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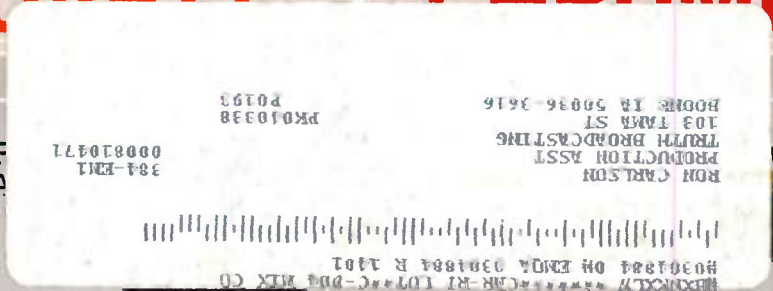# WIRELESS GUITAR GEAR

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COVER FEATURE

40   30

LYLE OWERKO

FEATURES

GEAR

HOW TO

DEPARTMENTS

World Radio History

No Excuses

CHANCES ARE you haven't heard of DJ Cassidy. He's known mainly as a celebrity party DJ, working the decks at rarefied events like Barack Obama's 50th birthday and the wedding of Jay-Z and Beyoncé.

For his debut album, *Paradise Royale*, Cassidy wanted to evoke classic R&B and disco by uniting the legendary musicians and producers of the era with top modern-day artists. But even for someone with A-list connections, recruiting his wish list was easier said than done. Cassidy literally chased artists around the country, crashing black-tie galas to meet Cee-Lo Green and Nile Rodgers and following R. Kelly to several tour stops, ultimately waiting in line for seven hours at a book signing to get some face time.

His tenacity paid off: One by one, he assembled his dream team, which included Rodgers, Verdine White, Philip Bailey, Ndugu Chancellor, Marcus Miller, Freddie Washington, Ray Parker Jr., Patrice Rushen, and other R&B legends, paired with top contemporary artists including Green, Kelly, Robin Thicke, Jessie J, Mary J. Blige, Estelle, John Legend, Kelly Rowland, and Usher. The result is an energetic, hook-laden record that expertly channels the spirit of the golden era of dance music. Mission accomplished.

You have to ask for what you want. And sometimes, your biggest obstacle can simply be a fear of putting yourself out there. Take inspiration from Cassidy's story, which begins on page 30.

SARAH JONES
EDITOR
sjones@musicplayer.com

COMMUNITY

"I DON'T THINK IT'S 'UNDERGROUND VERSUS OVERGROUND.' I JUST THINK IT'S POP CULTURE VERSUS PEOPLE WHO ACTUALLY LOVE THE MUSIC. SOME OF THESE PEOPLE HAVE NO CLUE WHY THEY ARE STANDING IN FRONT OF THESE DJS IN THE FIRST PLACE."

Carl Cox, reflecting on the growth of the mainstream EDM movement, on dancingastronaut.com, March 26, 2014

The *Electronic Musician* Poll

HOW MANY MICROPHONES DO YOU HAVE IN YOUR CABINET?

SEVEN OR MORE
49%

ONE TO THREE
25%

FOUR TO SIX
20%

I DON'T OWN ANY MICROPHONES
6%

IN THE STUDIO

>> **Jeff Crawford** with Brett Harris
BY BARBARA SCHULTZ

BRETT HARRIS'S LATEST ALBUM—FULL OF LUSH HARMONIES AND BEAUTIFULLY orchestrated rock arrangements—was made over the course of two years with bassist and studio owner/operator Jeff Crawford (arborridgestudios.com).

"We have two studios here at my place, Arbor Ridge Studios," Crawford says. "We recorded some drums in both of them, and some at the Fidelitorium, Mitch Easter's studio (fidelitorium.com). We also did some vocals in Chris Stamey's room, Modern Recording (chrisstamey. com), and we did some vocals here. Between four studios, we were going all over the place and letting the heart and voice and song decide where we recorded what."

For example, different drum sounds came from different rooms—a big, open sound from Easter's studio, or a tighter sound in Crawford's smaller space—as well as from the drummers who guested on Harris's project: Tommy Perkinson of Over the Rhine and Dale Baker of Sixpence None the Richer.

Different environments meant different tools as well: "In Chris Stamey's place, the vocal mic on Brett was a Peluso 2247 LE through an 1176 compressor and a Neve channel strip," recalls Crawford, who also plays bass on the album. "At my place, we used an [AEA] R84 mic to get a darker sound, and that went straight to Pro Tools."

Brett Harris

However, nailing down the sonics wasn't always even as simple as balancing vibe with technology. "We always joke that we find the most unusual method of getting a usual sound," Crawford says. "There was an acoustic number where I wanted a brushy snare part but we couldn't get it with a brush and a snare, so we took a tambourine with a calfskin head and put tape over all the little [zils] and hit it with a paintbrush. We miked that up with the R84, and it sounded like a snare drum."

---

ask!

I'M A SONGWRITER; I READ AN ARTICLE BY CRAIG ANDERTON ADVISING TO START WRITING WITH MIDI SO IT'S EASY TO CHANGE KEY AND TEMPO AS THE SONG DEVELOPS. HOWEVER, MY MAIN INSTRUMENT IS ACOUSTIC GUITAR, NOT KEYBOARDS. I USUALLY STEP-ENTER MIDI PARTS AS "PLACEHOLDERS" FOR LATER REPLACE-MENT, BUT IT TAKES FOREVER AND IS AN INSPIRATION-KILLER. MIDI GUITAR IS EXPENSIVE, AND I DON'T KNOW HOW WELL IT WORKS WITH ACOUSTICS ANYWAY. ANY SUGGESTIONS ON HOW TO WORK FASTER WITH MIDI?

**RICK WERNER
DAYTON, OH
VIA E-MAIL**

Ableton Live 9 includes an audio-to-MIDI conversion feature. For other DAWs, Celemony Melodyne does pitch-to-MIDI conversion and can export MIDI files. PreSonus Studio One Pro 2 and Cakewalk Sonar X3 support the Celemony/PreSonus ARA (Audio Random Access) protocol, which offers a powerful advantage—simply drag an audio track that's been analyzed by Melodyne into a MIDI track, and it becomes MIDI data. (The Melodyne version bundled with these two DAWs handles only monophonic lines, but you can upgrade to a polyphonic version.) Expect other DAWs to integrate ARA in the near future.

You can even sing a melody as well as play guitar into a mic. However, audio-to-MIDI conversion accuracy depends on the input signal being "clean." Cleaning up audio prior to conversion may take some time, but with simple lines the conversion is often "good enough" that you can continue the songwriting process with just a little touch-up (pitch correction with Melodyne, and MIDI quantizing).
THE EDITORS

In PreSonus Studio One Pro 2, the blue audio track has been opened for editing in Melodyne (which has corrected the pitch center and drift), then dragged into an Instrument track (yellow) to drive the Mojito soft synth.

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

1

Akai Pro
Rhythm Wolf
Analog drum machine/
bass synth
$199.99

HIGHLIGHTS 5 drum sounds with
adjustable tuning, volume, and
amplitude envelope • 6 MPC-
style pads • 32-step sequencer
• bass synth with sawtooth and
square waveforms • Howl control
for adding distortion • Swing
control • standard and USB MIDI
I/O • analog gate trigger input •
independent outputs for drum
machine and bass synth
TARGET MARKET DJs, producers,
and musicians
ANALYSIS Low-cost, yet versatile,
the Rhythm Wolf offers features
you would expect in a classic
analog rhythm-and-bass machine.
akaipro.com
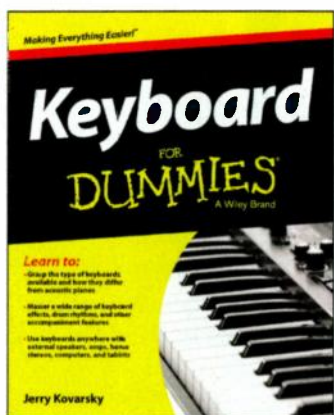
2

Wiley
Keyboard for Dummies
Instrument guide
$24.99

HIGHLIGHTS Jerry Kovarsky's
easy-to-use tutorial explains the
wealth of features available on
electronic keyboard instruments
• covers the fundamentals of
synthesis, offers playing tips, and
makes suggestions on finding a
keyboard that suits your needs
• covers MIDI, sequencing, and
audio recording • audio examples
available online
TARGET MARKET Anyone interested
in learning about digital
keyboards
ANALYSIS A fun and informative
book that even experienced
musicians for whom technology
is intimidating will find useful.
dummies.com

3

Antelope Audio
Zen Studio
Audio interface
$2,495

HIGHLIGHTS 20 analog inputs, 14
analog outputs at 24-bit, 192kHz
resolution • 18 channels of
digital I/O (ADAT and S/PDIF)
• 12 Class A mic preamps with
phantom power • 4 instrument
inputs • 2 independent
headphone jacks • 2 TRS insert
jacks • D-Sub-25 connectors
TARGET MARKET Musicians and
recording engineers
ANALYSIS A compact and portable
audio interface for studio or
mobile recording that offers
high resolution and lots of I/O
for situations where space is at a
premium.
antelopeaudio.com

4

sE Electronics
sE5 Pair
Condenser microphones
$599 street

HIGHLIGHTS Two small-diaphragm,
cardioid condenser mics •
package includes a pair of
shockmounts, stereo bar, and
flight case • highpass filter
(low-cut) switch at 100 Hz
• pad switch with -10 and
-20dB settings • 20Hz - 20kHz
frequency response • matte black
finish
TARGET MARKET Musicians,
recording and live-sound
engineers
ANALYSIS An affordable kit based
around a stereo pair of "pencil
condensers" designed for stage
and studio use on acoustic
guitars, piano, and percussion,
including drum overheads.
seelectronics.com

All prices are MSRP except as noted
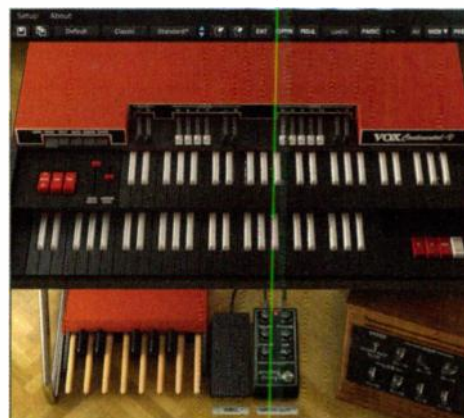
5

Line 6

AMPLIFi FX100

iOS-enabled multi-effects pedal

$299.99 street

HIGHLIGHTS Uses free AMPLIFi Remote iOS app • compatible with iPhone, iPod touch, and iPad • Bluetooth audio streaming from your music library • mono amp output • stereo headphone and Main outputs • USB port • pedal controller • Drive control • three EQ controls

TARGET MARKET Guitarists who perform and record

ANALYSIS Line 6 has made amp, speaker, and guitar modeling even easier to use with its automatic tone-matching algorithm, which suggests appropriate tone setups based on your song selection.

Line6.com

6

MacBeth

Elements

Analog keyboard synthesizer

$6,499

HIGHLIGHTS 3 VCOs that go into sub-audio range • VC LFO that goes into audio range • 4-octave touch-capacitive keyboard • noise generator • hard sync • sample and hold • tape-delay simulator • 5-pole diode-ladder VCF • ring modulator • spring reverb • CV and gate I/O • MIDI I/O • audio input

TARGET MARKET Keyboardists, composers, sound designers

ANALYSIS With the expanded range of its oscillators, processing capabilities, and capacitive key pads, this synth packs high-level features in a relatively compact format.

macbethstudiosystems.com

7

Arturia

Vox Continental-V

Virtual instrument

$129

HIGHLIGHTS Model of the dual-manual Vox Continental 300 with bass pedals • includes Jennings J70 mode • independent outputs for each manual and effects processor • Leslie rotating speaker and guitar amp models • full complement of drawbars • each pitch individually tunable • available in AAX, VST, VST3, and AU formats

TARGET MARKET Keyboardists and composers

ANALYSIS Arturia goes above and beyond what you'd expect of the sound and behavior of this classic transistor-based combo organ.

arturia.com

8

Korg

Nuvibe

Chorus/vibrato pedal

$499.99 street

HIGHLIGHTS Mono 1/4" instrument input and output • 10 Wave sliders that allow you to create your own LFO wave shape • controls for Intensity and Speed • expression pedal included • runs on 6 AA batteries or AC • battery slot is easy to access and doesn't require screwdriver to open

TARGET MARKET Performing and recording guitarists

ANALYSIS Created with the classic Uni-Vibe pedal in mind, this update takes this rich chorus/vibrato effect to new heights.

korg.com

Pro Tools in the Cloud

Avid reveals phase one of Avid Everywhere

Cloud Collaboration is a fully integrated system that gives users the ability to collaborate in real time or offline over the Internet.

BY GINO ROBAIR

IN ADDITION to announcing Pro Tools 11 and Media Composer 7 at last year's NAB (National Association of Broadcasters) trade show in Las Vegas, Avid unveiled Avid Everywhere, its "strategic vision for creating the most fluid end-to-end, distributed media production environment in the industry." Spearheaded by its new president and CEO, Louis Hernandez Jr., the strategy promised to be a major paradigm shift for Avid's overall business model, though few details were presented.

This year, the company revealed the Avid MediaCentral Platform during Avid Connect, the inaugural gathering of the newly minted Avid Customer Association (ACA), which took place just days before the 2014 NAB show. The Avid MediaCentral Platform encompasses the

Stream mixes via the Pro Tools iPad app.

entire life cycle of audio and video projects, including creation, monetization, and secure delivery and storage, with a major emphasis on collaboration. Any of the areas in the Platform you have permission to use can be accessed with a single sign-in. And although Avid's system was designed with the needs of major media organizations in mind, independent producers and artists can also take advantage of what the platform offers.

The most interesting news for Pro Tools users is Cloud Collaboration, a fully integrated system that gives you the ability to work in real time or offline with others around the world over the Internet. In addition to providing basic production tasks, the new technology promises versioning, cloud storage, archiving, metadata tagging, and rights management, as well as delivery and distribution of assets (e.g., any part of your project that can be licensed, sold, or distributed) with encryption and authentication tools to provide a secure and streamlined workflow. Unlike the creative software tools from other developers that have gone to a cloud-only system, Avid will continue to provide Pro Tools software for local-only use on your computer, as well. A server-based version will also be available for production facilities that cannot send files outside of their firewall.

Visitors to Avid Connect were given demonstrations of the collaborative features, and the developer says it will roll out a new version of Pro Tools later this year that incorporates the new technology.

Using the new Cloud window in Pro Tools, you can invite online collaborators to join your session. Once they log into your Pro Tools Cloud project, you can then communicate with them by text or video in

a chat window. The update will include the ability to freeze tracks in a project, which facilitates data sharing with your collaborators, as well as in-app plug-in purchases and rentals from within Pro Tools, so your collaborators can get access to effects or instruments that they need for the project. Avid says that downloaded plug-ins will automatically authorize, making the process painless.

Once your collaborators add their parts and you accept their changes, the updates are added to your Pro Tools project on a track-by-track basis (rather than updating the entire session). If you're collaborating with an offsite mix engineer, the workflow is similar: The engineer downloads the media, does the mix, and uploads only the changes.

When the project is ready, share it with others involved in the project (e.g., producers, label executives, etc.): From within Pro Tools, you can send a notification or link that allows them to securely stream the mix from a Web browser or a Pro Tools iPad app.

The final piece in the puzzle involves the new Avid Marketplace, a secure system for sharing your work with the public or between private parties. While the service provides an opportunity for content creators to monetize their work, Avid also intends it to be a source for organizations who license content. Your final mix can be uploaded to the Avid Marketplace from within Pro Tools, and the Avid MediaCentral Platform handles the transaction, licensing, and transfer of the assets, automatically.

Although specific release dates were not announced, I was told that we can expect to see some of these new products roll out within the year. ∎

Big Wide Vocals.

Introducing Microshift.

MicroShift adds massive width, enormous depth, and huge thickness to vocals, guitars, synths, whatever. A simple but powerful vocal effect taken to new dimensions with the Soundtoys spin. Our unique Focus control lets you add "shimmer" to vocals, "air" to guitars, richness to synths or bass without affecting the rest of the sound.

Based on a classic studio pitch shifter trick, MicroShift emulates three of the most widely used sounds from two of the all time classic pieces of gear that made this technique famous, all right at your fingertips.

MicroShift does NOT require an iLok USB key. MicroShift also adds AAX Windows, and VST Mac 64.

Qu-Bit Electronix Nebulae

Put some granular processing and Csound in your Eurorack

BY GINO ROBAIR

NOWHERE ELSE has hacker culture collided with the mainstream more successfully than in the area of Eurorack modular gear. The most interesting hybrids, born from unusual circuit-bending and coding schemes, spread quickly, often leading a designer toward entrepreneurship: And, thus, a module company such as Qu-Bit is born.

One of the most versatile DSP-based modules available is the Qu-Bit Nebulae ($429), which hosts a Raspberry Pi microcomputer programmed to play audio files, offer granular processing, and run Csound instruments. The well-designed user interface makes it easy to load data, and the module can hold up to 9.5 minutes of mono audio, which you can deconstruct in a variety of ways—time, pitch, and other playback parameters are under full voltage *and* MIDI control.

The Nebulae uses an 11-bit DAC running at a sampling rate of 22.05kHz. It supports stereo or mono WAV, AIFF, Flac, and Ogg files, though it plays everything back in mono. (Qu-Bit also recommends you use mono files because they load quicker.)

Loading files is easy: Power up the module, plug in your USB stick, and the system automatically loads the sounds or .csd file stored in the drive's root directory. (.csd files get priority if they share the root directory with audio files.) You can unplug the USB drive when using Csound and in Looping mode, but you must leave it in for One Shot mode.
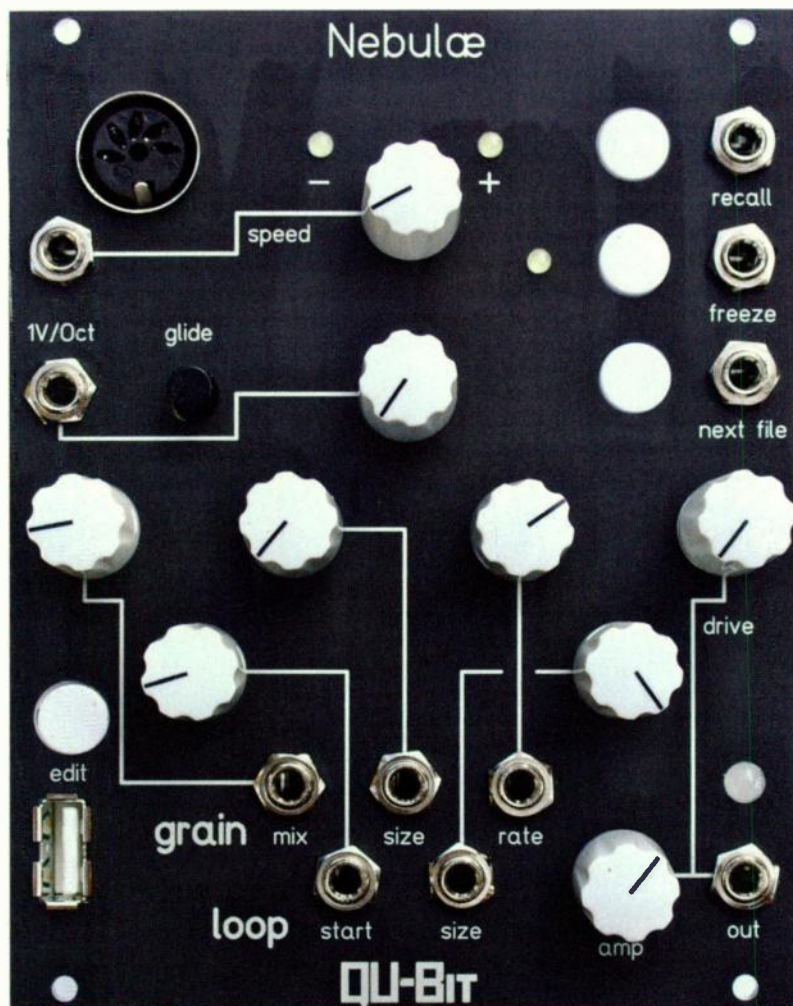
The Nebulae can run Csound instruments, or play and process custom audio files using its granular features.

To load something new, insert the USB drive that has what you want on the root level, then hit the Edit and Next File buttons together. Load time is surprisingly quick. When powered down, the module's SDRAM dumps whatever you've loaded into it, though you can save presets of the current CV and knob states to a USB stick. You will want to have USB drives dedicated to each sound set or .csd file you plan to work with.

The module comes with a thumb drive containing sound files, documentation, and five Csound instruments—a synth voice with FM, a Karplus-Strong plucked algorithm (with 10-voice polyphony), an oscillator that plays seventh chords, another with four tunable waveforms, a vowel-formant instrument, and a .csd template for rolling your own. The Qu-Bit website also provides the Nebulae's source code (including Arduino .ino files) and schematics for you DIY types.

