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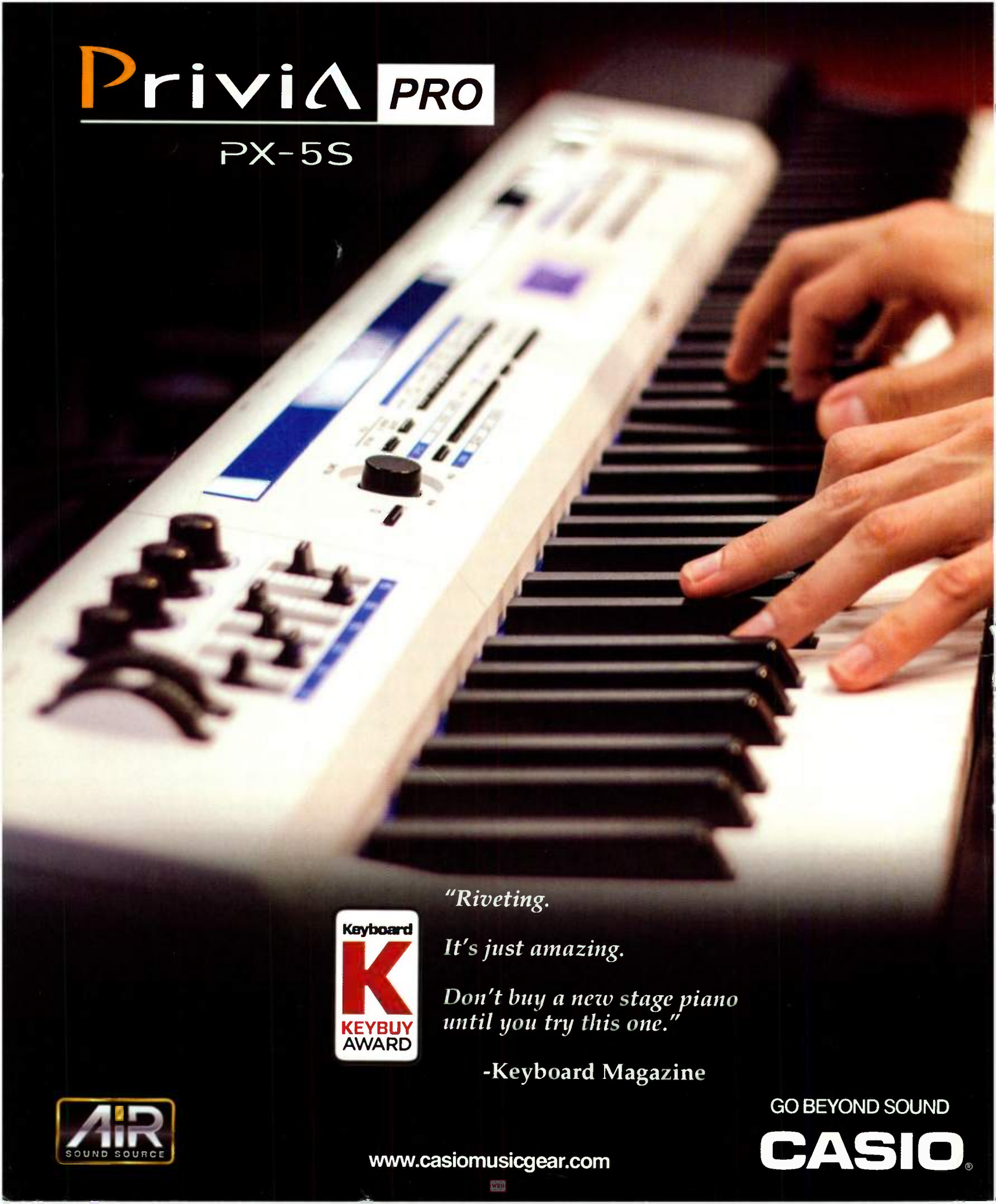
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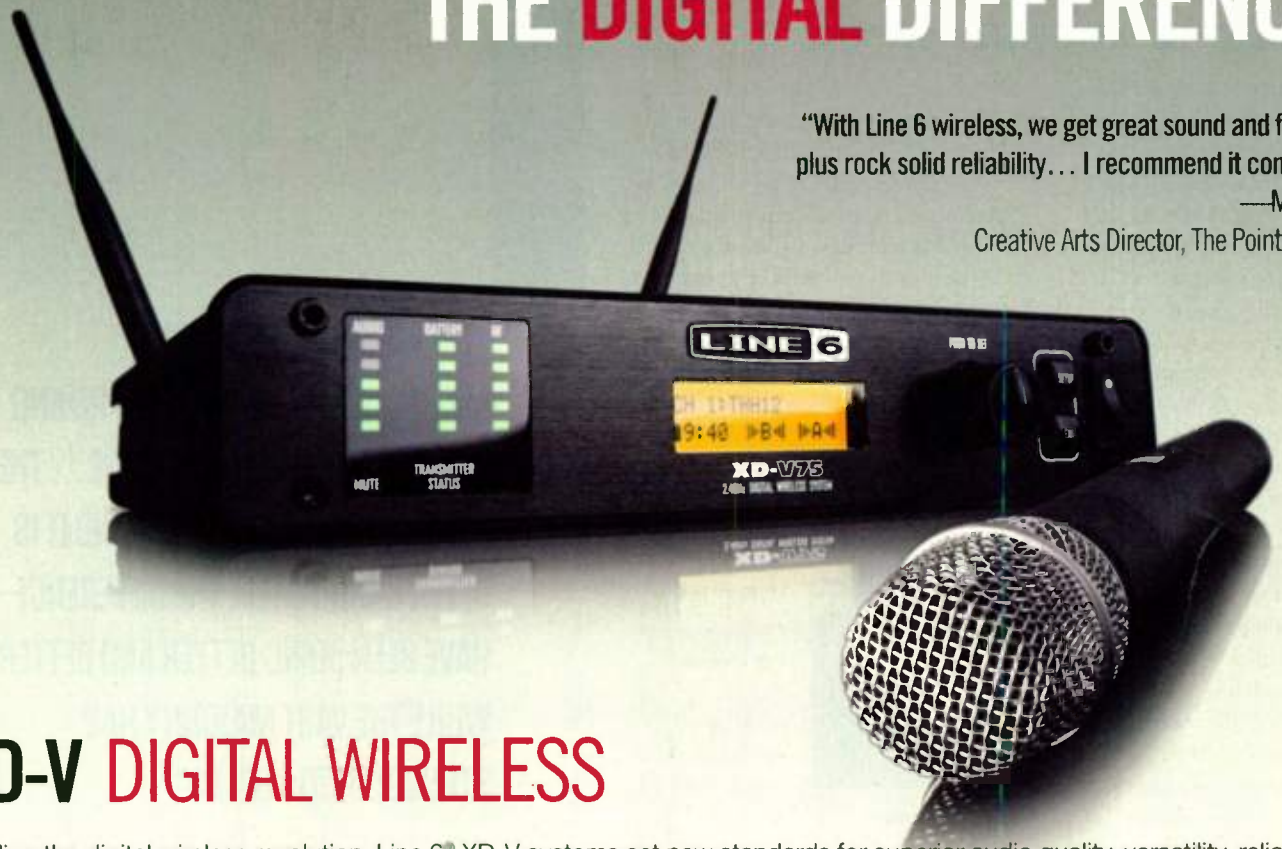

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insight

The Mic Is Not the Music

HOW SPECIALIZED does a mic have to be to work on drums? That depends on your ear. Nonetheless, many manufacturers assemble suitable transducers into all-in-one packs that provide the best bang for the buck when you need to work with a kit in the studio or onstage.

This month, we evaluate eight such packs, ranging from $299 to $2,499. Although the packs vary in number and types of mics included, we examine their overall characteristics to help you differentiate them by something other than cost. That's because price doesn't make one mic sound better than another on drums. Other factors determine which mic is right for the job, including the musical style, the player, the room, and the instruments themselves.

But while it's easy to over-analyze the combination of all of these ingredients, the trump card is in the musical performance. The gear doesn't make a bit of difference if the drummer isn't nailing the part. Consider this: Some of the most memorable hits in early rock history were played on cardboard boxes, Ringo was tracked with one mic overhead and one on the kick, and John Bonham's paradigm-shifting part on "When the Levee Breaks" was captured with only a pair of ribbon mics high above the kit.

While we hope that this month's roundup helps you make the decision that fits your budget and tastes, remember: It's the musician who makes the *mic* sound good, not the other way around.

GINO ROBAIR
TECHNICAL EDITOR
gino@ginorobair.com

COMMUNITY

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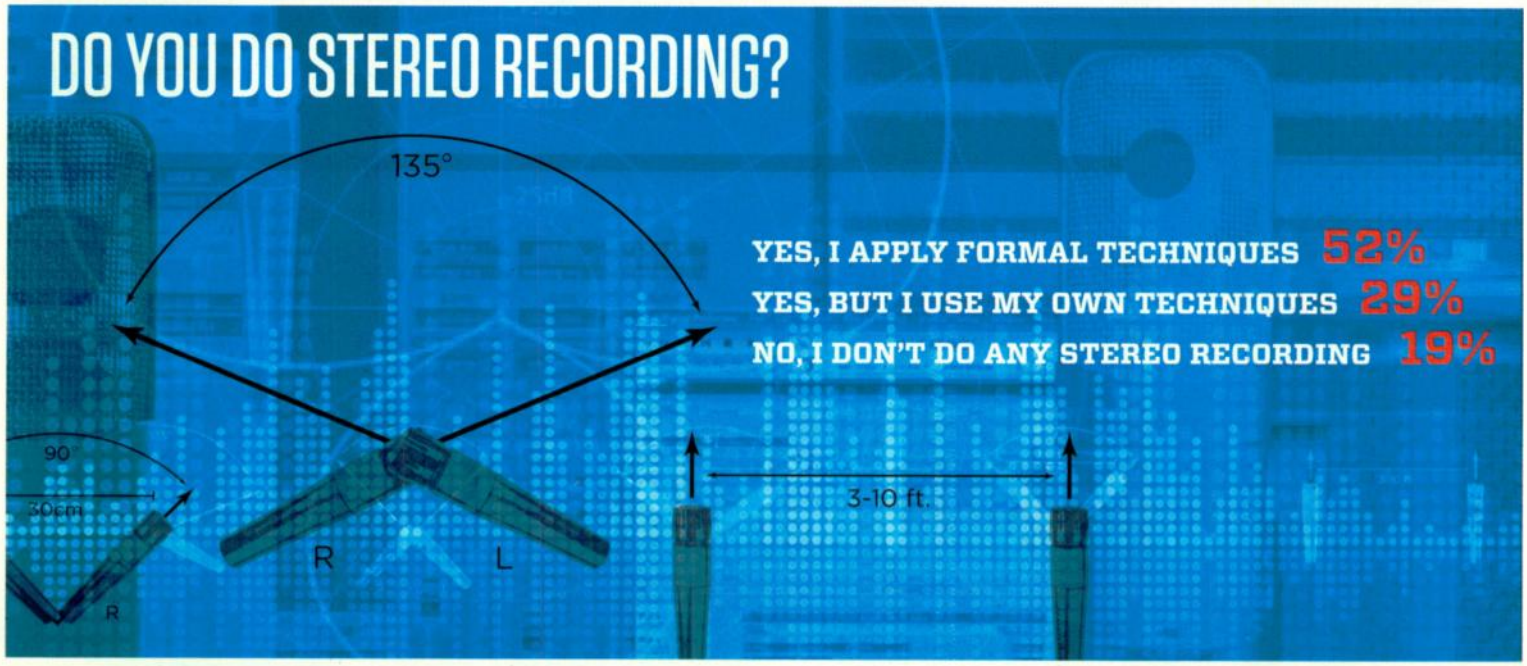
Alan Krueger, the chairman of the White House Council of Economic Advisers, speaking at the Rock and Roll Hall of Fame in Cleveland, July 3, 2013

The *Electronic Musician* Poll

DO YOU DO STEREO RECORDING?



DIG MY RIG

"The Bullfrog" is the name of this mix station. This live setup is for jamming mouse-free. The Cirklon hardware sequencer is a 64-track unlimited bar sequencer. With this, I am able to keep the mix going for as long as I need it to. The FX chain is an Eventide Space going into an Oto Biscuit. From there it goes through a Strymon Mobius and finally into a Strymon Timeline. I use the FX to create transitions between loading up new sounds or patterns. Native Instruments Maschine is only being used to control the DMX lighting and elements in MODUL8.

Most of the time, I feel more grounded having fake plants around me for some reason; they neutralize the whole technical overload. Everything glows in the dark, and is also reactive to UV light.

TIM GOODE
@FROGSTA

ask!

I PLAY IN A METAL BAND (TWO GUITARS, BASS, DRUMS) AND WE'VE RECENTLY ADDED A SYNTH PLAYER. SHE PLAYS MOSTLY HARDCORE, RIPPING SOUNDS ON A CASIO XW-P1 DIGITAL SYNTH, NOT SAMPLES OF REGULAR INSTRUMENTS. SHE'S GREAT LIVE, BUT IN THE STUDIO, THE SYNTH DOESN'T GEL WITH THE OTHER PARTS. WOULD A MORE EXPENSIVE SYNTH HELP?

JOHNNIE JACKSON
PHOENIX, AZ
VIA EMAIL

Probably not, so before you check out a different synth, try two techniques. First, synths tend to have more high-frequency energy than guitar, bass, and vocals. Sometimes just trimming the highs a bit will help a synth fit better in a track. Second, if you're recording the synth direct but the other instruments with mics, the synth will sound more "up front" because it won't have any room ambience. Try plugging the synth into a relatively clean amp (like a Fender Twin) and recording it with a mic, similarly to how you record the guitars.

If an amp doesn't give the sound you want, with a direct-recorded track add several short, low-level delays to provide a bit more "air." Prime-number delays (*e.g.*, 13ms, 17ms, 19ms, and 23ms) usually work best because they won't create unnatural resonances. Also, several amp sims offer an "air" parameter, and reverbs often include "ambience" settings with delays much shorter than those used for reverb—give them a try, too.

THE EDITORS

PSP Audioware's PSP 608 is a multitap delay with eight taps; it's a fine "construction kit" for creating short, tight reflections within a virtual room.

>>> Got a question about recording, gigging, or technology? Ask us! Send it to ElectronicMusician@musicplayer.com.

Terry Bozzio's drums on steroids.

Sweetwater GearFest '13

A look back at one of summer's biggest audio events

BY GINO ROBAIR

Although AES and NAMM are among the biggest trade shows in the world for gear manufacturers, they're not often open to the general public. Instead, they're places where deals are made with distributors and new products are shown to the press.

Then there is Sweetwater GearFest. Now in its 10th year, the two-day event (June 21-22) takes the best aspects of an MI tradeshow—master classes, product demos, and concerts—and brings them to the public. But unlike at other tradeshows, GearFest attendees can buy the gear they see at a show-only discount price. My favorite examples were Shure SM57s priced at $57 and SM58s priced at $58. You have to physically attend GearFest to get these deals, which means traveling to Sweetwater HQ in Fort Wayne, IN. But the trip is worth it, and the prices and events attract people from all over the world. More than 7,000 attendees pre-registered, and I met visitors from Japan, Germany, and the U.K. during my visit.

The layout of GearFest '13 was remarkable: A dozen large tents were set up in Sweetwater's massive parking lot, each filled to the brim with gear. Manufacturer reps were on hand to answer questions and share production techniques. This year there were four Pro Audio tents, where you could find everything from mics and preamps to iOS-related gadgetry and digital storage devices. Two tents were dedicated to electric guitars, one to acoustic guitars, and one to drums. One of the largest tents, Electronic Production, was home to a variety of hardware and software manufacturers including Ableton, Moog, Korg, Line 6, Vestax, M-Audio, Native Instruments, and Arturia, among many others. At the center of the tent was a DJ station where demos and concerts were ongoing throughout the weekend.

The reputation of GearFest has grown in influence to the point where many major manufacturers launch products during the show. This year the big news was Avid's announcement of the availability of Pro Tools 11. Not surprisingly, Avid had the highest visibility of any manufacturer at the event, with workshops stretching from 9:30 A.M. to 4:30 P.M. each day, on topics ranging from video post-production techniques using Pro Tools 11 to "Getting Studio Sound Quality Live" using the Venue console. I sat in on "Pro Tools 11 A-Z for Experienced Users" in Sweetwater's Russ Berger-designed Studio A control room, and was knocked out by every aspect of the presentation—sound quality, vibe, and depth of instruction.

In addition, there were master classes by leading producers and engineers including Chris Lord-Alge, Frank Filipetti, and Jack Douglas; performances by top musicians such as bassist Billy Sheehan, guitarist Brent Mason, and percussionist Terry Bozzio; and product-related workshops

Crowds braved sweltering temps for great gear deals.

from PreSonus, iZotope, Mojave Audio, Vox, MOTU . . . just about every major brand that Sweetwater handles. There's no way to see it all in two days, but it was fun trying.

And if that wasn't enough, a flea market tent brought in used products from regional attendees. That's where I found a 1920s, 28" Ludwig bass drum and matching concert snare (all with original calf heads), among tons of vintage amps and guitars. A few steps away, Sweetwater held its "open box" tent, where prices were slashed on demo units and closeout items of everything from

Working the Electronic Production tent.

Gibson and Fender guitars to stompboxes and digital interfaces. Attendees could also win new gear, with winners announced on an hourly basis.

This was my first time attending the Sweetwater GearFest, and it was so much fun that I'm already holding the weekends at the end of June 2014 open in anticipation of next year's event. It wasn't a bad way to spend the Summer Solstice.

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FIRST TAKE

BONNAROO SUPERJAM

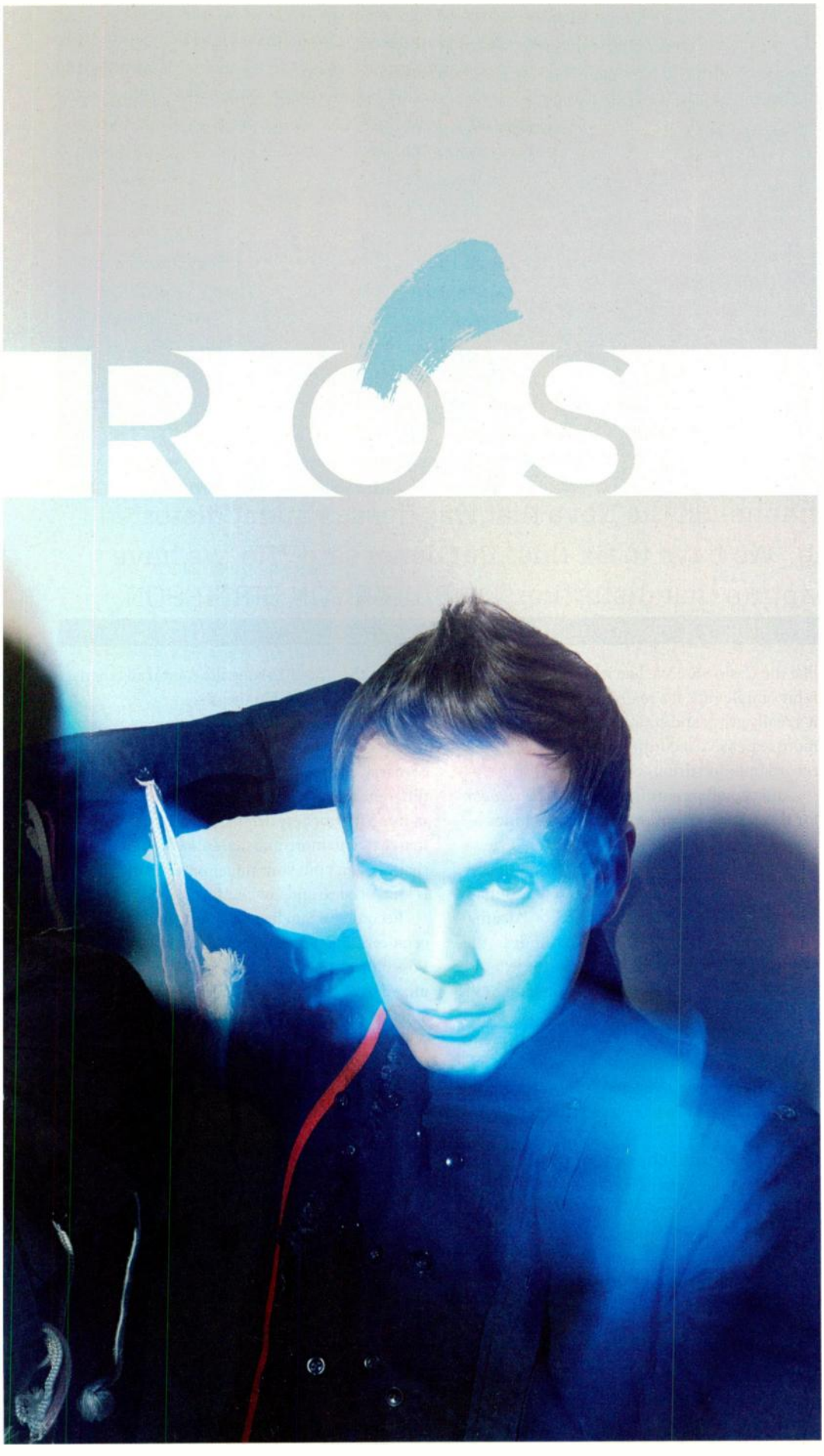
MANCHESTER, TN
JUNE 15, 2013

PHOTO BY DAVE VANN

This year's Bonnaroo festival featured not one but three Superjams, including a set led by My Morning Jacket's Jim James and featuring guest appearances by John Oates, Alabama Shakes Singer Brittany Howard, and R&B crooner R. Kelly and perennial rocker Billy Idol, who both headed from their own headlining sets to jam on the (relatively) intimate tent stage. Highlights included R. Kelly's renditions of classics "A Change Is Gonna Come" and "Bring It On Home," and Idol's sneering, scorching cover of T. Rex's "Bang a Gong (Get It On)." The all-star act kept rocking until 4.am—just another typical night at Bonnaroo.

