrees I wanted for an ORTF array.

During my time with the sE5s, I used them on a number of sources, from mandolin to bullhorn. For the bullhorn, which we feed from a headphone amp, I placed an sE5 about 18 inches straight out from the bell; with the horn being overdriven and the amp breaking down, we get the perfect blend of drive and EQ curve. The sE5 was then fed into my Warm Audio TB12 preamp that I drove hard, adding more color. From there I went into an old blackface Ashly SC50, then into Sequoia. The sE5 handled the bullhorn without issue.

Next, I close-miked my trusty solid flamed maple Guild guitar. I am normally a die-hard fan of using large-diaphragm condenser microphones on acoustic guitar, but the sE5 was right at home in the mix. Using my ADK S51tc or the AT4050 would be a better choice for me if the acoustic was the main or only instrument, but the sE5 worked for a song with lots of instruments, as its frequency response will help it cut through a little more, and its handling of transients would help the acoustic sit in a mix where part of the acoustic's job is to be a percussion instrument.

Finally, I set up a single sE5 on a boom microphone to capture the audio shotgun-style for the video interview portion of a Web show. The sE5 was positioned approximately 2.5 feet away from the subject's mouth, and its output volume and tone were good—good enough that the sE5 was used on the final take. I realize the mic was not really designed for this, but not only did it work, it sounded more natural than the shotgun microphone I have used in the past.

WHAT'S THE VERDICT?

In a world with so many microphone choices, and a crowded small-diaphragm market, it has become impossible to try them all. There are many things that as a studio owner I need to consider when making buying decisions. Sound of course is Number One, but in today's climate, price does become a factor.

If you are doing live classical recordings at 192 kHz with only a stereo pair and demand absolute flatness in your mic's frequency response, these may not be what you are looking for. But if you are producing rock, pop or country records with real drum kits and instruments in a room, or simply want a great-sounding stereo pair, the sE5 needs to be on your must-hear list. Both the frequency and transient response of the sE5 are stellar, and the detail that this microphone captures is outstanding. I am a huge fan and now own a pair. ■

Tim Dolbear is a producer/engineer at Eclectica Studio in Austin, Texas.

Continued from p. 51

getting keeper lead vocals, counter and background vocals, and rhythm guitar "all cut to a click," Bell says. "I have an MPC 60, so I banged in sketches of drum parts, too. So we did the final vocals first. Most records you do that last. But we wanted to build around them and really capture the meaning of the song." Bell used a Sony 800-G for most of the vocals "and on one or two we used vintage Neumanns.

"After that, we started the overdubbing process," he continues. "My studio partner in Portland is called Falcon Studios, and Dennis Carter, the owner, is one of my favorite drummers. He also has Digital Performer and 40 channels of Apogee, so we went there and cut drums to the click; just a couple of days—10 songs in two or three days. And that was really the first thing we'd paid for on the whole project, because everything else had been in my studio or GarageBand or using cheap Dropbox or WebEx subscriptions I had.

"Then I went on the great overdubbing trek. I had a laptop with Digital Performer and a portable interface—at the time I was using a MOTU Traveler—and I started calling my musician friends." He caught up with bassist Freddie Washington when he was on tour in Roseburg, Oregon, with Michael McDonald, Boz Scaggs and Donald Fagen in the Dukes of September: "I brought my laptop and UAD Satellite with all my plug-ins to the hotel the day before the show, and I set up a 2.1 monitor system and two DIs and a bass rig, and we did 10 songs in five hours. It was fantastic." And so it went. He captured B-3 and piano parts over two days at the SF Bay Area home of Santana keyboardist Dave Matthews, did Jay Koder's and Tod Carver's guitar parts up in Oregon, and tracked down Ray Parker Jr. in L.A., while the esteemed Niko Bolas—a friend of Bell's since their days together with Neil Young in the '80s— mixed in Pro Tools in his room at Capitol Studios in Hollywood, before turning it over to mastering engineer Richard Dodd in Nashville.

"This album was literally recorded one track at a time over about six months," Bell says, with a couple of songs requiring around 80 tracks (and an external Thunderbolt solid-state drive, once his internal hard disk was almost maxed-out). Amazingly, though, it sounds like it was performed by a real band playing together, with Nestler and Hawtin soaring above the fray with their impeccable vocals and driving guitars (and cello). It was, unquestionably, quite a feat for all involved to pull it off.

Marketing a genre-crossing album such as this is its own challenge, Bell admits, but he's confident that the quality of the songwriting and performances will ultimately get it noticed, perhaps building from a college or Internet radio start.