In addition to the Looping and One Shot performance modes for audio-file playback, there is a system-editing mode. The front panel indications are for Looping mode, where a selected sound file continuously repeats. The panel I/O and controls are mapped differently for the other modes and Csound instruments: Qu-Bit provides documentation for each layout.

In Looping mode, you can use CVs to step through the bank of sound files in either direction or randomly; freeze playback; alter the rate, size, and wet/dry mix of the grains; and change the loop size and starting point in real time. Knobs for each parameter adjust the CV response, and you can have consistent distance between grains or variable distances (Scatter). The Drive control provides analog distortion on the output.

In One Shot mode, you can play up to eight individual audio files using discrete analog gate inputs, front-panel buttons, or MIDI. A knob controlling playback speed is available for each file, as well as a global varispeed control. Drive is also available on the output. This mode is great for creating a simple, sample-based drum machine with your Nebulae.

Although granulizing my own sound files was fun, I enjoyed the powerful instruments made possible by the implementation of Csound. Because the module is based around an open-source framework, you can expect a library of user-designed instruments to develop over time, which will allow the Nebulae to stretch your modular system far beyond what you ever thought possible. ■

STUDIO BLISS.

RXA6: 6-inch: 100 watts, 45Hz–27kHz

RXA5: 5-inch: 70 watts, 50Hz–27kHz

RESOLV RXA ACTIVE STUDIO MONITORS deliver the sonic elements essential to any studio setup, featuring Samson's newly-developed *Air Displacement Ribbon Tweeters* for extended high-frequency response and increased dynamic range.

Sold individually in 5 and 6-inch models, RXA monitors offer a true reference sound with no hype, just precise audio imaging for authentic and critical sound reproduction.

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SAMSON

"We're influenced by more than just one type of old record," says Macklovitch. "So, Drake came out with his record at 100 BPM, which is such a sexy tempo, and I felt we really should do one like that, too, but with our harmonies, humor, and a twist of earthy nostalgia, kind of like those blue-collar American songs that had videos shot in black and white: Don Henley's 'Boys of Summer,' Marc Cohn's 'Walking in Memphis,' that sort of thing. That's where the song 'Old 45s' came from, which kind of has a ZZ Top 'Rough Boy' thing in the solo, too. We heard the chorus chords when we were in the studio with [Los Angeles production duo] Oliver, and we build it from there."

BY TONY WARE

Chromeo

On *White Women*, the Canadian duo explore new musical influences and sound design tricks, yet maintain their modern electrofunk sound. • FOR MORE than a decade, Chromeo has been ahead of the retro curve. Now, on the group's fourth full-length, *White Women*, the follow-up to 2010's *Business Casual*, Chromeo continue to show that you can teach the old school new tricks.

Made up of childhood friends David "Dave 1" Macklovitch and Patrick "P-Thugg" Gemayel, Chromeo debuted in 2003; already established as tastemakers and hip-hop producers in their native Montreal, they were offered an opportunity to release music through local acquaintance Tiga—a producer, DJ, and head of Turbo Recordings. The resulting experiment, exemplified by the single "Needy Girl," introduced the Chromeo template: playing it cool against warm analog synths.

Initially tagged with Jheri curl funk, nu_new jack swing, 8-bit pastiche artists and other such electro-funk derivatives, Chromeo evoked memories of Cameo, Rockwell, Zapp, the System, Phil Collins, and Yaz. Singing through a Rocktron Banshee Talk Box for pitch modulation well before the commercial breakthrough of T-Pain and his Auto-Tune oscillation, Chromeo made it clear that most important filter when using keyboards was the human. Assembling a cache of vintage synthesizers and rhythm machines, Chromeo recombined each component's DNA into hybrid grooves bridging eras and tonal arrangements.

Chromeo approached *White Women* as an opportunity to incorporate wider influences, including vintage disco, ABBA-to-Scissor Sisters glam revival, Trevor Horn, ELO, Roxette, Vampire Weekend, and Kendrick Lamar, next to standards such as *Purple Rain*-era Prince, Midnight Star, and some surprising masters of joyful melancholy.

Indeed, *White Women* is the first Chromeo album where Macklovitch and Gemayel actively courted outside opinions (from friends and management) as well as some co-production (from the Oliver duo) to craft an album as quirky and relevant to gearheads as it is universal for modern pop fans.

"P and I have done three albums in a complete vacuum, and we wanted the challenge of integrating feedback early on, because we felt like we needed to improve, for there to be a qualitative leap [in songwriting and sound quality] on this record, the same way there was between our first record [2004's *She's in Control*] and [2007's] *Fancy Footwork*, our second album," says Macklovitch. "And we figured we needed to spend more time writing together to do that, so P moved to New York to do this album. We set up a studio in Brooklyn and started working full-time together, while on previous records he'd be in Montreal, I'd be in New York, we'd do writing on our own ends, and then we'd get together and exchange ideas.

"In this case we did everything together from the jump, and with no time constraints or scheduling crunches we spent double, triple, or more time on every aspect of the record," continues Macklovitch. "Where we might have previously tracked vocals in one or two days, we did it in a week. Sure, we've always accumulated more gear between albums, but it's not about just using more; it's more about spending time doing each aspect of the record more
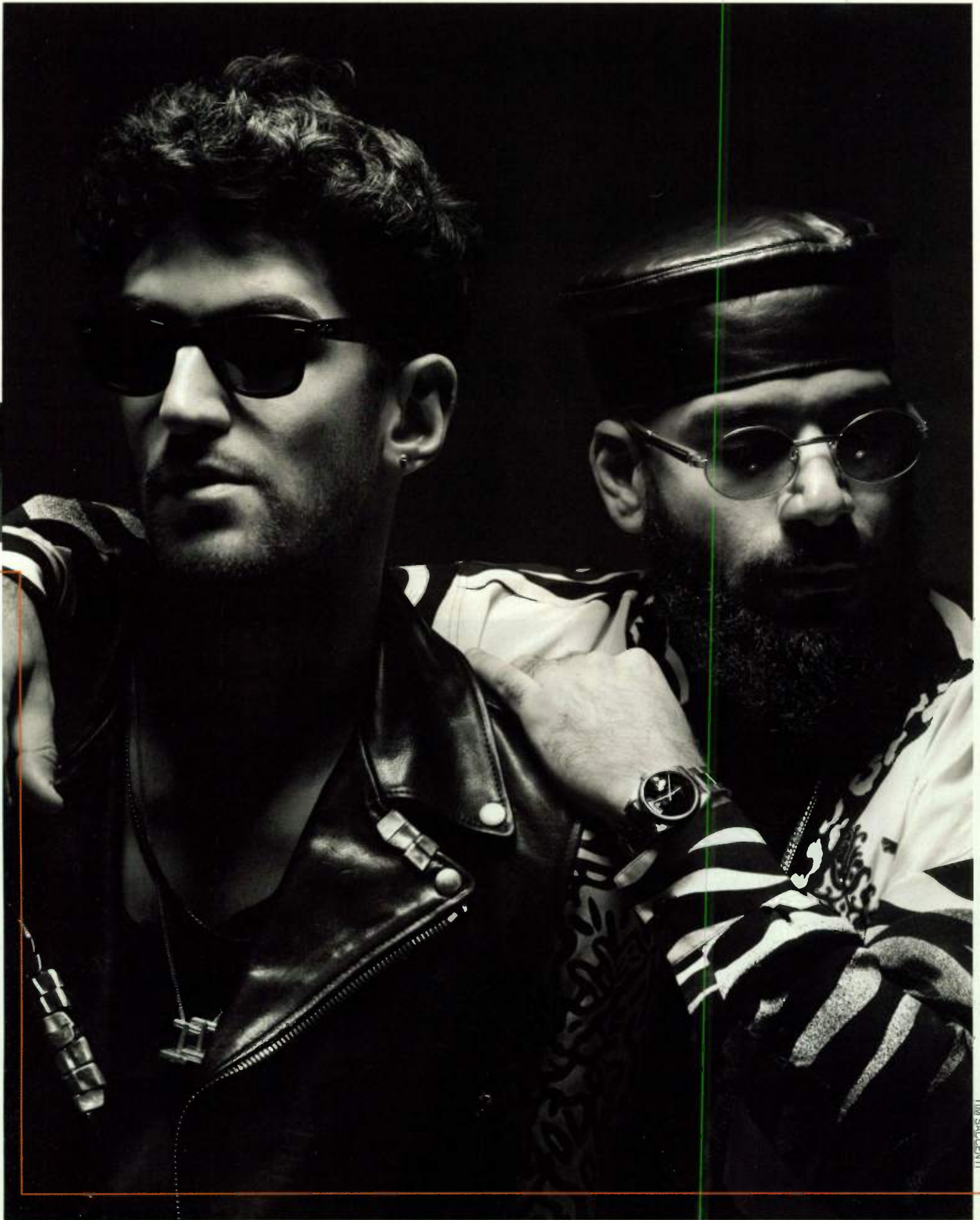
thoroughly. We work in a very traditional way where all the steps are separate: We do the writing, then the arranging, then the recording, then the producing, and only then the mixing. We still start out sequencing in Cakewalk on a Pentium II from the late '90s because it makes us focus on the raw sound and arrangement instead of how much we can treat a wave file."

Flanking the workstation, sitting floor to ceiling, are painstakingly maintained acquisitions, including the Roland Juno-106 and Jupiter-8; Moog Prodigy, Minimoog, and Memorymoog; Elka Synthex; Sequential Circuits Prophet 5, Pro-One, and DrumTraks; Dave Smith Instruments Prophet '08; Linn Electronics LM-1; Oberheim DMX; Yamaha DX5; Korg PolySix and Mono/Poly; Oberheim OB-X; Wurlitzer 206A; and Clavia Nord Modular G2, to name a few. Gemayel, who refers to the gear in highly textural terminologies (aka describing the "taste" of various oscillators), emphasizes the importance for musicians to begin the songwriting process with a thorough knowledge of each synth's intrinsic character.

I'm the guy who goes to the studio, turns all the synths on, and puts one oscillator on every synth, just a pure saw tone, because I want to

know how different that sawtooth or pulse wave sounds from synth to synth," he says. "These are building blocks of your song, so I think it's great to just take a MIDI controller,

"Some people record with reverb on their vocals, but I track with nothing, because if it will sound decent like that it will only sound better with effects."
—DAVID MACKLOVITCH

assign all the keyboards to a sequencer, close your eyes, change tracks, and press the same note and A/B between all the oscillators.

"You need to know how warm or cold each oscillator is; if it's a very stable, digitally

controlled, colder sound or a plush and mushy one," continues Gemayel. "I'd rather know the synth personalities and how they relate to and support each other so I can pick exactly what I need for a stack, rather than trying to compensate for what's missing later. If it's too trebly, midrange, if it has too much buzz, I'd pick a different synth or add one to complement rather than be back at square one when it's time to mix, and taking high or low out makes you add EQ or effects to compensate."

Drum machines are selected for the character of their inherent sequencers, though no tracks are the result of a single machine. Drawing on the DrumTraks (the start of many varying demos, thanks to interchangeable EPROM sound bank chips), the LM-1 (also augmented by numerous EPROMs), a DMX modified to include sample pitching, as well as an Akai MPC5000 and other samplers and rhythm and percussion generators (including Moog and Korg keyboards), Macklovitch and Gemayel compile patterns reprogramming kicks, snares, etc. from a variety of sources on each track.

For example, "Jealous (I Ain't With It)," the opening track on *White Women*, includes a detuned LM-1 rim shot (think Prince's "When Doves Cry"), there as an accent, a

David Macklovitch (left) and Peter Gemayel

TIM SACCENTI

wink to those in the know, but not part of an entire pattern intended to sound retro. The entire track is an example of Macklovitch and Gemayel's precisely-tuned-chords-meets-Pro Tools mentality for *White Women*.

"Jealous," like several of Chromeo's recent songs, began with Macklovitch introducing an aesthetic agenda and melodic top line, at which point Gemayel composed various potential progressions to support the piece. At that point the two worked diligently to voice the idea in a direct, radio-friendly manner without being too harmonically straightforward. Compiling very Chromeo-like melodies and *"Ghostbusters-*type synths" after an atypical four-on-the-floor intro, the two took the demo to L.A., where Oliver tweaked the arrangement, added some embellishments, suggested guitar parts, and used virtual synths to bring out high end that wasn't present in the hardware.

"We're not against plug-ins; we just use them to add shimmer to a vintage stack or provide as close to an original sound as possible," says Gemayel. "Like on 'Over Your Shoulder,' where there's the 'Fly Like an Eagle' delayed effect with an ascending scale. I saw in a video that came from an ARP 2600 into a [Roland RE-201] Space Echo, but I only have

the Arturia [ARP2600 V] emulation. So I get it as close as possible to the sound and send the output into an amp and re-amp it into Pro Tools with an analog Space Echo.

"I'm very adamant about using gear the way it was meant to be, so if I have an emulation I need to use when my hardware is having tuning issues, I'll take out everything post-oscillator not found on the original and send it to a real amp [often the Fender Hot Rod Deluxe III, Fender '65 Twin Reverb, or Roland JC-120] to get a sound as dry and raw as possible."

While a good 50 percent of *White Women* was tracked live through a compact board into Pro Tools (including keyboard solos and portamento punch-ins), even the parts that weren't maintain a balance of sequence and swing. If a motif is to be looped repeatedly, Gemayel will often play it into MIDI for four bars but not quantize it. And, Gemayel jokes, Chromeo wouldn't have a career without the ability to work the mod wheel.

As for layering, the choice of synth bass or live bass would dictate the next instrument selection. to keep the initial impulse pristine. The goal is a defined, almost rigid pocket with little more than some Prophet '08 or Nord G2, comped to provide subbass reinforcement. From there chords, pads, and other patches are layered. Finally, Les Paul or Fender Strat (effected by little more than Boss stompboxes and internal amp reverb/chorus/sustain) would be tracked through an SSL preamp, Neve strip, or Tube-Tech compressor, and little trademark keyboard flourishes and unisons would be added. Vocals came last, tracked commonly through a Neumann TLM-103 for Talk Box and a Manley microphone for natural subharmonic accentuation/attenuation of Macklovitch's voice.

"P and I will take forever on sound design because we don't want to have to polish a turd when it comes to mixing," says Macklovitch. "Tracks that are unmixed sound like the same thing without reverb ... it's less wide, less stereo image, less low on the kicks, less high on the top end, and less reverb, but the song is there. When I'm recording and arranging, we'll do a rough mix in Pro Tools, but we have a rule that we don't put on any plug-ins, nothing. It's got to sound good on a rough mix, just settled through the faders. Some people record with reverb on their vocals, but I track with nothing, because if it will sound decent like that it will only sound better with effects."

Gemayel says Talk Box and "guitarmonies" are the few subgroups where Chromeo may extensively premix during recording, being careful careful to pan and level without

messing up the harmonic build. For everything else, Chromeo concentrated on working with an engineer to strip any hiss or hum evident between notes and then took the sessions to Dave Bascombe (Depeche Mode, Peter Gabriel, Tears for Fears) for mixing.

Set up on an SSL 4000 G+ 64-channel console in London's Sphere Studios, Bascombe sat with Macklovitch to brighten and compress tracks, concentrating more on enhancement than carving things out.

"The stuff was recorded so well, with everything in the right place, you pushed the faders up and you were halfway there already," reflects Bascombe. "And Dave was incredibly analytical in a good way and communicated

> "It's great to just take a MIDI controller, assign all the keyboards to a sequencer, close your eyes, change tracks, and press the same note and A/B between all the oscillators."
> —PATRICK GEMAYEL

the little changes he wanted immediately. We used the SSL compression for getting drum punch and we used some valve-y outboard gear–Pultecs, Fairchilds, the Chandler Limited EMI Curve Bender–when something like guitar needed a helping hand to stand out in the mix. We worked with some overdrive and subtle distortions, splitting signal into dry and distorted and then blending, and with most of the parts being monophonic with everything in its own well-defined space, it wasn't particularly challenging to hollow out room where needed."

Using a hybrid setup, Bascombe applied some sidechaining in Pro Tools and digitally processed tricky changes like riding syllables in the vocal or auto-panning, but much of his process was translating a feel through the faders. "When we had everything sitting as a cool balance, Dave would ask me to do a pass riding the faders on

the automation, so if we had a static synth pad, we'd just feel it and push it up in the gaps of the vocals as it seemed natural."

With the SSL and the album being mixed to a Mark Spitz ATR 1/2-inch machine, then printed back in the box at 96 kHz through Lavry Gold converters, Bascombe bypassed much of his signature mix bus processing. While a fan of the UAD Ampex ATR-102, UAD Studer A800, and Waves Kramer mastering tape recorder emulations, he skipped much of that, while applying some Avid MDW Hi-Res Parametric EQ or Sonnox Oxford EQ, as well as iZotope multiband limiting.

Ultimately, though, vocals took the most sculpting, aided by SoundToys' EchoBoy plug-in and an actual EMT 140 plate reverb. Sprinkling that across the board, Bascombe and Macklovitch got depth and resonance without clouding the picture.

"It brought back memories of how I used to do things 20 years ago, having the artist there working on an analog desk, having the ergonomics to make fast, creative changes," says Bascombe. "Having Dave there to go over the details and sign off on every mix was wonderful; we didn't have to go back, exchange files remotely and redo anything over and over, as can often be the case."

The use of tactile feedback to reinforce sonic presence slots in nicely with the overriding Chromeo philosophy, and *White Women* exudes both consistency and variety, as intended. Running through how he designed the song sequence, Macklovitch reiterates the importance of dialing in a vibe without being chained to a "purist" mentality.

"It starts with all these poppy songs, then there's a middle section that gets moody ... there's the song featuring Solange that's almost like a movie soundtrack, then the song 'Play the Fool,' with a heavily analog coda, then it almost goes Vangelis for a second. Then there's a piano ballad and something closer to the '90s, almost a George Michael thing, then it ends almost disco. We wanted to explore different moods and influences we hadn't tapped, but it was always just as important to sound current, because the conversation we're part of will always be a modern one." ∎

Tony Ware is a writer and editor based outside of Washington, D.C.
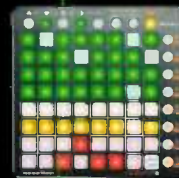
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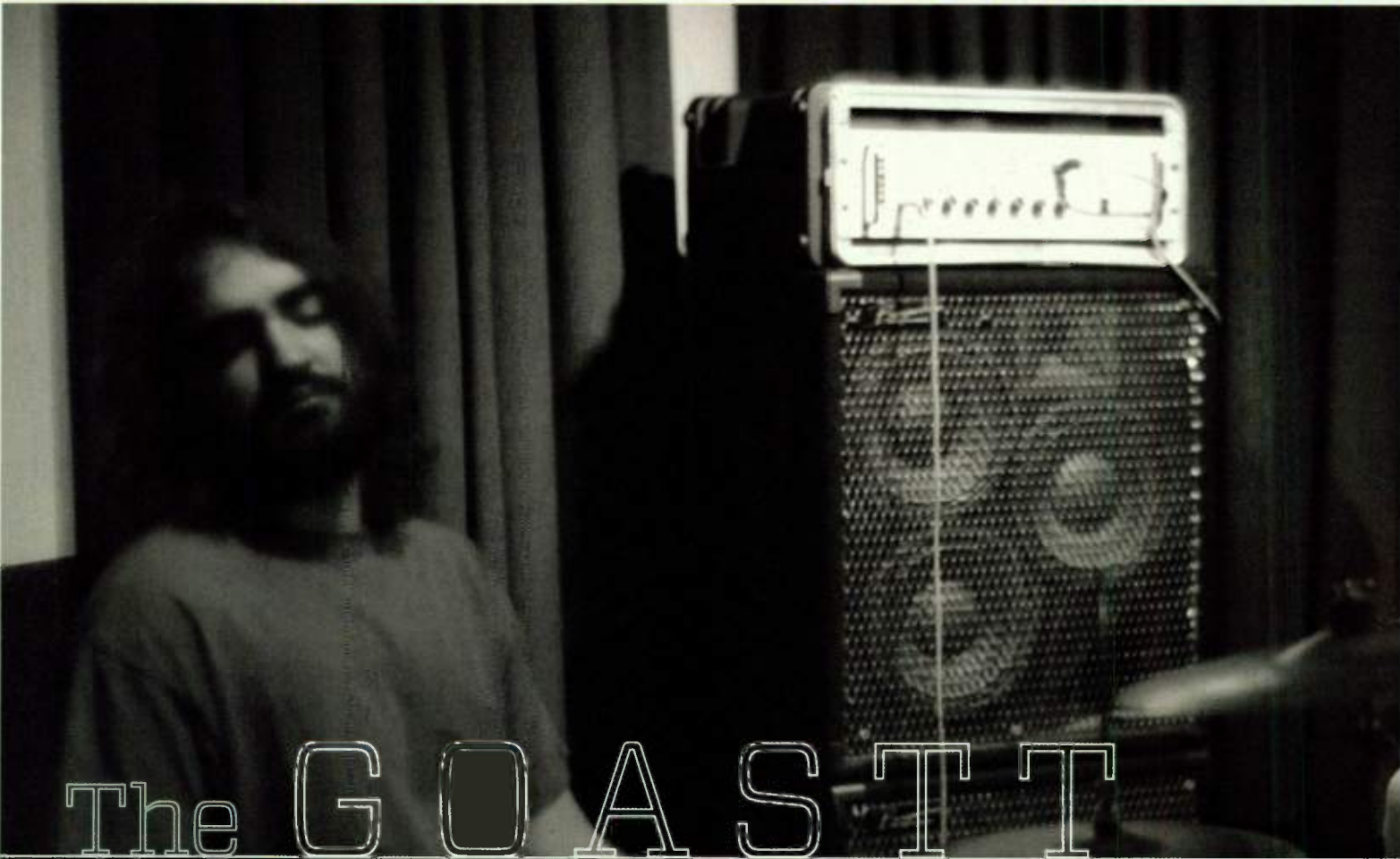
The GOASTT

SEAN LENNON AND **CHARLOTTE KEMP MUHL** CONDUCT WILD STUDIO
EXPERIMENTS TO AVOID SONIC CLICHÉS ON *MIDNIGHT SUN*.