SIGUR

RYAN MCGINLEY



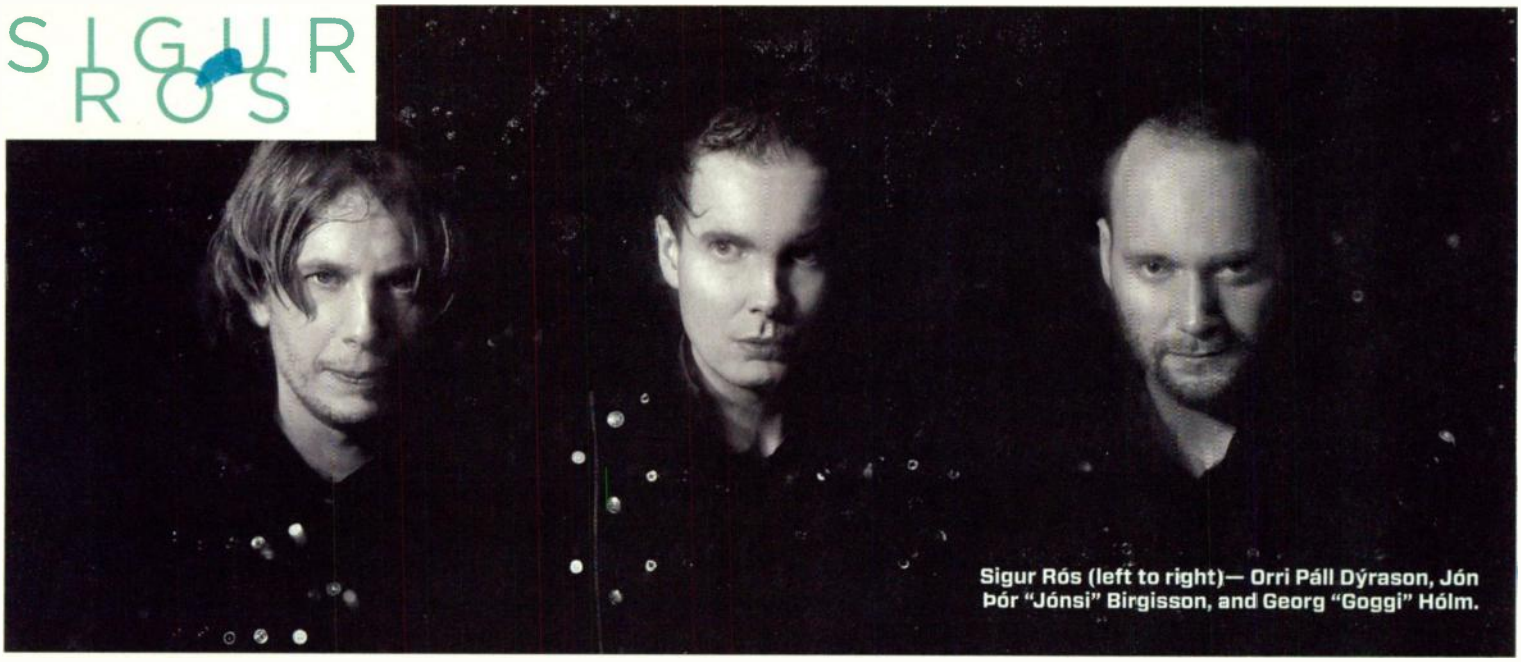
On *Kveikur*, the Icelandic atmospheric trio work through self-imposed studio limitations to juxtapose ethereal melodies with dark, aggressive soundscapes

BY KEN MICALLEF

Recording music is often about working with limitations. Unless you're a Platinum-selling artist, you're probably cutting tracks in a home studio, with an assortment of cost-effective plug-ins, instruments, and laptop as the bare-bones tools of your trade. But on their latest crash-and-burn soundfest, *Kveikur*, Icelandic atmosphere merchants Sigur Rós also embrace limitations.

Prior to tracking *Kveikur*, Sigur Rós underwent changes that forced them to recognize barriers and work past them. With the departure of keyboardist Kjartan "Kjarri" Sveinsson, the core of Sigur Rós was down to the trio of Jón Þór "Jónsi" Birgisson (vocals, guitars, bowed guitar, keyboards), Georg "Goggi" Hólm (bass guitar, samples), and Orri Páll Dýrason (drums, samples). Though Sundlaugin, the band's famed "swimming pool" studio in Álafoss, was at their disposal, the band recorded elements of songs in rehearsal spaces on tour using a Shure Beta 58, Apogee Duet, and a laptop. They tracked drums and bass to an Otari MTR 90 at Sundlaugin, but also made extensive use of a 1980s-era Yamaha PortaSound VSS-30, an 8-bit sampling keyboard that is the origin of the apocalyptic sounds that fill *Kveikur* with equal parts cryptic joy and doom-laden dread (Jónsi: "Something not comfortable").

SIGUR RÓS



Sigur Rós (left to right)— Orri Páll Dýrason, Jón Þór "Jónsi" Birgisson, and Georg "Goggi" Hólm.

"For one song, we had a channel on the Neve that was bussed and it distorted like hell. We were thinking, 'We have to fix this.' But Jónsi said, 'No, we have to record through it and capture that distortion.'" — BIRGIR JÓN BIRGISSON

Kveikur's production is the result of massive overdubbing (in Logic), Native Instruments Kontakt, and tools and toys from esoteric sound design company Folktek, but also guerilla tactics and lo-fi methods (such as recording drums to tape at a faster speed then normalizing them)—limitations to be exploited and embraced.

"I like that philosophy," Jónsi explains from Reykjavik. "We've been touring a lot. Having cheap gear to record on the road is great; it's pretty solid and it sounds good. You can achieve really, really good results with cheap gear. For example, we recorded a bunch of stuff backstage using a laptop and Logic Audio, Apogee Duet and a Shure 58—simple stuff. We know what we want, and how gear and plug-ins and computers work. Ultimately, it's all about how you use it."

"If you are really limited to a laptop and Logic, I would get a nice tube preamp and a good mic," Goggi adds. "That's key to what we did on this album. We recorded at rehearsal spaces here and there with a good mic and laptop with Logic. And that's on the record; a lot of guitars were recorded just like that. It's all guerilla for guitars and overdubbing; put a mic there and see what happens. Taking chances is key to enjoying what you're doing. If you think too much, it becomes boring."

And that ancient Yamaha sampler, which has graced Sigur Rós' albums as far back as 2005's *Takk...* and perhaps even further?

"The Yamaha is like a toy," Jónsi replies. "It's like the Casio SK1. We like it because it has an 8-bit sample rate, it's really sh*tty quality, but it's really gritty and cool. It marries well with a more expensive recording approach when you record bass and drums to tape."

And though recording to tape is *de rigueur* for those who can afford vintage machines and setup and maintenance costs, Jónsi views tracking to tape as a healthy limitation that reaps benefits, both musically and emotionally.

"It's good when you have to record drums and bass and guitar on tape," he confides. "When you record to tape, it's just there and you have to move on. You have to decide, 'This is final take and I am happy with it,' and you have to let it go. Instead of when you have Pro Tools and you can just record forever. You can record 100 takes on Pro Tools then spend two weeks finding out which take is the best."

Creating Soundscapes Like a teenage heroine in some gory action thriller rescuing her unlucky girl gang from undead zombies and psycho vampire killers, *Kveikur*'s hypnotic melodies squirm to the surface through a din of stacked vocals, clattering drums, and the ghostly crunch of sonic fatalism. But what sounds like skyscrapers collapsing, planes crashing into happy suburban homes, and the Red Sea parting is anything but. It's actually the Yamaha VSS-30 sampling everything from Celeste, glockenspiel, strings, and Wurlitzer to tuned gongs and found sounds, the VSS-30's squeaky 8-bit trails then treated and inserted in the mix.

"We've always wanted to create a soundscape in music," Jónsi explains. "We like the idea of marrying drums and bass and guitar with different soundscapes and sculpting the sound more so it's not only drums, bass, and guitar. We marry that to more unusual sounds, something that you can't put your finger on. Something that is kind of eerie and not comfortable."

Recorded at Sundlaugin by longtime band engineer Birgir Jón Birgisson (a.k.a. "Biggi"), Sigur Rós compatriot Alex Somers, and Sigur Rós, and mixed by Rich Costey (at Eldorado in Burbank) and Somers, *Kveikur* is a mammoth production, with all the aggression of modern warfare and the ethereal beauty of a midnight mass.

"The band wanted this record to be really in-your-face and aggressive and not polite," Somers explains, "as rude as possible, and Jónsi's vocals as dreamy as possible. The drums and bass are really intense and aggressive. I made them as loud as possible when mixing. Orri often puts cymbals on his drums and records drums separately, and layers and treats the drum sounds. And the bass is really distorted and overdriven. And there is a lot of bowed guitar. It's really reverbed out, and Goggi and Jónsi both play the bass and guitar with a volume pedal to make a super-slow attack."

From *Kveikur*'s first shudder, the aggressive/beauty thing is on, as in the

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stomping drums and *Terminator* death strings of "Hrafntinna," the near-yodeling vocals and shimmering guitars of "Isjaki," the ghostly backward vocals of "Yfirboro," and the throbbing pummel, falsetto cries, and unsettling stillness of "Rafstraumur."

"We started writing the songs for this record by creating sounds or loops," Goggi explains. "Maybe 10-second loops of a soundscape we all liked. Almost like we were working on a song, but we were just working on a loop. We played the loop back from the computer through the P.A. and jammed on top of it. Often the loops dictated what the song felt like. It was just a lot of experimenting and sampling our own instruments. We sampled Jónsi's bow on a ukulele. Then we treated it and made it sound completely different. So a lot of experimenting with the computer and pressing a lot of buttons to see what happens."

As always, Sigur Rós tracked bass and drums to Sundlaugin's Otari MTR 90 tape machine, ran the signals through the internal preamps of their Neve VR console, then dumped to Logic. Guitar overdubs recorded on the fly in the studio were added to the mix, as were the myriad distorted samples that warp the songs like an alien blessing.

"For one song, we had a channel on the Neve that was bussed and it distorted like hell," Biggi recalls, shedding light on Sigur Rós' process. "We were thinking, 'We have to fix this.' But Jónsi said, 'No, we have to record through it and capture that distortion.' It made perfect sense within the song."

"I Like the Sound of a Choir" Jónsi's layered vocals are a Sigur Rós trademark, and they're not arrived at easily. He typically sings through a Neumann U47 into either a Chandler TG1 or Preservation Sound pre, and at Somers' studio, Retro Sta-Level vocal compressor and Chandler Curve Bender EQ.

"It's almost like a lead solo vocal," Jónsi says. "When I do backing vocals, I layer them a lot. I like to layer maybe one voice into four layers, then when I do harmonies, another four voices; and if I harmonize, then I do another four voices. So 12 voices total. I like the sound of a choir. It doesn't sound like so many layers, even though I sing a lot of voices. When you sing four pieces on the same voice, it becomes kind of unified and has a stronger sound. It doesn't sound like so many voices; it maybe becomes more solid.

"It's all guerilla for guitars and overdubbing; put a mic there and see what happens. Taking chances is key to enjoying what you're doing. If you think too much, it becomes boring." —GEORG "GOGGI" HÓLM

"It's the most fun and creative part of being in the studio for me," he adds. "Because when you write a song, it often takes two years to finish everything. But when I'm doing backing vocals, it's the most spontaneous part of being in the studio because it just happens. I don't plan anything. I really like that process."

He makes it sound simple, but Somers describes Jónsi's vocal process as one of consistency, creativity, and hard work. (Costey mixed vocals using among other things, Kyma granular reverb—"some insane voice processer not meant for music," says Somers.)

"Jónsi is really invested in backing vocals," Somers says. "Usually he improvises on the spot. We always record four of each backing vocal and pan them hard left and hard right, sometimes for 20 minutes, sometimes for three hours while he comes up with sh*tloads more backing vocals. Sometimes we don't work with them the way they were recorded. We reverse them, f**k with them, and move them around in a different spot in the song. Then he might come back and do the final lead vocal after all the backing vocals are there or sometimes it's done first.

"He wanted the vocals to be quite dreary on this record," Somers continues. "On 'Brenninsteinn,' Jónsi sang that through a handheld mic through my guitar with the spring reverb really far up. He wanted all the vocals to sound sh*tty and f**ked up."

Getting' Biggi With It Sundlaugin, built within an old concrete swimming pool, is popular among artists other than Sigur Rós. Bands come for the sound, which can range from mad and booming for drums, to thoroughly contained, depending on adjustments that Biggi makes.

"It's a big room sound when it's completely open," he explains. "For some bands, we have to control it, using theater drapes to adjust the sound, but for drums we keep it a bit open. The ceiling is wooden, and the main room is around 20 x 20 feet with four iso booths where we place amps. But surprisingly, the reverb is not huge in the studio. With loads of instruments in there, it breaks up the waves."

Biggi walks through the recording process, starting with guitar: "On the guitar amps, I used AKG C12A and Pacific Pro Audio (PPA) ribbon mics; they're about 100 bucks and they are really great. And Thermionic Culture Rooster mic pres. The PPAs can handle a lot of SPL, and usually the amps are really loud. For most of the ribbons, they start to break up on sustained sounds like that, but the PPAs can handle a lot and they just sound nice. It's quite rough sounding, too, but with loads of low end. Usually I combined the PPA with another condenser for brightness. Jónsi uses the 1960s 412 Marshall and JCM 2000 head, so I placed one mic on the lower cones, and another one on the higher cones."

Dýrason plays a Gretsch kit with two kicks on some of the songs. "I put a Sennheiser e602 in the bass-drum hole and an AKG D25 out

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front, close below the middle of the head," he explains. "Snare top is a Sennheiser MD441; a Shure SM57 under the snare. I used two Coles 4038s as overheads, six feet off floor, facing down in figure-8, with three feet between them and similar distance from the snare middle to each mic. The one on the drummer's right is usually a bit lower than the other one. I do that mainly because that is where the ride cymbal is, and it's lower so I try to place it closer to those than the crash and hi-hats to pick up the cymbals. And I like Lomo Russian valve mics for room mics. They are bright and have loads of detail, and for this room, they are really good. I have two of them on each side of the room with a meter-and-a-half between them, and facing the drums, two meters away and two meters high."

Biggi ran bass through an Avalon DI, and miked a '60s-era Ampeg B15 Portaflex with a Neumann U47 a foot away from the center of the cone, sent through an LA610 pre into a Thermionic Culture Vulture. Goggi played Fender Jazz, Precision, and Jaguar basses with a host of distortion pedals including EBS MultiDrive [Universal] Overdrive Pedal and EBS ValveDrive [Pro Dual Mode Tube Overdrive] Effects Pedal, and a Boss Multi-Effects pedal. "That has 20 different effects built in, which are usually not that great," says Goggi, "but if I just turned everything on, and all up to 11, it sounded great."

With the resulting sonic stew from the Yamaha VSS-30, guitars recorded on the road, and enough vocal layers to bury Phil Spector, the role of the mixer was especially important to the success of *Kveikur*. Somers and Costey shared duties and headaches.

"We wanted the drums to be really overdriven," Somers recalls. "I used the Thermionic Culture Rooster; that drives the drums really hard. I tried to get them really loud and aggressive and often over-compressed. That imprints the drums with this sense of urgency. Usually I have to bring the bass back in 'cause the distortion and compression tend to take it away. I have an EQ after that, and find the kick drum spot and bring that back in. It was really about really loud drums and good, clear vocals."

EQing individual tracks via Neve outboard and the SSL EQ, and UAD plug-ins in the Logic sessions, Costey ran bass through a combination of UAD plug-ins, Distressors, and Neve 1073 EQs. On the drums, for outboard gear, he mostly used a vintage Decca limiter as a parallel compression unit. Jónsi's guitar, keys, and strings were left untouched. The lead vocal chain involved splitting the vocal out into several channels, with different EQ and compression on each channel. The intense reverbs heard throughout the album are a combination of Costey's UAD EMT 250, Valhalla reverb, and stock Logic plug-in reverbs, as well as his outboard Bricasti, Lexicon, and AMS units, and Kyma granular reverbs.

"Jónsi was very involved in the mixing process, typically taking a mad scientist approach, grabbing faders and really digging in," Costey explained. "My job was to keep it from going too far in any one direction. For example, he was always pushing the reverse reverb higher and higher on the lead vocals, and I would keep his rides but then try to bring their overall level back to some semblance of sanity. There were quite a few instruments hitting in the same range—treated falsetto vocals, bowed guitar, and strings battling throughout the album on a number of songs. The trick there was to have the guitar under the vocal with the strings on top, EQ-wise. I generally did not use much compression on individual instruments—partly to preserve dynamics and partly because it just makes things sound worse sometimes by changing the envelope and release of a performance."

When asked about the job of the mixer in the era of the home studio, Costey replied, "The first job of a mixer is to not ruin whatever is being given to him or her. That's not as easy as it sounds—the temptation is always there to add more and more processing to a recording, but in most cases these days, the recording is probably fairly processed already. And I would say that the second job is to think about the intent of the material and try to take it further down whichever road it's heading. One thing that's important to bear in mind when mixing is that to make something sound extreme outside of the studio, it has to sound very extreme inside of the studio. There are parallels between mixing and editing a film, cooking dinner for family and friends, conducting a group of musicians, and running air traffic control."

Accidental Music After the departure of Sigur Rós' longtime keyboardist, the remaining trio felt the need to experiment and to use those limitations to their benefit. Did taking chances pay off? "It was more extreme experimentation this time," Goggi says. "We felt we should be completely free to do whatever we want. We should open our minds and do whatever; it doesn't matter if it doesn't sound great in the beginning. We'll work on it and see what comes out of it. We do like accidental music. When you might accidentally hit a button or you forgot to turn something off. Or you didn't hit the right note. You keep it on the record. You take that chance." ■

Ken Micallef has covered music for Downbeat *and* Rolling Stone *among others..*

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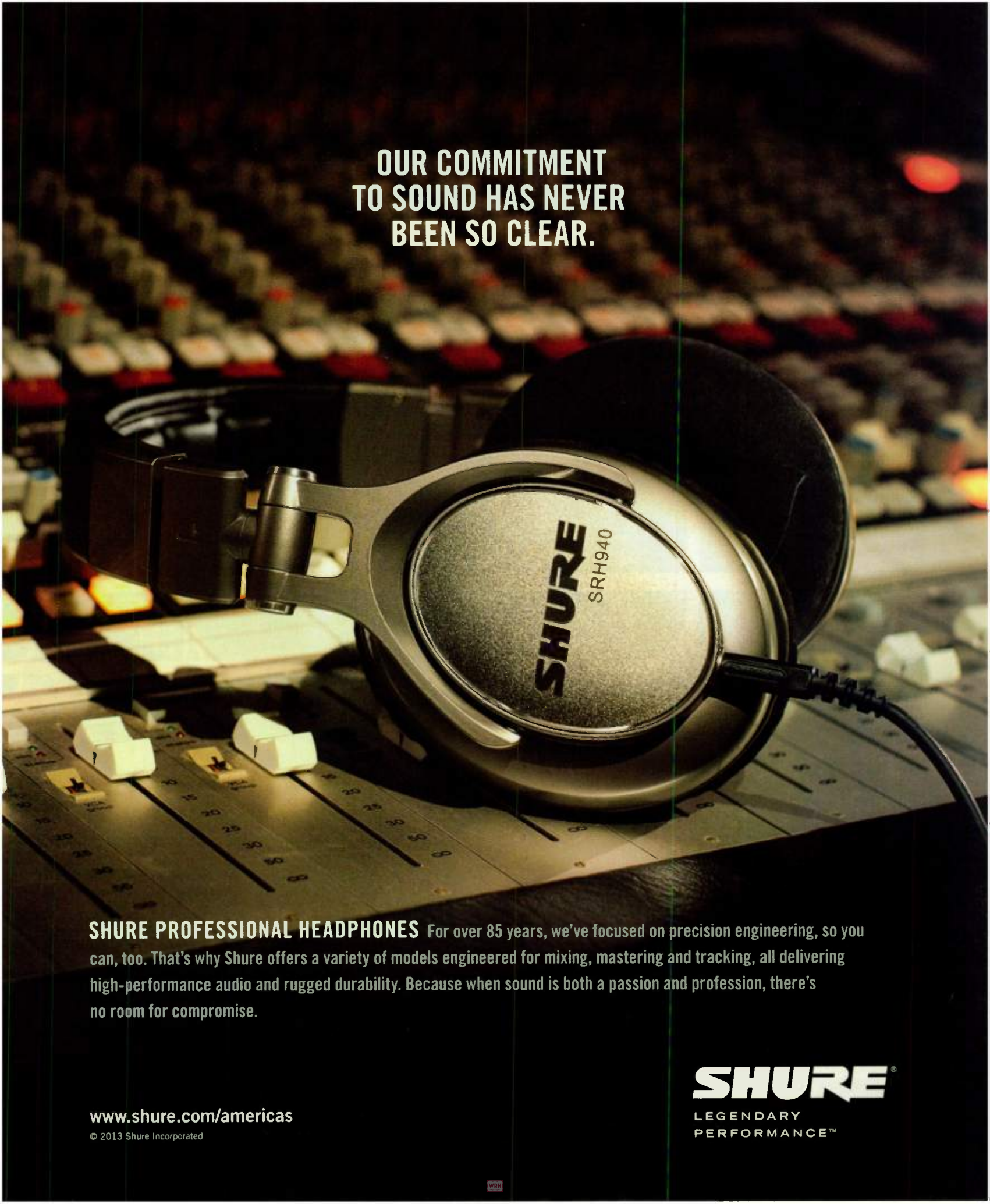
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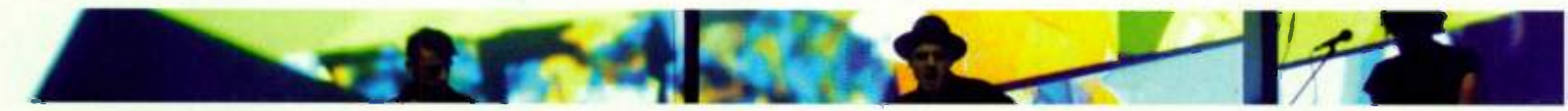
MODERAT

The Berlin-based supergroup formed by Apparat & Modeselektor tap into plug-in effects and vintage gear to distill consciously "non-perfect" electronic sounds on //

BY TONY WARE

ON //, the sophomore album from Moderat, a collaboration between Berlin-based producers Sebastian Szary, Gernot Bronsert, and Sascha Ring, there's plenty of synth tinkering, studio improvising, and software processing across its 12 tracks, but no footsteps. Spiritually and emotionally, however, the footprints of six months of recording resound loudly for the trio of old friends, who bring together simultaneously diametric and symbiotic aesthetics.