"One of the messages I want to get out," he says, "is that all these inexpensive tools are here now and you can take advantage of the same computer you use for your day job to make an album that sounds as good as some of the best stuff you hear on the radio." Still, he notes with a chuckle, "I think for the next album we might do a simple acoustic record with just vocals, guitar and cello." ■

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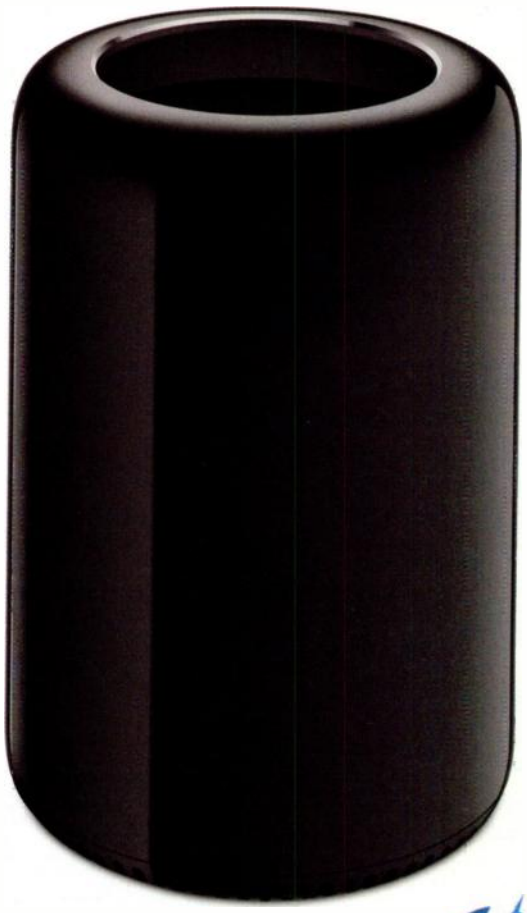

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On Being a Sponge

By Kevin Becka

Everyone knows the Chinese blessing/curse, "May you live in interesting times." For me, the polarity-flipped blessing would be, "May you always be surrounded by those smarter than yourself." For most of my life I've either gotten to hang with smart people for free, or I paid for it. When I was young and on the road as a guitar player, whether I was in L.A., Kansas City or Kankakee, I'd get a lesson with the resident monster. You just had to ask around and a name or two would pop up. The local gurus were happy to give a lesson and make some extra bucks, and I was happy to pick their brains.

As tech editor for *Mix*, I get a contact high from all the brains around me. At a party held during a balmy AES in NYC a few years ago, I sought a cool breeze so ventured to the roof and found Wes Dooley up with others checking out the city from the top floor. Wes can go deep on tech topics. We talked about tensions on ribbon elements, the history of RCA, and the varying output impedance of ribbon mics when the source frequency approaches the resonant frequency of the ribbon. I get the same buzz around David Royer. David is not only a microphone encyclopedia, he's willing to talk about the extra attention to detail needed when your production is off-site and how he comes up with his ideas for new mics (some involving a hot tub in the desert and a six-pack). David and Wes not only give you a lot take to take away during a conversation, but you have plenty to chew on later.

Sennheiser's Joe Ciaudelli and Volker Schmitt had a road show for a while, which taught me volumes about wireless, and so has Mark Brunner from Shure. Mark, aka Mr. Spectrum, sat across a table with me upstairs in the Shure booth at the last Winter NAMM and laid out what was going on with the FCC and wireless—chapter and verse. The issue is such a moving target that I learn something new every time I meet with Mark. White spaces, UHF, VHF, gap bands, guard bands and the latest—the voluntary *wink* FCC Spectrum Incentive Auction that will likely obliterate bandwidth currently occupied by wireless audio.

At my new gig in Nashville, the last year has been a bonus round of collaborating with big brains. Ken Scott showed us how if you detune an acoustic guitar double by just 1 cent, the combined tracks sound almost like a 12-string. I sat in on 10 completely different drum mic setups with engineer/producer Nick Raskulinecz. One setup was all SM57s, which through EQ and other tricks, Nick was able to make sound astonishingly great.

When challenged with the task of miking a resonant kick drum head with no hole, engineer Jacquire King placed his finger on the head near the rim, then slowly moved it toward the center while the player kicked the drum from the other side. When Jacquire found the spot that killed the resonance the most, he didn't put the mic directly there, but between there and the rim to give the mic a better look "inside" the drum.

Engineer Toby Wright placed his snare mic into the drum from under the hi-hat to keep the cymbals out of his track. Then he placed his room mics off to one side of the kit in a tight spaced pair, the thought being that no one's head is 12 feet wide, as room mics are sometimes placed.

Engineer John McBride gets an amazing kick drum sound using a Shure SM91a laying inside on the pillow and an RCA 44 about a foot outside the resonant head—if God had a band, John should record his tracks. Vance Powell told me how he got a unique vocal sound by recording a vocalist with two mics, one a Green Bullet sent to a miked guitar amp giving him an instantly grunged-out double. Yup, it works great.

But good sponging is tied to the blessing: I love emulating brilliant people. It brings up my game.