BY KEN MICALLEF

MIDNIGHT SUN, the fourth album from Sean Lennon and Charlotte Kemp Muhl, aka The Ghost of a Saber Tooth Tiger (GOASTT), is a psychedelic fun house of *Magical Mystery Tour* proportions. Like that 1967 psychedelic master class, *Midnight Sun* is the product of both classic technology and experimental recording techniques. And if you ever wondered what happened to John Lennon's guitars, amplifiers, and effects, you need listen no further than *Midnight Sun*.

Though Sean Lennon and engineer Andris Balins wouldn't confirm details, the gear John Lennon used to record *Imagine* went up for auction in 2013, the Craigslist ad including two Studer B62 stereo tape recorders with 706 varispeed units, an EMT 140S stereo transistor reverberation plate, and Neumann U87, KM84i, and U47FET microphones. Balins did verify that John Lennon's former gear was indeed at Sean's studio, The Farm, deep in the wilderness of upstate New York, while Lennon, Kemp Muhl, and a handful of musicians recorded *Midnight Sun*.

Beyond his father's fabled gear, as far as microphones, the far-from-flamboyant Lennon took a thrifty approach when outfitting The Farm.

"We used cheaper mics for the record," Sean explains. "I would love to have an E-LAM 251, but you have to weigh your priorities. I would rather have ten synths than one fancy tube mic. We have basic stuff: an imitation U47 and an AKG 414, many SM 57s, but my favorite is the RCA 77 DX; we use that for drums a lot."

Explaining his process for tracking vocals, Sean says, "When I finally figured out that I didn't want to sing through a U47 anymore, and an SM57 instead, the

"We like tape echo a lot. I like getting my fingers in there and f*cking with the actual tape while we're recording through it. It's all about irregularities. That's the only thing that separates real music from quantized modern music."

—CHARLOTTE KEMP MUHL

engineer I was working with looked up the microphone my dad used. We found a story about how he didn't like the way his voice sounded on the U47 at Abbey Road and he wound up using a dynamic mic. It took me until I was 35 to realize that. So if I find a vintage dynamic mic or ribbon from the '60s or '70s for under $150, I buy it. It has to do with [creating sounds] that aren't clichés."

In their goal to avoid clichés, Lennon, Kemp Muhl, and Balins pursued mad experiments with instruments and effects including a Chamberlin Mk4, ARP 2600, Moog Minimoog, Binson Echorec, Hammond B3, Baldwin Electric Harpsichord, an 1800s calliope, marimba, Rhodes, Ampex 440-AG tape machine, and various Fender Jazz Master, Fender Jazz Bass, and Martin acoustic guitars. Tracked both digitally and to tape, without a console, the sessions were largely the result of Lennon recording vocals, guitars, keyboards, bass, and drums solo, with Kemp Muhl editing up to [their shared] 40 vocal tracks and even more instrumental tracks in Pro Tools, before handing off to producer Dave Fridmann at Tarbox Studios for final polishing/mixing. "We recorded all our ideas at once and then edited everything together like Frankenstein," Kemp Muhl explains. "Sean would layer 20 million ideas then storm out of the room, then I'd sit there and edit for eight hours."

Lennon and Kemp Muhl were on a serious Pink Floyd/Beatles binge when they decided their latest songs (following an acoustic EP, *La Carotte Bleue*) deserved a full-blown "Flying" meets *The Madcap Laughs* production esthetic.

"The more we got into electrifying the songs, the more we felt they deserved an elaborate psychedelic landscape," Lennon explains. "That seemed to fit the music, especially as our songs are very surreal and the chords are really unpredictable. We feel like the production reflects the songs."

"Our shared love for The Beatles and Pink Floyd expanded exponentially," Kemp Muhl adds. "We'd make weirder and weirder sounds and write weirder and weirder chord changes. Many tracks started with me on guitar and Sean on drums. Then we'd layer things from there. We kept trying things until it became this weird psychedelic onion."

Asking Lennon and Kemp Muhl to describe their favorite sonic experiments is like opening a cookie jar in a kindergarten class. They go mad for it.

Lennon: "I actually taped open-chord-tuned acoustic guitars to my drum kit. The pickups on the acoustics ran into amplifiers and each guitar had a different effects path.

One would have a delay pedal running through a phase and another would have a harmonizer and each guitar played a different chord. Every time I would hit a drum it would resonate that guitar in an open chord. We'd blend that into different songs."

Kemp Muhl: "For backward guitar, we used the 1960s Ampex tape machine that sounds f*cking awesome. We'd play a track backward and Sean would track the guitar to the tape machine, then we would flip the tape forward. We recorded all the drums and bass to tape first, 'cause those are the instruments where you'd notice tape distortion. We love that warm '60s tape distortion sound."

Lennon: "At one point we tried to strap the guitar amp to the grand piano and record the strings resonating as a reverb. If you put a brick on the piano's sustain pedal, then all the strings are open; then if you scream into the strings you'll hear that reverb. But that didn't work at all. You could hear the strings reverberating but the source signal was so much louder than the reverb."

Kemp Muhl: "I love our Binson Echorec; it has this metallic-y, bright delay quality. And we like tape echo a lot. I like getting my fingers in there and f*cking with the actual tape while we're recording through it. It's all about irregularities. That's the only thing that separates real music from quantized modern music. Moving the tape around adds skips and hiccups to guitar and vocal tracks that sound cool."

Lennon: "We recorded drums on an old Panasonic boom box. We'd use that as an effects track for a really dirty sound. And Charlotte would put drums through the ARP 2600. If you do a manual filter sweep and play with the ring modulator on the ARP, it does amazing stuff to the drums. If anything sounds boring, we run it through the ARP."

Kemp Muhl: "Our EMT 140 plate sounds better than any reverb. The plate is under the stairwell, so sometimes we will sing directly into the plate and record the signal from the plate. Or we will drop stuff down the stairs which makes a weird sound off the plate. We'll put that sound into the track to add a weird, creepy effect. And we spy on people. When the other musicians take a break near the stairwell, which is close to the door, we can hear every word they're saying because the plate will pick them up."

Lennon played two drum sets from the '50s and '60s, respectively. Often one song will contain two different sets from three different sessions. Kemp Muhl re-amped drums, and most everything else, to achieve consistency.

"We discovered this amazing trick where you could send the drum track through a speaker pointed at an actual snare drum and it will excite the snare drum," she exclaims. "It's like a ghost is hitting it. We recorded the sound of the snare being triggered and that would double the actual snare in the drum tracks. We'd also re-amped the shit out of guitars to make them sound cohesive, maybe re-amp them together coming out of one amp. We embraced the Frankenstein quality of it."

Kemp Muhl also embraced her inner Frankenstein when editing the gargantuan number of tracks involved on *Midnight Sun*. "During editing I was trying to carve negative space," she recalls. "Kind of mute sh*t and move things around to avoid having any sonic redundancy. We've developed this philosophy of not having any redundancy in the frequency range or in the melodic notes. Each song only has about 50 percent of the ideas we recorded originally. Sean and I are definitely of the 'more is more' mentality. And Sean doesn't know it, but I sometimes I edited his scratch vocal track into the finished tracks, they sound more natural and unforced."

Engineer Andris Balins confirmed Lennon's fondness for inexpensive mics, starting with the Shure SM57.

"The 57 complements the quality of his voice," Balins says. "We also used an AEA 440 ribbon, and the [Placid Audio] Copperphone on his vocals. Charlotte used an AEA 440, AKG4 14, and [Neumann] 'Blue' U47, and our mic pre's included vintage Neve 1073s and Mercury V72s; compression was a UA LA2A and Retro Instruments Sta-Level, and we used pedals for everything, including re-amping."

In addition to the vintage guitars (owned by the senior Lennon, Balins says), Sean Lennon used vintage Fender Deville and Fender Hot Rod Deluxe amps, and a vintage '60s Fender Bassman. Balins typically miked guitar amps with a Beyerdynamic M160 or Shure SM57, and he multimiked guitar amps using drum mics. "I generally mic on the cabinet, center of the cone and a couple inches from grill," he explains. "Room mics for guitars would be 15 to 20 feet away at ear height."

That layout also applied when miking Charlotte's Hofner, Rickenbacker, and Fender Jazz basses, as well as when re-amping using an SM 57 or AKG 414 on an Ampeg B15 Portaflex.

"The ARP and the Chamberlin ran direct," Balins says. "The Chamberlin works off these belts inside the unit, so we had to get the noise floor to an acceptable level. It has such a magical sound as the tape slides past the heads. We ran the Chamberlin through the guitar amp as well, and DI'd the ARP to get all its frequencies."

Drum miking schemes varied from two mics to ten. Balins used a pair of Coles 4038s as overheads, which also doubled as tom mics. Or he would close-mike toms using Sennheiser

441s or 421s. A Blue U47 worked as the room mic, in omni pattern, with an AKG 414 placed six feet from the kit three to four feet high to capture kick drum energy. Alternately, he placed the AKG 414 on the other side of the room 20 feet away and ten feet high for a bigger drum sound. An SM57 covered both heads of the snare drum, with an AKG D12 or 112 inside the bass drum.

Balins confirms Kemp Muhl's re-amping approach to achieve a uniform sound, often through the ARP 2600. "We re-amped a lot to make it feel like a live project," Balins confirms. "When Sean tracked a lot of instruments, we didn't have that bleed between the mics that you'd get with a band in a room. We used different effects chains and amps and pedals and miking at different distances, then blended that with the original signal to get more of a sense of a band live performance."

"On the last track, 'Moth to a Flame,' the drums ran through the ARP, and you can clearly hear it for the last half of the song," he adds. "It's usually the lowpass filter and the ring modulator that are being used from the ARP. And we used a number of signal chains for re-amping, including an Ibanez Flanger FL 301 pedal running while tracking so they can hear the effect. I also used the Flanger on Sean's vocals on 'Xanadu'; it has a percussive, rubber-band sound; he's basically responding to the effect in real time.

Finally, after the writing and experimentation and tracking and editing, The GOASTT handed off the mix to Dave

Fridmann. "We'd already mixed the record; it was warm and professional, but it was boring," Kemp Muhl says. "It missed that spark. It didn't sound half as pop as it became with Fridmann. At first we thought his mix was too much, but it's perfect. It's like when you get into a really hot Jacuzzi and you think it's too hot, but after a minute you realize it's perfect. We were experimental with sounds and writing, but we didn't know how to mix experimentally. Fridmann brought the balls to it. He's a genius."

Boisterous, foul-mouthed, and smart, Charlotte Kemp Muhl would seem to be the John Lennon to Sean Lennon's Yoko Ono. At the very least, Lennon has a great collaborator for future The GOASTT projects and experiments in sound. "We wrote all the songs together," Sean says. "But Charlotte is faster with lyrics. We both write music really quickly. But she's a poet; she's won a bunch of poetry awards. Charlotte has taught me to sit and work on lyrics. She's taught me to be a better lyricist. But I don't work slowly with anything else. Musically I can write 12 songs a day. I am really fast on the music side." ∎

Contributor Ken Micallef is based in New York City.

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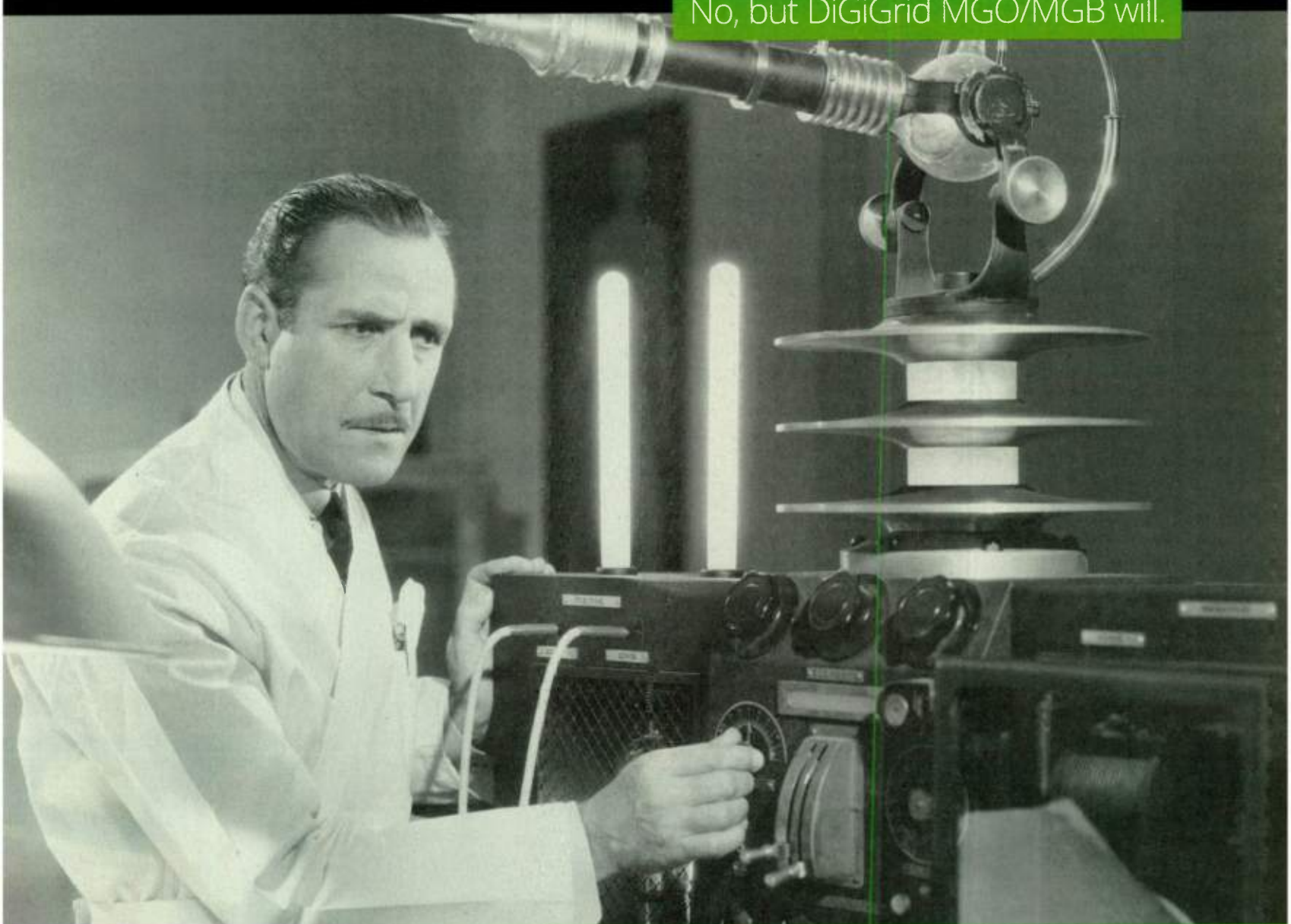
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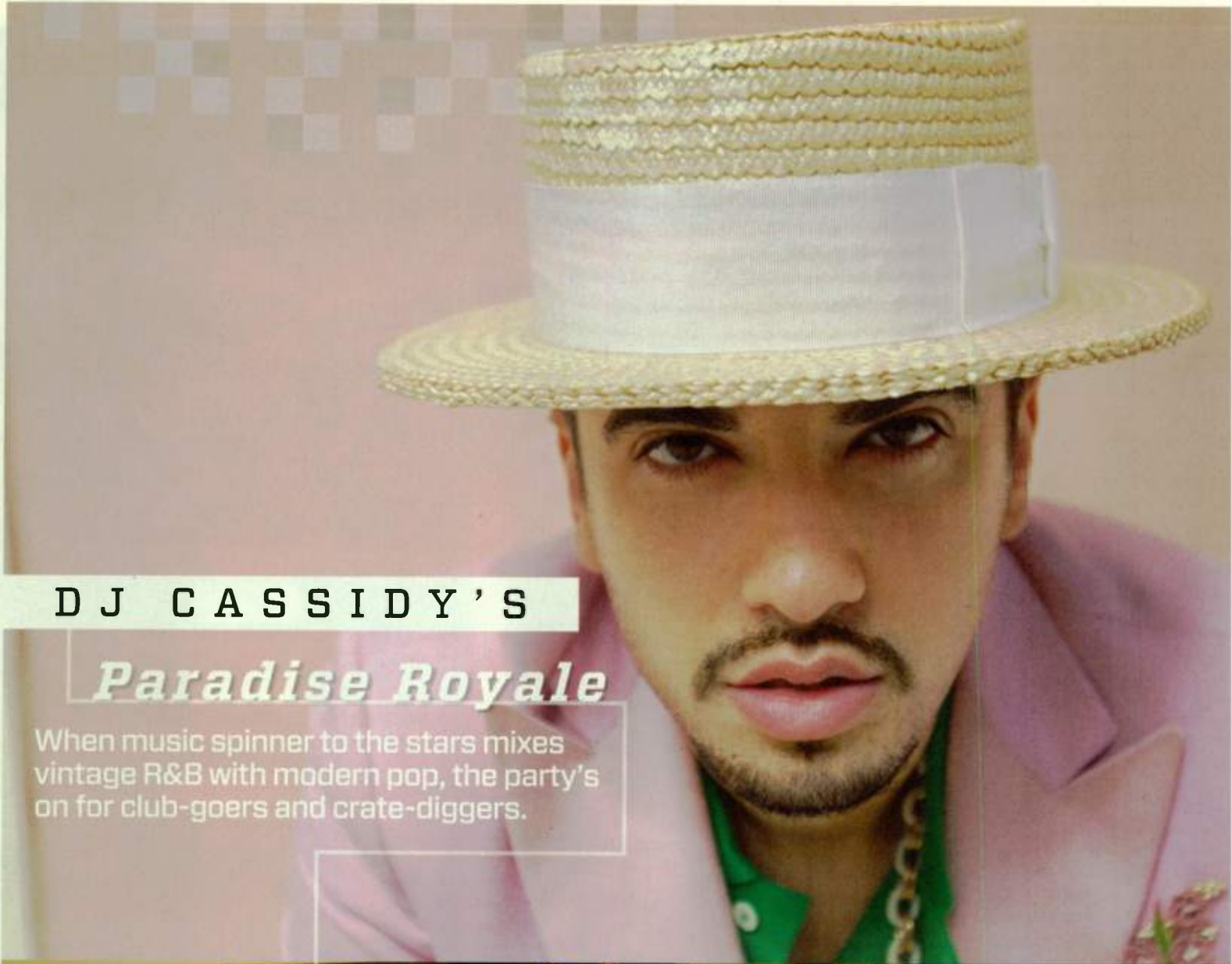
DJ CASSIDY'S

Paradise Royale

When music spinner to the stars mixes vintage R&B with modern pop, the party's on for club-goers and crate-diggers.

DJ Cassidy in the studio with (L-R): Freddie Washington, Ray Parker Jr., and Ollie Brown; Cee-Lo Green; John Legend; and Verdine White, Larry Dunn, and Philip Bailey of Earth Wind & Fire.

BY BARBARA SCHULTZ

IN THE video for the first single from *Paradise Royale*, a character played by DJ Cassidy, discouraged after a break-up, wanders into a hat shop, where the proprietor offers him a straw boater. With the magic lid on his handsome head, the DJ is instantly transported into a pastel Miami-style fantasy, where young musicians play shiny '70s funk in a flamingo-colored nightclub, and superstars Robin Thicke and Jessie J sing "Calling All Hearts."

This is Cassidy's idea of heaven: where chart-topping performers like Cee-Lo Green, Mary J. Blige, R. Kelly, Estelle, Ne-Yo, John Legend, Kelly Rowland, Usher, and more front a band that echoes the DJ's favorite funk and disco sides from the late '70s and early '80s.

Cassidy's great love of bands like Earth Wind & Fire, Kool & the Gang, and Chic stemmed from his early fascination with hip hop.

"At that point in my life, I was closed minded," he says. "I thought that to fully embrace hip hop, I had to hate everything else. But my saving grace was my heroes. I looked up to Kool Herc, Afrika Bambaataa, and Grandmaster Flash. These were the godfathers of hip hop culture, and they were my superheroes. I thought, in order to be like my heroes, I had to play like my heroes, and I realized they were creating a new kind of music by playing *all* forms of music."