"Sascha isn't a sneakers guy; he has very classic-type shoes, and you can hear the sound of his heels as he comes down the hall," says Szary by phone from the



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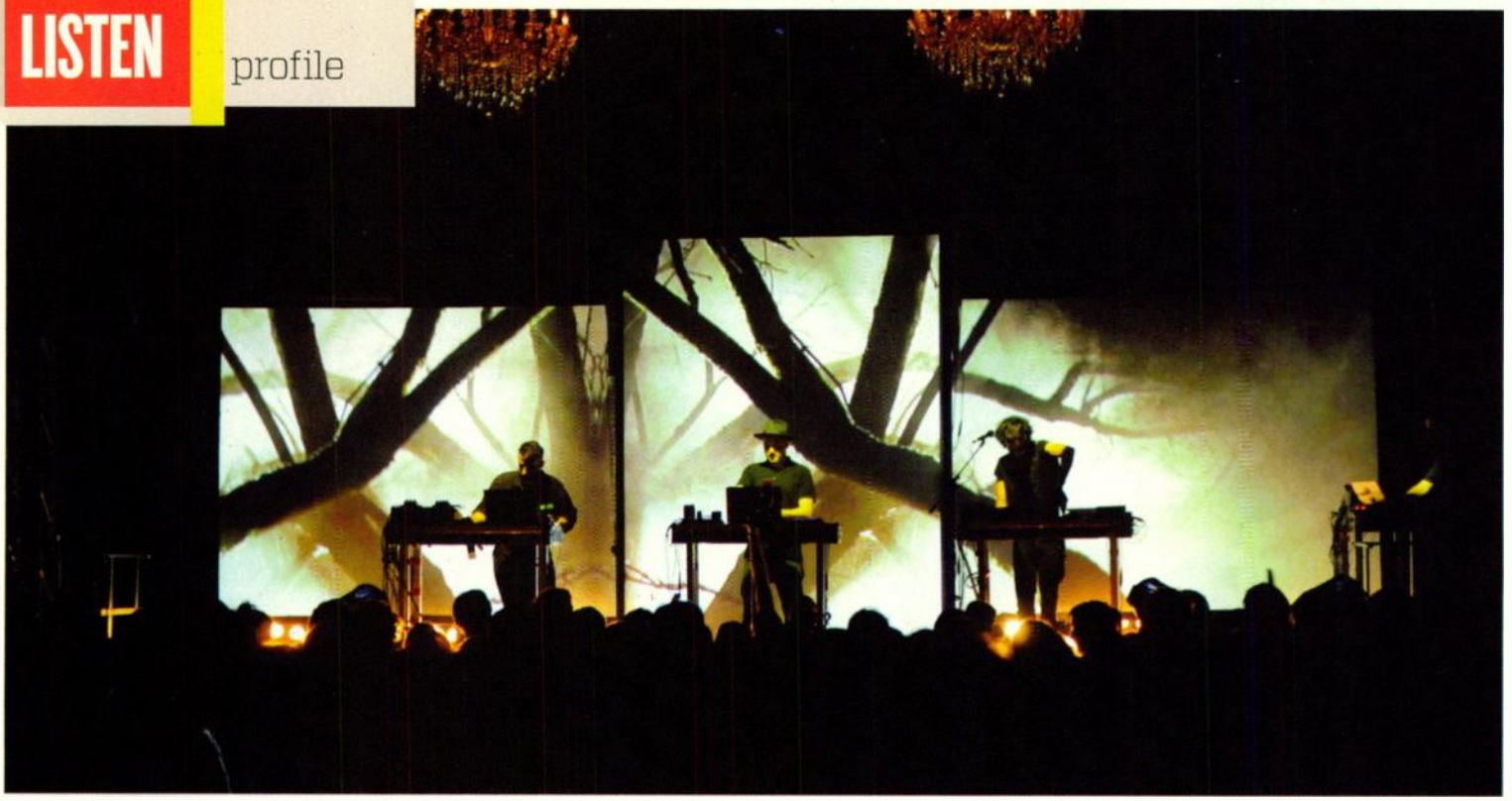
studio in Berlin's Alexanderplatz. "So we'd know when he was approaching with a [flash drive] of recordings, maybe 20 or 30 vocals tracks and melody ideas, and he'd ask us to choose the best ones while he'd go get some food. On the first album, we started making tracks by restoring lost pieces found on hard drives, but for this one we developed song-oriented ideas together, even if we would start them working in different rooms."

"It's important to have other people you trust when you are an electronic musician, people who can help you make your ideas clear and to the point," agrees Ring, conferenced in from Geneva. "Sometimes it's easy, sometimes it's not, but we help bring each other's recordings forward. Our first album was more a compilation of parts we liked, while for this one we distilled a basic sound we all share."

Operating as Modeselektor, a name adapted from a knob on the Roland RE-201 Space Echo, Szary and Bronsert have established a party- and sneakers-friendly reputation for saturating audiences with walloping subbass pressure and champagne (explored in a recent documentary, *We Are Modeselektor*). They have even established their own label/booking agency, Monkeytown Records, to



promote likeminded machine-enhanced sonic architects and absurdists. Ring, meanwhile, primarily records bit-crushed acoustics and astral sound design under the name Apparat, associating with futurist outlets including Bpitch Control and Mute Records.

Immersed in production and the Berlin scene since the '90s, having developed an interest in electronic composition and moving from the East German countryside as dusty basement techno parties and flat shares spread across a reunified nation, the three share a common backdrop of strobes and haze, Detroit-style Roland TB-303/TR-808, and Aphex Twin and Hard Wax Records.

Moderat's self-titled full-length debut was released in 2009, and since then, both Modeselektor and Apparat have rearranged their workflow: Modeselektor, with the help of an acoustician, optimized a former film sync studio and then had "Christmas in April," unpacking years of accumulated gear and patching it together alongside a Mac Pro running Logic Pro, a Midas Venice F32 desk, RME Fireface 800 interface, API Lunchbox preamps, a dbx 119 compressor/expander (among other compressors and channel strips), and both Genelec 1038A and 8040A monitors.

Apparat, meanwhile, sold his formal studio (where *Moderat* was compiled) and now sketches in Logic Pro on a MacBook Pro with an Apogee Ensemble, an API Lunchbox (housing an API 512C mic pre, Shadow Hills Mono Gama mic pre, two Inward Connections VC500 Kompressors, and two API EQs), fed by a Bock Audio 151 cardioid tube condenser mic, as well as such instruments as the Eowave Persephone MKII analog ribbon synthesizer and a Fender Mustang guitar. He then takes tracks to various studios for refinement; in the case of *II*, most of the work prior to mixing and mastering was completed in Modeselektor's facility during the "typically depressing Berlin winter," says Ring.

"On Apparat albums, I would use more instruments; I would experiment using an old speaker for a kick-drum microphone, but making a record [as Moderat] we end up doing mostly a digital thing inside Logic."
—SASCHA RING

Logic played a central role for everyone involved, hosting such tools as iZotope's Iris sample-based synthesizer and many instances of SoundToys Decapitator analog saturation modeler. "We made the choice to make a non-perfect record that sounds dirty in parts, resampling stuff and playing it to get less of a preset feel," says Ring. "The meter wasn't just blinking sometimes; it was just red!"

Feeding this desire to stray from the grid, *II* made use of a variety of sample and filter sources to achieve a sound that's "sh*tty in a good way," according to Ring. The eclectic list includes Roland Space Echo, Korg Stage Echo, Roland MC-202 MicroComposer, TR-77, and TR-808, Vermona DRM-1, Yamaha PSS-570 and VSS-30, CasioTone MT-70, Electro-Harmonix Big Muff pedal, various Boss pitch-shift pedals, Electro-Harmonix Memoryman. Simmons SDS 8 drum synthesizer, Sakae snare drum, Korg Monotribe, Roland Juno-60, Crumar Multiman-S, Waldorf Rocket, Korg MS-10 and Korg MS-50. Older gear, with no MIDI and no recall, was tracked intentionally out of the grid then edited down.

Only two rules were imposed when initializing work on *II*: no smoking in the studio and no use of Native Instruments Massive. "Massive was our favorite for the last record, but we noticed we were using all the same sounds, so it was banned this time so we wouldn't end up with the similar stuff," says Ring. "We still have many Native Instruments toys in our toolbox," adds Szary. "Much of our bass was built in [NI's additive synthesizer] Razor, and

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we did a little in the new Monark [a monophonic analog modeling synth based on the Minimoog]."

Whenever creativity would hit a speed bump, the trio turned to the Teenage Engineering OP-1 portable synthesizer/workstation/controller. "It is limited, but in a good way; it is not so complex that you spend more time programming than starting ideas," says Szary. "It helped us build many ideas from scratch, and for this album, we wanted to remove the things that keep us from recording ideas right away."

"On Apparat albums, I would use more instruments; I would experiment using an old speaker for a kick-drum microphone, but making a record [as Moderat] we end up doing mostly a digital thing inside Logic, because we need everything to have total recall and to be able to be shared," says Ring, who still uses Native Instruments Guitar Rig 5 to split channels and emulate different spatial/miking/reamping effects in tandem.

"I have to say I love to drive [sessions], but I am not the fastest one, so often Gernot or Sascha would sit in front of the desk at the monitor, with the one not in the pilot's seat working behind on a couch, and I would be at a station on the side of the desk working parallel," explains Szary. "I would make loops and Reaktor patches, Sascha would often be in the vocal booth working, and then we meet up with ideas and new energy and Gernot would glue them together."

"It was important to have freedom and space from time to time, because if you have too many discussions about hi-hats for half an hour, you want to kill each other," laughs Ring. "So I would be making beats or singing melodies or writing ideas on a guitar, because I'm not a trained musician who plays instruments with black-and-white keys, and I would bring them in and the themes would end up being building blocks used by Gernot or Szary in a soft synth or to start a drum machine jam tied directly to the desk."

Sidestepping the more contentious drum-tuning conversations, the Moderat collective instead had to settle debates on where to draw the line between tracks and songs. While one of the first impulses for the new album had been to compose a series of instrumentals, so many ideas came out of vocal improvisation that structure became the main sticking point. On the one hand was Bronsert, promoting a more DJ-oriented stretched out flow, and then on the other hand were Ring and Szary, who wanted to take a more verse-chorus-verse-bridge approach. In the end, the balance proved a cohesive one. Unlike on Moderat's debut, where say a dancehall-infused track would pop up before dubstep before an almost Sigur Rós-like wash of dream-pop-cum-acid-house, the concepts on *II* evolved concurrently, so the arrangements support each other and inhabit common ground.

"We made the choice to make a non-perfect record that sounds dirty in parts, resampling stuff and playing it to get less of a preset feel."

—SASCHA RING

This more band-like result didn't mean that mix engineer Francesco Donadello at Berlin's Vox-Ton recording/mixing studio and Calyx Mastering didn't have his work cut out for him, however. For instance, on the epic, moody house track "Milk," the guys achieved what Szary describes as "the moment when we put the chairs away," meaning a song that makes everyone just want to dance around with a beer. However, when the track in question made it to Donadello, he found the track—full of tuned-down samples, dirty shakers, dense granular synths, and a spectrum-swallowing bassline) to be unfathomably muddy, listening through his 1972 Cadac console on ProAc and Westlake speakers. Luckily, Moderat had already instituted a policy of sending over tracks for premixing as they neared completion, so Donadello could pull them up in Logic with the same plug-ins (including native Logic and Waves EQs that dialed in Moderat's rough mix), and he could rebuild the mix in a hybrid manner using both digital automation and outboard gear (bypassing plug-ins when possible with a vintage Universal Audio 175b compressor, API bus compressor, Urei 1176, Ampex 351 tube tape machine, Klein and Hummel UE 1000 EQ, and an EMT140 tube plate reverb).

However, after listening to the frequency range of the "Milk" kick and its relation to the bassline, and recognizing the already-heavy sidechain compression, everyone determined that it would take more than editing the attack and release parameters to in rein the bass. Recognizing the physical boundaries that were being pushed, they built another bass tone, which let Donadello concentrate more on boosting mids for presence rather than making drastic carves to seat the bass.

"Having Francesco involved so early made us keep in mind that we had to make the music mixable, and having him allowed us to spend more time on writing parts that sound powerful without [the listener] having to turn everything up," says Ring. "On *Moderat* we mixed the song 'Rusty Nails' 38 times, and I don't miss that."

It may not sound like it, but Moderat's *II* is a simplified experience in comparison to the group's debut, which is a fact even evidenced by the album covers. Whereas *Moderat*'s cover was an illustration of a woman punching herself in the face (a representation of frustration echoing that album's one year of audio scrap resuscitation), the cover of *II* is of a man removing a mask, a sentiment more of relief and revelation.

"With our first album, we were working more with each other's production, and I feel with this album we discovered the way we produce best together," reflects Ring. "This is the sound of us, at least for the moment," agrees Szary. Moderat approaches its evolution one step at a time. ■

Tony Ware, a writer and editor based near Washington, D.C., understands how right it feels to do things "wrong." In addition to writing interviews for Electronic Musician, *he enjoys writing about mobile production tools for sister publication* Pro Audio Review, *among other noisy hobbies.*

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EDWARD SHARPE AND

Finding a fresh musical perspective by cutting to the chase in the studio

BY TONY WARE

FORMED IN 2007, Edward Sharpe and the Magnetic Zeroes is an 11-person troupe named in part after a messiah-like superhero dreamt up by the band's creative hub and lead vocalist, Alex Ebert. And you might think it would take some sort of superhuman power to capture the lively dynamic of such a mercurial ensemble, which includes multiple guitarists, male and female vocalists, pianists and keyboardists, a drummer and percussionists, an accordion player, a trumpet player, and a bassist. All it took, however, was a willingness to leave the window open to moments of inspiration.

Tracking initial concepts at the band's own studio, nicknamed the Ed Shed, in Ojai, CA, Edward Sharpe and the Magnetic Zeroes started the 12-track self-titled follow-up to 2012's *Here*, an album of lysergic folk-rock and revivalism gospel-pop. With the band's third album (released on Community Music/Rough Trade Records), Edward Sharpe and the Magnetic Zeroes has captured an even warmer, naturally enriched sprawl of psychedelic roots-rock hymns. It's an album where "all the bells and whistles" refers to actual instruments, not the over-application of high-end mixing and mastering components. We talked to Ebert and the band's recording engineer, Matt "Linny" Linesch, about the ongoing augmentation of the band's sonic palette.

So, Alex, Beatles or Rolling Stones?
Ebert: Definitely Beatles.

THE MAGNETIC ZEROES

I figured . . . I hear a definite late-Beatles-meets-early-1970s Laurel Canyon influence on the new record, and I'm also getting a little Four Seasons and some Joe Cocker, among other sonic touchstones.
Ebert: Yeah, I'm in. I don't know what's been going on for the last 30 years, but I do think there's been a decline in the greatness [of recordings], and I think it's a combination of the production, the performance, and the songwriting getting buried in mechanization.

Are we putting too much in the signal chain?
Ebert: I came up with a quote that I like, and it's: 'Music is too important to be left to professionals.' I think there's been a professionalization of the process that's made it stale and where you actually can hear the process before the song. It's as loud as the mix . . . everything from [Antares] Auto-Tune and [Celemony] Melodyne to the amount of compression to just the amount of gadgetry in between the song and the playing and the speakers. I'm a huge fan and love gear, especially good gear, physical gear, so certainly this album has plenty of gear going in and out, but the science has been distilled too far and the creative side of learning equipment and experimenting with equipment and getting sounds that aren't 'clean' and 'professional' isn't heard as much; it's usually just when artists are recording and mixing it themselves.

So when did you reduce the separation between yourself and the recording?
Ebert: I think it actually began with the first Edward Sharpe album [2009's *Up From Below*]. We were ready to start recording and we bought our own gear, starting with a Trident 70 Series console. Nico [Aglietti] our [then] guitar player led the initial charge; he was reading *Tape Op* and forums and I'd follow his lead, so together

we shucked and jived the album together, blindfoldedly charging through along with Aaron [Older], our [then] bass player. It was then I got into mics, gear in general, and my personality with recording started coming through.

My style is a fast approach . . . I'm generally anti-establishment naturally, so anytime anyone tells me where to put the mic, I instantly don't want to. Telling me to not push the board, not to make it too hot . . . as long as it's sounding good and I'm having fun and the moment of inspiration is not being pushed aside to get the right miking technique or right setting on the preamp, that's when I'm happy. So we started recording relatively fast, mixing a bit wildly, and we did it all on tape as part of a huge learning process, because we didn't have automation on the board.

Knowing the limitations, what drew you to the Trident and the tape machine . . . were you looking for a specific coloration?
Ebert: Oh, we're all about color, color, color, color, color. We went with an Ampex MM-1200 because of the saturation on the low end and all that sort of beefy stuff down there. The Trident . . . I personally like the idea that Bowie used the A Range, and T. Rex used one. Also, a friend had it, was selling it, so it was an easy thing, close and relatively cheap . . . we just picked it up and rolled with it. We rented a bunch of mics—a Neumann U 47 and TLM 67—we had the *Recording The Beatles* book [by Kevin Ryan and Brian Kehew] and we'd flip through it to mock some stuff up, then we'd forge our own way.

What did you find those mics lent to your desired result?
Ebert: My favorite mic on my voice for almost anything, except if I want it to be hi-fi, is the RCA 44B . . . that mic is a little wizard with male vocals; females, it pinches, but male vocals sung in the lower register, you basically don't even need to compress. For me that's the perfect amount of color . . . antiquation . . . parallel-universe stuff on it. I love every version of that mic that I've heard. And then I love the idea of 47s, and if you get a good one, you got a great one; but there's so much variation from mic to mic. A good one, though, has warmth on the low end and it's a hi-def mic . . . no wonder it was George Martin's favorite . . . so that I used as much as I could. But we used an AKG C 12 and a 47 when recording [female lead singer] Jade [Castrinos]. And also a mic with a C 12 capsule in it, a Telefunken ELA M 251, which is my favorite if I'm singing in a higher register. But a lot of my parts are on that 44B; I think ribbons are intentionally underused, but they have an amazing EQ bump in the midrange that I love.

Are you running everything through the same board into the Ampex?
Ebert: No, we moved up to a Trident 80B. The main mic pres throughout this entire album were four channels of [Telefunken] V76s for separate parts, and then if we were recording everyone at once, we'd use some pres from the Trident.

Linny: About two years ago, we started putting together this studio, based on experience in various studios, recommendations from respected producers and engineers and auditioning various equipment from Vintage King, etc. We needed gear that had its own vibe but wouldn't get in the way of the creative flow.

> "There's been a professionalization of the [musical] process that's made it stale and where you actually can hear the process before the song."
>
> —ALEX EBERT

Recording Edward Sharpe is all about continually moving forward, so we're pretty minimal in our microphone treatment, which forces us to get creative with getting sounds. It's a 50/50 shot whether or not we track with compression, but we've got a stereo pair of Urei LA-4 compressors, one [Empirical Labs Inc.] Distressor, two Pulse Techniques Pultecs, the V76s, the [Shadow Hills Industries] Equinox analog summing mixer, a [Thermionic] Culture Vulture, an EMT 140 Stereo Plate, and some other outboard gear for getting positive distortion and reverbs, etc. We premix as we go, and I monitor on the Event 20/20 BAS, plus a pair of Hot House PRM 165 MK IIs.

Ebert: We finished mixing the album at Ocean Way Recording [in Hollywood, CA]. We had recorded to Pro Tools HD 10, but I really wanted to mix on a Neve and they have a custom expanded 8068 [in Studio B], so we took the whole thing over there and recorded some more overdubs while we mixed for a month.

This album sounds like there was a concentrated effort at tonal depth. . . . Was it a goal to arrange as much front to back as left and right?
Ebert: Yeah, I'm not a huge fan of close-miking everything. I love using the room, so for instance we weren't EQing beforehand, but we did use mic placement for getting things spatially to sound the way we wanted pre-mix. That's a key to me, because you can re-create space with reverb and slap, but it's just more fun to make the drums sound distant and big because you miked them from far away. Be legitimate.

Linny: In 'Country Calling,' there's the moment in the song where the music drops out and Alex says, 'I'm in the country again.' There's actually two voices taking place, and one of them is him saying it through a megaphone, and to make it sound that way we got a megaphone. Why wait to do in the computer what you can do in the live room?

How far do you take physical experiments?
Ebert: I've definitely done tricks, miking the air vents or whatever, but for me the joy isn't in spending an hour-and-a-half taping a mic to a metal duct, because by then the inspiration gets clouded. We'd use mics in omni or figure-8 to get the other side of the sound, mike kicks from the front with the RCA 77BX over the snare in the tom area . . . and we'd put this Coles ribbon mic [the 4038] just off-center from the kick to pick up the bottom of the snare; incidentally, I found out The Beatles used it in the exact same place. But for the most part, it's just about room miking and keeping it relatively simple. As soon as something sounds right to me, that's it, because the songs aren't necessarily complete when we go to record; they are ideas that are relatively complete and then we start recording and the process has to be contiguous to the inspiration to record; it has to be this thoroughfare that's created.

For instance, when we recorded the song 'Life Is Hard,' I was already mixing the album and taking a break to play the grand piano, and Linny calls from the other room, 'That's cool,' and I just yell back, 'Get the mics!' And this is in the

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middle of mixing; we're supposed to be turning an album in, but still we just start recording. And I didn't have the lyrics, I didn't have the whole song, but I had enough and I was excited enough so we went for it. And because I was excited and we were going for it, we didn't have a drummer around, but I had a basketball and I started bouncing it around and we got three knocks of it and looped it to create the first beat that's going through the whole song.

Linny: I quickly set up the [Neumann] KM88 and AEA R44 pretty close-miked on the hammers of the piano to get the chord progression. Then I spun the KM88 around to record the basketball, and we tracked over that using the same mics. And the electric guitar on the chorus is a Strat going into a Vox AC30 recorded with an SM57 pumped into the V76 which has a chassis that allows us to attenuate the output. So we just drove the input of the preamp and essentially drove the tubes of the V76 and pulled the output back, that's why it has that wild sound that no pedal could get.

If you're embracing the bleed, but you're working with nearly a dozen players, how do you compensate for the congestion?

Ebert: It's all about making those bold choices, going ahead and deleting or muting something, and it's tough, man. We recorded a beautiful piano solo in 'If I Were Free' that battled the guitar solo there, and I had to pick someone and I had to go with the guitar solo, because it was such an outrageous choice. For all the instruments you hear, there's probably at least double you're not hearing that had to be muted or toned down. I'm here with a band of 10 people and I want everyone to be heard at some point, so I can't just keep everyone subtle and just have one thing turned up, because that doesn't represent who we are, especially live. So a large part for me is just EQing things and riding them in and out of the salient sound.

Walk me through the workflow for mixing a track.

Ebert: Basically, we had over a year of parts, which essentially just went through a mic pre. Then quite often we'd mock up EQs and compressors using Universal Audio plug-ins or some Waves stuff. And then we'd get the Pro Tools session into Ocean Way, where we brought our Pultecs and a couple compressors . . . our Retro [Instruments] Sta-Level [tube compressor].

Linny: One of the most recent acquisitions was the Dramastic Audio Obsidian Compressor. We were at Ocean Way and we needed something more transparent as a stereo bus compressor. It has a built-in sidechain and it's an extremely useful compressor, since most of the other ones we have are so colored.

Ebert: And then they have their [Urei] 1176LNs and, of course, there are the EQs on the board. So for the most part we set up the session and we'd break it all out on the board, and in the cases where we used a digital EQ, we thought would translate into the real world we'd keep that mock-up, but for the most part we'd end up muting all the plug-ins we had and just start from scratch. We'd send our drums through a parallel compressor already built in the board . . . and once in a while sum them all through a stereo compressor and an EQ . . . basically we'd put everything

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(JAM)

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(IPIKLIPSTUDIOIN)

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(MD823ZM/A)

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through a compressor and an EQ, and see where we were at. Some stuff, like the bass, we would end up going with these dbx [160 and 165] boxes a lot, and there were API [550a] EQs we'd use.

Linny: Having a Fairchild racked up anytime we wanted to use it was great. And they have a whole rack of API EQs that go in line with the EQ on the console by the flip of a button, so it wasn't hard to put the songs back into an analog environment and to let them go through transformations as Alex would jump into the live room and play with the current melodies.