One way of reacting to a plethora of smarty-pants in your life is to be intimidated. I remember in my teens I had a gig as a hotel bellman at the airport HoJo on the 405 in L.A. Other hops called the ace bellman, who got the lion's share of tips, "The Snake." While he wasn't malicious, Snake would always outdo you by being in the right place at the right time. Someone wanted an iron in 633? Snake was on it, getting a $10 tip. While you were schlepping empty luggage carts from upper floors, Snake was greeting a bus of tourists in the parking lot, getting $100 for his effort. I remember the aha moment that came when I gave up being mad at him and tried to emulate and learn from him, creating my own good luck. It works for me to this day.

Being called a sponge can be seen as derogatory—someone who doesn't do for themselves but hangs off of others. But good sponging is tied to the blessing: I love emulating brilliant people. It brings up my game. ■

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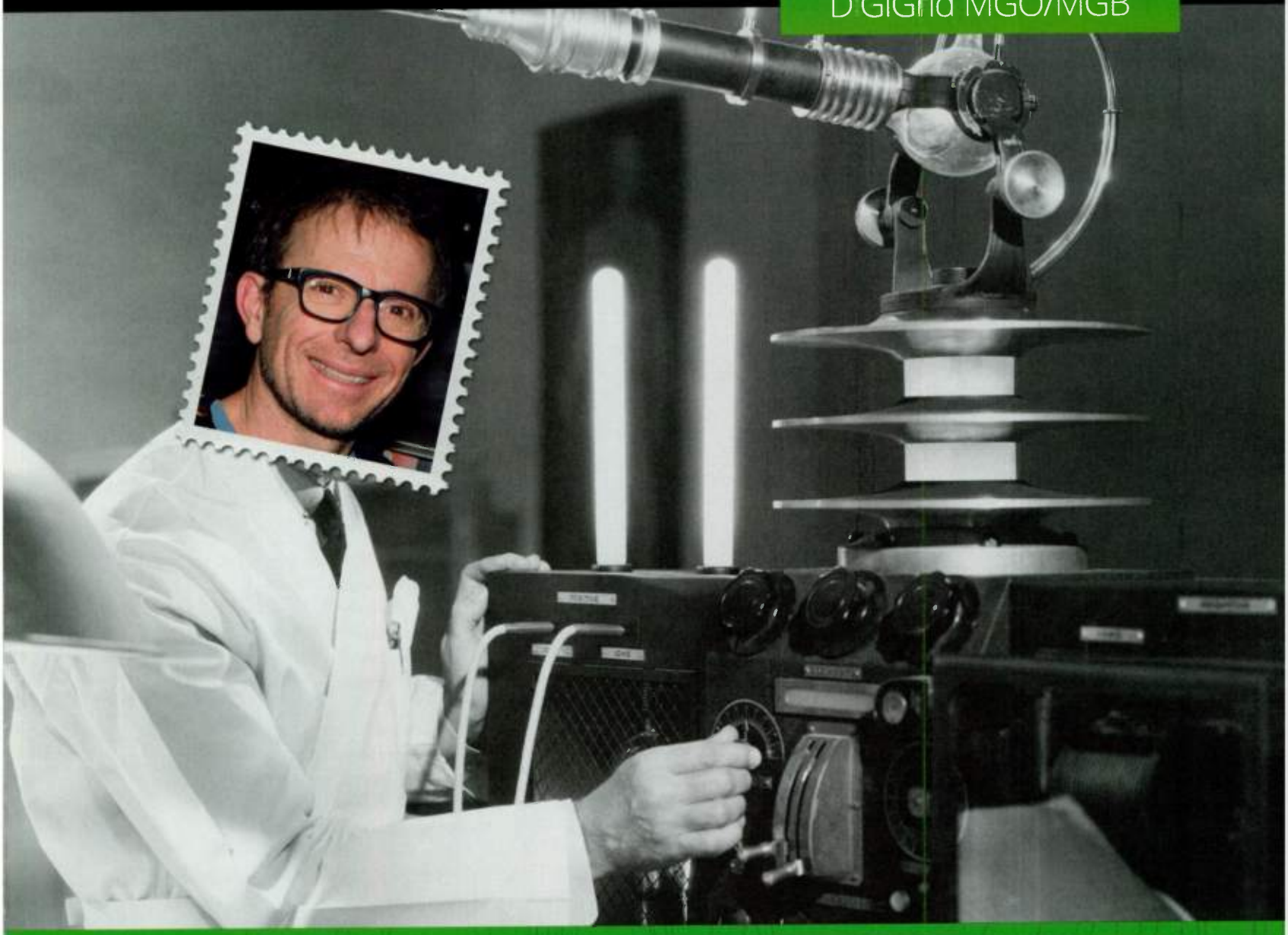

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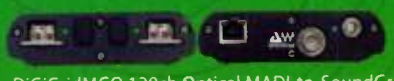

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