Cassidy built his DJ career on what he calls an "undefined" foundation, at times playing 30-year-old music for 20-somethings, and hot new songs for celebrities from Puffy to Jay-Z to Oprah. He even counts Barack Obama among his fans; a short film about the making of the song "Calling All Hearts" includes a shout-out from the president.

"No matter where I went, the classic records of the late '70s and early '80s not only worked, they killed," Cassidy says. "They put a spirit and emotion and energy in the air like no other kind of music. This isn't just because we've heard these songs our whole lives; it's because when dance music is made by real musicians with real instruments, it affects our souls differently. It moves our bodies differently. And I thought, wouldn't it be great if people from my generation could have music that sounded like this, that felt like this?"

Cassidy fixed on the idea of bringing vintage dance music to a new generation, and he decided to find those sounds at the source. His *Paradise Royale* project started four years ago, when he made an iTunes playlist of 25 favorite songs from the '70s and '80s. He found that, not only did they all fall into a pocket of four years—between '78 and '82— but also a lot of the same musicians played across multiple tracks.

"If you made a list of similar songs from today, you might see Pharell's name over and over, or Timbaland's name over and over. And in that era as well, it was clear that the artists and producers of my favorite records were essentially recruiting the same musicians. These were the architects of the sounds. I'm talking about people like Verdine White, Philip Bailey, and Larry Dunn of Earth Wind & Fire; Nile Rodgers; John "J.R." Robinson and Bobby Watson of Rufus; Jerry Hey conducting horns and strings; Ndugu Chancellor on drums; Marcus Miller and Freddie Washington on bass; Ray Parker Jr. on guitar."

Parker—famous for the "Ghostbusters" theme as well as for playing with Raydio and on other artists' hits, such as Cheryl Lynn's "To Be Real"—turned out to be a gatekeeper for Cassidy, who visited the guitar legend at his home in Calabasas, Calif. When Parker heard the DJ's playlist, he phoned longtime collaborators Freddie Washington (Herbie Hancock, Anita Baker, Lionel Richie) and Ollie Brown (Michael Jackson, Rick James, Debarge) and got them involved. One musician led to another, and player by player, Cassidy assembled his fantasy session team.

Meanwhile, Cassidy and his production partner, Greg Cohen, were also writing and mocking up arrangements for a collection of new songs. By the time they went into their first recording sessions, in engineer/producer Bill Schnee's Schnee Studios, they had clear guidelines for the musicians to embellish.

"I'd leave New York with what we called the 'machine tracks' and say, 'we're going to bring it live.'" Cassidy says. "We'd have the chord structure, the bass chart, the drum pattern, and the musicians would make it their own. Then Jerry Hey would arrange the horns and strings."

Cassidy asked that, whenever possible, musicians come with the instruments they'd played on those '70s and '80s hits. "Nile Rodgers always uses that one guitar," he says. "It's called the 'hitmaker.' It's a Strat, and I think he bought it at a pawn shop. Freddie Washington also used the same bass he used on Patrice Rushen. Ndugu Chancellor used the same drums he used on 'Billie Jean,' Marcus Miller used the same bass he used on Luther Vandross' 'Never too Much.'"

The DJ also turned to studios and engineers that had some history connected to the 25 inspiration songs. Engineer Steve Sykes, for example, has not only been recording this style

of funk and R&B since it was new, but he also played guitar with Philip Bailey and Larry Dunn before they joined Earth Wind & Fire.

"We were in a band in Denver called Friends and Love," Sykes says, recalling the period when he was gradually making his way west from Philadelphia in a VW bus. We opened for Earth Wind & Fire, which consisted at that time of Maurice White, Verdine White, a sax player, and a girl singer. Our band was smokin', and Maurice White, being the shrewd businessman that he is and seeing the talent, asked Philip and Larry if they would join his band."

"When dance music is made by real musicians with real instruments, it affects our souls differently. And I thought, wouldn't it be great if people from my generation could have music that sounded like this."
—DJ CASSIDY

While in Denver, Sykes re-set his sights on an engineering career and ultimately traveled to L.A. in 1979. His engineering and mixing credits include albums with Stanley Clarke, Isley Brothers and Al Jarreau, as well as music for two seasons of the TV show *Miami Vice*.

Sykes' first sessions for Cassidy's *Paradise Royale* were on rhythm tracks recorded in LAFX in North Hollywood (lafx.com). "It's

one of the best-sounding control rooms in L.A. They have a magnificent API console that has been modified by Steve Firlotte," Sykes says. "It's also a rental house, so any piece of gear I can imagine that I might want, they've got it in the back room and I can drag it out. Cassidy brought his charts and prerecorded tracks—the machine tracks—and then I loaded those into Pro Tools."

The drummer all of Sykes' sessions was J.R. Robinson, who counts Chaka Khan and Rufus, Madonna, the Pointer Sisters, and Daft Punk among his telephone book of credits.

"I set up J.R. with my standard miking scheme," Sykes says. "Inside the kick was a Shure Beta 52. On the outside, my normal favorite is a FET 47, but theirs was out on rental that day, so I used a Soundelux, which I also love. Snare was the old 57, top and bottom, then a [Neumann] KM84 on the hat, and across the toms, Sennheiser 421s. Overheads were two Neumann 67s. For the room mics, I used two Royer 121 ribbon mics.

"The kit was situated to my left in the main tracking room," Sykes continues. "The room is on the smaller side for a drum room, but it gets a really punchy sound. That's one of the reasons I really like it for dance music. There's something about the compactness of that room that makes the drums jump out of the speakers."

Bassist Bobby Watson played live with Robinson. His instrument was taken direct, through a Neve 1073 outboard mic pre and a Tube Tech CL1B compressor, into Pro Tools. Later in the day, Sykes captured some of Paul Jackson's guitar parts. "Paul is the easiest guy in the world to capture guitar from," Sykes says. "I just put up a pair of Royer 121s ribbons. A lot of people use a Royer and a 57 together, and I'll do that if I'm making a rock record, but in this case, the warmth of two ribbons on his cabinets was preferable for a fat rhythm part.

"Paul comes with 10 or 15 different electric guitars, and something like eight different heads and two refrigerator-size racks with multiple power amp heads and multiple cabinets, and you never really know what he's running through at a given time," Sykes continues. "Depending on the part and the song, he'll switch something on his own little patchbay, and all of a sudden I have a totally different amp sound even though I'm still miking the same two cabinets in stereo. His rig is so set up, you can just throw two mics in front of it, get a level, and push Record. It's almost like cheating."
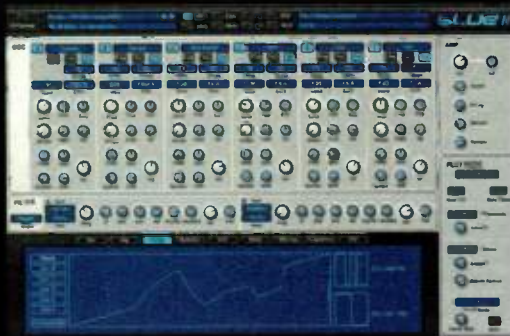
Four months later, Sykes was called to help bring more of Cassidy's machine tracks to life. This time, he headed to Capitol Studio B (capitolstudios.com) to record music for the single "Calling All Hearts" with Robinson, Verdine White on bass, Larry Dunn on keyboards, and Philip Bailey on percussion and backing vocals.

"The Capitol session was like a band reunion in a way, except now I'm the engineer and not the guitar player," Sykes says. "That was so much fun."

A delightful aspect of "Calling All Hearts" is the way Cassidy's reverence for vintage funk shines through. There's a quintessential Nile Rodgers guitar riff. (Check out the making-of video at emusician.com to see how it developed.) And the horns, keys, and backing vocals on this track celebrate the classic lush and powerful orchestrations of Earth Wind & Fire.

"Philip played congas and cowbells—lots of percussion instruments," Sykes recalls. "I think I used a stereo Royer 122, and some [AKG C]451 on most of his instruments, and a C12a on congas."

The making-of video for "Calling All Hearts" shows Bailey and Valerie Davis singing "Ooh yeah"s together into a single mic: "I was using one of Capitol's classic [Neumann] U47s, like

they used to record Frank Sinatra," Sykes says. "That went into a very simple dbx 160vu—one of the old 160s. And of course in Capitol B they have a vintage Neve 8068 that's to die for, so every single mic pre in there is something you'd pay great money for on its own. You don't need much outboard in the chain at a place like that!

"The dbx we used is one of the most invisible compressors that's ever been made. Sometimes you want a compressor because of the color it imparts, but on background vocals I just want as much purity as I could get. A lot of times, I'll just go with no compressor at all and just ride the fader, but for this song, it added smoothness—just to cut the peaks a tiny bit."

Larry Dunn played Minimoog and Fender Rhodes on the session. "I took the Rhodes DI," Sykes says. "A lot of times—this is the old-school way to do it—I used to mike the speakers in that suitcase below. There's nothing like the sound coming from the speakers in a Fender Rhodes piano. But in this case, that keyboard wasn't a featured part of the song, so we kept it simple."

Sykes also engineered a few days in Studio D at The Village. "We worked on a few songs in there with J.R. Freddie Washington played bass on some of it, and Marcus Miller came

in as well," Sykes says. "The Jerry Hey horn section came in, too, but it was a mock session. They weren't available for the original video shoot, so even though they had already played the track, the horn section came in. I fed them the audio, and they played the parts just so they'd have it for the film. There's an earlier part in the video showing one of the other engineers, Mike Stern, recording them. He's the one who deserves the credit for getting the wonderful horn recordings."

By the time Cassidy was ready to add lead vocals to the tracks, he had a lot of completed music and a very clear vision of the vocal arrangements.

"Cassidy was extremely thorough," says Mark "Exit" Goodchild, who recorded Usher's vocals on the title track, and Jessie J's parts on "Calling All Hearts." "He came in with split stems and instrumentals; I had every file of every version I could possibly want to record her with."

Goodchild has worked on several Jessie J albums and he's the go-to engineer for Claude Kelly, who co-wrote "Calling All Hearts."

"We were just finishing an album for release in the UK on her [in KMA Studios], and Claude and Cassidy took the opportunity to let her know about this record," Goodchild

explains. "So, the vocal-recording chain I used on her is the same as what's on her album: a vintage C12 into a John Hardy M1 mic pre and a Tube Tech CL1B compressor.

"Jessie almost makes me mad," Goodchild continues. "She's one of the only artists I know that actually likes to be in the vocal booth. She just goes in and when she opens her mouth and starts singing, she has so much raw talent, with a mixture of technical skill. There are lots of times when I'm working with her, and Claude and I look at each other like, how is it possible?"

Not surprisingly, capturing a great vocal sound from artists like Usher, Mary J. Blige, Estelle, etc. wasn't a huge challenge. The harder part was tracking them all down, and taking time in their busy schedules.

"That journey was as much, if not more, of a journey than recruiting the musicians," Cassidy says. "I was literally chasing musicians around the country, and I refused at any point in four years to email a song. I always wanted to get in the room with the artist so they could look me in the eye and hear and see the inspiration for this music. Sometimes those meetings took a day to happen, and sometimes a year.

"To recruit R. Kelly, I flew to Chicago eight times over the course of 20 months. I

went to five shows on his tour, and finally I went to Barnes & Noble and bought his book and waited in line for seven hours to get to the front to talk to him. To recruit Cee-Lo, I crashed a 25 thousand-dollar-a-plate black-tie gala in New York. I never gave up in my mission to bring the greatest and most universal dance music of all time back to nightlife, back to the airwaves, back to the dance floor."

"[On *Paradise Royale*], you get the best musicians of that era—of the '70s and early '80s," observes Robin Thicke in the video about making "Calling All Hearts." "To have Earth Wind & Fire involved is amazing, and this record with Cassidy and Jessie J is really just a culmination of great music, great musicianship and great singers coming together to make fun music. It's a great project to be a part of." ■

Barbara Schultz is a contributing editor to Electronic Musician *and* Mix *magazines.*

Steve Roach
Spiral Meditations
TIMEROOM EDITIONS

In an age when anyone with a computer can automatically churn out tracks that lack identity, master synthesist Steve Roach demonstrates a level of sophistication that is often missing in modern electronic music. Here, lush sequences are layered and slowly evolve over time while rarely repeating. Although his timbral palette has the richness of early space-music pioneers such as Tangerine Dream, Roach's work is never nostalgic. These meditations are moody, polyrhythmic, and invitingly organic.

GINO ROBAIR

Ben Frost
A U R O R A
MUTE /BEDROOM COMMUNITY

Throw all the geomorphic adjectives you like at Australian-born, Iceland-based drone composer Ben Frost and you'll barely scratch the mantle when describing his seismic fifth full-length. Wielding lurching scorched ether machines, Frost grinds forth dissonant ash clouds and tectonic uplift. Featuring Thor Harris (Swans), Greg Fox (ex-Lithurgy), and Shahzad Ismaily, *A U R O R A* emits billowing polarities and looming chimes through its charred melodies, seizing cadence pits and unsettled synth fissures.

TONY WARE
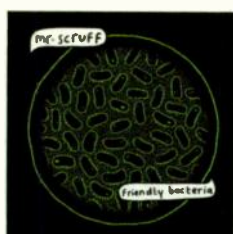
Mr Scruff
Friendly Bacteria
NINJA TUNE

Old-school (read 1990s) sample jockey Andy Carthy shows how much music can still be made with minimal tools. Scruff's biggest hit, "Get a Move On," was built around a lone sample of "Bird's Lament (In Memory of Charlie Parker)" by Moondog. *Friendly Bacteria* is equally minimalist, drawing on simply looped beats, unquantized bass lines, and synth gurgles adorned by faceless R&B crooners. Still, it's spot-on happy, particularly in the sample-bountiful title track.

KEN MICALLEF

The Horrors
Luminous
XL RECORDINGS

With every album, the Horrors becomes gentler in tone and more crafted in songwriting. On the band's fourth, *Luminous*, the title describes the feel of these shimmering compositions, which give nods to both '80s new wave and '90s indie rave sounds. Echo and the Bunnymen-like chimes inform "I See You," and bright jangles propel "First Day of Spring." Elsewhere, Ride-esque shoegazing rhythms dazzle on "Mine and Yours," and "Sleepwalk" closes *Luminous* on a dreamy note.

LILY MOAYERI
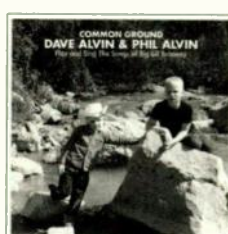
Dave and Phil Alvin
Common Ground
YEPROC

The Alvin brothers' first full album together since Dave split The Blasters in the mid-'80s, *Common Ground* is a joyous, loving tribute to the songs of blues pioneer Big Bill Broonzy. The Alvins aren't Everly-type brothers; their talents and vocal tones are different. But when Phil's clarion voice meets Dave's smokey one, and Dave's inspired guitar licks start flying, these Americana-lovers become greater than the sum of their parts.

BARBARA SCHULTZ

Eno/Hyde
Someday World
WARP

A richly textured album of live rhythms, natural-sounding keyboards and guitars, and Karl Hyde's selfless vocals, *Someday World* is exactly what you'd imagine from two of the most creative electronic music minds of the past 40 years. Bearing the inescapable stamps of Brian Eno and Hyde in almost textbook examples, *Someday World*, produced by Eno and Fred Gibson, is impossible to absorb in easily digestible samples, its nine tracks spiraling through glowing grooves and evocative sounds that are equally immediate and dreamlike.

KEN MICALLEF

Cody ChesnuTT
B Sides and Remixes
VIBRATION VINEYARD

These seven bonus tracks from the marvelous soul and funk singer/songwriter feature appearances and song reinterpretations by some stellar guests. Guitar wizard Gary Clark Jr. duets with ChesnuTT on the high-energy blues "Gunpowder on the Letter." And Questlove of The Roots moves "What kind of Cool" from *Landing on a Hundred* (2012) to a new, ultra-groove-y, sultry place. This assortment of gems offers new ways into ChesnuTT's powerful original songs.

BARBARA SCHULTZ

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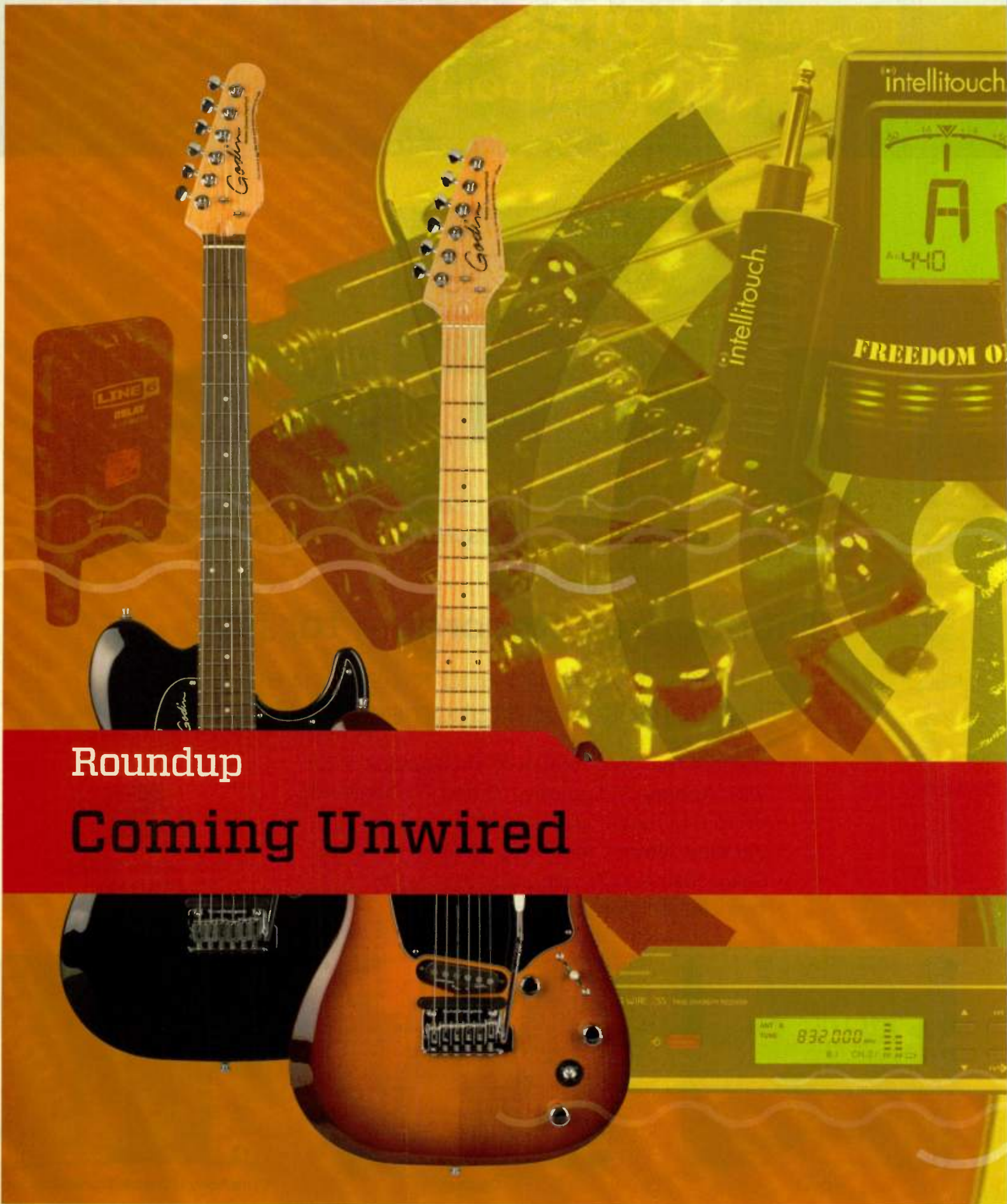
Roundup
Coming Unwired

GEAR

Six wireless guitar products that let you strut your stuff, untethered

BY MARTY CUTLER

MORE THAN other musicians, guitarists often find themselves tangled in a rat's nest of cables connecting pedalboards, rackmount gear, and amps. But that doesn't mean they have to stand in one spot when playing. For the musician who wants mobility, there is the wireless guitar system.

The idea is simple: Your guitar plugs into a transmitter that is clipped to your belt. The transmitter sends your guitar signal over high-frequency carrier waves to a receiver that is plugged into your pedalboard, effects rack, or amp. The system you choose should be easy to set up and use, free of signal dropouts, and allow you work at a distance from your gear that makes sense for the types of venues and stage sizes you play.

Five of the products in this roundup transmit audio; the Godin Custom Session TriplePlay transmits MIDI data. Although all of the audio systems were designed with guitarists in mind, they can be used with other instruments, as well.

To test the wireless systems I used three electric guitars—a Godin Custom Session TriplePlay, an Epiphone Genesis Pro, and a Brian Moore. Because each wireless system's frequency response exceeds the range of the typical electric guitar, I auditioned everything through a Hartke KM60 keyboard amp and a MOTU UltraLite audio interface to see if there were any issues at the edges of the sound spectrum. (All prices are manufacturer's suggested unless otherwise noted.)