Ebert: I just love making giant changes on the EQs . . . with instruments, not vocals . . . just really brash choices to get the song sounding good. The longest the mix took was six days, and it would be really frustrating to be working that long on a single song, especially if it was just for a single part, like Jade's vocal on 'Two,' but I would feel like a great failure for not having it translate. When she goes up into the upper register loudly, she's got this tremendous voice that's beautifully overwhelming, and I was just trying to get the grandeur and the loudness without it taking your head off. It was a difficult balance to figure out, and eventually I had to put a multiband compressor on it, and anytime she hit anything between 1kHz and 3kHz really loudly, it would dip so that it would lop that off and allow it to smile at you. Then when she dropped back down, it would come back. That was one of the rare instances when a plug-in came in handy. It was a UAD one; we have a quad-core UAD-2 DSP accelerator that's in the PCIe slot in Ojai.

> "Music is naturally not perfect, and we have to get everything going before we can hone it or else we'd stifle what's so great about the process, which is the fact that it can fluctuate."
>
> —MATT "LINNY" LINESCH

Linny: It's always about bringing out an emotion, never about fitting into a grid. We'll leave something a little fluid in the song, even if it strays a little wide or bends a little wildly. Music is naturally not perfect, and we have to get everything going before we can hone it or else we'd stifle what's so great about the process, which is the fact that it can fluctuate. ■

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Read interview extras with Alex Ebert and Matt "Linny" Linesch.
Emusician.com/september2013

View from the Depeche Mode stage at Berlin Olympia Stadium

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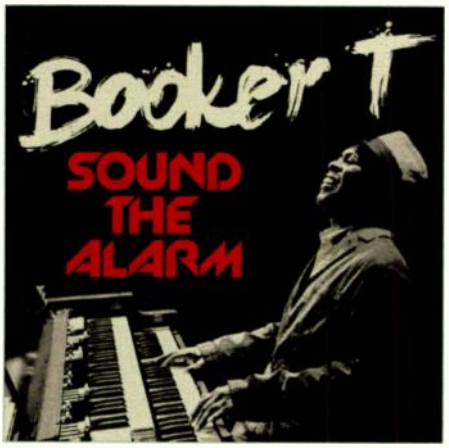


Booker T
Sound the Alarm
STAX

Grammy winner Booker T. Jones dishes up generous helpings of funk, soul, and R&B, with help from his production partners the Avila brothers (Usher, Mary J. Blige). The B3 master co-wrote 12 new tracks, which feature guest appearances by Luke James, Anthony Hamilton, Sheila E., and more. As he's been for 50 years, Booker T remains a beautiful player and an inspiration, and the high points are truly the tracks that highlight his B3: instrumentals like "Austin City Blues," where he trades licks with blues guitar phenom Gary Clark Jr.

BARBRA SCHULTZ

The Ecstasy of Gold
22 Killer Bullets from the Spaghetti West Vols. 1 & 2
SEMI-AUTOMATIC

Standing in the shadow of Ennio Morricone, the '60s and '70s produced a handful of successors who remixed the basic ingredients of the Italian Western soundtrack into something new but very familiar. This double CD/LP set is a deadly sauce of galloping beats, mournful trumpets, jumping castanets, and flamenco guitars, created by such skilled craftsmen as Stelvio Cipriani, Bruno Nicolai, and Riz Ortolani. Morricone's iconic soundtracks may have created the genre; *Ecstasy* keeps the saddles blazing.

KEN MICALLEF

Mayer Hawthorne
Where Does This Door Go
UNIVERSAL REPUBLIC

Mayer Hawthorne is known for break-up songs. The crooner's third long-player flips the Motown revivalist script to focus on coming-of-age high school years with 20/20 hindsight and humor. Hitmaking producers Pharrell Williams, Jack Splash, Oak, and Greg Wells mold "Her Favorite Song (featuring Jessie Ware)" into R&B-lite punctured by flatulent horns while "The Stars Are Ours" is a bouncy what-happened-last-night story and "The Innocent" is Outkast revisited.

LILY MOAYERI

Jon Hopkins
Immunity
DOMINO

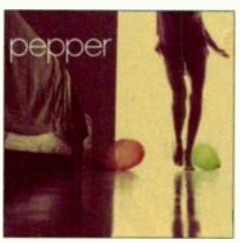
Based out of a studio in Hackney, East London, Jon Hopkins grafts analog synthesis and electroacoustic sound design into expertly paced vignettes teeming with ambient detail. Spiritual kin to producers Apparat, Underworld, Boards of Canada, and James Holden, Hopkins crafts melodies that evolve and dissolve through pitch-bent sidechains into systolic grooves and interstitial harmonics. Saturated with Korg MS-20 crispiness, tracks build to a climax with "Collider," then unfurl into beds of fuzzy warmth and haunting resonance.

TONY WARE

Chris Thile
Bach: Sonatas and Partitas, Vol. 1
NONESUCH

Best known for his virtuosic and inventive bluegrass work in Nickel Creek and then the Punch Brothers, mandolin player Chris Thile brings an equally sensitive and fluid approach to this collection of classical Bach pieces. As always, Thile has the skill and delicacy to coax great emotional depth from his instrument, and from complicated compositions. This labor of love should be enjoyed by fans of any genre, and with luck, the title means that there is more to come.

BARBARA SCHULTZ



Pepper
Pepper
LAW

The self-titled, self-released sixth album from Pepper starts with unexpected bite. The Hawai'ian reggae trio grinds on "Deep Country" leading the listener to think island vibes have been forsaken for hardcore ones. Song by song the sounds become softer and more perfumed ("Hunny Girl") until they are downright caressing ("Stole My Bike"). Halfway through, it is party time with the undulating, hands-in-the-air, aptly titled "Party of Your Life." The moods continue to vary, but the energy is all happy.

LILY MOAYERI

µ-Ziq
Chewed Corners
PLANET MU

The first album from Mike Paradinas in more than five years, *Chewed Corners* embodies all that µ-Ziq has been and that Paradinas' label Planet Mu has become. Producing and/or promoting synthpop, electro, IDM, drill 'n' bass, grime, dubstep, and footwork over the years, Paradinas can do serotonin-spiking acid-funk as easily as pensive orchestral melodies, and he skillfully mixes both through articulated filters. Retrofuturistic soundtracking, euphoric chords, and glitchy, ambient house coexist among other pleasing bass-anchored tics and trills.

TONY WARE

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LEWITT

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Roundup

Drum Mic Packs

LUST

When you need to capture a kit, these collections have you covered

BY GINO ROBAIR

WHEN IT comes to bang for the buck in the mic world, look no further than the drum pack. The typical pack contains several dynamic mics for close-miking—one voiced for kick, one for snare, and others for toms—and usually a small-diaphragm condenser or two for use as overheads. Two of the products in this article diverge from the formula.

Manufacturers often repackage existing products from their line in a way that makes a drum pack more affordable because everything you need is included: Without even counting the accessories and carrying case, it's cheaper to buy the mics in one of these configurations than to purchase them individually. As a result, drum packs are an efficient way to assemble a collection of mics for stage, studio, classroom, and houses of worship—anywhere you need to balance cost with convenience. Of course, any of these transducers can be put to work on other instruments—guitar and bass amps, brass, vocals, and percussion. And many of these mics have been around for years, so they have passed the test of time.

This article is by no means an exhaustive list. Some of the manufacturers in this roundup offer more than one package, and in those cases, I chose the kit that seemed the most representative. The products are listed in order of street price, from low to high.

Keep in mind that sound quality isn't necessarily tied to price when it comes to a drum mic. An inexpensive kick or snare mic can be just as effective as a high-ticket item depending on musical style and personal taste. Look no further than the ubiquitous SM57, which streets for under a $100, for proof of that.

Under $1,000 (street)

CAD Audio Touring7

CAD Audio Touring7

CADAUDIO.COM

$299 STREET

CAD is known for offering low-cost mics that are rugged and sound great for the price. I use their mics frequently in my recording classes and can attest that they hold up well to the rigors of daily abuse.

As the name suggests, the Touring7 pack contains seven mics, along with clips and four drum-rim mounts, providing enough coverage for a 5-piece set: the D12 dynamic, voiced for bass drum; four TSM411 dynamics for snare and toms; and a pair of GXL1200 pencil condensers for overheads. The kit and caboodle comes in a soft vinyl case (with strap) that is about the size of a laptop bag. While that makes the Touring7 perfect for carting around to gigs, these mics are also intended for recording and studio use. The product comes with a 5-year warranty.

The cardioid D12's frequency response chart shows a +15dB rise around 80–90Hz and a similar peak at 5kHz. This resulted in a hefty low end with a rounded attack yet minimal high-frequency bleed from the snare and cymbals—a plus! The D12's metal casing feels solid and well built, and the attached swivel mount can be removed and replaced if it gets damaged.

The TSM411 is made of metal and feels solid. It sits in a plastic clip with a rubber sleeve that holds the mic tightly in place. On toms and snare, the TSM411 displayed a decent transient response for a dynamic, providing the solid smack you want for modern music. The supercardioid pattern helps minimize leakage from surrounding instruments. However, it has a surprisingly wider frequency range and sounds less throaty than other dynamic mics, especially on the snare.

The GXL1200 cardioid condensers don't show much of a presence peak on the supplied frequency chart, but they emphasized the cymbals quite a bit when used overhead. However, their output was hot enough that backing them away from the cymbals created a better balance without losing much signal strength.

Samson 8Kit

Samson 8Kit

SAMSONTECH.COM

$299.99 STREET

Samson offers a very good deal by providing eight microphones, most of which are low-profile and can be quickly set up. The kit includes five of Samson's Q-series drum mics, which the company has tailored for specific drums (snare, kick, and three toms), as well as three condensers—the small-diaphragm C02H for the hi-hat and a pair of large diaphragm C01s for overheads.

The bodies of the Q-series snare and tom mics are made of ABS plastic, and each is attached to a swivel mount that is part of a drum clamp: They're not designed for stand mounting. As a result, the mics are very lightweight, though I worry that an errant drumstick could break the mic off of the mount, which would be difficult to repair. The kick mic has a metal housing and can be removed from its clip.

Despite looking identical to the tom mics, the snare mic has a supercardioid pattern and a presence peak around 3.5khz. The low end begins tapering off at 1kHz. The toms have a hypercardioid response so they'll reject adjacent instruments better, with peaks at 4 and 6kHz and a small boost at 200 before rolling off the low end. The kick mic has a significant peak at 4kHz and a small one around 70Hz.

The kick mic is punchy, though a little two-dimensional compared to others in this roundup, but not boxy. I had to position the snare mic just right to minimize hi-hat bleed, but it sounded solid and yielded a wider midrange response than other snare mics in this roundup. I also tried a tom mic on the snare and liked its round tone and how it emphasized stick impact.

The C01s are large-diaphragm studio condensers, which are popular as budget-priced vocal mics. However, they're large and heavy so you will need a studio-quality boom stand if you want to place them on a stereo bar above the drummer's head. Otherwise it'll be difficult to position them without the boom arm sagging from the strain.

Nonetheless, they sounded good as overheads, capturing the crispness of the snare from above and the sparkle of the cymbals, while emphasizing the attack of the kick. In fact the hi-hat was so well represented in the overheads that I didn't need to spot mic them with the C02H. So I used it as a room mic in the hall and then squashed it with a compressor, which provided a satisfying timbre when mixed in.

Shure PGDMK6

Shure PGDMK6

SHURE.COM

$399 STREET

While Shure's SM57 and SM58 have been staples in the studio and onstage for decades, the company also offers two drum packs based around its PG-series microphones—the PGDMK4 ($249 street) and PGDMK6. Both feature three PG56 tom mics and a PG52 bass drum mic, so they are perfect for close miking a 4-piece kit. The PGDMK6 adds a pair of PG81 electret condensers, each of which can run off of a single AA battery or standard phantom

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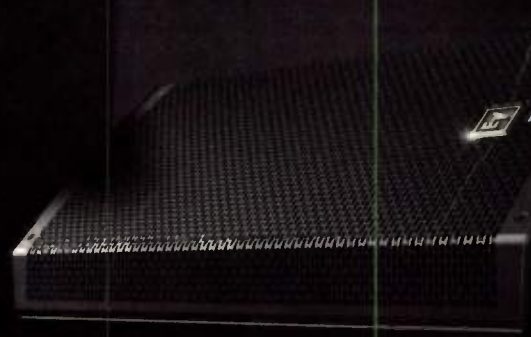

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power, for overhead use. All six mics, as well as the three drum-rim clamps, are packed into a rugged soft-shell case. And Shure includes six 15-foot mic cables to get you started.

All three mic models have a cardioid pattern and their frequency charts show a conservative amount of presence boost and no low-end tilt compared to other drum-tuned mics in this roundup. Despite the lack of low boost, the PG52 could move the subwoofer as well as the other kick mics here, but it also captured a 3-dimensional shell tone. In addition, the highs were muted enough that they didn't compete with the frequencies picked up by the overhead mics.

The PG56s, on the other hand, tamed the low frequencies coming off of the kick drum while mitigating a lot of the highs. As a result, they weren't difficult to place around the drums when I needed to minimize cymbal bleed. They gave the snare the solid thump that you want from a dynamic mic, and pulled strong, meaty tones out of the toms.

I was pleasantly surprised by the overall blend from the PG81s: they didn't over-emphasize the hats or ride but gave the snare a somewhat compressed sound that blended well with the snare mic. For the best fidelity, you should use them with phantom power, but they sounded fine when running on battery power. You'll appreciate the battery option when you're in a situation where you want to use these as overheads but you've run out of phantom-powered inputs on the board.

If it's the sound of the venerable SM57 you're after, Shure also offers the DKM57-52 ($399 street), which combines three SM57s and a Beta52a kick mic with clips, mounts, and a case.

Lewitt DTP Beat Kit Pro 7

LEWITT-AUDIO.COM

$999 STREET

Lewitt's approach to a drum pack is quite a bit different from what we've seen so far.

The first thing you'll notice in this pack of seven mics is that the DTP 640 REX for the kick has both a condenser and a dynamic element. If that weren't cool enough, it includes switchable EQ curves—Enhanced Frequency Response (EFR)—which changes the output characteristics of each element, and a pad switch with -10 and -20dB settings.

Lewitt DTP Beat Kit Pro 7

With both elements flat (no EFR), the condenser gives you a punchy kick, with sharper transients and greater dimensionality than a dynamic, while the dynamic element provides that weighty thump that you want for rock. The first EFR setting boosts the dynamic element's low-end and presence response but leaves the condenser untouched. The second EFR setting essentially acts as a lowpass filter on the condenser element and a highpass on the dynamic, which makes the most sense when both elements are mixed together. Of course you don't have to use both elements at the same time, but to use the condenser side on its own, you will have to send it phantom power. The included cable has a 5-pin connector on one side and a pair of XLR connectors (individually marked "dynamic" and "condenser") on the other.

The MTP 440 DM cardioid dynamic is intended for the snare and the three diminutive, supercardioid DTP 340 TT mics are for toms. The tom mics are easy to position, offer remarkable side and rear rejection, and provide a round, warm sound. The MTP 440 DM has a focused frequency response and the least amount of proximity boost of the dynamic snare mics in this article

The LCT 340 small-diaphragm condensers have removable capsules, with cardioid and omni caps included. The overall output of these in overhead position was about 5dB lower than the other condensers here, but they captured the sparkle of the cymbals in a remarkably smooth way (when compared at equal gain to the other mics). The LCT 340 also has three pad settings (-6, -12, -18dB) and three lowcut settings (40, 150. and 300Hz).

Everything is packaged in a lightweight, but sturdy, plastic briefcase, with two interior layers. The mics sit in the upper tray of the case, and below it sits the clips and drum clamps in fitted foam slots. All told, the DTP Beat Kit Pro 7 is a great deal for the money.

Sennheiser e 600 Mic Pack

SENNHEISER.COM

$999.95 STREET

Sennheiser assembled seven of its evolution 600-series mics to create the limited-edition e 600 Mic Pack, suitable for close miking a 5-piece set. The e-series dynamics are designed to handle very high SPLs—the e 604 can withstand 160dB—making them very attractive to hard-playing drummers and loud stage environments.

The pack includes four e 604s for use on the snare and toms. They have a fiberglass shell with an integrated (but removable) stand mount that feels durable, offers flexible positioning, and is easily installed and removed from the drum rims. The mic provides a decent amount of proximity boost, which beefed up the sound of my toms and snare significantly.

The e 602-II kick mic has a cardioid pattern and a significant boost in the upper and lower range that helps it get a solid, punchy sound. The integrated swivel mount is sturdy and the mic's lightweight aluminum shell seems built to last. The remarkable thing about the e 602-II is that it can make nearly any bass drum sound good, which is one reason to try this kit if you haven't already done so.

The e 614 condensers have a supercardioid pattern with good directivity and decent off-axis rejection. They did a nice job of balancing the drums and cymbals, but without sounding boxy or pinched. And they were especially good at keeping the kick drum tone to a minimum, so I had no problem mixing them in with the kick mic itself.

Sennheiser e 600 Mic Pack

Over $1,000 (street)

Close miking is not the only way to work with a drum kit, nor is it appropriate for all styles of music. Whether you're going for a modern or vintage vibe, the 3-mic method—two mics overhead and one on the kick—can provide an open, yet beefy sound when you've got well-tuned drums and a solid player in a good sounding room. And at this price point, it is assumed that you have all three in order to justify the investment. Whether you use them in concert or in the studio, the next two kits are meant to provide an uncolored sound—exactly what the drummer hears—with a minimum of setup.

Earthworks DK25/L

EARTHWORKSAUDIO.COM
$1,649 STREET

For the DK25/L, Earthworks assembled a trio of its SR25 mics and windscreens, added a KickPad inline passive attenuator/EQ for use with the bass drum mic, and put everything in a compact aluminum case. The "L" in the name indicates this kit is for live sound applications: The mics have a cardioid response and can be positioned to reduce onstage feedback. The DK25/L, however, is also suitable for studio use.

The DK25/R ($1,549 street), on the other hand, matches an SR25 and KickPad with a pair of TC 25 omnidirectional mics for overheads. The omnis provide a killer combination for recording in a space with lovely acoustics, but they would be difficult to manage against feedback in a sound reinforcement situation.

Earthworks notes that it designed the SR25 specifically for drums. The mic is renowned for its clarity thanks to its un-hyped frequency range and articulate transient response. The high end reaches to 25kHz, but without the presence peak other condensers have, while the low end extends below 50Hz when the mic is placed at a distance of six inches from the sound source. The ability to handle SPLs up to 145dB means that the SR25 is up to the task of spot miking if you need it. Side and rear rejection are excellent, which is why these are suitable for stage use.

With a pair of SR25s overhead and one placed a few inches away from the beater side of the bass drum head for a rock tune, I was surprised at how balanced the low end sounded, with surprisingly little bleed into the kick mic from the hi-hats and cymbals. And the overheads revealed things in the kit that were missed by the other mic kits—subtle noises and harmonic interactions between instruments that brought an additional amount of realism to the recording. Overall, the SR25's transient response and uncolored frequency characteristics make it perfect for highly nuanced music, such as jazz, while holding up well to more aggressive and louder styles.

Earthworks DK25/L

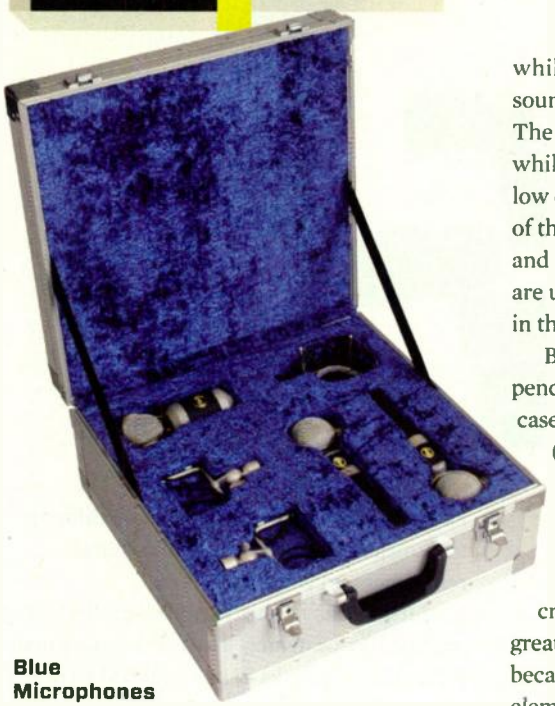
Blue Microphones Pro Drum Kit Kit

BLUEMIC.COM
$2,499 STREET

To provide a suitable 3-mic solution, Blue assembled a matched pair of its Dragonflys and a Mouse, along with three shockmounts, and put them together in a plush suitcase for a lot less than you would pay for the mics separately. While they're not specifically voiced for drums, the Dragonfly and Mouse are capable of translating every aspect of the kit—at a distance or in close-miking situations. And, of course, they can be used on any other instrument that benefits from a large-diaphragm condenser.

The capsules in both mics are internally shockmounted, but it's nice to have the external mounts to further mitigate rumble. Positioning the capsules is easy because they rotate vertically, allowing you to accurately aim them without having to contort the boom stand. Because the mics have a hypercardioid response, mic placement is critical in tailoring your drum recording.

The Dragonfly has an exceptional transient response and very low self-noise. And despite its presence peak, it has a smooth high end, handling ride and crash cymbals well. The Mouse displayed a balanced tonal range in a number of positions around the bass drum. When placed a few inches in front of the kick, which had both heads on and was unmuffled, it captured a solid attack and realistic tone. On the other hand, when I placed it two feet in front of the set at waist height, pointed between the snare and hi-hat, the results were a satisfying blend of kick, snare, and hats that complemented the overheads.



Blue Microphones Pro Drum Kit Kit

Considering the number of mics Blue has to choose from, this particular collection offers a unique sound with the drums and is a surprising bargain at this price point.

Audix STE8

AUDIXUSA.COM
$2,499 STREET

Going full circle, we return to a multi-mic kit. Audix offers eight drum packs, spanning a range of prices and configurations. But the top of the line is the Studio Elite 8 (STE8), which assembles four D-series dynamics, an i5 dynamic, and three SCX-series condensers, with all the necessary clips, clamps, and shockmounts in an aluminum carrying case. This is the cream of the crop when you want the option of close-miking a 5-piece kit using high-quality condensers as overheads and a spot mic for the hi-hat.

Both colleges where I teach have a collection of D-series drum mics, so I'm quite familiar with them: They sound great on drums, amps, and acoustic instruments while standing up to enormous wear and tear. The D6 is a perennial favorite on the kick drum, because of how well it translates the punch and upper partials in a pro-sounding way, while the i5 achieves a very tight snare sound with good focus and high output levels. The little D2 mics are voiced for rack toms, while the similar looking D4 has an enhanced low end that beefs up the floor tom nicely. All of these mics work well on other percussion, and their differing frequency characteristics are useful for solving tonal problems that arise in the studio.

But the STE8 also includes Audix's stubby pencil condenser, the SCX1-HC, which in this case is outfitted with a hypercardioid capsule (the HC suffix) to minimize spill from surrounding instruments. (Cardioid and omni capsules are available separately.) This configuration is well suited to hi-hats, capturing a nice tone without creating overly crunchy highs. It also sounds great on hand percussion and acoustic guitar, because it de-emphasizes the unwanted harsh elements of their upper registers.

The real treat in this pack is the inclusion of a pair of SCX25A condenser mics. These large-diaphragm lollypops sound fantastic and are perfect as overheads: They provide plenty of detail, capture a balanced overall frequency range, and have the ability to tame the brittle characteristics of today's bright cymbals. They're solidly built but not so heavy that you can't mount a pair on a normal boom stand with a stereo bar. And their directionality allowed me to really focus in on particular areas of the kit.

Consequently, the STE8 is of high enough quality overall that it would provide excellent sound whether you use a 3-mic setup, the Glyn Johns technique (condenser mics placed above and to the right of the drummer; spot mics on the kick and snare), or simply get in close and tight on all the drums. ■

Audix STE8

Arturia

Beat Production **Anywhere!**

"Guys, this little drum instrument is way too much fun to play! I seriously have not enjoyed the act of banging out patterns on a drum machine this much since the original MPC. Kudos to Arturia on a well thought out performance interface - one that actually is about PERFORMANCE."

Tape Op

"Everyone who is making music right now should check out what the Spark LE could offer their tracks even if they don't think they need another drum machine right now, it really is that good."

DJ Mag

SPARK LE
Creative **Drum** Machine

SparkLE is a highly creative drum machine, combining the intuitive hands-on control of hardware with the power and integration of software. By using analog synthesis and physical modeling, as well as samples, Spark's sound engine opens a new realm of possibilities in drum design.

Subtle fine tuning or dramatic transformations are available instantly at your fingertips, making SparkLE a flexible and intuitive instrument. Whether you are into Electronic Music, Hip Hop, Film scoring, modern Pop, Rock, Dubstep or anything else, SparkLE is the weapon of choice for today's producer.

www.arturia.com

Novation Launchkey and Launchpad S

USB keyboard, fader, and pad controllers for your DAW and iPad

BY LEN SASSO

Fig. 1. The new Launchkey controllers can be used for pad triggering, mixing, and device control.

SUMMARY

STRENGTHS: Low-profile, feature-laden units well suited to studio and portable use that reaches beyond Ableton Live to other DAWs.

LIMITATIONS: Use with the associated iPad Apps requires the Apple Camera Connection Kit, limiting connectivity between your iPad and your computer.

Launchkey 25, $149.99 street; Launchkey 49, $199.99 street; Launchkey 61, $249.99 street; Launchpad S, $169.99 street
Novation.com

THE NEW Launchkey keyboards from Novation provide advanced integration with most DAWs that use Novation's InControl system: Ableton Live and Propellerhead Reason use custom InControl configurations to provide the most robust implementation; Apple Logic, Avid Pro Tools, and Steinberg Cubase have more limited implementation via the Mackie HUI protocol. The Launchkey can also function as a standard MIDI control surface. The upgraded Launchpad S is primarily designed for clip launching in Live and, as of Version 11, Image-Line FL Studio, as well as for custom-scripted applications.

The Launchkey keyboards and the Launchpad S are MIDI Class Compliant, meaning that most computer and tablet operating systems will recognize them without the need to install special USB drivers—individual software applications may still need to be configured, however.

Launchkey The Launchkey comes in 25-, 49-, and 61-key configurations. Along with typical keyboard functions (keys, Pitch and Mod wheels, and octave-shift buttons), all Launchkeys offer eight knobs, a 2-row pad matrix, and DAW transport buttons. The two larger models also have a panel of nine sliders and buttons, whereas the 25-key has a single data slider.

The Launchkey presents two sets of I/O ports to your computer (labeled InControl and MIDI). Switches for the knobs, pads, and sliders sections toggle between the two ports. This configuration lets you switch between whatever special InControl features are supported by your DAW, and standard MIDI operation. (You could use that in Live, for example, to switch between clip triggering and playing a drum synth.)

InControl is supported natively in Live, and the Launchkey is enabled in Live's preferences like any other control surface. The top row of eight pads triggers clips from the selected Scene starting at the selected track; the bottom row of pads stops the corresponding clips. Round buttons at the end of each row of pads start and stop all clips in the Scene. When you toggle the pads to MIDI-port mode, they send note messages C1 through D#2—the standard mapping for 4x4 drum-pad configurations. In InControl mode, the eight knobs are mapped to parameters of the currently selected plug-in. The sliders manage track volume in banks of eight, and a button below each slider mutes or solos the track. The ninth slider targets master volume, and the button below it toggles the other buttons between muting and soloing.

For InControl to work with Reason, you need to download and install a special

Fig. 2. The Launchpad S is faster and brighter than the original model, and it is MIDI Class Compliant.

script and then enable the Launchkey ports in Reason's preferences. Every native Reason device has a custom InControl configuration, which you'll find documented in a downloadable guide. The targeted device is determined by track selection.

Launchpad Side-by-side and unplugged, the original Launchpad and the Launchpad S appear identical, apart from slightly different labeling and the metallic finish on the latter. But when you plug them in and start pounding on the pads, you'll immediately notice that the pad backlighting is brighter and refreshes faster on the S version. That's probably not enough to get you to buy an S if you already own a Launchpad, but the big news is under the hood: A fast 32-bit ARM core replaces the original 8-bit processor, resulting in a much faster USB connection, which among other things, allows the Launchpad S to be MIDI Class Compliant.

The Launchpad was designed as a clip-launcher for Ableton Live, and version S works in the same transparent way with Live. In fact, the units can work side by side, so if you have a Launchpad but want more pads, the Launchpad S is a nice way to get there.

The Launchpad S now works with FL Studio for clip launching, and you can set up its two user pages for note triggering and parameter control. For other DAWs, it supports Novation Music's Automap, making it potentially usable for pad-based functions.

A programmer's reference guide is available as a free download from the Novation website; you can use it to write applications for the Launchpad S with software like Max/MSP or Pure Data. But even if you don't create your own, others will undoubtedly make applications readily available.

Extras Novation developed free iPad applications, appropriately named Launchpad and Launchkey. The Launchpad App sports a 6x8 simulated pad matrix and a good-sized collection of loops and one-shots that are assignable to the pads. It's like having a little bit of Live inside your iPad. The App does not allow you to load your own samples, and it cannot be used as a MIDI triggering device (for the obvious reason). The Launchkey and Launchpad S hardware connect to your iPad using Apple's Camera Connection Kit (not included). The units are bus powered when connected to your iPad individually, but you need a powered USB hub to connect them simultaneously.

The Launchkey App is an analog-modeled synth with built-in arpeggiator. You can play it onscreen or with any standard MIDI hookup, but it is especially designed for the Launchkey hardware. The Launchkey can simultaneously target both iPad applications—letting you launch clips in the Launchpad App from its pads while playing along and manipulating Launchkey App parameters from its keys, knobs, and faders. At the Novation website, you'll find free downloads of Novation's Bass Station and V-Station plug-ins, a gigabyte of sample content from Loopmasters, and the Ableton Live Launchpad Edition.

Ready for Takeoff Both the Launchkey and Launchpad S are versatile and competitively priced units. For Ableton Live users, the Launchpad S is great as a lightweight, low-profile primary controller, or as an adjunct to the Launchkey or any knob-and-button box. (You can never have too many clip-launch buttons.) The Launchkey's compact design and its ability to toggle individual sections between InControl and standard MIDI operation make it an excellent choice for portable operation with a laptop or iPad. And the two larger models are equally useful in the studio as primary keyboard controllers. ■

Len Sasso writes about electronic music technology. You can hear some of his music at swiftkick.com.

Peavey AT-200/ Antares Auto-Tune for Guitar

An affordable axe you can tune in an instant

BY GEARY YELTON

SUMMARY

STRENGTHS: Instant tuning. Perfect intonation. Unprecedented versatility. MIDI control. No batteries needed with optional breakout box. Full chords with heavy distortion have perfect intonation.

LIMITATIONS: Most features are optional purchases. Can't save presets without optional Feature Packs. Installing upgrades requires Windows and either the breakout box or a non-standard MIDI Y-cable.

$999 MSRP
$499 street
autotuneforguitar.com

NO MATTER how long you've been playing guitar, quickly and accurately tuning your strings is always a challenge. How much time and money have you wasted in the studio, and how many audiences have had to endure long breaks between songs while you tuned up? Another problem facing guitarists is that no matter how expertly you set up your guitar, chords that sound perfectly in tune when you play them close to the nut can sound less in tune as you ascend the neck.

Enter Antares Audio Technologies, a company whose fortune was built on its Auto-Tune software, which ensures that live and recorded vocals never sound even slightly off-key. In 2011, Antares announced Auto-Tune for Guitar, and the first instrument to offer the technology is now available from Peavey Electronics.

A Good Guitar Based on Peavey's basic-model Predator Plus ST, the AT-200's pleasing tone, build, and playability belie its entry-level platform. The AT-200 has a solid basswood body, two ceramic humbucker pickups, a nicely adjustable bridge containing a hexaphonic pickup, and string-through-body anchoring. The bolt-on maple neck has a 25.5-inch scale and a rosewood fingerboard, and the cutaway allows easy access all the way to the 24th fret.

Inside the guitar's body, four AA batteries supply enough power to the Auto-Tune for Guitar DSP system for about ten hours of use. Plugging a cable into the output turns on the electronics. To avoid draining the batteries, you can pull up on the tone knob to disengage Auto-Tune when you're not using it.

Alongside the 1/4-inch output jack, an 8-pin female DIN connector connects to the optional AT-200B breakout box ($80 list, $60 street) via the included 15-foot cable. The box provides phantom power for the electronics, a redundant 1/4-inch output for the guitar signal, and MIDI In and Out ports. Even without the box, you can plug a standard MIDI cable into the DIN connector, which then serves as a MIDI In port.

Peavey's new AT-200 is the first guitar with Antares Auto-Tune built right in. Now you can instantly tune your guitar and, with optional Feature Packs, apply a virtual capo, select alternate tunings, and a whole lot more.

Instant Intonation New capabilities that Auto-Tune gives guitarists include String Tune, which quickly tunes all six strings, and Solid-Tune, which monitors each note's pitch and corrects it as you play. Solid-Tune effectively compensates for intonation problems and excess finger pressure. Additional features can be added via downloadable Feature Packs, which include collections of alternate tunings, virtual capos, string doubling, modeled simulations of different guitars, MIDI control capabilities, and the ability to store and recall presets."

Automatically tuning your guitar couldn't be simpler. Just strum all six open strings and press down on the volume knob. Not only will your guitar be in perfect tune, but intonation

will also remain perfect all the way up the fretboard. Do you have trouble playing difficult chords without slightly bending one or two strings? Auto-Tune makes them sound perfect. Want to play full chords with heavy distortion? Auto-Tune makes those sound perfect, too.

Ears Wide Open Auto-Tune affects only the amplified signal, of course. If you aren't playing with headphones, your amp has to be loud enough to completely drown out the acoustical sound of your strings. Otherwise, unless you've manually tuned the guitar perfectly, you'll hear the acoustic sound of the strings beating against the amplified signal, often resulting in a chorusing effect (or worse) that anyone close enough may hear.

Auto-Tune for Guitar wouldn't be very useful if it didn't accommodate string bending, and it does this beautifully. When you play a string, as long as it stays within a very narrow range of pitch, Auto-Tune will correct it. The moment you push the string beyond that range, however, either by bending or by applying vibrato, Auto-Tune no longer tries to correct it.

As I played, I listened carefully for signs of latency and couldn't detect any. ADC and DAC latency are about 1 millisecond, according to Antares, and processing latency is no more than one cycle. Bending and vibrato both felt and sounded perfectly natural. I couldn't hear any artifacts as I often do with Auto-Tune on vocals, but Auto-Tune does change the guitar's tone by rolling off some of the top end. Use EQ to compensate if you prefer the guitar's original tone.

Features Aplenty Features are divided into several categories. By installing a Feature Pack, you can select any of several alternate tunings such as open-A, double drop-D, or DADGAD. You can also transpose the entire fretboard up or down as much as an octave using the virtual capo feature, making it much easier to play in difficult keys. I especially enjoyed transposing down an octave and playing the guitar like a bass. Doublings take advantage of Auto-Tune for Guitar's ability to produce two string sounds at different pitches from a single note; emulating a 12-string guitar is just one example. Another feature set lets you choose from ten models that make the AT-200 sound more like a Stratocaster, a Telecaster, or a Les Paul, among others.

Using MIDI Designer, you can easily access features for the AT-200 from your iPad.

In addition to String Tune and Solid-Tune, three free bonus features are available for download for the AT-200: an open-E tuning, a virtual capo at the fifth fret, and an acoustic guitar model. For more features, you'll need to buy an optional Feature Pack. At the time of this review, installation requires a Windows-based computer and either the AT-200B breakout box or a unique MIDI Y-cable unlike any I've seen before. Antares says it'll have a Mac solution later this year, but in the meantime suggests using either Boot Camp (which means you'll also need to buy a copy of Windows) or a friend's PC.

If you have at least one Feature Pack installed, you can save favorite features or combinations of features as presets. The Essential Pack ($99) gives you a selection of 16 features, the Pro Pack ($199) gives you 32, and the Complete Pack ($299) gives you 64.

Once installed, the most direct way to enable features and presets is by Fret Control. To select a feature, press a particular string at a particular fret with one hand and then play the string while pressing down on the volume knob with the other. For example, select drop-D tuning by playing the A string at the first fret, or capo up a perfect fifth by playing the G string at the seventh fret.

You can also turn features on and off using MIDI Control Change messages. If you're an iPad user, a free controller layout for MIDI Designer Pro ($25) or MIDI Designer Lite (free) from Confusionists (mididesigner.com), lets you instantly access features at the touch of a button. To use it, you'll need a MIDI connection between your iPad and the AT-200. For most users, that means Apple's Camera Connection Kit and a class-compliant MIDI interface (one that doesn't require a specific driver).

Even if you don't spring for one of the Feature Packs, it's possible to create your own transpositions and alternate tunings by simply fretting as you engage String Tune. For drop-D tuning, for example, just hold down the bottom string at the second fret while tuning. To transpose down an octave, barre across the 12th fret while tuning. You'll have to do this every time, though, because you can't save presets unless Feature Packs are installed.

Stay Tuned Auto-Tune for Guitar technology works, and it works well. You can be sure that more guitars will follow in the AT-200's footsteps, and a luthier's kit will soon be available for retrofits. When you consider the cost of adding Auto-Tune to a guitar, the expense of the Feature Packs, and the near-necessity of buying the optional breakout box, it isn't cheap, but your guitar will let you do things you've only dreamed of until now. ■

Former senior editor Geary Yelton has been writing for Electronic Musician *since 1985. He lives in Asheville, North Carolina.*

Propellerhead Software Reason 7

An innovative audio production environment continues to grow in the right direction

BY DOUG MICHAEL

Fig. 1. Reason 7's new features includes updates to the mixer, the Audiomatic Retro Transformer and Spectrum EQ effects, the External MIDI Instrument, and the ability to create REX files within the program itself.

SUMMARY

STRENGTHS: Audio Quantize is easy to use. Create REX files with Bounce to REX file. Grouping/submix mixer channels. Parallel processing. External MIDI Instrument. Spectrum EQ.

LIMITATIONS: No new instruments. No Detect Silence or Duplicate Events features.

$449 MSRP; $129 upgrade
propellerhead.se

SINCE ITS introduction in 2000, Reason has stretched our expectations of digital audio workstation capabilities. Although Version 7 is not as groundbreaking as some previous updates, it introduces studio workflow features that you find in traditional DAWs, such as output busing and track duplication, while the supercharged quantizing capabilities and the ability to create REX files internally will certainly make seasoned Reason users happy.

The first thing you will notice when you launch Version 7 is that the mix channel in the rack has volume and pan parameters, which makes it possible to perform basic mixing right from the rack. In addition, the mix channel has a new Spectrum EQ window: Click the Show in Spectrum EQ Window icon and you can now watch frequencies bounce up and down as the track plays. The beauty of this function is that the EQ and filter selections in the Spectrum EQ are directly tied into the mixer channel strip. For example, you can click on the Low Pass Filter box to determine exactly how your EQ adjustments in the mixer affect the track—a welcome addition.

The new Audio Quantize feature works well; of all the DAW quantizers I've used, it is the least painless and the most seamless. Once you know the keyboard shortcut (Command/Control + K), you can quantize audio to the grid in seconds. For example, import or record audio and double-click on the waveform. The audio file will open in the Arrange View, similar to the way automation clips open. Here, you will see the Slice Marker lines throughout the waveform; these are automatically added, based on the waveform's amplitude peaks. From here you can adjust, add, or delete slices. Once you have the slice markers set to your liking, go to Edit > Quantize and your audio

Fig. 2. To build a submix in Reason 7, pick the channels you want to include and select New Output Bus in the Edit menu. The selected channels will be routed automatically to the new destination.

will conform to the grid based on the quantize value set in the Tool window. This setup makes what could be a tricky process very simple. You can also manually drag each slice marker to get wild and interesting results. The algorithm Reason employs for stretching audio sounds really good, so stretch away.

DIY REX Files A new Bounce Clip to REX Loop feature allows you to save your quantized audio as a REX file within Reason; it can then be opened in the Dr. Octo REX Loop Player. The process is simple: Take an audio file and go into the inline Arrange view by double-clicking on the waveform. From here, choose Edit > Bounce > Bounce Clip to REX Loop.

Once the audio is bounced, the Tool window will open, and you can see your REX file in the All Self-contained Samples area. Select To Rack at the bottom of the Tool window; a Dr. Octo Rex Loop Player will be created with your REX file inside. Hit Copy Loop To Track and you now have MIDI notes triggering the audio. This process works intuitively and with minimal steps.

Here's where it gets interesting. The first thing I did when I created my own file, a chordal guitar riff, was to alter the notes in the Tool window. I then copied the notes to the new lane and scaled the tempo to play the riff twice as fast as the original. A few more "alter note" clicks and I had a very usable variation on my original riff. This technique would have been close to impossible to recreate without the Bounce to REX Loop feature, but it will soon be part of the creative process of many Reason users.

You can also export your audio file as a REX (.rx2) file, bypassing the need for ReCycle. Of course ReCycle has other features that are not in Reason, but if you are simply making REX files, this can now be done entirely in Version 7.

Mixer Features It is now easy to create a submix because Reason 7 offers an additional mixer channel-strip destination called an output bus. To create a submix, shift-select all your mixer channels and go to Edit > Route to > Bus. (You can also right-click on your mixer channel strip.) A new, colored channel strip will be created called Bus 1, and all of your selected mixer channels are routed to it (see Figure 2). Each of those individual mixer channels will have the name Bus 1 under Output. Lower the Bus 1 volume fader and all the mixer channels routed to that channel will decrease in volume.

Propellerhead has also introduced a quick way to make a duplicate track for parallel processing, which allows you to process the second track in a different way than the original. The recording engineers at Motown used this technique on vocals back in the 1960s, squashing the duplicated signal with a heavy dose of compression and then applying a high-shelf EQ to brighten up the results. When you combine the processed track with the original, it results in a much more present vocal that sits in the mix with a focus that was not there before.

To duplicate a track for parallel processing, select its channel strip in the mixer and go to Edit > Create Parallel Channel. A new channel strip with P1 added to the name will appear next to the original. This is the cloned signal that is now ready for processing.

The External MIDI Instrument A surprising new feature in Reason 7 is the External MIDI Instrument, which allows the program to communicate with external hardware synthesizers or VSTi soft synths. The setup can be tricky, but I hooked up my old Roland JV-1010 and within minutes was triggering the JV patches, recording them as MIDI, and soon thereafter as audio back into Reason. Make sure the External MIDI Instrument is set to your MIDI interface and that you have MIDI In connected to your hardware synth. In addition, connect your synth's audio outputs to your soundcard so Reason can capture your MIDI performance as audio. Once you have these set up, the External MIDI Instrument feature works very well.

A CC Assign parameter lets you control any MIDI Continuous Controller that your synth patch responds to. I had no problem automating CC 74 for filter cutoff and CC 71 for added resonance. Rewind and record that as audio for the completed result, which can now be included in your final bounce.

The Hits Keep Comin' Other new features in Reason 7 include the ability to import MP3, AAC, and WMA files, and the addition of the rack-extension Audiomatic Retro Transformer effect. Propellerhead calls it "a psychoacoustic future retro effect," and it can definitely put vintage character into your track. The Audiomatic Retro Transformer is a separate download from your Propellerhead account under rack extensions. Once it is downloaded and installed, restart Reason and you'll find it under Create > Creative FX.

Reason 7 has expanded its factory patches, with a focus on drum samples and loops. Check out the new drum kits in the Kong and the loops in Dr. Octo REX. (These are found in the Metal, Dubstep, and Tech House folders.) All in all, Reason 7 is a commendable and worthy upgrade. ■

Doug Michael is a commercial-music composer and teaches music technology at Diablo Valley College.