Audio-Technica
System 10 Stompbox
AUDIO-TECHNICA.COM
$614.95

Audio-Technica produces several System 10 wireless configurations, designed for various microphones and guitar. The System 10 Stompbox ATW-1501 departs from the bulky, rabbit-eared receiver by combining the ATW-R1500, a solidly constructed, metal stompbox receiver, with the ATW-T1001, a light but sturdy plastic transmitter. You can place the receiver within a pedalboard or plug it directly into your amp. The transmitter fastens to a belt with a rigid wire clip. A 3-foot cable connects the transmitter to the guitar, using a locking 4-pin connector that terminates in a 1/4" TS phone plug. The receiver includes a 9V power supply (and will work off external supplies of 9-12V, tip positive or negative), while the transmitter uses a pair of AA batteries (not included). Battery life is about seven hours.

The 24-bit digital wireless system operates on the 2.4GHz industrial, scientific, and medical (ISM) band, keeping it well away from common types of television interference, including HDTV. To ensure a continuous, uninterrupted signal, the unit transmits on two frequencies. The system arrives already paired together at the factory. However, a button at the top of the receiver lets you change system ID numbers to accommodate additional transmitters. The illuminated display identifies which system ID is in use, and a 3-segment meter warns when your transmitter's battery level is low. Two small LEDs are on the left side of the unit: One glows red when the input is overloaded, and the other glows green with a successful pairing.

The footswitch toggles the receiver between balanced TRS 1/4" outputs A and B, or mutes one for tuning. A small switch next to the power supply sets the receiver's output mode so that, for example, the footswitch can mute the A output to temporarily access a tuner attached to the B output.

The transmitter's input is factory-set for guitar level signals. However, you can remove the cover and adjust the input level with the supplied screwdriver. I would have preferred an external trim pot, as the trim screw feels fragile and could be at risk for stripping.

Fortunately, the input seemed to be just right for my guitars, and the signal was clean and static-free, affording me a line-of-sight range of all 40' that my space allowed. (The system can reach a 60' radius.) According to Audio-Technica, in environments with more possible signal interference, the unit will dynamically search for and select cleaner frequencies without disturbing the output signal.

The System 10 Stompbox comes with a 2-year limited end-user warranty.

Intellitouch
Freedom One WT1
ONBOARDRESEARCH.COM
$149.95

The Intellitouch Freedom One represents the simplest and least-encumbered system covered here. Rather than relying on a clip-on body-pack that connects to your guitar with a 1/4" cable, the transmitter plugs directly into the guitar's output jack. The receiver doubles as a stompbox tuner and can take its place as the first box in your pedalboard or plug directly into your amp. Stepping on the pedal toggles the tuning function, which mutes the guitar output. You can also plug directly into the receiver and use it as a tuner, passing the signal through its output.

The 24-bit digital wireless transmitter and receiver are constructed of high-impact plastic, and the transmitter swivels from the end of the plug, enabling it to accommodate virtually any location on the guitar's body where the jack plate might be mounted. The package supplies a 9V battery for the receiver; optionally, you can use a power supply. You also get a AAA battery with the transmitter. The company promises 10 continuous hours of battery life.

There are no channels or frequencies to set: The unit automatically selects the best of 18 channels. Simply power up the transmitter and receiver, and you are connected. The unit broadcasts at 2.4 GHz. Intellitouch claims an effective broadcasting range of 30', but I was able to achieve 40' (and probably could have squeezed more from it).

A button on the transmitter engages the unit's Soundcheck mode, which provides a visible confirmation of your range boundaries—green when you are within range or flashing red when you've

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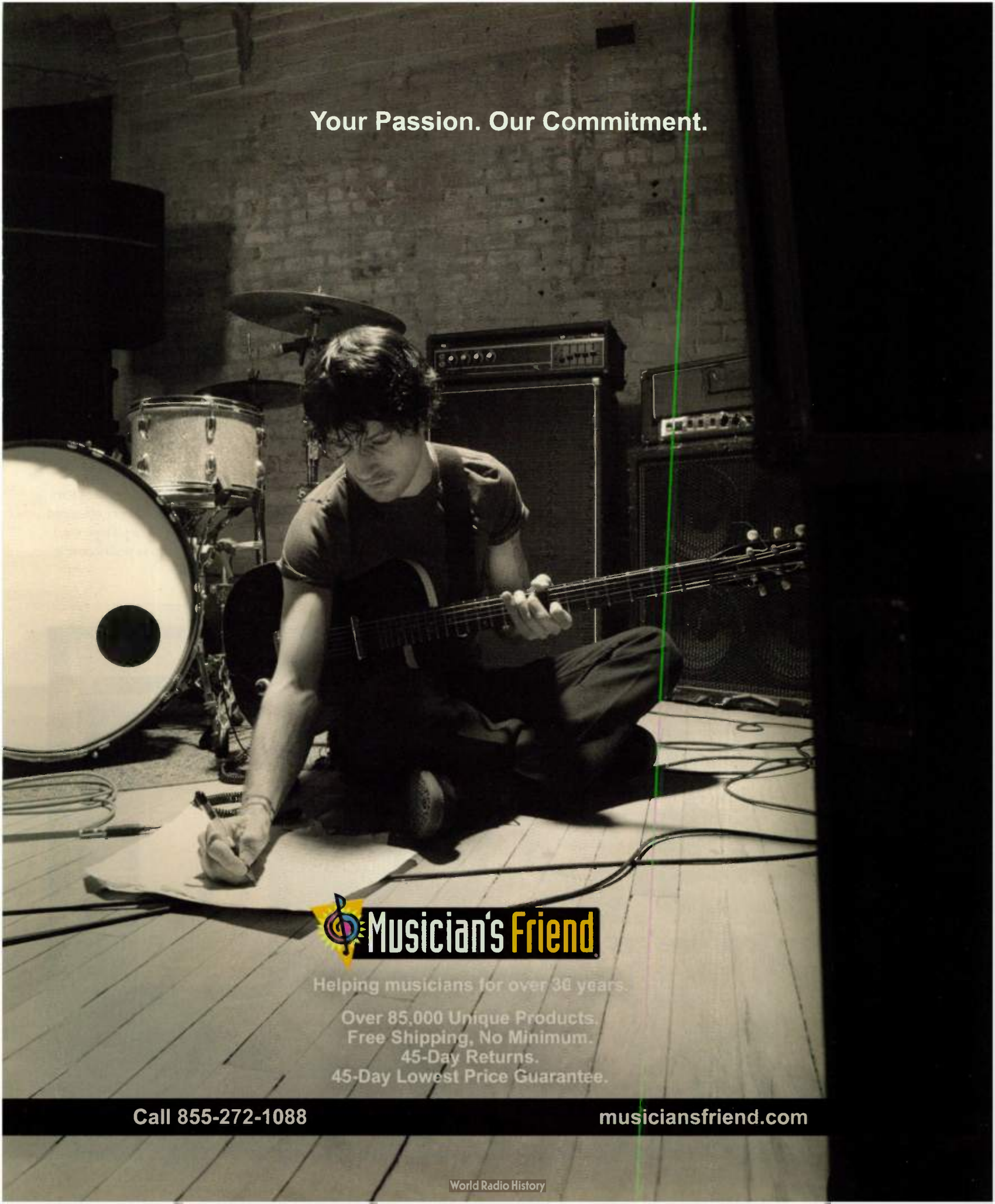
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lost contact with the receiver. Its range makes the unit ideal for small stages and situations where you aren't expecting to play at great distances from your rig.

The system's frequency response is listed as 10 Hz to 20 kHz, which will more than adequately cover the range of any electric or acoustic guitar. I plugged the receiver into my amp, and the signal was clear and clean, and to my ear at least, equal to any of the more expensive units in this roundup.

Line 6 Relay G50
LINE6.COM
$399.99 STREET

Line 6 offers several digital wireless guitar systems. The G50 pairs their standard TBP12 transmitter with the G50 RXS 12 receiver, a stompbox-style unit that sits on the floor in-line with a pedalboard, though there's nothing to step on. Instead, two antennae lock to the left side of the floor unit. The G50's range is double that of the Relay G30—200', line-of-sight.
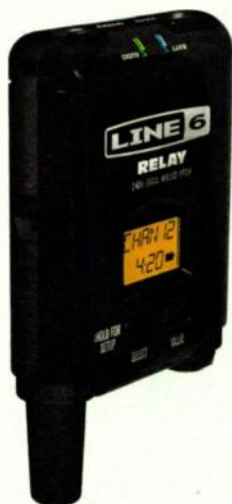
Both the receiver and transmitter have solid metal, built-like-a-tank construction. The transmitter, rather than the receiver, carries most of the informational display, which could make it more difficult to consult without careful positioning. The transmitter clip is rigid metal, maybe a bit more rigid than I am used to, requiring extra force to pry open and fit on a belt, guitar strap, or shirt. However, I was confident that once it was positioned, it was not likely to fall off.

Two AA batteries power the Relay body-pack transmitter. On power up, the battery light glows blue when fully charged, glows red as a low-power warning, and flashes red when it's time to change batteries. The light next to it glows green when audio is present. The LCD includes a countdown of the number of hours left in the battery.

Most of the controls are conveniently placed on the transmitter, and the switches feel smooth and solid. Setup uses two buttons situated just below the display, including naming, setting the transmission channel (it can access 14 channels, although the G50 receiver offers 12), and high or low power consumption. The low-power setting extends battery life, but limits the wireless range and leaves the system more vulnerable to RF interference. Nonetheless, the low-power settings were acceptable and are ideally suited for folk clubs and jazz gigs, where your typical venue is smaller. Once you have made your settings, press and hold the two buttons to lock the settings.

The receiver has a relatively simple interface. In addition to the antennae, you get a pair of unbalanced 1/4" outputs, a main out, and an auxiliary output for a tuner or another amp. A 9V wall-wart power supply is provided.

Take note of the unit's Cable Tone knob, which helps you match the wireless tone to a cabled signal that you might also be using. A second knob on the receiver is used to match the channel ID with the transmitter. Pairing is quick and painless, and the signal is clean, dynamic, and nuanced.

Sennheiser
XSW 72
SENNHEISER.COM
$399.95

Sennheiser markets several versions of their XS Wireless line, including systems for microphones and headsets. Specifically for guitar, the XSW 72 package includes a body-pack transmitter. Unlike the other units covered here, the XSW 72 is analog and operates within the 500 to 600MHz range. Because these frequencies may be more densely populated (and subject to RF), it's good that you can tune to any of 960 frequencies. True Diversity enables the EM-10 receiver to compare two signals and continuously shunt to the strongest. The unit stores eight banks, each of which can hold up to 12 preset channels.

The EM-10 is housed in a light-but-solid 1/2RU metal body with a backlit LCD. In addition to a Sync button and small volume knob, it offers three multifunction buttons that govern navigation and menu selection.

A pair of BNC connectors for the antennae skirt the rear panel, which also holds XLR and unbalanced 1/4-inch outputs. A switch squelches unwanted interference from other signals, although its awkward positioning next to the power socket can make access difficult.

Powered by AA batteries, the SK20 bodypack is a relatively simple, lightweight unit housed in metal and backed with a wire clip. A flexible, nondetachable antenna sits at the top. Just below the power switch is the Sync button, which initiates the pairing process. A small red light at the top of the transmitter confirms on or off status, and behind it, a yellow light activates when you hit the mute switch sitting to its left. A plastic 4-position switch lets you boost the transmitter's amplitude in 10dB increments. I would have preferred a more expensive switch or continuous rotary control, as this one felt rigid and subject to wear and tear.

Finding a frequency was a bit difficult given the three buttons governing the menu of manual

tuning, preset selection, or scanning (which will search for the strongest frequency available). Once settled on a channel and frequency, you only need to hit the Sync button on the transmitter and then on the receiver. After a band was established, the signal was clean and stable, with a frequency response of 50 Hz to 15 kHz.

The XSW 72 seemed less susceptible to line-of-sight issues, allowing a stronger signal where walls and doors blocked a direct line to the receiver; frequencies in the UHF range have a longer wavelength, are less directional, and are less subject to absorption than frequencies in the 2.4GHz range.

Shure GLXD16

The GLXD6's metal stompbox receiver is compact, but hefty and solid. This, the GLXD1 transmitter, and proprietary cable, comprise the GLXD system. The forward-thinking design incorporates powerful, rechargeable batteries and a built-in guitar tuner in the receiver that can switch from the standard display to a strobe display, which can be more handy onstage.

The GLXD transmitter hosts a minimum of buttons or controls. Other than the power switch and a link button nested with the mini-USB charging port on the side, you'll find a four-pin connector for the proprietary guitar cable; an LED that indicates linkage, power, and battery-charging status; the antenna; and the battery well. The metal-encased transmitter, with its solid, professional construction, has high-quality switches and buttons throughout. The batteries retain up to 16 hours of charge, and a quick recharge of 15 minutes will garner about an hour-and-a-half of battery time. Charging options are flexible, requiring either a wall-wart power supply or USB.

Built like a tank, the GLXD6 receiver has a raised surface that flanks the display and controls to prevent wear. The footswitch sits just below the protectors for easy access. I prefer the unit's lump-in-the-line power supply, as it takes up less real estate at the socket than a wall wart.

All setup is handled via the foot pedal, and given the amount of allotted workspace, the buttons are easily accessed and sensibly laid out. Yet there was little for me to do: The transmitter and receiver connected instantly on power-up. Should you need to reprogram the pedal, it's simple to group multiple receivers, and you get a choice of presets based on how many receivers you need to accommodate: Hold down the Group button momentarily until it flashes and hit the same button repeatedly to cycle to the group you want.

Hitting the Channel button in a similar fashion accesses the channel you want. Then hit the corresponding Link button on the appropriate transmitter, and you are set. Tap the footswitch and the receiver mutes its output and puts you in tuning mode. Group and Channel buttons double as increment and decrement buttons, and Tuning mode switches between a needle or strobe display. The bright display can be seen easily while playing.

Shure claims an effective range of around 200', line-of-sight, and a frequency response of 20 Hz to 20 kHz. The GLXD16's signal was powerful, clean, and detailed.

AT GUITAR CENTER

MOBY
CAPTURING THE MAGIC IN THE AIR

"What initially amazed me, and still continues to, even though we oftentimes take it for granted, is that the movement of air—the compression and rarefaction of air—can somehow elicit the most profound emotional responses any human is capable of having," Moby says. "Music doesn't exist. It's just air hitting your eardrum a little bit differently than it otherwise would be hitting your eardrum. The air hits someone's eardrum a little bit differently, in a slightly more structured [...] it makes people dance, it makes [...] sex, it makes people move across the country and cut their hair. It makes armies march into battle. It makes people weep. And all it is, is air. So that's magic. I just couldn't believe that something could have that much power over me. I couldn't see it, I couldn't touch it and I couldn't taste it, but somehow it was affecting me so profoundly. That's pretty much why I've dedicated my life to music."

To read the entire interview and see the gear Moby uses to make magic, visit guitarcenter.com.

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Godin
Custom Session TriplePlay

GODINGUITARS.COM
$1,095 STREET

The Custom Session TriplePlay does not send audio over its wireless system—only MIDI. For guitarists used to the standard 13-pin DIN cable that feeds a guitar-to-MIDI converter, wireless is a great relief, as most 13-pin cables succumb to shorts and are generally expensive to replace.

The guitar I reviewed featured a maple neck and a basswood body, resembling a sort of hybrid Telecaster/Stratocaster design with a neck-position humbucker, a bridge-position single-coil pickup, and a five-position switch allowing you to get a wide variety of tones. Fishman's TriplePlay MIDI pickup was factory-mounted, with its controls and transmitter built into the guitar. The divided pickup is just the right distance from the strings, though Godin provides the tools to make adjustments.

The TriplePlay is powered up from a switch mounted in the back of the guitar body. The receiver, a USB device that plugs directly into your computer, has a button that lets you pair it with the system. Alternately, you can do that from a button on the back of the guitar. Achieving a link is quick and painless. The Custom Session TriplePlay relies on a proprietary 2.4GHz ISM band. There are no channels or frequencies to search for: As soon as the light on the receiver glows a steady red, you are paired and ready to play.

The unit is powered by a rechargeable battery embedded in the controller, and it can run for about 20 hours before recharging. A mini-USB port in the back of the guitar's body accepts a cable for charging.

Godin provides a suite of software tools, including Fishman's TriplePlay host software, along with Native Instruments Komplete Elements (essentially, limited versions of Guitar Rig, Reaktor, and Kontakt, with patches optimized for guitar), PreSonus Studio One Artist, IK SampleTank, and Notion Music Progression. These are more than simply bonus software packages; they are hosted by the TriplePlay software, which includes the setup and tuning of the guitar and can be launched from the guitar itself, wirelessly. The software works standalone or as a VST plug-in.

However, you can easily set up any software instrument or DAW to work with the unit.

Remarkably, the tracking from this guitar system is superb—accurate and articulate. And while my line-of-sight traveling space was limited, I had no problem transmitting from upwards of 40'. (Godin claims a range of up to 100'.)

Although there is no official support as yet for iOS devices, I connected the receiver to a USB camera interface with my iPad 3 and was playing its synth apps with equally excellent tracking and no perceivable latency. Likewise,

if you have a portable MIDI interface with a USB input, such as the Kenton USB MIDI Host, you can play hardware synths without a computer (although you *will* need the computer to tweak sensitivity and other performance parameters). ∎

Marty Cutler's music draws from decades of experience as a bluegrass banjo player and electronic musician. He has worked with a range of artists, including Tex Logan, Peter Rowan, an   harp.

The Nord Drum 2 is a portable, 6-voice drum synth with a flexible, easy-to-program interface. Conveniently, it connects to the Nord Pad controller with a single CAT5 cable.

Clavia Nord Drum 2 and Nord Pad

The dynamic duo of electronic percussion

BY GINO ROBAIR

CLAVIA IS back in the percussion-controller game with a vengeance: Not only is the Nord Drum 2 (ND2) a significant upgrade of an outstanding table-top drum module, it easily integrates with the Nord Pad, a new lightweight and portable pad controller (available separately).

SUMMARY

STRENGTHS Intuitive interface. 6 discrete trigger inputs. Small and lightweight.

LIMITATIONS No USB. No power switch. Stepping can be heard when a sound is sustained and you lower the output control.

Nord Drum 2 $699
Nord Drum Pad $499
nordkeyboards.com

The ND2 is a powerful 6-voice synthesizer that is slightly larger than a paperback book but easy to program, thanks to a clever integration of buttons, modifier keys, and data wheel. Each voice, controlled by a separate pad or trigger input, can use one of three types of synthesis—subtractive, FM (6 algorithms available), or resonant models (harmonic, tuned percussion, drum head, and cymbal-like algorithms).

Percussion-related parameters include control over Click (initial attack transient), Punch (attack characteristics such as pitching the first cycle of the waveform up or down), velocity-controlled pitch bend, and Mute groups for silencing other channels. The Spectra parameter adjusts upper harmonic content or controls modulation amount, while the Clap parameter adds a reverb tail in higher settings. Scale presets (chromatic, pentatonic, hexatonic, and hang) are available, as are distortion and echo effects.

The ND2 stores eight banks of 50 programs; four of the banks have factory kits ranging from realistic acoustic-drum timbres to electronic kits and sound effects. The sound quality is excellent overall. You can edit and replace any of these presets or save your own in the four user banks. Clavia offers the free Nord Drum 2 Manager (Mac/Win) for transferring sound banks to and from your computer over MIDI. There is no librarian app—it's that simple to edit, even on-the-fly!

The rear panel has two unbalanced 1/4" outputs, MIDI I/O, a headphone jack, and six 1/4" trigger inputs. A CAT 5 (RJ45) port connects the ND2 to the Nord Pad. The module and the pad include mounting clamps that can be attached to traditional drum hardware; a CAT 5 cable is included with the Nord Pad.

If you use the CAT 5 cable, only external-trigger input 1 can be used (typically assigned to a kick-drum pad). Parameters for adjusting trigger type, sensitivity, and threshold allow you to use a variety of third-party controllers with the ND2. It was also fun to trigger the six channels using my Eurorack modular system.

The Nord Pad is roughly the size of an iPad, with six 3.75"x 3.75" rubberized sections that respond well to sticks and hands. You can edit the response to suit your playing style, and Trigger presets are available to get you started. There are no rims around the pads, so you can trigger two pads simultaneously by hitting across them with the flat part of a stick or hand. Most importantly, I had no false-triggering issues with the controller.