1

2

1
Universal Audio
Ocean Way Studio Reverb
Convolution reverb plug-in
$349
HIGHLIGHTS Uses impulse responses taken from Ocean Way Recording's Studios A and B • three mic distances: Near, Mid, and Far • selectable mic bleed and proximity effect • Reverb mode lets you mix wet and dry signals • Re-Mic mode replaces original room and mic sound • vintage mic collection used to create IRs • requires UAD-2 DSP accelerator card or Apollo interface
TARGET MARKET Engineers and sound designers who are looking for reverb from two classic rooms
ANALYSIS Using Universal Audio's high-quality processing to harness the sound of Ocean Way Studios is a no brainer.
uaudio.com

2
Acon
Acoustica
Premium Edition 6
Digital audio workstation
$119
HIGHLIGHTS Includes multitrack editing and a suite of audio restoration plug-ins • support for multichannel audio, including 5.1 and 7.1 surround • phase-linear EQ • includes Declipper plug-in • VST and DirectX plug-in support • works with Windows 7, 8, XP, and Vista operating systems • Acoustica Standard Edition 6 ($39.90) and Acoustica Basic Edition 6 (free) available with fewer features
TARGET MARKET Semiprofessional engineers and musicians in personal studios who are honing their recording skills
ANALYSIS An inexpensive DAW that the company says is designed for "ambitious home users."
acondigital.com

3
Keith McMillen Instruments
QuNexus
USB controller
$149 street
HIGHLIGHTS MIDI-to-CV conversion • 25-pad keyboard that senses velocity, pressure, and tilt • polyphonic aftertouch • pitchbend and octave pads • 2 CV inputs that support an expression pedal • 3 CV outputs and 1 gate output • bus or AC powered • weighs less than 1 lb. • software editor for Mac and Windows • iOS and Android compatible
TARGET MARKET Anyone looking for an interface that connects between their DAW, mobile device, and analog synths
ANALYSIS A highly portable USB keyboard controller that facilitates communication between digital units using MIDI and analog gear via control voltages and gates.
keithmcmillen.com

4
Blue Microphones
Nessie
USB microphone
$99.99
HIGHLIGHTS Positional condenser mic capsule with cardioid pattern • 16-bit, 48kHz resolution • frequency response of 20Hz to 20kHz • three recording modes: Voice, Music, Raw • adaptive DSP includes de-esser, EQ, and level control • built-in pop filter • internal shockmount • mute button and onboard volume control • no-latency headphone output • supports USB 1.1 and 2.0
TARGET MARKET Musicians, podcasters, and voiceover artists who want to go beyond consumer-quality mics
ANALYSIS Blue has done its homework in developing desktop USB mics that include digital signal processing that makes it easy to get pro-level results.
bluemic.com

All prices are MSRP except as noted

5
XILS-lab
V+
Software vocoder
$194

HIGHLIGHTS 10-band vocoder modeled after the Roland VP-330 Vocoder Plus • arpeggiator • mixer and formant tuning • control over pitch tracking and the attack and release of the analysis algorithm • Stereo space, reverb, and phaser effects • modulation matrix covers 14 sources and 24 destinations • Mac/Win • works as an AAX, RTAS, Audio Units, VST2.4 or VST3 plug-in

TARGET MARKET Musicians, DJs, and sound designers looking for classic vocoder sounds in a virtual instrument

ANALYSIS Once again, XILS has modeled a desirable vintage instrument that everyone else has ignored.

xils-lab.com

6
AIR Instruments
Loom
Software additive synthesizer
$199

HIGHLIGHTS Additive synthesis • 3 LFOs for modulation • 4 velocity-sensitive envelope generators • repeater function • spectral modulation • spectral distortion • modulation and reverb effects • "moving" filter and Blur functions • global pitch and glide-time controls • Smart Sound Randomizer • VST, Audio Units, and RTAS plug-ins • 64-bit • 350 presets

TARGET MARKET Composers and musicians who desire an out-of-the-ordinary sound palette that offers a high degree of tweakability

ANALYSIS AIR Instruments (formerly Wizoo) has a long track record of high-quality virtual instruments, so this is an additive synth you'll definitely want to check out.

airmusictech.com

7
Numark
Orbit
DJ-style controller
$99

HIGHLIGHTS 2.4GHz low-latency wireless controller with 100-foot range • 16 pads that configure into 64 assignable buttons • assignable jog wheel • X and Y accelerometers • USB connectivity • 4 banks with 4 virtual knobs per bank • supports lossy and lossless audio files • includes Orbit DJ Software and MIDI Editor (Mac/Win) • lightweight (11.2 oz.) • 8 hours of continuous operation

TARGET MARKET Musicians and DJs who want to control audio, video, or lighting remotely

ANALYSIS A lightweight and inexpensive DJ-style control surface that is all the more useful thanks to battery power and wireless operation.

numark.com

8
Zoom
H6 Handy Recorder
6-channel portable digital recorder
$399.99 street

HIGHLIGHTS Records six channels simultaneously • built-in stereo mics in XY and Mid/Side configuration • 4 XLR/TRS combo inputs with three levels of phantom power • works as a 6x2 USB audio interface • audio resolution up to 24-bit/96kHz with BWF support • accepts SD, SDHC, and SDXC memory cards up to 128GB • mounts to camcorder or DSLR with accessories • built-in effects, tuner, and metronome

TARGET MARKET Recordists who need a portable digital recorder for music or sound for picture

ANALYSIS Zoom has extended its line of rugged portable recorders to a seriously professional level.

zoom-na.com

9
Electro-Harmonix
8 Step Program
Control-voltage sequencer
$164.51 street

HIGHLIGHTS Step sequencer for devices that accept CV or expression pedal input • stores 10 user presets, expandable to 100 with optional foot controller • 3 Play modes: manual, one-shot, and loop • tap-tempo footswitch • MIDI In syncs to MIDI Clock • expression input • four directions: forward, reverse, bounce, and random • includes 9V power supply

TARGET MARKET Guitarists and synth players who normally use expression pedals or other control-voltage sources to modulate effects

ANALYSIS Electro-Harmonix has a knack for creating inexpensive products that fill an unmet need. This is definitely one of them.

ehx.com

10
Waldorf
Nave
Wavetable synth for iPad
$19.99

HIGHLIGHTS Two wavetable oscillators • create and edit your own wavetables • integrated speech synthesis • build wavetables by analyzing audio files • multimode filter • Drive effect can be placed pre- or post-EQ or filter • includes modulation effects and modulation matrix • delay and reverb • onboard 4-track recorder • arpeggiator

TARGET MARKET Musicians and sound designers looking for a state-of-the-art soft synth on a mobile platform

ANALYSIS Waldorf has a long history of innovation with wavetable synthesis, all of which has been distilled into a powerful iPad instrument that will satisfy beginners and pros alike.

waldorfmusic.de

11
Yamaha
Pocketrak PR7
Portable digital recorder
$249

HIGHLIGHTS Portable digital recorder with stereo condenser mics in an X/Y configuration • records up to 24-bit, 96kHz WAV files • records MP3 files up to 320kbps • plays WMA files • external mic and line inputs • overdubbing mode • built-in tuner and metronome • playback speed ranges from 50–200% • 5 recording presets • 2GB internal memory • accepts micro SD/SDHC memory cards

TARGET MARKET Anyone who wants a small, high-resolution device to record gigs, lessons, and jam sessions

ANALYSIS The additional features in this portable digital recorder make it well suited for musicians of every level.

yamaha.com

12
Line 6
Relay V75-SC
Digital wireless mic and transmitter
$399.99 street

HIGHLIGHTS Supercardioid polar pattern • 24-bit resolution • 14 channels • includes models of Shure Beta 58A, AKG D5, and Electro-Voice N/D767 mics • handles up to 118dB (A weighted) • 10Hz to 20kHz frequency response • no compander • metal mic body • includes hard-shell case

TARGET MARKET Singers and public speakers who work in performance venues and houses of worship

ANALYSIS Expands the Line 6 Relay system of reliable digital wireless products into an affordable handheld microphone that offers four mic models.

Line6.com

All prices are MSRP except as noted

DREAM IN COLOR

HOG2 transports your axe to a technicolor universe of fantastic sounds. Play single notes or chords and it creates 10 totally polyphonic octaves and intervals soaring from two octaves below to four above your instrument's pitch. Each voice is completely independent. Use them individually or in combinations – with or without your dry signal.

New algorithms, our most advanced ever, elevate the quality of the HOG2's sound generation and Freeze functions to unprecedented levels, while tracking is telekinetic. Polyphonic perfection awaits!

- 10 fully independent voices: -2 Octaves, -1 Octave, Original, +5th, +1 Octave, +1 Octave+5th, +2 Octaves, +2 Octaves+3rd, +3 Octaves, +4 Octaves.
- 7 Expression modes: Octave Bend, Step Bend, Volume, Freeze+Gliss, Freeze+Volume, Wah Wah and Filter. Expression pedal included.
- Full MIDI control over all parameters and presets.
- Freeze modes: hold a note or chord and play over it or glide to a new one with gliss.
- Master volume for added convenience.
- Separate lower and upper harmonic amplitude envelopes to sculpt attack or decay speeds.
- Dedicated resonant filtering with sweepable frequency control.

Save and recall up to 100 preset programs with the optional Foot Controller.

electro-harmonix

WWW.EHX.COM

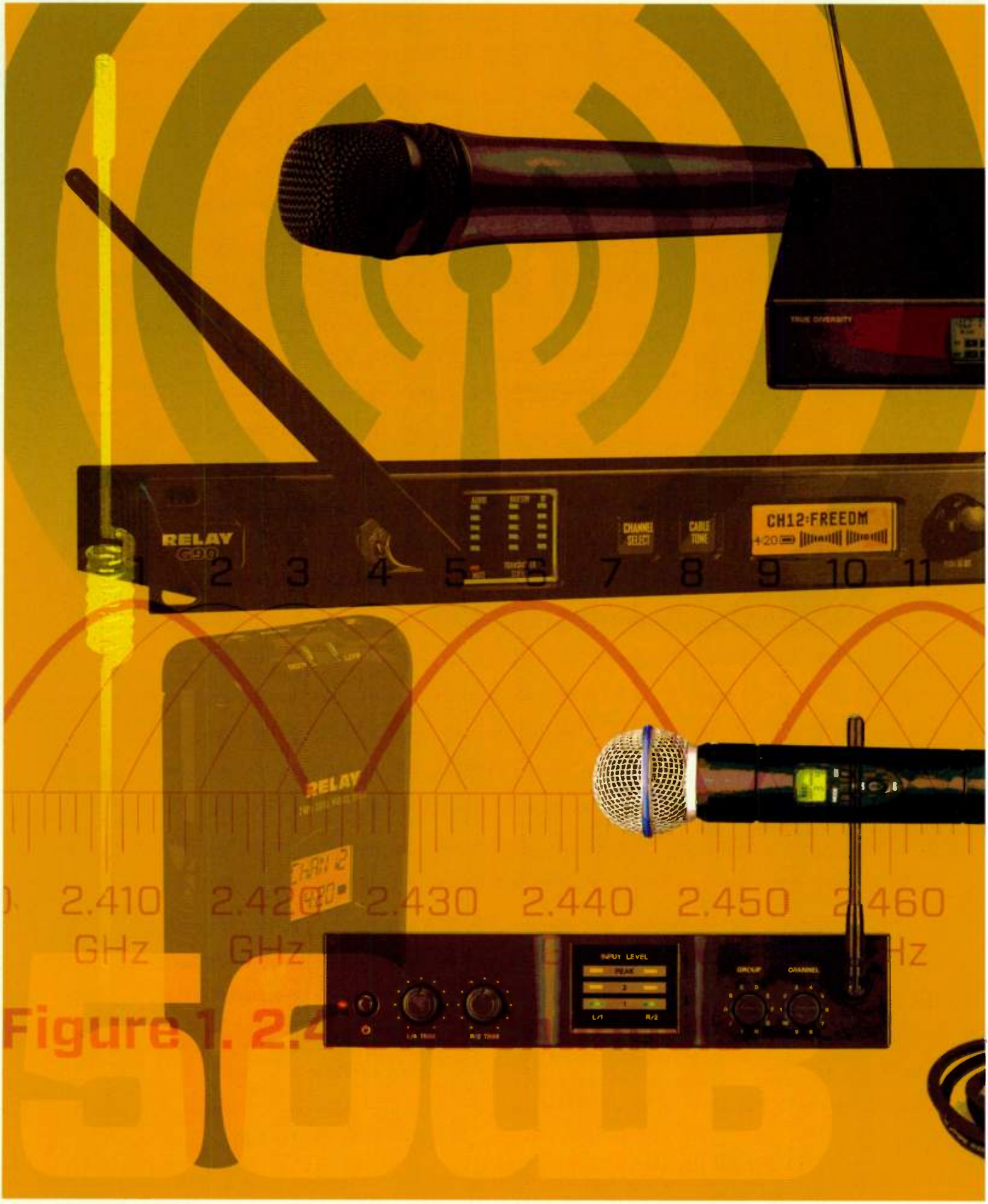

RELAY
CHANNEL SELECT
CABLE TONE
CH12:FREEDM
1 2 3 4 5 6 7 8 9 10 11
RELAY
2.410 GHz
2.420 GHz
2.430
2.440
2.450
INPUT LEVEL
PEAK
GROUP
CHANNEL

Figure 1. 2.4

LEARN

master class

Wireless 101

Choosing and using the right rig

BY STEVE LA CERRA

AH, THE freedom of wireless microphones. The thrill of standing next to the drummer on a wobbly riser. The excitement of walking into a crowd and singing with drunken patrons. The wonder of hearing a taxi dispatch through your P.A. system. . . . Well, no gig is perfect, but using a wireless mic or instrument system definitely beats the confines of a wire.

This month, I'll help you choose a wireless system that fits your needs and offer tips to keep the taxi dispatcher from crashing your party. (Note that the principles here hold for wireless mics, guitar/bass, and IEM systems.)

How High Is Ultra High? The majority of wireless instrument systems operate via Frequency Modulation (FM) in the Very High Frequency (VHF) and Ultra High Frequency (UHF) bands. There was a time when many people in the pro audio community snubbed their noses at VHF wireless, deeming it inferior to UHF—but that's simply not the case. Each has advantages and disadvantages, and may be more appropriate for a given application. UHF transmission tends to suffer less interference due to the fact that traditionally the UHF band has been less crowded. On the other hand, the inherent construction costs for UHF systems are higher. Battery life of a VHF system tends to be better than that of a UHF system. The point here is not to rule out a wireless mic simply because it's VHF. In fact, you'll find that manufacturers are revisiting the VHF band for new products because the UHF bandwidth available to pro audio is shrinking. (See the "Buyer Beware" sidebar on page 64.)

The 2.4GHz "ISM" (Industrial, Scientific, and Medical) band is rising in popularity, since it has the advantage of being license-free to use worldwide. (A license is currently not required for use of wireless mics/instruments/IEMs in the United States, providing that the equipment is used in the core TV bands and is transmitting at 50mW or less.) Manufacturers such as AKG and Line 6 are

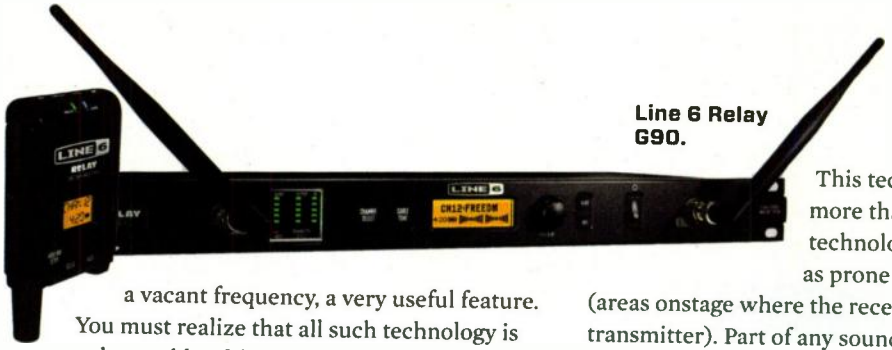
using 2.4GHz technology for digital transmission of full-bandwidth, uncompressed audio. (See the "Wireless Audio Processing" sidebar on page 62.) Other advantages of digital wireless include increased dynamic range and data encoding to prevent interference and unauthorized eavesdropping (!) from third parties.

Digital wireless may take various forms. Some systems employ frequency-hopping, spread-spectrum technology similar to that used for cordless phones. This technology requires more bandwidth than an FM signal, so they usually operate in the 900MHz or 2.4GHz unlicensed bands. Lectrosonics' Digital Hybrid Wireless® combines traditional FM transmission with digital audio: Analog audio is converted into digital information; the digital audio is encoded *back* into an analog signal, which is broadcast via FM. The information transmitted is digital (and encrypted), yielding an inherently low noise floor, but since the transmission itself is analog, efficiency and transmission range are increased.

Arguably the single most important wireless feature is frequency agility. A fixed-frequency system will cost far less, but you'll be stuck with a predetermined operating frequency. At some point, you may need the ability to change the channel to avoid interference—even in a relatively immobile installation (such as a church). If you are traveling with a wireless system, then fixed-frequency operation should be considered a deal-breaker.

Frequency agility varies with price. Some receiver/transmitter combinations offer a choice of four or five frequencies, while others can tune across thousands. Initially, this might not seem important, but take a look at the wireless requirements of your typical four- or five-piece bar band: a wireless mic for the lead singer, two wireless guitars, and one bass, plus several sets of wireless IEMs. All of a sudden, you need eight frequencies that won't interfere with each other or anything else in the neighborhood and vice versa. You definitely want a wide choice of frequencies.

Speaking of interference, some wireless receivers have the ability to scan the airwaves and automatically choose a vacant frequency, a very useful feature. You must realize that all such technology is only capable of detecting RF gear operating when the scan takes place—so if you are performing in a venue where (for example) security uses radios to communicate, ask them to turn their radios on during soundcheck. When this feature was in its infancy, you'd need to manually tune the transmitter to match the receiver, but more and more systems use infrared remote to "auto-sync" the transmitter to the correct frequency.



Line 6 Relay G90.

Diversify Your Portfolio Radio transmitters broadcast their signals without really caring where those frequencies go. As a result, a transmission may travel directly to a receiver's antenna or it might bounce off an object and then travel to the receiver (or both). "Multipath" is when a signal reaches an antenna via more than one path. Much like low-frequency audio waves bouncing around a control room, multipath can cause phase cancellation, resulting in dropouts. One of the best ways to combat signal loss due to multipath is through the use of *true diversity* wireless. True diversity employs two tuners and two antennas for reception. A little troll living inside the receiver analyzes the signal at each antenna/tuner and throws a switch connecting the stronger one to the receiver's circuitry (okay, it's not a troll, it's a comparator circuit). This provides a major advantage in maintaining reception. A non-diversity system utilizes one antenna and one tuner and thus may be more subject to multipath—but again, the application dictates the importance of the feature. If the receiver is located relatively close—within, say, 20 feet and line-of-sight of the transmitter—multipath is less of an issue.

A variation of this concept is antenna switching, when an electronic circuit automatically compares signal strength at the two antennas and connects the one with the stronger signal to the tuner.

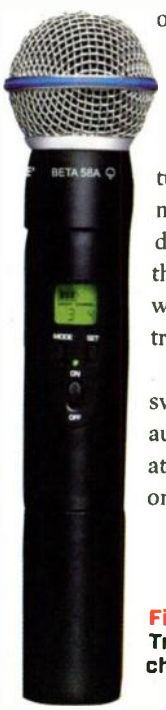


Fig. 1. The Shure ULX2 Handheld Transmitter can be ordered with a choice of capsules.

This technology costs more than non-diversity technology but is not as prone to dropouts (areas onstage where the receiver loses the transmitter). Part of any soundcheck should be walking the stage with the transmitter and marking the floor at dead spots. (I guarantee the lead singer will stand there all night!)

Keep Your Antenna Up Ideally the receiver is within line-of-sight of the transmitter. This positioning provides the greatest operating distance but is not always practical—in which case, true diversity may provide better performance. (Most manufacturers' range specifications are measured under line-of-sight conditions, and can be very optimistic.) In rack-mounted wireless systems, the antenna should be placed outside of the rack, because the rack itself can pose an obstacle to reception. Thus, it may make sense to either remove the unit from the rack after transport, or get the antennas out of the rack. Most manufacturers offer panels for mounting antennas on the outside of a rack, or remote antennas that mount on mic stands and can be located on the side of the stage. Try to space the antennas at least 1/4-wavelength apart—roughly four inches for UHF and 16 inches for VHF systems—and at right angles to each other.

HOW WIRELESS WORKS

Wireless microphone and instrument systems operate in the same manner as FM radio and terrestrial broadcast television. An oscillator is used to create an extremely high-frequency tone that we cannot hear (in the MHz range). This frequency, known as the carrier, has the ability to radiate into space when amplified. Audio is mixed with the carrier, amplified, and sent to an antenna, which converts the electrical signal to electromagnetic radiation and broadcasts it into space. A receiver (tuned to the frequency of the carrier) detects the signal and converts the electromagnetic radiation into a small electrical signal. This signal is amplified and the carrier is stripped away using a lowpass filter—leaving the audio signal behind.

se•lec•tion [səˈlekSHən]

noun

1. the action or fact of carefully choosing someone or something as being the best or most suitable

2. a number of carefully chosen things

3. what you get with Vintage King

GRACE DESIGN M501
Transparent and detailed pre, brings out the best in any mic

RETRO DOUBLEWIDE
Single-channel tube compression amplifier

MÄAG EQ4
Sassy six-band EQ with the original AIR BAND®

MILLENNIA HV-35
Authentically transparent preamp for unrestricted creativity

JDK V12
Stereo-linkable compressor with patented THRUST circuitry

Do not underestimate the importance of the antenna. Always use the antenna recommended by the manufacturer. Antenna efficiency is critical because transmitter output power is limited by the FCC, and battery life is a function of output power. Antenna size is directly proportional to wavelength of the system: Lower radio frequencies require longer antennas. Never cut the antenna or substitute an antenna from a different system, and always extend telescoping antenna to maximum length.

Choosing a handheld wireless mic is no easier than choosing a wired mic, due to the large number of choices and the challenge of finding a model that complements a singer's voice. Lower-priced systems tend to have non-removable capsules. As you scale the price wall, you'll find handhelds with interchangeable heads. For example, the Shure ULX2 Handheld Transmitter can be ordered with a choice of capsules (SM58, Beta 58, etc.), or the capsule may be swapped out at a later time. (See Figure 1 on page 60.) A number of wireless transmitters may even be used with capsules from other manufacturers—providing a wide range of choices. Expect shorter battery life when using a condenser capsule, due to the power requirements of the capsule itself in addition to those of the transmitter.

All wireless transmitters require batteries, and it's an unfortunate fact of life that non-renewable alkaline batteries possess the most desirable discharge characteristics for the application. You don't want to lose a wireless mic to a dead battery in the middle of the show, so as a matter of habit, change the batteries before every show. (Save questionable batteries for soundchecks.) NiCAD rechargeable batteries are a no-no in wireless transmitters because they have a nonlinear drain characteristic, and by the time you get a "low battery" warning, it'll be too late. Lithium ion rechargables fare much better but beware that not all batteries of this type output maximum voltage when fully charged. Thus, the battery gauge may be inaccurate or the transmitter may not work at all. Fortunately, more companies are offering rechargeable battery packs specifically designed for their products. A battery gauge on the transmitter is a must; remote battery indication on the receiver is strongly suggested.

The concept of mixing your own monitors is particular to IEM systems. Systems from Audio-Technica and Shure offer the ability to mix two separate signals at the belt pack, so for example, you could have a band mix on one channel and "me" on the other (see Figure 2). An adjustable limiter can help prevent audio accidents from hurting your hearing, and a headphone jack on the front of the transmitter is very useful for troubleshooting.

Fig. 2. The Audio-Technica M2 IEM lets you mix two signals at the belt pack.

Sennheiser EW100 receiver.

Six Pack? Wireless instrument, lavalier, and headset microphones employ bodypack transmitters, typically with a TA or mini-XLR connector (hopefully locking). The same packs can usually be used with cables that have a 1/4-inch TS on the instrument end, but remember that a guitar or bass does not react to a wireless pack the same way it reacts to the input of an amplifier. To compensate, some manufacturers build cables designed to load the pickups in the same manner as an amp. Lectrosonics' MI39ARA cable (see Figure 3) is specifically designed for use with passive pickups and has an active DI with a J-FET front end built into the 1/4-inch connector (!). More companies are also offering "cable compensation" circuitry in their packs to model the interaction between guitar (or bass), cable, and amplifier input.

The output from guitars and basses varies widely depending upon pickup type and design, so it makes sense to "tune" the input of the bodypack to the instrument. Active pickups produce a hotter output level that can potentially overload the input of a pack. Look for an input sensitivity adjustment and overload LED (or meter) on the bodypack. Spend a few minutes playing the instrument aggressively with the volume control turned all the way up while observing the meter. Adjust the sensitivity so that when the instrument is at its loudest the indicator barely blinks red or shows overload; then, back it off a hair.

When using a handheld microphone transmitter, observe the same practice and expect a different output level if the

WIRELESS AUDIO PROCESSING

Most UHF and VHF wireless systems use two audio processes for enhancing signal quality. Companding is compression before transmission and expansion after reception.

The transmission strength of wireless audio systems is limited by the FCC and may not legally be exceeded; however, the dynamic range of UHF/VHF wireless is typically less than 50dB. If a signal is broadcast with a wide dynamic range, noise will be a problem because the quiet parts of the audio signal will fall below the noise floor of the transmission. One solution is to compress the audio, transmit the signal, and expand the audio back to normal when it is received, allowing many systems to achieve a dynamic range close to 90dB.

Pre-emphasis/de-emphasis is a noise-reduction technique that uses equalization to boost the high frequencies of an audio signal before transmission. The receiver has a complementary EQ circuit that restores the high-frequency response to normal. If any static or hiss is picked up during transmission, the noise is also cut, reducing its level by around 10dB.

These techniques vary from manufacturer to manufacturer, which is one reason that units from different manufacturers operating on the same frequency are incompatible.

Radial 500 Series Racks... More of Everything!

"The Workhorse certainly lives up to its name. The feature set is deep, the system is scalable, construction is solid and it sounds great"
~ Mix

"The Workhorse is one of the most versatile and well equipped racks I've ever tried. It exudes the typical Radial Engineering detail and thoughtfulness..."
~ Sound-on-Sound

"Radial can't seem to leave well enough alone! Oftentimes, they take what might be otherwise mundane and turn it into a must have."
~ Tape Op

"Every connection and function worked as promised. The Workhorse is truly professional grade and worth the cost."
~ Pro Audio Review

"The Workhorse makes a terrific host for modules - solidly built with useful routing features and extensive connectivity."
~ Resolution

"No other manufacturer currently offers anything like this level of functionality in a 500 series rack."
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"From its build quality to its feature set and open-ended architecture, the Workhorse is currently unrivalled for supremacy."
~ Recording

"Radial is to be congratulated for putting plenty of thought and design smarts into such a compact and attractive package."
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"The Workhorse is a more sophisticated, more capable, and more costly re-thinking of what a 500-series rack frame should be.""
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More Performance!

The Workhorse™ - an 8 channel power rack with built-in summing mixer! Lets you combine modules in series or in parallel with more efficiency to deliver creative results that let your mixes stand out. D-subs, XLR and ¼" TRS connectors for cross patching are included!

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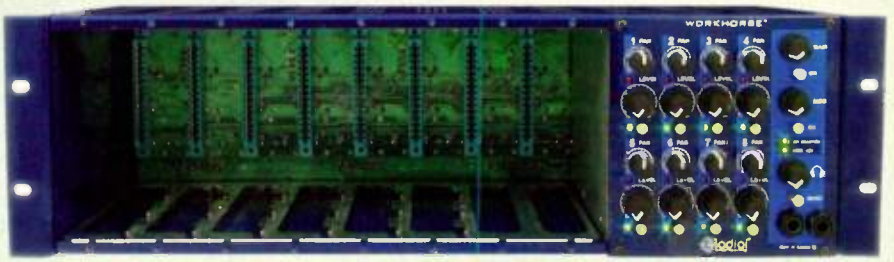
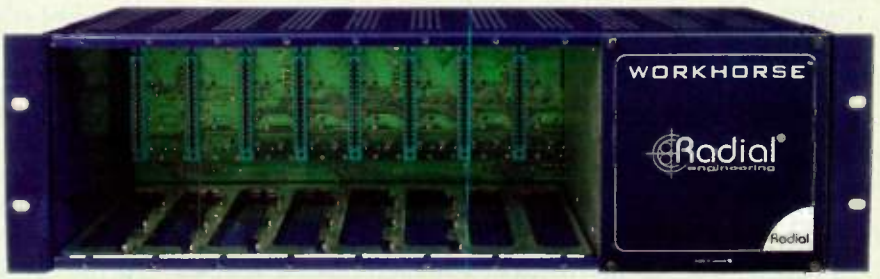


More Flexibility!

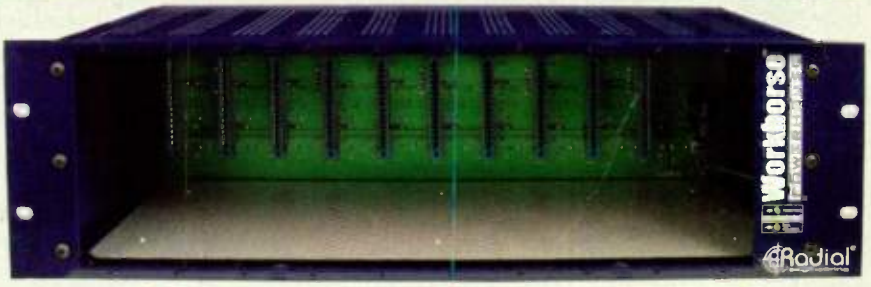
The Workhorse WR-8™ - designed for those with mixers in place, the WR8 gives you 8 channels to house your 500 series modules and lets you upgrade by adding the Workhorse mixer section later. Fully backwards compatible to older 500 series formats.



More Power!

The Powerhouse™ - This 10 space power rack delivers 1600 milliamps of current for extra headroom while maximizing your studio space. Built-in feed and stereo link switches make it easy to integrate with your recording system.

PAR EXCELLENCE nominee



More Convenience!

The Powerstrip™ - Single rack space Powerstrip lets you assemble your favorite preamp, EQ and compressor to create the ultimate channel strip. Use it in the studio or take it on the road!

More Easy!

The Cube™ - This small wonder gives you a more easy and affordabe way to enjoy the fun and excitement of 500 series mixing, combining up to three modules to create all new sounds! Place the Cube on your work surface, carry it around the studio with the built-in handle or build it right into your desktop with the optional mounting flanges.

More Options!

The NEW Six-Pack™ - Desk-top power rack for 500 series modules lets you mix and match up to six modules and safely power them to create stereo channel strips or unique signal chains. The powerful 1200 milliamp supply will not sag when loaded. Set the SixPack down on your work surface or carry it around the studio with the integrated handle.

Electronic MUSICIAN editors choice 2013

* Modules shown are not included!

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Radial® engineering
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capsule is changed. The audio output of the receiver also requires a bit of attention. Is the output jack operating at microphone level? In that case, you'll need to connect the receiver's output to a microphone input on the mixing console; but if the receiver's output is at line level, you'll need to connect it to a line input. Just because you see a 1/4-inch jack for the audio output, does not mean that the output is line level. If the receiver has a control for the audio output level, adjust this *after* you have dialed in the transmitter's input sensitivity. This is particularly critical for guitar amps, which behave differently depending upon the strength of the signal presented at their inputs.

Guitarists and bassists may notice that as they switch instruments, their stage volume varies. The elegant solution to this is to use multiple packs, each adjusted to the output of the instrument. If you take that approach, ensure that the packs are transmitting on the same frequency and that only one pack is powered at a time. Powering up multiple transmitters on the same frequency is a sure bet for interference. A less-than-elegant solution is to adjust the sensitivity so that the instrument with the strongest output does not overload the transmitter input, and live with the fact that other instruments may produce less stage (and P.A.) volume. Get into the habit of removing the cable from the belt pack when traveling, especially when flying—TSA agents love to pull out those connectors without releasing the locks. I warned ya'. ■

Fig. 3. Lectrosonics' MI39ARA cable is designed for use with passive pickups.

BUYER BEWARE

In January of 2010, the FCC banned the sale of wireless microphone and instrument systems operating over the "700MHz" (actually 698MHz to 806MHz) band in the United States. As of June 2010, the FCC made it illegal to use these devices in those bands, which are now reserved mostly for providers of wireless broadband. As a result, you may find shady people trying to sell older wireless mic or instrument systems that are illegal for use in the United States. As the old adage goes: If it sounds too good to be true, it probably is. When purchasing a used wireless system, make sure that it operates outside the 700MHz band.

Steve La Cerra is an independent audio engineer based in New York. In addition to being an Electronic Musician *contributor, he mixes front-of-house for Blue Öyster Cult and teaches audio at Mercy College, Dobbs Ferry campus.*

"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:

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

Paul Hager - Front of House Engineer - Miley Cyrus

"I have been using the i5 on snare (top and bottom) for 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

"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

"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 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."

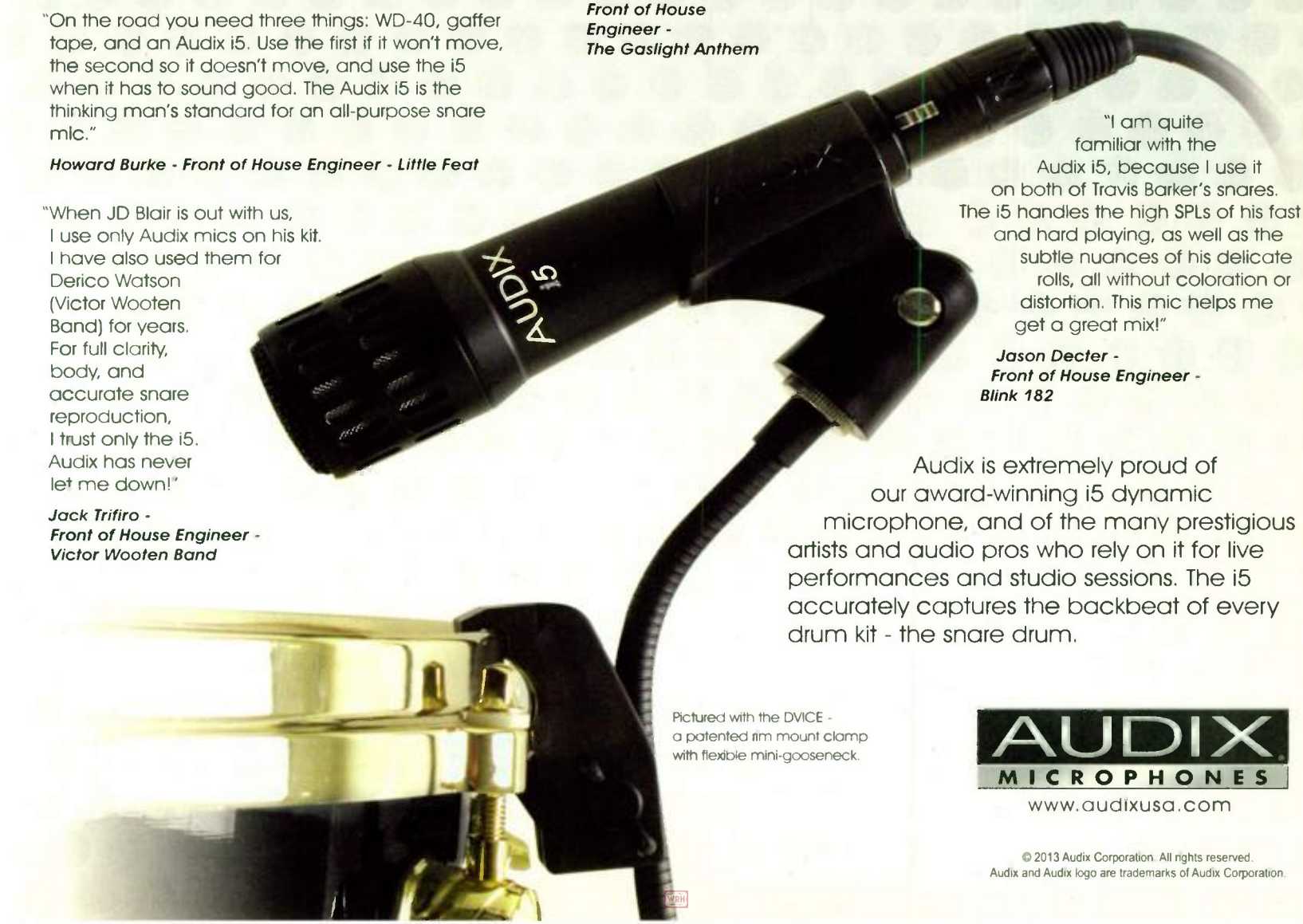
Joe Amato - Front of House Engineer - The Gaslight Anthem

"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

"This mic is slammin'! If you're tired of a heavy stick hit blowing your snare mic cap to pieces, you'll love the Audix i5!"

Anthony Roberts - Monitor Engineer - Tower of Power



"I am quite familiar with the Audix i5, because I use it on both of Travis Barker's snares. The i5 handles the high SPLs of his fast and hard playing, as well as the subtle nuances of his delicate rolls, all without coloration or distortion. This mic helps me get a great mix!"

Jason Decter - Front of House Engineer - Blink 182

Audix is extremely proud of our award-winning i5 dynamic microphone, and of the many prestigious artists and audio pros who rely on it for live performances and studio sessions. The i5 accurately captures the backbeat of every drum kit - the snare drum.

Pictured with the DVICE - a patented rim mount clamp with flexible mini-gooseneck.

AUDIX
MICROPHONES
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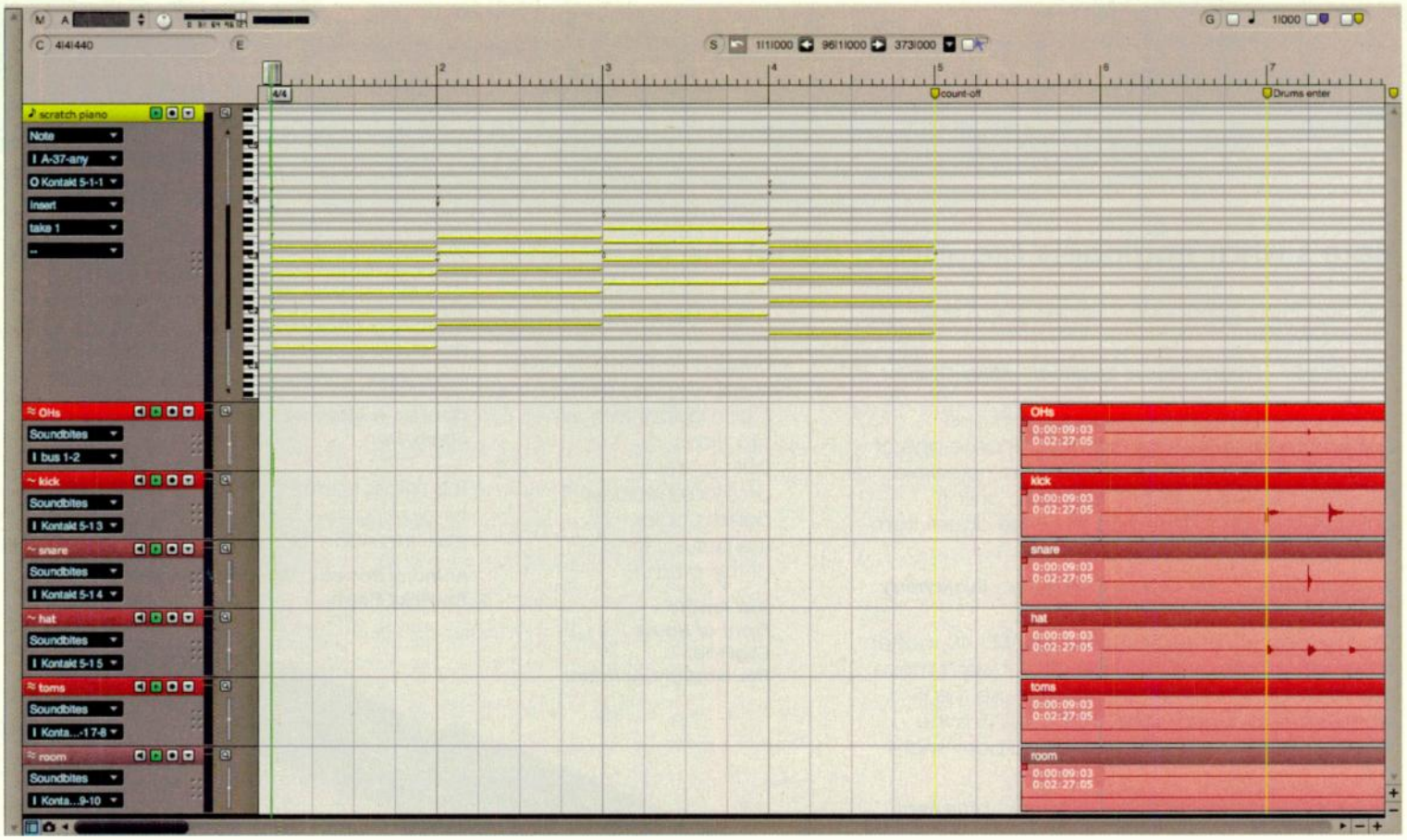


Fig. 1. Sampled grand piano—recorded in a scratch track before a song's downbeat—is used to double-check tuning for guitars and other pitched instruments.

Pre-Production Pointers

Give your tracks a strong foundation using these techniques

BY MICHAEL COOPER

SOME PEOPLE think of pre-production solely as arranging that's best left to spontaneous recording sessions. But it's a lot more fundamental than that. Shun pre-production, and your so-called keeper tracks might end up being out-of-tune, in the wrong key, recorded at a bad tempo, or riddled with unintended dissonance—not exactly what you'd want to keep.

In this article, I'll detail the pre-production techniques I use to guarantee that keeper tracks will be built on a strong foundation. I always begin with the singer in mind.

Find the Right Key If someone other than you will sing the song, listen to other recordings on which they've performed. Determine the highest note the vocalist can sing with strength, and then transpose your song so that the top note of your melody is the same note. We'll call this your initial target key. If your melody hits its highest note many times in succession, you'll probably need to lower the initial target key a major 2nd in order for your songbird to be able to nail it repeatedly without sounding strained or pitchy.

Now find the lowest note of the melody in your newly transposed key. Is it too low for your singer's range? If so, and if using a different singer is not an option, consider changing the melody slightly. An isolated bottom note that drops a 5th below the second lowest note can sometimes be moved higher, so that it drops only a 3rd, without hurting the melody. If that change falls within the singer's range, the key is good to go.

Set a Pace Once you've found the song's optimal key, record a guitar/vocal or keyboard/vocal dummy take of one verse and chorus, using a metronome set to what you think is probably the best tempo for the song. This needn't be a great performance free of clams and bad singing, but it's important that it's locked to the metronome's tempo.

Record additional dummy takes at tempi two, four, and six bpm faster and slower than your first scratch recording. For example, if your original tempo was 130 bpm, record additional takes at 124, 126, 128, 132, 134, and 136 bpm. Listen back—without playing an instrument—to all seven takes (including the original), and pick the tempo that sounds best (for example, 134 bpm). Then record two more dummy takes that are 1 bpm slower and faster (133 and 135 bpm), to zero in on the absolute best tempo.

Don't be surprised if the tempo you ultimately choose is faster than that of the first scratch take. When we play a relatively new and unpracticed song, we tend to do so at a tempo at which it's comfortable for us to perform—not necessarily at a tempo a listener would most enjoy. If you bypass this exercise, you're more likely to end up with keeper tracks recorded at a plodding tempo that bores.

Record your click track at your preferred tempo—or *tempi*. You might find that the chorus needs to be one or two bpm faster than the verse, to fan the flames. If that's the case, program tempo changes in a conductor track throughout the song and record your click track to that.

Tune Twice If you record any guitar tracks in pre-production, beware: A guitar can sound perfectly in tune with itself while being a few cents off from concert pitch. It's only later, when keyboards and other properly tuned instruments are added to the production, that the guitar will sound sour. You can use a polyphonic pitch-shifter to move the guitar's tuning to concert pitch, but it's far better to avoid the problem in the first place.

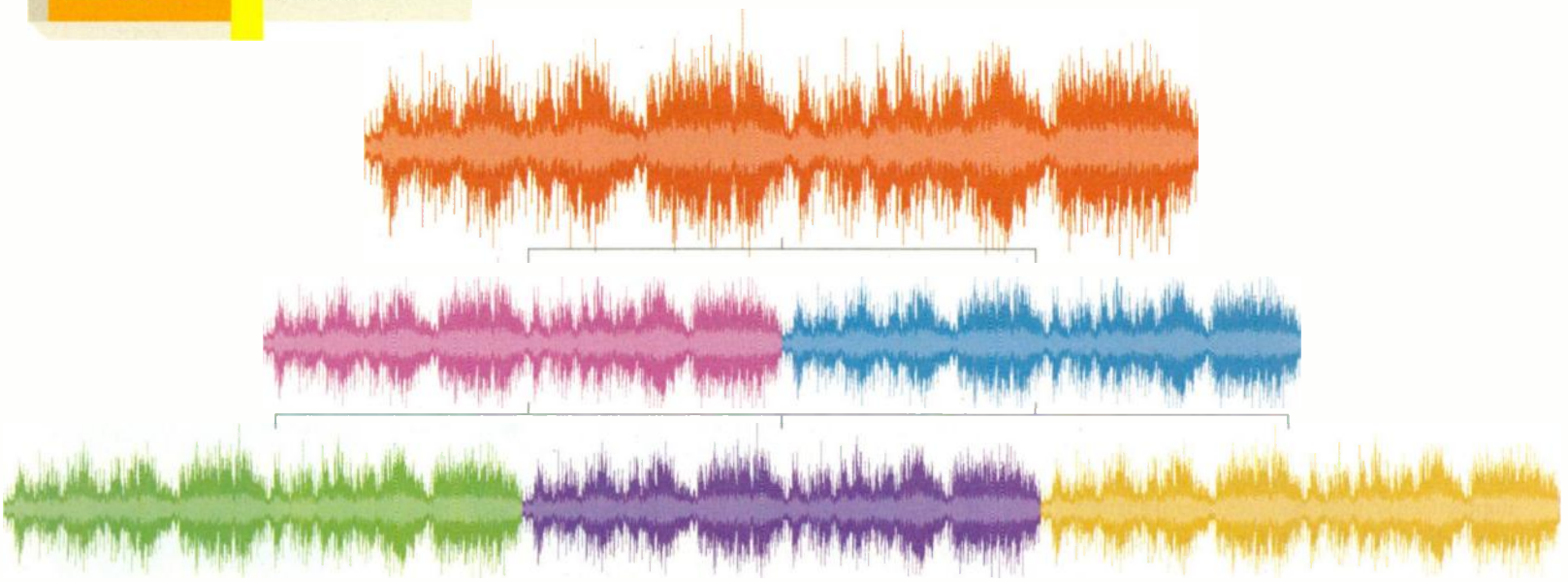
The solution is to tune twice: first using an accurate tuner, and then to a musical reference. I typically record several bars of sampled grand piano, playing chords for the song in whole notes, to a scratch track (see Figure 1). I use that piano track as my musical reference against which I double-check my guitar's tuning. If the guitar's intonation sounds sweet alongside the piano track, I know it'll sound in-tune with any keeper tracks I subsequently lay down.