Another control option is Nord Beat 2, a free step-sequencer app for the iPad. You will need a MIDI interface that supports USB from the iPad and the DIN connectors on the ND2. For me, the biggest drawback of the ND2 is the lack of a USB port, which would simplify the connections needed to use the iPad app and sound-bank manager.
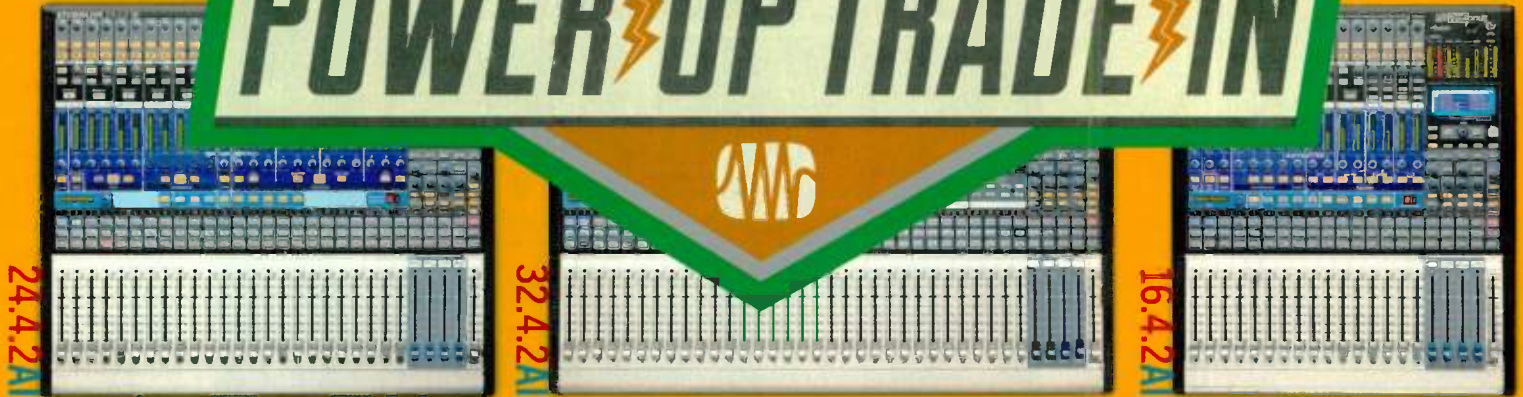
Nonetheless, the Nord Drum 2 sounds great, and it's simple to use and easy to schlepp. If sequencing realistic drum parts is your intent, add the pad. Together, they create the most portable electronic-drum modeling system available that provides uncompromising sound quality. ∎

Gino Robair is Electronic Musician's *technical editor.*

The StudioLive 16.4.2AI adds network and remote-mixing capabilities to the wide array of features of this mixer/interface. The Fat Channel controls are front and center, making it easy to adjust dynamics and EQ on individual tracks.

PreSonus StudioLive 16.4.2AI

A digital console that is much more than a mixer

BY STEVE LA CERRA

SUMMARY

STRENGTHS Comprehensive DSP. Secure wireless control via iPad and iPhone. Easy integration with Capture 2 and Studio One software. Built-in Smaart analysis tools.

LIMITATIONS No pad on the mic pre. Manual faders. Limited reverb and delay parameter-editing onboard.

$2,499; $1,999 street
presonus.com

WHEN PRESONUS introduced the StudioLive Series several years ago, it caused a stir: Here was a digital console in the $2,000 price range that offered mic preamps, DSP on every input and output channel, a FireWire recording interface, and integrated production software. With its Active Integration (AI) series, PreSonus has expanded StudioLive's capabilities by adding network control and remote mixing via iPad and iPhone, offering audio interface options on an expansion card (FireWire 800 stock, Dante or Thunderbolt), and including Smaart audio analysis (see Figure 1).

The StudioLive 16.4.2AI features 16 analog inputs, four subgroups, and a stereo mix bus. Six aux sends can feed external monitor mixes while another four are dedicated to onboard reverb and delay effects with associated returns. This gives you a total of 10 sends. (The 24.4.2AI and 32.4.2AI increase the number of sends to 14 and 18, respectively.)

Each input channel includes the PreSonus XMAX Class A mic preamp (with individually switched phantom power); TRS line in and insert jacks; Solo, Mute, and Select switches; and direct analog output. Inputs may be routed to the L/R mix, four subgroups, or 10 aux sends. Each bus has a noise gate, compressor, EQ, and limiter. The aux and effects sends add a highpass filter—a smart move given the need for it on monitor mixes. Channels and auxes can be linked for stereo operation in traditional odd/even pairing.

Every input channel and mix bus has a dedicated FireWire send for easy channel-to-track recording, alleviating the need to make the assignments yourself in software. In addition, each channel has a digital DAW return from FireWire that can replace the analog input. Having used other mixers that require menu access to swap an analog input for a digital return, I found the PreSonus approach easier and crystal clear: If the digital-return switch is lit, the signal is coming from the DAW.

This also makes overdubbing with zero latency a no-brainer. Monitor the analog input during recording and switch to the digital return for playback. There's no need to impede your workflow by opening a menu to play back an overdub.

Fat Channel The Fat Channel is a set of centrally located controls for adjusting EQ,

dynamics, bus assignment, and aux send levels, one channel at a time. Fat Channel settings can be stored and recalled from a library or copied and pasted (with the exception of polarity, phantom power, and aux and effects-send levels).

Four effects sends are organized as two reverbs and two delays. Reverb parameters include decay time, predelay and (for some algorithms) early reflections: The Large Hall program, in particular, is excellent for snare drum and toms. Delay parameters include delay time, feedback, Time X (the note value when using the tap function), and in the case of the filtered delay algorithm, filter frequency, gain, and Q. I loved the filtered delay since I typically chop off the highs and lows to keep the delay out of the way of the original sound. As with Fat Channel settings, reverbs and delays may be stored and recalled from a library or within mix Scenes.

Every StudioLive bus features a gate, compressor, and EQ. The 16.4.2 AI does not have the global EQ on/off switch found in the larger models; you'll have to switch each band on or off separately. The main, aux, and subgroup outputs also feature 31-band graphic EQ, which proved handy for tuning a P.A. and sculpting a wedge mix.

Live With a Net(work) The most exciting feature of the StudioLive AI line is networking. PreSonus furnishes a USB Wireless stick with the console, or you can connect the StudioLive to a router using the rear-panel Ethernet port. I used the Ethernet port to attach the 16.4.2AI and a MacBook

PreSonus packed a lot into the StudioLive 16.4.2AI. While it is equally at home with live and studio work, it makes an excellent recording interface.

running Universal Control AI to a wireless router for the remote devices. (Note that the StudioLive 16.4.2AI does not work with all routers: PreSonus recommends a D-Link DIR-655, which worked very well.)

I used this feature to create an onstage network, running SL Remote via iPad and assigning several cue mixes to band members' iPhones running QMix-AI. (SL Remote and QMix-AI are free apps available from the App Store.) The mixer's Systems menu contains pages governing network access and

permissions. Our network gave the iPad front-of-house access for all remote functions, while allowing each iPhone control only over the respective musician's aux send. It was awesome!

If you are concerned that musicians will totally ruin their mixes, you can give them the "Wheel of Me," a clever feature in which a single dial controls the "me" channel(s) and a second dial controls overall level of the band—very cool!

Captured Live Using the included Capture 2 software, recording to a DAW has never been this painless. Open the program and the Record Now option appears: Click this, and recording starts immediately. The system I tested offered resolution up to 24-bit/48kHz; a free firmware update in June will add 96kHz sampling rate and the ability to link two consoles. (Using 96kHz will not require the user to sacrifice other assets such as processing.) Each mixer channel is prerouted to its own track. If the mixer channels have been named, Capture 2 imports the channel names to the tracks. When the recording software is networked to the mixer, the analog inputs automatically switch to track outputs on playback. Perfect for a virtual soundcheck!

As you'd expect, the StudioLive 16.4.2AI integrates with PreSonus Studio One production software, and it worked without a hitch as an audio interface for Pro Tools, Digital Performer, and Reason.

Home and Away: OK! PreSonus packed a lot into the StudioLive 16.4.2AI. While it is equally at home with live and studio work, it makes an excellent recording interface: There is no disappointment in sound quality in any of these situations. A major bonus is the inclusion of Capture 2, as well as Universal Control AI. The system's networking capabilities will be especially welcomed by working bands that need to manage their own mixes.

With the StudioLive 16.4.2AI, you'll be amazed at what two thousand bucks can buy these days. ∎

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.*

Fig. 1. Each mic input features an XMAX Class A preamp with individually switched phantom power. A card slot is available for FireWire 800, Dante, or Thunderbolt connectivity, while pre-insert balanced direct outputs are available on D-Sub connectors.

EZDRUMMER 2

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EZdrummer 2

Drum production tool kit gets a major update

BY GINO ROBAIR

Click the Drum tab to view your kit and swap out instruments. Here, I've created a custom kit from the includedVintage sample library and saved it as a user preset for this particular project.

THE WORST thing that can happen when the creative juices are flowing is to get bogged down by technology. Although there are plenty of sophisticated software drum environments capable of creating lifelike grooves, sometimes you just want just get on with songwriting and not bother with programming. The original EZdrummer was created with this in mind.

EZdrummer 2 continues to provide a musically intuitive tool kit for crafting realistic drum parts, but it includes an updated GUI, sound engine, and mixer, as well as clever search and arrangement features. In addition, you get a newly recorded sound library that takes advantage of EZdrummer 2's 24-bit

SUMMARY

STRENGTHS Simple to use. Great sounding library that loads quickly. Swap instruments during playback. Drag-and-drop MIDI groove export. Offline audio bouncing. Intelligent search capabilities. Unlimited undo.

LIMITATIONS No keyboard shortcuts. Some cymbals have too short of a decay

EZdrummer 2 $179; $99 upgrade from EZdrummer
toontrack.com

playback resolution, while retaining backward compatibility with earlier EZX libraries through real-time sample rate conversion.

Toontrack provides a stand-alone version of EZdrummer 2, as well as Audio Units, VST, RTAS, and AAX plug-ins: I tested EZdrummer 2 in stand-alone mode and in Live 9, Logic X, and Pro Tools 11.

Easy Flow EZdrummer 2 adds several new features that help you build drum parts quickly and without leaving the creative headspace. In the new Song Track, you can record your own grooves using a MIDI pad or keyboard controller or assemble entire song arrangements in the timeline using the included MIDI groove files or ones you import. Quantization and a click track are provided for recording. You can loop and overdub one part at a time if you need to, and then edit the groove without worry—100 levels of undo are available.

Finding the groove you need, and then picking appropriate drums, is simple. The interface has only four main tabs—Drums, Browser, Search, Mixer—and a Preset window on top; numerous self-explanatory pull-down menus are sensibly located elsewhere. The Browser and Search tabs provide different ways to find groove files that fit your project. As you would expect, the Browser hierarchically

reveals the contents of files in any Toontrack EZX pack you have, and you can audition files before dragging them onto the Song timeline.

The Search tab, however, provides several convenient ways to scan the MIDI library based on musically relevant criteria. The Tap To Find function will reveal appropriate MIDI files based on the pattern you play into EZdrummer 2, using either your MIDI controller or by clicking the drum pictures in the GUI. Or you can drag a groove you like into the MIDI Drop Zone to find other suggestions. In both cases, the search results provide a list of grooves ranked by how close they match the beat you used in your example. These Search features were designed to model how a real drummer would figure out parts and variations if given suggestions for a beat, and Toontrack nailed it. Additionally, there are filters for genre, style, ride instrument, time signature, and so forth to help you locate (or avoid) appropriate files.

Song Creator makes the arrangement process even easier. Simply drag and drop a MIDI groove you like into the Song Creator window, and EZdrummer 2 will offer suggestions for an entire arrangement, which you can fine-tune by grabbing variations of the groove sections. Alternately, you may select one of the included song-structure presets. From there, you can edit,

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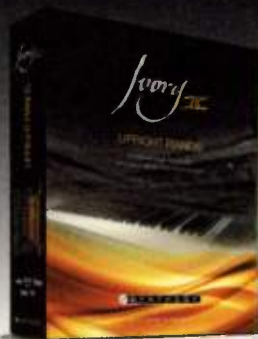—KEYBOARD MAGAZINE

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add, or rearrange the grooves to taste. Song parts are named Verse, Chorus, Bridge, Intro, and so forth, suggesting how they can be used, and variations are provided for each.

You can further personalize the performance by changing the Power Hand, an icon that you drag and drop over the instrument you want used for the ride pattern. Place the Opening Hit icon over a kit piece to hear an instrument, such as a crash cymbal, play on the first beat of groove.

You can dial in the Velocity and Amount—or, more accurately, statistical likelihood—of each kit piece and percussion instrument that's heard in the groove. Depending on which instruments you choose and the Amount level you set for them, you'll get grooves that sound like a real drummer played them, without having to record or edit MIDI data. (Of course, if you want to edit or overdub further, the tools are provided.)

Content Is King Under the Drum tab, you can select from two Modern and two Vintage kits. The Modern kits are based around a Yamaha 9000 and a Gretsch USA Custom, which offer as many as seven drums, and five cymbals plus hats. Additional snares and toms by Brady, DW, Pearl, Sonor, and Tama are available here. A '70s-era Ludwig Vistalite and a Beatle-like '60s-era Ludwig comprise the Vintage kits, which are based around a four-piece with three cymbals plus hats. Sabian and Paiste cymbals are used throughout. Percussion samples include tambourines, shakers, maracas, cabasa, cowbell, hand claps and finger snaps.

Click on the Preset tab to select a specialized kit to fit the style of your music. Basic, unprocessed kits are available, as well as configurations with titles such as Tight, Metal, DiscoPop, Levee, and LoFi Tape, which offer tuning, instrument choices, and effects that fit a specific vibe. When you select a kit, the library is quickly loaded in the background as you play. At any point in your production, you can swap out kit pieces or alter the tuning and volume of each piece, even as a MIDI file plays and without interrupting the groove—nice!

However, these presets can be altered to suit your needs: Each instrument has a pull-down menu where you can swap it for another model, as well as change its pitch and volume (even during playback). Once you've selected the drums and cymbals that best fit your song, save them as a User Preset. Remarkably, you won't need the manual to figure this stuff out.

Fig. 1. The revamped Mixer, showing the effects that are included in the Tape Filter kit preset. When you click on a channel's fader (OH, in this case), the effect channel that it's bused to (Reverb, in this instance) illuminates.

The library sounds great, overall, and the attention to detail is obvious when you audition the various instruments, solo them in the mixer (the ambient mic tracks are especially nice in a mix), alter the bleed in the kick and snare tracks, and change a drum's decay. The only issue I have with the library is that some of the crashes are choked before they fully decay.

In the Mixer, you can mute, solo, and alter the panning of each instrument and effects track. (Click on a channel's fader to highlight the effects it is bused to.) A window below each fader is used to set the output channel for each track. EZdrummer 2's mixer provides 16 stereo outputs that you can assign to as many as 30 different outputs on an audio interface.

On some presets, an additional row of effects, programmed to behave appropriately for the track you are working on, appears below the mixer (see Figure 1). My favorite set of effects appears with the Tape Filter kit, which has controls for Tape/Drive level, a lowpass filter, tuning control over the drum heads, and reverse reverb—perfect for cloudy, lo-fi situations. As you would expect, you can automate these parameters when using EZdrummer 2 as a DAW plug-in.

Once your drum part is finished, you can export the part as a WAV or MIDI file. (WAV export happens off-line, faster than real time.)

Toontrack makes things even easier by letting you drag and drop the complete sequence into a MIDI track in your DAW or onto the desktop, without having to go to a menu.

EZdrummer in Use I attended a pre-release demonstration of EZdrummer 2 at Mark Knopfler's London-based British Grove studios, where the library was recorded by Grammy-winning engineer Chuck Ainlay. This gave me a chance to check out the drums, mic placement, recording consoles (a Neve 88R for the Modern kits, and an EMI REDD51 for the Vintage), as well as get a glimpse into the intricacies of the program. The developers promised plenty of flexibility, and I couldn't help but wonder if EZdrummer 2 really would be easy to use.

My worries were unfounded. Every aspect of EZdrummer 2 lives up to its name, from installation through song creation to file export. I didn't even need a manual to get my first project completed. Everything I needed was in an obvious place and appropriately named.

More importantly, the instruments in the included kit libraries are killer, providing a wide variety of sounds that you can tailor to meet your needs—if want to get that geeky about it. But if you're in the mood to write, why not let EZdrummer 2 create a hassle-free drum part for you, so you can do something more useful with your creative time. ■

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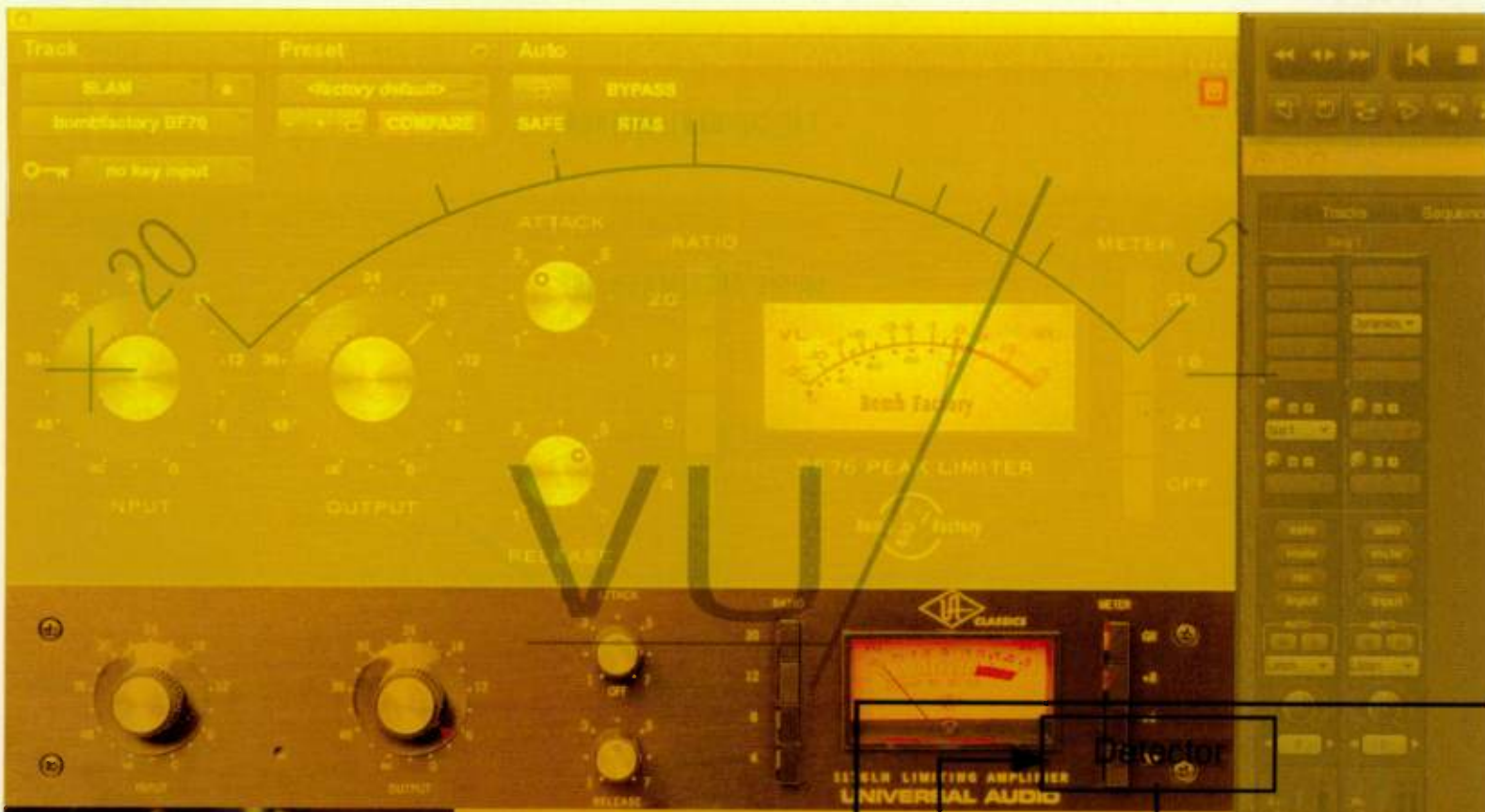
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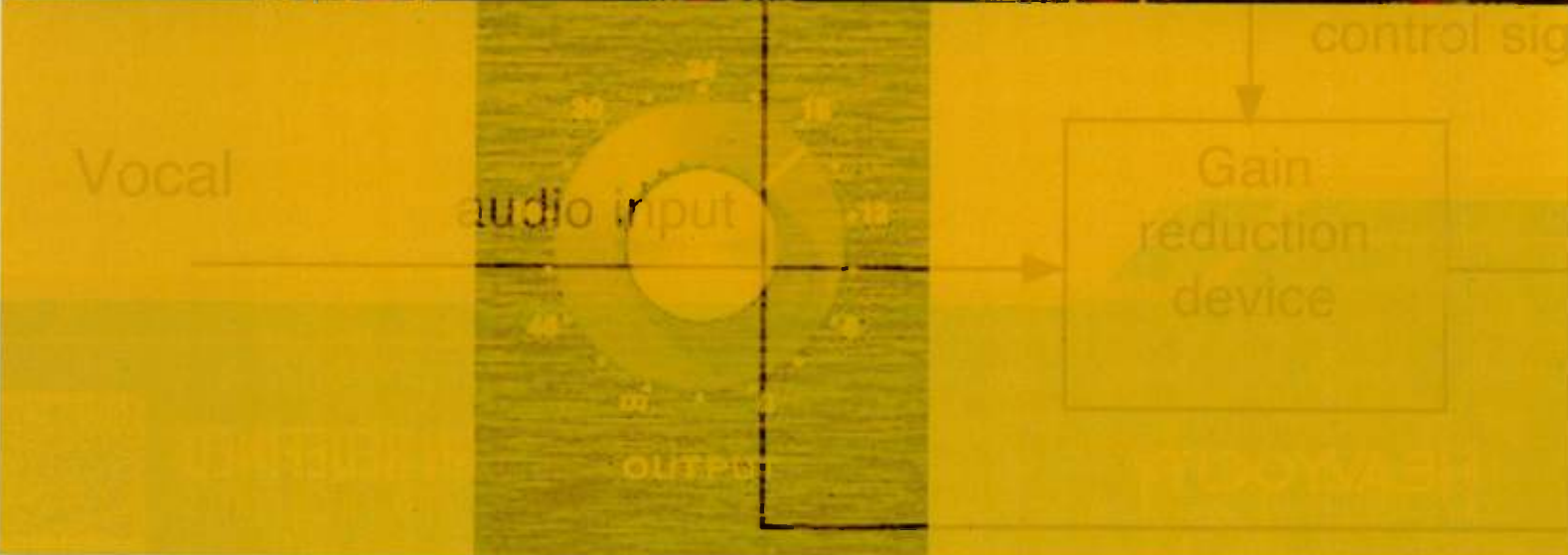
Detector

Gain reduction device

audio output

HOW TO

Master Class
Advanced Dynamics Processing Techniques

Sidechaining and keying

BY STEVE LA CERRA

WE OFTEN cover the basics of dynamics processing in these pages, focusing mainly on simple applications of compression, limiting, gating, and expansion, but advanced processing functions can be achieved using dynamics processors, through the use of techniques known as *sidechaining* and *keying*. This month we'll explain the concepts behind key inputs and sidechains, and explore applications for their uses. Most of these ideas apply to hardware and software processing, though the execution varies somewhat. While you're reading through this, please remember that the key input or sidechain to a dynamics processor is separate from the audio path.

Watching the Detectors All dynamics processors contain a control circuit, often referred to as a *detector*. This is the hardware circuit (or software emulation thereof) that does the thinking for the device. The detector analyzes the audio signal and—based upon the way you configure controls—applies the requisite gain control. [Editor's note: the sound of a compressor is all about the type of detector circuitry the designer has employed. Optical, Vari-Mu, and VCA compressors possess very different gain control characteristics, resulting in distinct sonic characters—all of which are eminently useful. That's a discussion for another time.]

Sidechain filtering can be used to avoid excessive compression due to a high content of low frequencies in a mix.

Under most circumstances, the detector is listening to the same audio signal that is being processed. This sounds deceptively simple: After all, why wouldn't the detector be controlled by the same audio that it's processing? The answer is, a lot of advanced dynamic effects can be created when the detector reacts to a signal other than the audio signal it is processing. To accomplish this, a hardware compressor must have a separate key input or a sidechain path consisting of a dedicated input and output. You can route anything you want to this input and use it to take control over the detection process. For example, you can route a kick drum to the detector and let the kick drum govern gain reduction on a vocal; see the block diagrams shown in Figures 1A and 1B. Figure 1A (right) shows audio in the compressor being split and routed to the audio path and the detector. Figure 1B (page 64) shows a vocal in the audio path, but a kick drum is routed to the detector's key input. Every time the kick drum is hit, the compressor acts on the vocal.

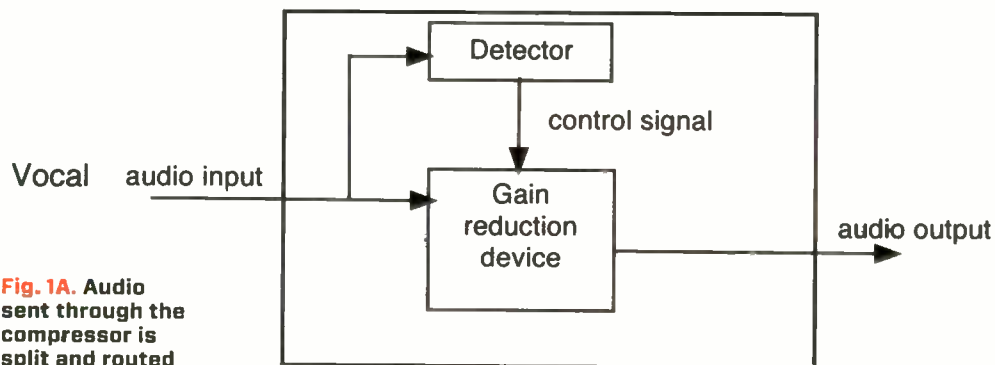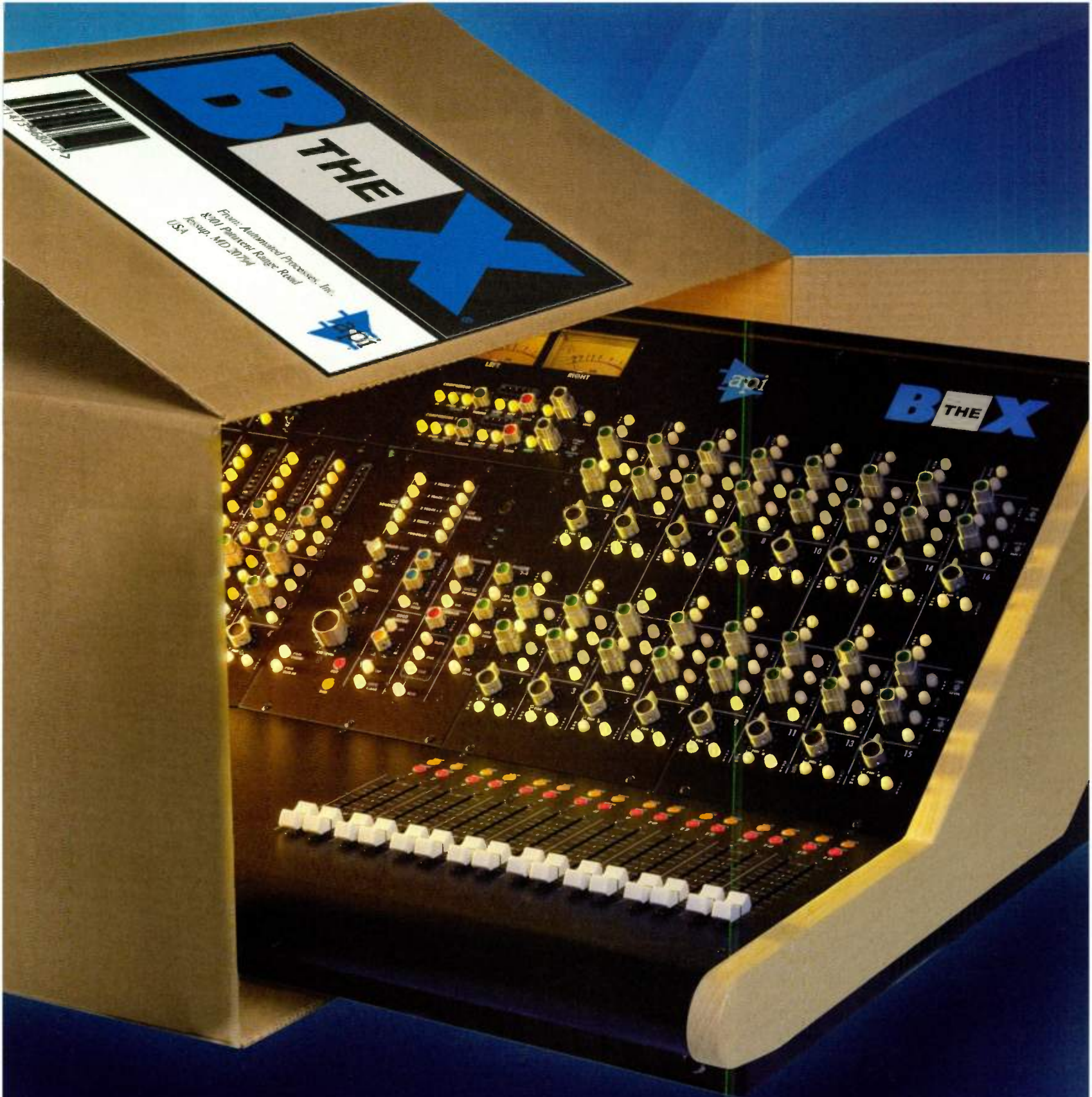Example of automated key operation, using MOTU Digital Performer.

Fig. 1A. Audio sent through the compressor is split and routed to the audio path and the detector.

The beauty of using plug-ins is that many of them feature a key input, even if that plug-in is emulating a hardware device that did not have a key input. For example, the original Universal Audio 1176 limiter did not have a key input, but the Bomb Factory BF76 1176 emulation does, letting you accomplish processing that was impossible with the original hardware unit.

Key Control Enabling key operation simply requires feeding any signal you'd like into the key input. Let's take as an example the commercial "donut": Radio and TV commercials typically start with a few seconds of music, and then a voiceover comes in to deliver the sales pitch. In the olden days, an engineer would manually lower the music when the voiceover started so that the music would not compete with the message. When the voiceover ended, the music would briefly return to the original level before fading out.

This process can be automated by using the voiceover to control the gain of a compressor inserted on the music track. The routing for this process is demonstrated in the screen shot of Digital Performer's mixer window shown on page 62. In this window, the track on the left (highlighted red) is the voiceover. The track on the right (highlighted blue) is the music.

MOTU's dynamics processor is inserted on the music track and is set to Compressor. The drop-down menu for the Control Signal is open. You'll see Input at the top of the menu and a list of buses underneath. When the Control Signal is set to Input, the dynamics processor behaves as you'd expect: It acts based upon what the music is doing—i.e. when the music track gets louder, compression increases. However we have set the Control Signal to Bus 1.

The Voiceover track has a send on Bus 1; the send knob is turned up and the send is set Prefader so that the key signal is independent of the vocal fader. This routing enables the compression on the music track to be "triggered" or "keyed" from the voice track. When the voice starts, it feeds audio to the Control input of the dynamics plug-in, causing the music track to be compressed.

When the voiceover ends, the signal at the Control input ceases and the music track returns to normal volume. This process is known as a ducker. Note that once the Control

Many plug-ins feature a key input, even if that plug-in is emulating a hardware device that did not have a key input. For example, the original Universal Audio 1176 limiter did not have a key input, but the Bomb Factory BF76 1176 emulation does (see upper left corner), letting you accomplish processing that was impossible with the original hardware unit.

Signal is set to Bus 1, the compressor will not function unless there is a signal present on Bus 1. A similar technique can be used in a karaoke situation or for a restaurant paging systems in which the announcer's voice ducks the background music.

There are other uses for a ducker, one of which is a compression trick from back in the metal days. If you have a song with distorted rhythm guitars and you want to keep them "in yer face," use the lead vocal to key compression on the guitar tracks. Every time the vocal enters, the guitars are reduced in level. You'll need to set the parameters of the compressor so that the effect is subtle: Try medium to fast attack and quick release times so that as soon
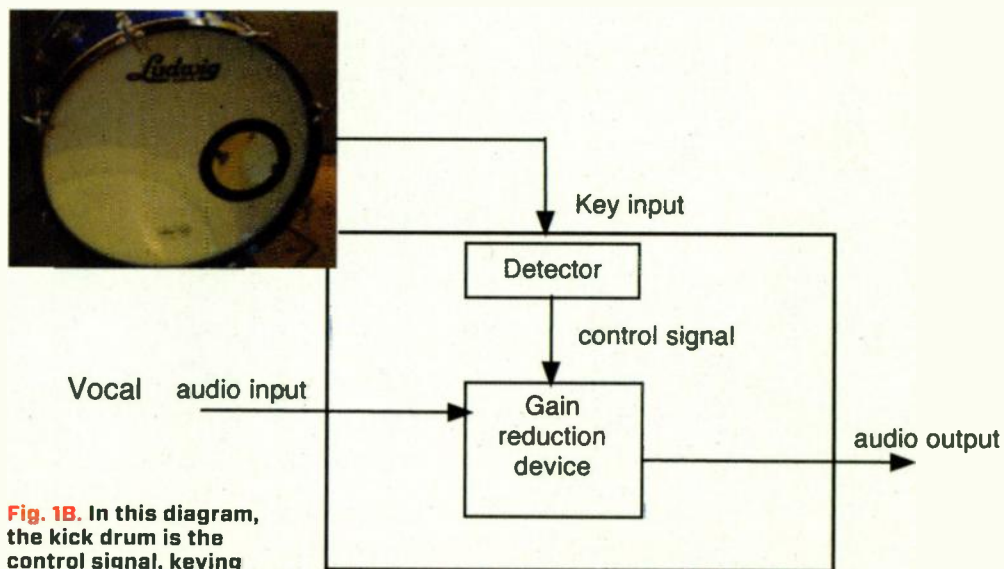

Fig. 1B. In this diagram, the kick drum is the control signal, keying compression on vocals.

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World Radio History

as the voice starts, the guitars duck and as soon as the voice ends the guitars come back to normal. Start with a ratio of 2:1 or 3:1; you'll need to play around with the threshold to achieve just a few dB of compression so that the effect is not obvious. The nice thing about doing this in a DAW (as opposed to the old analog days) is that you can easily route the vocal to key compressors on multiple guitar tracks without the hassle of physically splitting the signal and connecting a lot of patch cables etc. Simply set the key inputs of the

compressors to the same bus as the vocal send.

I use the same technique all the time with delay effects on lead vocal, live and in the studio. Ducking the delay while the vocalist is singing keeps the vocal in front and maintains clarity. When the vocal ends, the delay comes up, making it more audible.

Filter Your Mouth Sidechaining is a similar concept, but involves sending the detector signal out to an external processor, altering it, and then returning it back to the detector input. Patching an EQ into the sidechain is very common, and can be used to create a de-esser. A de-esser is actually a compressor that has been made sensitive or "tuned" to

sibilant frequencies. This process is achieved by applying an EQ to the signal before it returns back to the detector. In the block diagram shown in Figure 2, the vocal is fed into the compressor, and an EQ is patched into the sidechain. (Note that the compressor's sidechain switch *must* be engaged or the EQ is not applied.) I usually dump out all of the frequencies below around 3 kHz and apply a severe boost in the upper mids (anywhere from 4 to 8 kHz, depending upon the singer. You'll have to experiment), making the compressor very sensitive to sibilance. If you set the threshold, attack and ratio controls carefully, the compressor will act on "s" sounds but other sounds will not trigger compression.

Fig. 2. Here, the vocal is fed into the compressor, and an EQ is patched into the sidechain.
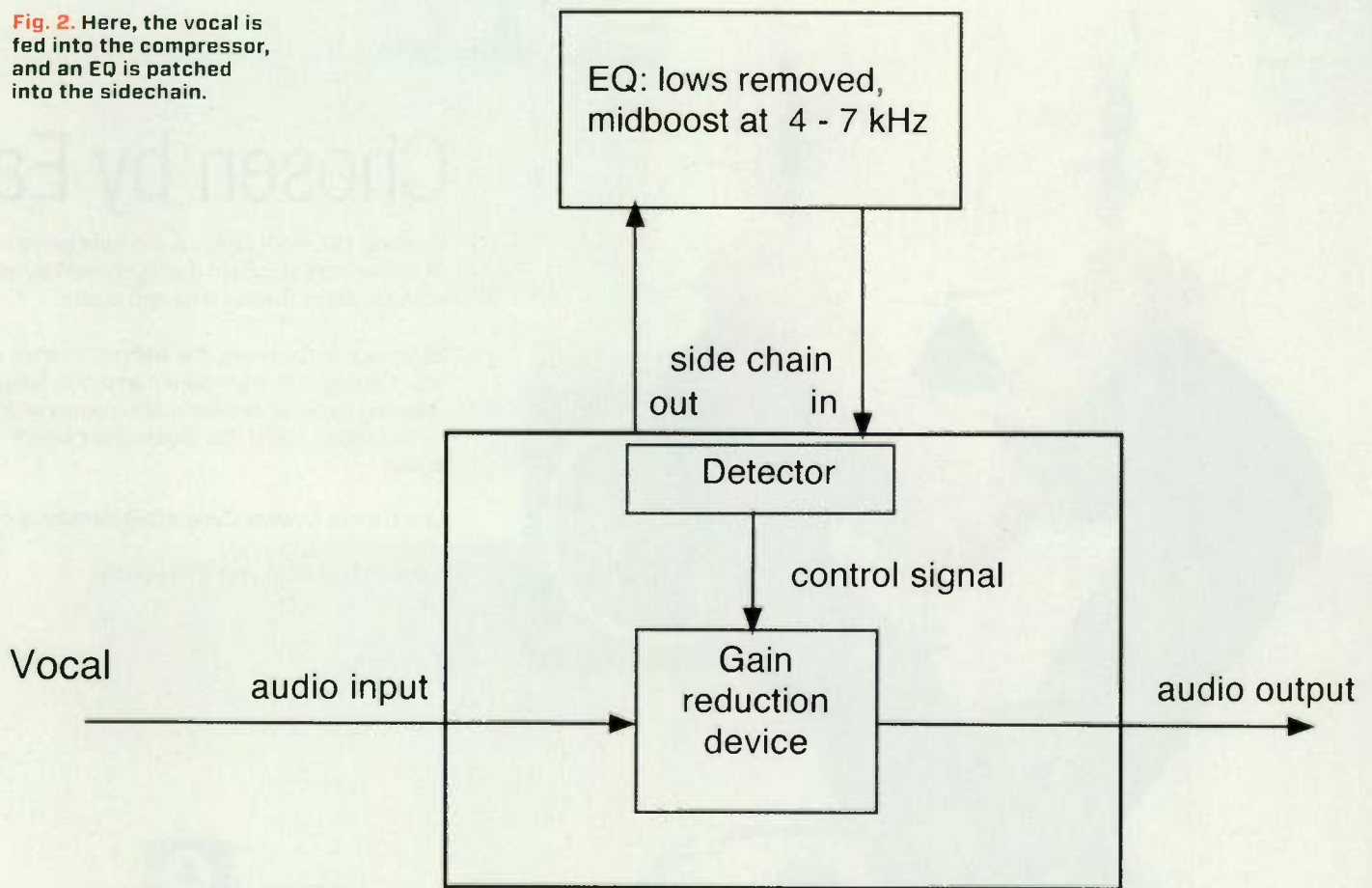
"Smarter" hardware gates such as the Drawmer DS404 feature front panel controls for low- and high-frequency filters. Using both filters simultaneously allows you to build a bandpass filter that removes some of the sounds that you do not want opening the gate.

Sidechain filtering can also be used to avoid excessive compression due to a high content of low frequencies in a mix. Low frequency sounds carry a lot of energy in a mix and they can trigger compression that causes audible side effects. For example, you might notice that every time the kick drum hits, the lead vocal gets sucked down. The cure is to remove some of the low frequencies from the compressor's sidechain (say, everything below 200 Hz). Filtering the bottom end stops the compressor from kicking in every time a kick drum is hit, but remember—you have *not* filtered the audio path.

Keys to the Kingdom Similar concepts can be applied to expander/gates. As with their compression counterparts, hardware gates will feature a key or trigger input jack, usually with an associated switch on the front panel. Plug-ins will offer a key on/off button along with a drop-down menu that allows you to choose a key input. This could be a physical input on your audio interface but more likely will be a bus that will receive a signal from elsewhere in the session.

Think of a gate as a door that opens or closes based on the strength of the signal at the doorway. If the signal is strong enough the door is pushed open, but the key or trigger input of a gate is like an electric door latch. That latch opens or closes based on a *remote* signal—regardless of the strength of the audio that is attempting to pass through the doorway. A gate that provides a key input allows you to use a secondary sound to open the "doorway." Let's say you insert a gate on a synth bass track but route the kick drum to the gate's key input. The synth bass itself will not open and close the gate—the kick drum will control the gate, allowing the synth to be heard or not. This can be used for some interesting effects (usually in the studio) where the synth is musically tightened up to the kick drum hits. In fact such a technique could be used to change the rhythm of the synth bass so that it precisely matches that of the kick drum. Swap the synth bass for a test tone generator tuned between 50 and 80 Hz, and you'll have a TR808 kick sound. A similar technique can be used to tighten up "gang" vocals by keying them from the lead vocal track.

Live engineers on major tours have been known to use contact pickups or triggers on each drum to key that drum's gate instead of using the signal from the microphone to open the gate. Let's say you have a mic on a snare drum and you are attempting to gate the mic. Depending upon placement of that microphone and the player's touch on the kit, audio from other components of the kit such as toms, cymbals and kick drum may leak into the microphone, causing false triggers that open the gate even when the snare is not hit. If we add a contact pickup or trigger to the snare drum and route it to the gate's key input, the gate opens and closes much more reliably because the trigger is in physical contact with the drum and is much less subject to leakage (though some contact pickups may be sensitive to vibration). This also means that softer hits on the snare can open the gate reliably so that grace note-style hits are not muted. As a bonus, we could split the signal from the trigger or contact pickup and send it to the trigger input of a drum module—allowing us to layer a sampled snare with the real snare or possibly record the performance as MIDI data.