Examine the Melody and Harmony Structure Ferret out clashes between your melody and harmony (chords) before sending your song to a hired singer or tracking basics. Play and sing the song at half-tempo or slower to spotlight any dissonance that was too fleeting to notice when played at full speed. Change either the melody or harmony to remedy any clash.

Record guitar/vocal or keyboard/vocal scratch tracks, and then listen back intently for any unwanted dissonance. You'll sometimes hear problems that went unnoticed when you were distracted by playing an instrument.

Get it Right From the Start If you forego pre-production, you might be able to rescue lame tracks using pitch- and time-shifting. But they'll almost never sound as good as if you fine-tuned your key, tempo, tuning, melody, and harmony at the starting line. Pre-production is the foundation for stellar tracks. ■

Michael Cooper (myspace.com/michaelcooperrecording) is a producer, audio engineer, and contributing editor for Electronic Musician *and* Mix *magazines.*



Mixing Your Music for Licensing

The six versions you should be making of each song

BY RANDY CHERTKOW AND JASON FEEHAN

ALTHOUGH MOST musicians focus primarily on creating singles and albums to sell directly to their fans, licensing music continues to be another good source for music income. It's also a great way to get your music heard and noticed by new fans. However, the mixes that television and film producers, advertisers, Youtubers, podcasters, and other licensors want from your music are often different than what you'd create for your album. The time to prepare your music is while you're in the mixing phase, not after the album is done.

Thinking about licensing during mixdown makes sense: It's easy to make another version of your song while you're already working with the tracks. Plus, you can often save money by mastering all of your tracks at once. Because of this, consider making the following alternate mixes while you're still in the studio:

1. Instrumental Mix Removing the vocals and creating an instrumental version of your song is one of the most versatile mixes you can make for licensing purposes. Instrumentals can be used as beds under commercial voiceovers, or for television, film, radio, podcasts, video games, and more. If you have to choose just one alternative mix to make, this is your best choice.

2. Vocals-Only Mix A vocals-only mix can be useful on its own, but is primarily used to help you create the next three mixes below. A vocals-only mix is typically synced and layered on top of your instrumental mix to make it easy to turn down, turn up, or remove certain vocals (such as profanity).

3. Vocal Levels-Down Mix Creating an alternative mix with a quieter vocal track down can be the perfect mix for television, film, and advertisers to use. This is so your words don't compete against voiceover or other dialog happening in the scene that it's playing underneath, without taking them out of the song altogether. To create this type of mix, turn the vocals down about 1 to 2dB.

4. Vocal Levels-Up Mix Alternatively, it may be the vocals that carry the exact sentiment licensors are hoping to capture. For these licensors, create a mix with the vocals up between 1 to 2dB.

5. Radio-Friendly Mix If your song is long or uses profanity or other non-broadcastable language, creating a radio-friendly mix can make you royalty income based on radio play, and could also be used for licensing that needs music without profanity.

6. Stems, Source Tracks, and Beats While it's easy to think television and film, many potential licensors are interested in your stems, source tracks, and beats, considering the huge number of remixing tools available. Today, there are entirely new licensing opportunities for beats and hooks, since musicians and remixers are looking for ready-made sounds for use in their songs. To pursue this type of licensing opportunity, you can present each of your source tracks "as is," and also mix down stems and beats out of parts of your song.

Once you've prepared your alternative mixes, you can upload them to your website to let potential licensors sample your mixes. Web pages with instrumental pieces can be especially useful to potential buyers. Or, you can submit them to music-production houses and licensing services such as sites like Beatstars.com, Musicdealers.com, and Magnatune.com. Naturally, you can send them to a publisher, or directly to potential licensors to create licensing opportunities for your music.

Of course, you may get ideas for other mixes that are useful to licensors. Often, the key is to have what they need ready to go when they ask so you can capitalize on the opportunity. If you make what they need during mixdown, you will save yourself time, and open up new sources of income and exposure for your music. ■

Randy Chertkow and Jason Feehan are authors of The Indie Band Survival Guide, *now in its second edition: indieguide.com.*

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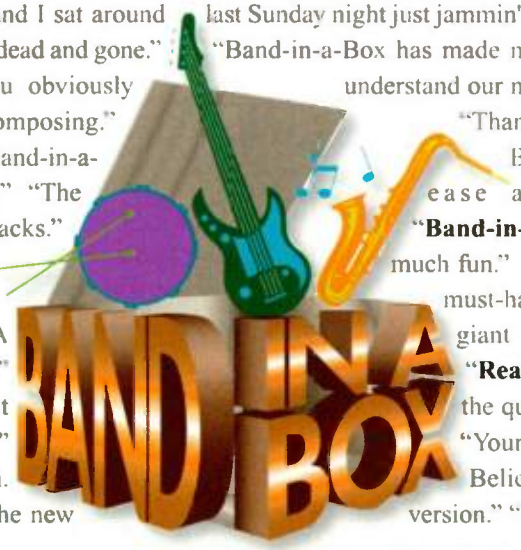

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Turn Your iPad into a Synth Workstation

Link your iOS music apps together with Audiobus

BY GEARY YELTON

IF YOU use an iPad or iPhone to make music, you've probably heard of Audiobus, and you may be using it already. Audiobus is an iOS app from an Australian company called A Tasty Pixel. It routes audio between other apps, which makes recording software instruments on your handheld device more like recording plug-ins on your computer. You can stream audio from a synth app, for example, process it with an effects app, and then capture the results into a multitrack recording app—something that was previously impossible in real time on the iOS platform.

Audiobus's Connections page presents you with three audio-routing stages: Input, Effects, and Output. Touching the Input button will list all your Audiobus-compatible apps that produce sound. When you select one from the list to load it, the onscreen graphics will indicate that it's asleep until you launch the app by touching the Input button a second time. Likewise, the Effects button lets you access apps that can process audio signals, and the Output button lets you specify their destination from a list of Audiobus-compatible apps.

Once your apps are loaded, a dock called the Connection Panel will appear on the side or bottom of each app's screen, allowing you to easily switch to other apps and access remote-control buttons. Exactly what those buttons do will depend on the app type. Usually, drum machines and sequencers provide buttons to turn playback on and off; recorders provide buttons to start and stop recording and playback; and effects provide buttons to toggle bypass.

Drive the Bus to the Garage Perhaps the biggest news for Audiobus came when Apple added Audiobus support in GarageBand for iOS. GarageBand is by far the most popular multitrack recording app in iOS, so let's take a quick look at using GarageBand with Audiobus.

Open Audiobus, select your favorite Audiobus-compatible synth app as the input, and select GarageBand as the output. Open GarageBand, add a track, and assign it to Audio Recorder. Switch to your synth app, touch GarageBand's Record button in the Connection Panel, wait for the count-in, and begin recording. Touch Record again to stop and Play to hear what you've recorded.

Now switch back to Audiobus and select another instrument app as the input. Switch to GarageBand again and add a second audio track. Switch to the second instrument, touch Record, and lay down your second track. Repeat this procedure until you're happy with the results. Notice that every time you add a new audio track, it will record whichever instrument app is onscreen when you touch Record in the Connection Panel.

Uptight, out of Sync This process isn't without problems. Because Audiobus handles audio only and not MIDI clock, as of this writing, it can't sync tempos between GarageBand and other apps. If you're recording a drum machine app or a synth's onboard sequencer, then you should try to match tempos manually to get an accurate count-in when you record, and then leave GarageBand's metronome turned off.

The good news is that an app called Jack from Crudebyte combines audio and MIDI routing, making synchronization possible. The bad news is that less than one-tenth as many apps support Jack as support Audiobus, and GarageBand isn't one of them. Fortunately, A Tasty Pixel is working to expand Audiobus's capabilities to encompass tempo sync, which will put the iPad and iPhone a few steps closer to being versatile and truly portable synth workstations. ■

Geary Yelton is former senior editor at Electronic Musician. *He lives in Asheville, North Carolina, and takes his iPad everywhere.*

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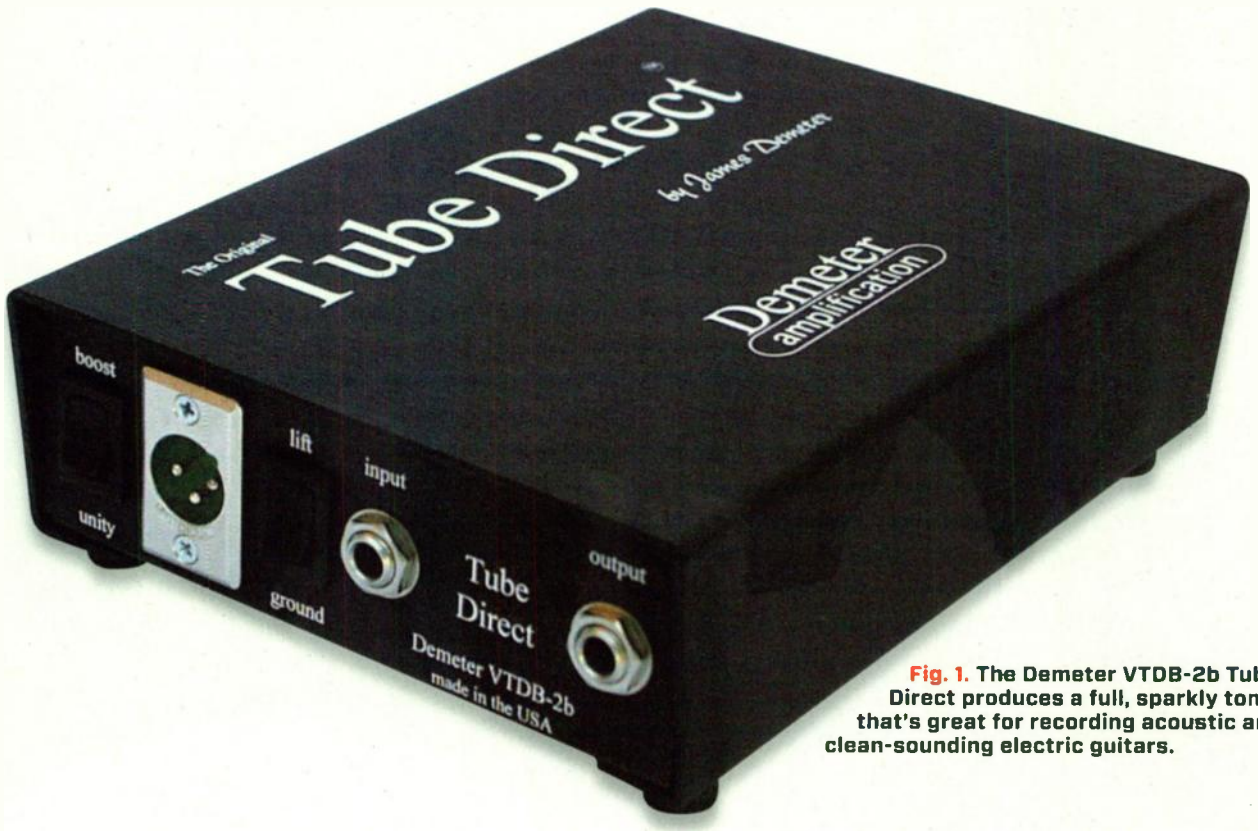

Fig. 1. The Demeter VTDB-2b Tube Direct produces a full, sparkly tone that's great for recording acoustic and clean-sounding electric guitars.

The Direct Route

Choosing and using a DI box for the studio and stage

BY MICHAEL COOPER

IF YOU'RE not using a direct box to record some of your instruments and in live performance, your productions are probably coming up short of their true potential. A direct box—also known as a direct-injection or DI box—with additional processing will often produce the best-sounding track, especially if your tracking room's acoustics sound crummy. And on stage, using a direct box can mean the difference between pristine sound and muffled trash polluted by noise.

Some DI-circuit designs will give you better results than others for a given application. In other cases, using a DI box isn't even necessary. Use the following tips to decide when to go direct and which DI model is best for you. For the uninitiated, I'll begin with a 30-second primer.

Avoid Line Inputs To ward off dull, choked, and lifeless sound, never plug your electric guitar, acoustic guitar (assuming it has a pickup), or passive electric bass into a line input. Plug your instrument into the unbalanced, high-impedance input for a DI box instead, using a standard guitar cable. Use a mic cable to connect the balanced, low-impedance XLR output of the DI box to a mic input on your I/O box, mixer, or external mic preamp. If your instrument is fitted with magnetic pickups, the DI box will maximize its high-frequency response, producing a more present and sparkly sound. It will also dramatically extend the bass-frequency response of an acoustic guitar fitted with piezo-electric pickups, yielding a fuller and rounder tone.

By repelling noise, a DI box will also help you record cleaner tracks. The DI will reduce pickup of hum and buzz from lighting fixtures and AC outlets. It will also muzzle static-y RFI (radio-frequency interference) from your computer, outboard digital effects units, and nearby radio or TV stations.

Check the Impedance The higher the DI box's rated impedance, the more extended your passive instrument's frequency response will be. All other things being equal, a DI box with an impedance of 10 Megaohms will produce more sparkly highs than a DI box that has a 1-Megaohm impedance, when used with a passive instrument fitted with

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magnetic pickups. Similarly, the higher the DI box's impedance, the more extended the bass-frequency response will be for an instrument fitted with piezo-electric pickups.

Very high impedance is obviously important when recording acoustic guitar, where a full tone with sparkly highs is of paramount importance. It's not always necessary or desirable, however, when recording electric guitar with an amp-simulation plug-in. The speakers in guitar amps generally roll off highs above 5kHz. Extending your DI'd electric guitar's highs far above this characteristic roll-off point could potentially make overdriven tones sound fizzy or icy. On the other hand, clean amp-sim patches sound terrific when you feed them your guitar patched through a DI box with sky-high impedance. Owing in large part to its stratospheric 27-Megaohm impedance, the Demeter VTDB-2b Tube Direct sounds killer on Strats and Teles, producing chime-y tones that stand on their own even without an amp sim or other processing (see Figure 1).

Check the Design Before You Buy Most of the tube-based DIs I've used over the years sound great. But if you perform live, there's another reason to use tubes: Assuming the DI's unbalanced output follows the tube-input buffer (which is usually the case), the unbalanced output will sport a constant impedance that will preserve high-frequency response over a long cable run to an amp. If you need a 30-to-40-foot leash to run around on stage, choose a box that uses this type of circuit design; models include the AMB Tube-Buffered Direct Injection Box (distributed in the U.S. by The John Hardy Company) and the aforementioned VTDB-2b Tube Direct.

Clean amp-sim patches sound terrific when you feed them your guitar patched through a DI box with sky-high impedance.

Some tube DIs use electronically balanced outputs, placing semiconductors in the signal path. All-tube boxes, on the other hand, use transformer-balanced outputs. If you need to run a long cable to an amplifier, choose an all-tube DI to drive the line. The transformer will reduce the pickup of hum.

Skip the Box? Synthesizers and active electric bass guitars don't require a DI box. You can plug these instruments directly into a line input without compromising their tone. But for all passive instruments that use a magnetic or piezo-electric pickup, a well-designed DI box will give you cleaner tracks with much higher fidelity. ■

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BY GINO ROBAIR

OBJECTIVE

Use the Iris Macro window to control multiple patch-specific parameters at a time.

BACKGROUND

You can assign your MIDI controllers to sets of parameters in Iris using MIDI Learn. The next step is to use the Macro window to save specific control routings to eight knobs that can be recalled as part of a patch. This allows you to set up elaborate controller assignments that will give you a higher degree of performance capabilities over your Iris instruments.

TIPS

■ Step 3: When you're finished making a Macro assignment, you can adjust the range for each parameter by selecting its minimum and maximum values. Set either your highest or lowest value on the parameter knob and then right-click on it. Hover over the Assign menu item, and then over the Macro Knob number that is checked. This will reveal a menu that offers Update Min and Update Max options; select the appropriate one for your controller setting.

Step 1 In the Mix window, use MIDI Learn to assign your MIDI controller to the parameters you want to use when playing a particular patch.

Step 2 Click on the triangle next to the word Macro to show the eight knobs and the XY pad. Knobs 1 and 2 control the X and Y coordinates, respectively.

Step 3 Right-click on a parameter knob to assign it to a Macro control; select Assign and scroll to the Macro knob number you want.

Step 4 Right-click on the Macro knob and select Rename to give it a new name.

Step 5 Macro routings are saved within the patch. If you like what you have, hit the Save button next to the Browser menu.

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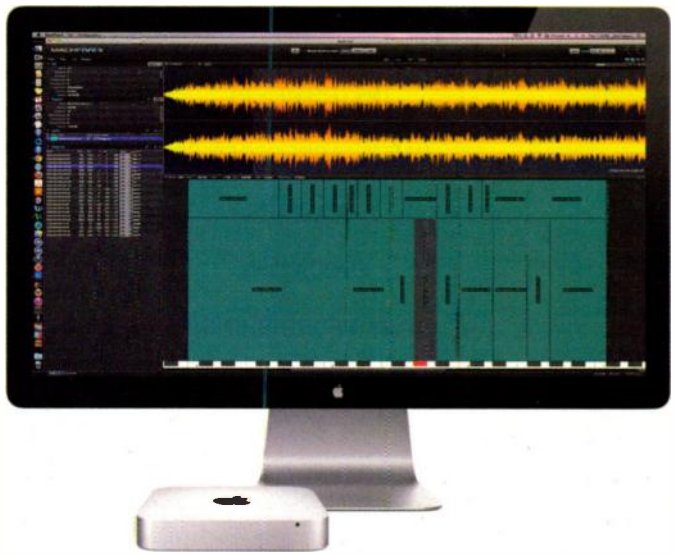

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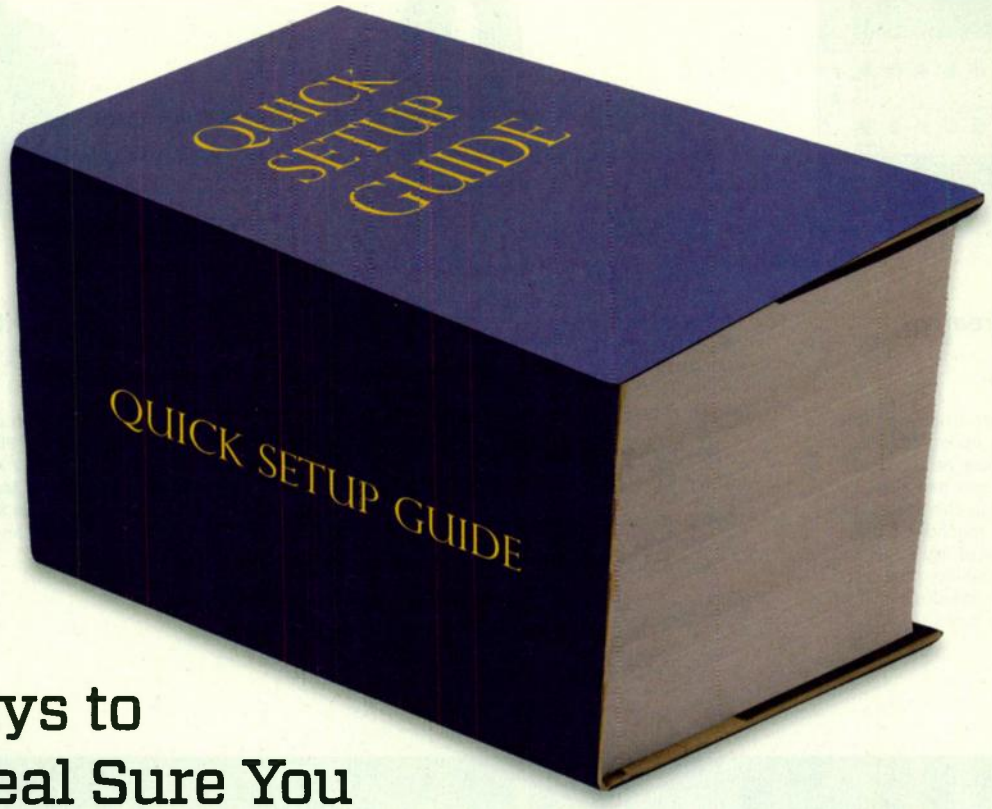


Five Ways to Make Real Sure You Buy the Right Gear

BY CRAIG ANDERTON

1

Attempt to read the manual. If you truly can understand it, then as surely as solid-body electric guitars have aphrodisiac-like properties, that's the right piece of gear for you—because you'll be able to figure out how to use it. However, remember you can't absorb a manual's contents by holding it up against your head. You actually have to read it.

2

With a synthesizer, simply audition the presets. It's *way* too much effort to create your own sounds, unless you're able to understand the manual (see previous). You'll probably just stick with whatever came with the synth anyway—so if you like the sounds, why not just surrender to the inevitable?

3

Buy what famous celebrities endorse. After all, they use gear exactly the same way you do, have trophy spouses just like you, *always* agree on what's best, and would never, *ever* let some form of paid compensation influence them in any way whatsoever.

4

Have a child-like faith in internet forums. All forumites are not only experts, they may even have *actually used* the piece of gear they're discussing! Not only that, all of them are Mensa members and thoroughly understand what they're talking about. No one has ever said something incorrect in a forum, so the level of credibility is equaled only by stock tips from famed late-night TV psychic Miss Cleo.

5

A salesperson's opinion is even more truthful than a lawyer's. All salespeople undergo grueling training, lasting many years (and sadly, some perish in their noble quest) so that they can understand all the nuances of every piece of gear. They're professionals! The fact that one product has a higher profit margin, or 10,000 of them are sitting in a warehouse, makes no difference at *all*.

se·lec·tion

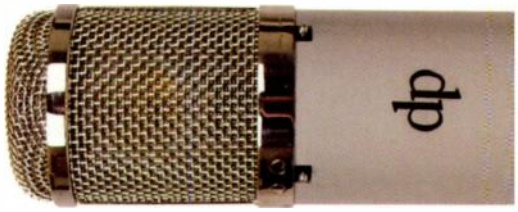
[səˈlekSHən]

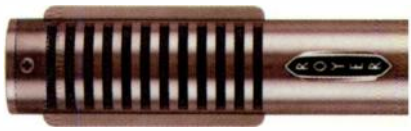
noun

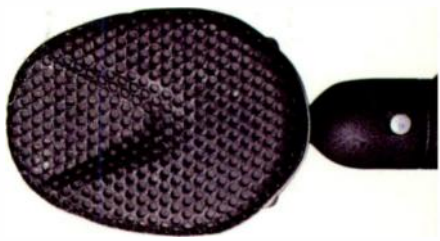
1. the action or fact of carefully choosing someone or something as being the best or most suitable

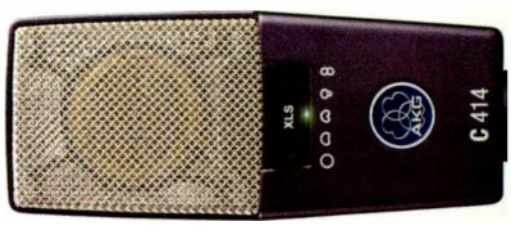
2. a number of carefully chosen things

3. what you get with Vintage King









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