Gates that have a sidechain (or a sidechain filter) can be especially useful because they let you filter unwanted sound from the sidechain—preventing them from opening the gate and effectively making the processor more sensitive to the sounds you *do* want opening the gate. A great application for a sidechain filter would be when you have significant kick drum leakage into a snare drum track, and the kick drum is causing the snare gate to open. By filtering the low frequencies from the sidechain, the gate will "hear" less of the kick drum and respond more to the snare. Remember that this filter applies to the sidechain and not to the main audio path. Most plug-in gates include a sidechain filter (Waves' Renaissance Channel for example), so take advantage of it. "Smarter" hardware gates such as the Drawmer DS404 feature front panel controls for low- and high-frequency filters. Using both filters simultaneously allows you to build a bandpass filter that removes some of the sounds you do not want opening the gate. You'll also typically find a sidechain "listen" switch that enables you to temporarily hear the filtered sidechain signal via the audio outputs. This is extremely useful in tuning the filters to pass only the signal you are trying to gate.

Take a Look Ahead One feature that is exclusive to software gates (and compressors) is the *look-ahead* function. Here's how it works: A gate or compressor can only act upon a signal when it reaches the input of the processor. In some cases, a transient such as a snare hit might fly right past the gate before the gate can respond—so that hit will be muted. Look-ahead allows the gate's sidechain to hear the signal before it hits the gate's audio input (did someone say "cheating"?), allowing it to open just before the sound reaches the gate's audio input. MOTU's MasterWorks Gate is great for this because you can set the look-ahead in milliseconds from 0 to 20. I find that setting it to 1 or 2 milliseconds is just enough that the gate can be set tightly enough to cut leakage but not chop off the leading edge of a snare or tom hit. A similar function on a compressor plug-in can help catch transients that are faster than the comp's attack time.

It's worth mentioning that if you are using hardware compression or gating, be careful about processing during recording. If a gate inadvertently removes audio that you wanted (that grace note on a snare, for example), it cannot be recovered. This is much less of an issue in DAWs because plug-in effects are almost always non-destructive—in other words, they are applied in the monitor path and can be removed without harm to the original audio file. ■

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> Live engineers on major tours have been known to use contact pickups or triggers on each drum to key that drum's gate instead of using the signal from the microphone to open the gate.

Uncharted Territory

What frequency-response specs don't tell you
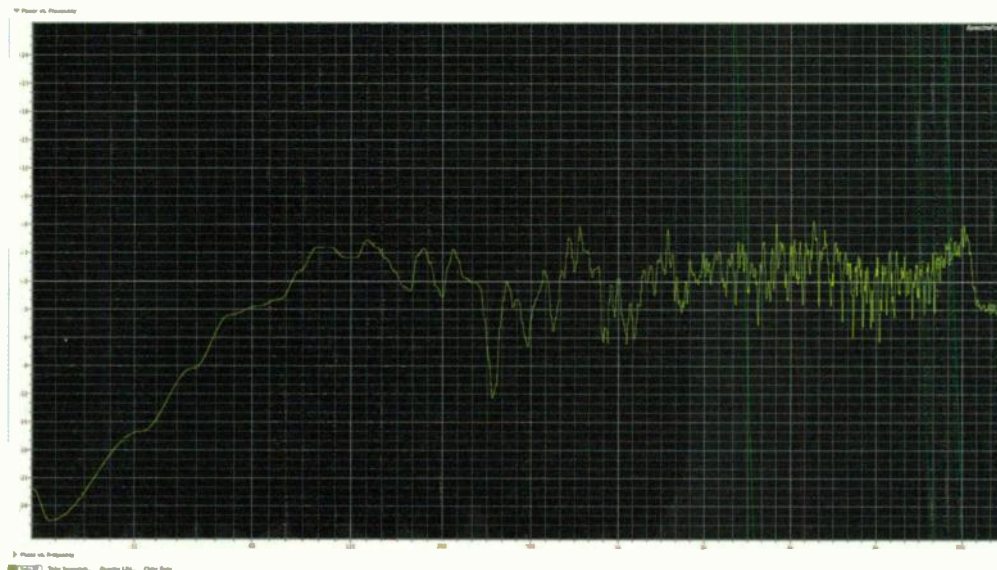
BY MICHAEL COOPER

Fig. 1. Metric Halo SpectraFoo Complete shows the transfer function of a reference monitor at continuous resolution, revealing every peak and dip in frequency response.
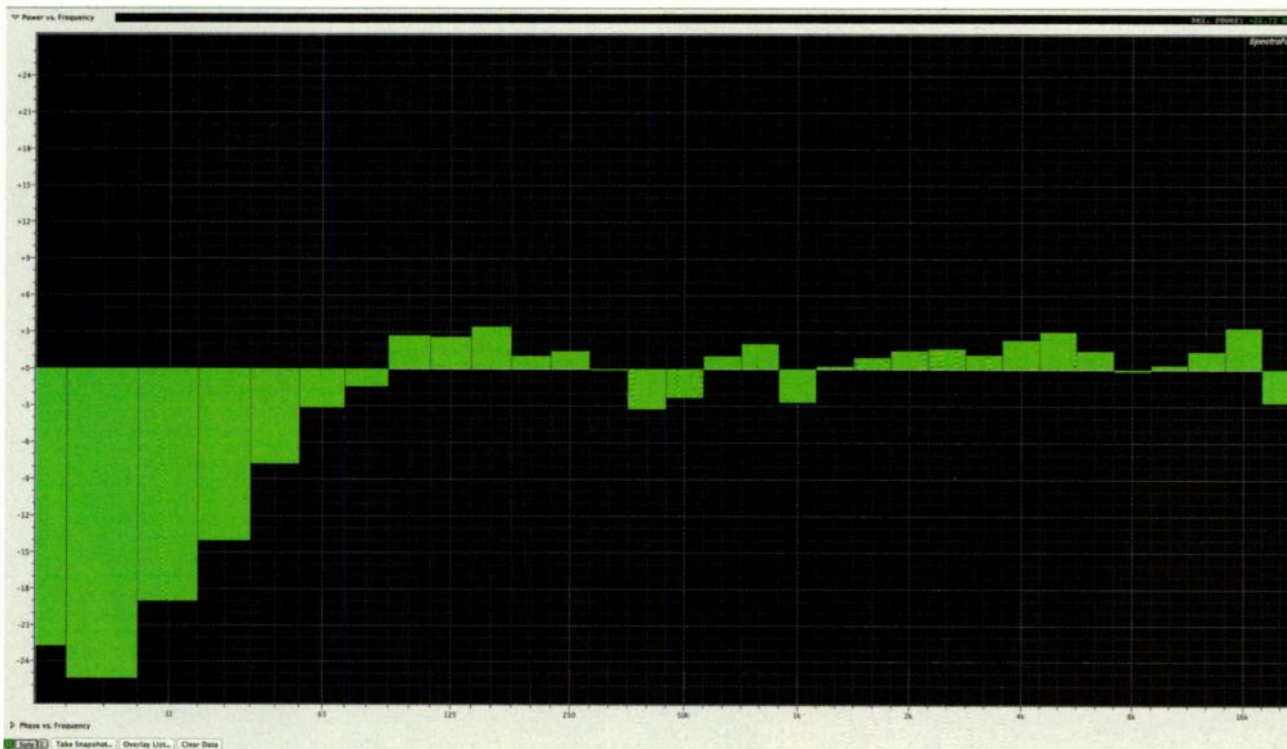
WHEN SHOPPING for professional analog audio gear, we typically turn to frequency-response specifications in the accompanying documentation as a trusted measure of performance. But here's our industry's dirty little secret: The frequency response can be made to look better than it really is. All it takes is manipulating the test conditions under which the data are derived.

There's no industry standard for the test conditions used to derive frequency-response specs, and most pro-audio manufacturers don't reveal their methods. That makes comparing the frequency response of two like pieces of gear an apples-to-oranges exercise.

In this article, I'll show you how the frequency response of a pro-audio reference monitor can be measured in various ways to obtain wildly different results. As you'll see, it's easy for manufacturers to cite a frequency response in a way that suggests excellent performance but is, in fact, misleading or even meaningless.

Zero Tolerance To demonstrate my points, I used Metric Halo SpectraFoo Complete 4—a comprehensive software suite of analysis and metering tools for audio—to test the frequency response of a popular, inexpensive studio monitor. The manufacturer states the monitor's

Fig. 2. The same monitor's transfer function is displayed at 1/3-octave resolution in SpectraFoo Complete, averaging the amplitude in each frequency band.

response to be 57 Hz to 20 kHz, with no tolerances provided. That is, the spec doesn't cite how far from flat the response deviates throughout its ostensible 57Hz to 20kHz range. There could theoretically be peaks and dips in response measuring 12 dB, in which case a more rigorous statement of the spec would be 57 Hz to 20 kHz, ±12 dB. Without that "±" bit, the spec is totally meaningless.

My test of the same monitor's frequency response is shown in Figure 1 on page 70. (Figure 1's graph shows the monitor's transfer function in SpectraFoo Complete, with traces for coherence and phase versus frequency hidden to simplify the view. The *averaging rate* was set very high to eliminate ephemeral spikes and dips.) The horizontal axis plots frequency, while the vertical axis shows power (amplitude) in decibels. With the resolution set to continuous mode (revealing detail as fine as 2/3 Hz wide), you can see several problems with the monitor's frequency response. These include a series of peaks and dips between 140 and 280 Hz (4.5 to 5.5dB swings in response) and a 12.5dB dip at 370 Hz, 7dB dip at 490 Hz, and 6dB peak at 740 Hz. To the manufacturer's credit, the response is only about 3 dB down at the 57Hz and 20kHz limits cited in their spec. It's the wild swings in between 57 Hz and 20 kHz that the spec sidesteps.

New Gear's Resolution Even when "±" tolerances are provided with the frequency-response spec, you can't always trust their veracity. A common way to favorably skew the spec is to average the transfer function's amplitude across relatively wide slices of the audio spectrum, thereby flattening any narrow (but potentially deep) peaks and dips.

Figure 2 illustrates this averaging technique. This figure shows the same monitor's frequency response derived with 1/3-octave resolution in SpectraFoo Complete. That is, the monitor's response is averaged in 1/3-octave slices across the spectrum. At this resolution, the series of peaks and dips between 140 and 280 Hz appear to flatten out a lot, completely hiding the dips and suggesting only a 2.5dB deviation in response. The 12.5dB dip at 370 Hz looks to be only 3.5 dB deep. The swings at 490 and 740 Hz look to be only one third as severe. Using 1/3-octave averaging, the ostensible frequency response can be stated to be 57 Hz to 20 kHz, ±3.5 dB. Trusting this spec implicitly, you would have no idea that the response varies -12.5 dB (at 370 Hz) and +6 dB (at multiple frequencies) across this monitor's useful range.

Figure 3 shows what happens when the frequency response is averaged in one-octave bands. The response looks to be 57 Hz to 20 kHz, ±3 dB—a further improvement in overall deviation from flat. More deceptive, the severe and discrete dips at 370 Hz and 490 Hz appear to be a smooth, conjoined trough only 1 dB

deep. The 6dB peak at 740 Hz has all but disappeared, inferring flat response in that band. The overall response appears to deviate only 4 dB (+3, -1 dB) between 90 Hz and 20 kHz. Impressive! But false.

Reality Check Even highly trained ears can have difficulty discerning shallow and narrow deviations in a monitor's frequency response. It can therefore be argued that continuous-resolution frequency-response charts are too detailed for many pro-audio buyers to find useful.

The rub is that some manufacturers take extreme license with their frequency-response documentation, and the other companies feel compelled to follow suit in order to prevent their products from looking poor in comparison. In the words of an insider at a company that makes reference monitors, frequency-response specs and charts are "pure marketing."

Your best recourse when evaluating gear for purchase is to trust your ears or, if a product audition isn't feasible, a credible review in a resource such as *Electronic Musician*. The frequency-response spec should be taken with a truckload of salt. ∎

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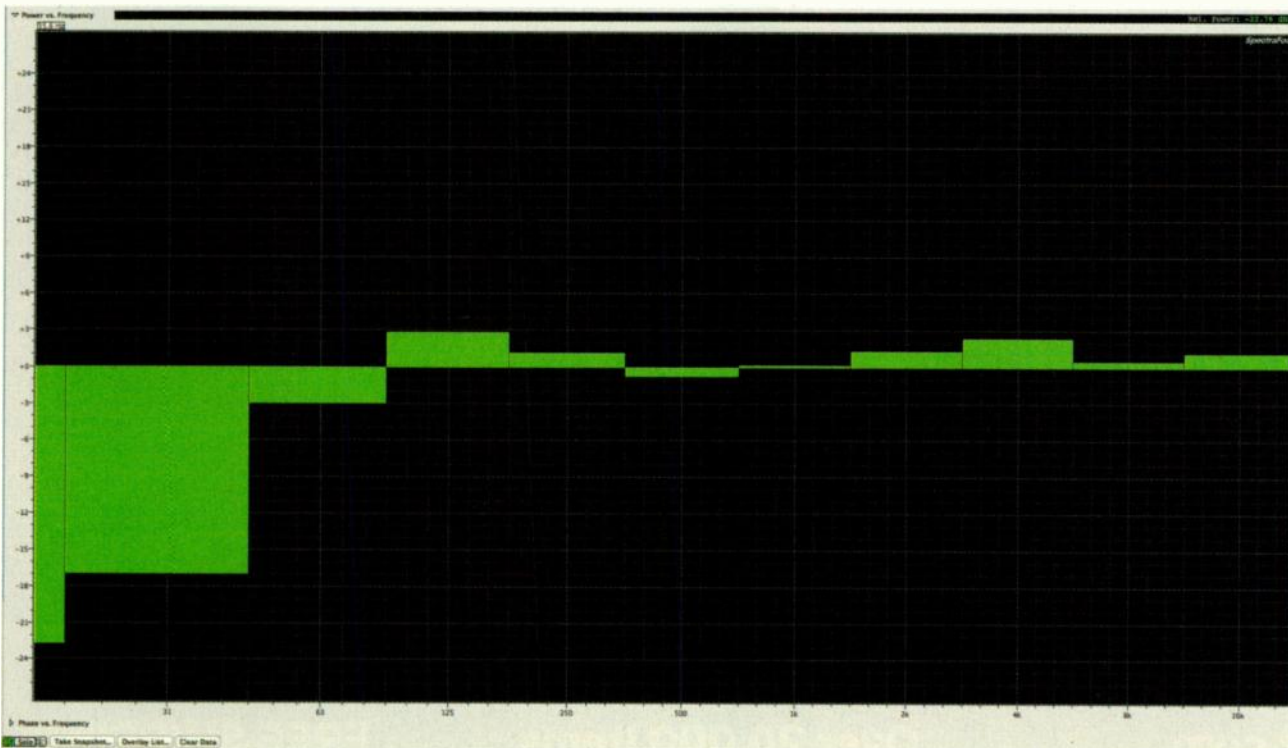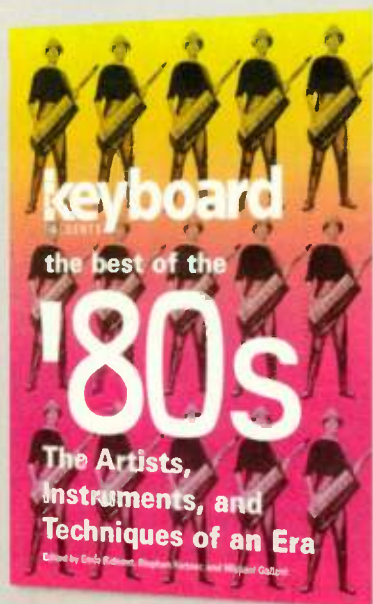

Fig. 3. Displayed with 1-octave resolution, the monitor's transfer function appears to be much flatter and smoother than it actually is.

Sites like SquareSpace let you to package any kind of digital files that you want, as well as add in extras that make your media more attractive for fans to buy.

Make Money On the Small Screen

Sell high-definition music videos to your fans

BY RANDY CHERTKOW AND JASON FEEHAN

CREATING MUSIC videos is one of the best ways to get exposure for your music. For one thing, YouTube is the number one search engine for music; it's where the party is. In addition, video is the most viral media there is, and YouTube comes with sharing tools and social media built-in. And most importantly, there are many ways to monetize the videos you create.

Don't just think of music videos in terms of potential advertising revenue; you can

sell your videos direct to fans from digital download stores or platforms such as iTunes. Of course, people can figure out ways to download your videos from YouTube (or other services such as Vevo or Vimeo), but there's no reason you have to upload the highest-quality versions to your channel. By saving the HD (high-definition) version for online sales, you reserve the ability to sell something better than what your fans can stream for free on YouTube.

Consider following these steps, so you can sell your music videos and create another income stream for yourself:

1. Create two versions of each music video: SD and HD. One version should be SD (standard definition), and should include end cards: extra material after the music video ends with information about where to buy the song and the video. End cards should also include a request for subscriptions and comments, and promotional information about your other videos or materials on YouTube or the web. This ensures that the

downloaded version of your video is different from the one that you want your fans to buy. The second version of the video should be HD, and should simply contain the music video—no promotional footage. This is the version you will sell.

2. Upload the SD version of your video with promotional footage to YouTube. Once your HD music videos and digital tracks are available for sale through digital music stores, you can upload the SD version of the video to YouTube. Be sure to add your promotional footage/end cards. Add buy links to the video and digital track to the video description and include spotlight annotations and links within the video. Doing so will help you capture impulse buys for your videos and music.

3. Participate in all of the money-making aspects of YouTube. Make sure to become a YouTube partner to get ad revenue, and upload all of your audio and video to ContentID so that you can make the most money from your videos. See our

Electronic Musician article "Five Ways to Make Money on YouTube" at emusician. com to make sure that you've covered everything to make the most from your channel.

4. Sell your HD versions of your videos yourself, or use a digital aggregator to sell on iTunes, Amazon, and other video stores.
To sell your music videos yourself, use Wordpress plug-ins such as Easy Digital Downloads (wordpress.org/plugins/ easy-digital-downloads), services such as Payloads (payloadz.com), or digital storefronts such as SquareSpace (squarespace.com). These allow you to package any kind of digital files that you want, which lets you add in extras that make it more attractive for fans to pay for it.

Once you have enough videos to make a collection (so that you can set a price to make enough to cover the initial conversion costs), sign up with digital aggregators like CDBaby (cdbaby.com) to get your music videos on iTunes, Amazon, and other stores. Prices vary and depend on the length of video you'll be selling. Also, be sure to carefully follow the formatting requirements as the conversion services charge extra if the original material doesn't meet their specifications.

5. Make a print-on-demand DVD. You can also make a print-on-demand DVD out of your music videos. Print-on-demand costs nothing up-front, so you can make money on every sale. Also consider adding bonus material, such as behind-the-scenes footage and/or interviews, so the DVD collection offers more than what you've released via digital stores or on YouTube. Services that specialize in print-on-demand music videos include Lulu (lulu.com) and CreateSpace (createspace.com).

Finally, remember that you're not just limited to music video. You can follow these five steps to sell any video material you own, such as live performance video, raw backstage footage, interviews, or any other videos that you shoot. Using this method, you can create a new, additional income stream from your music videos rather than simply releasing them for free on YouTube and other video platforms. ∎

Randy Chertkow and Jason Feehan are authors of The Indie Band Survival Guide *(St. Martin's Griffin), now in its second edition.*

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Novation Bass Station II
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Bass Station II is an analog mono-synth based on the classic original Novation Bass Station but re-worked for the 21st century. It has two filters, three oscillators, patch save, and a fully analog effects section. Add a step sequencer, arpeggiator, full sized keys and a powerful modulation section and you have the makings of a synth that is built for bass, but capable of so much more.

MOTU

Zynaptiq PITCHMAP 1.5
Real-time polyphonic pitch processor

PITCHMAP is the only plug-in that lets you change melodies, harmonies and chords within mixed music, in real-time! Simply play or select a new scale and your mix conforms automatically, without affecting the drums. Suppress sounds within a mix, or apply revolutionary synth-like transformations to your music. Play PITCHMAP like a musical instrument, or use it as a corrective tool. Check out PITCHMAP — and Zynaptiq's other jaw-dropping plug-ins, UNVEIL and UNFILTER. Prepare to have your mind blown!

Shure Beta 181 Stereo Set
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Mackie MR8mk3 Powered Studio Monitors will help you make better sounding music, with innovations like an enhanced waveguide for a wider sweet spot, custom-tuned rear porting for smooth, extended bass response, and customizable frequency controls to let you dial in the perfect response for your space. Now offered as a full-range series, choose the size that's perfect for your MOTU studio and budget: from 5", 6", or 8" full-range models, as well as a brand new, hard-hitting 10" subwoofer. The MRmk3 series are Mackie's latest assault on the state of the monitoring art.

World Radio History

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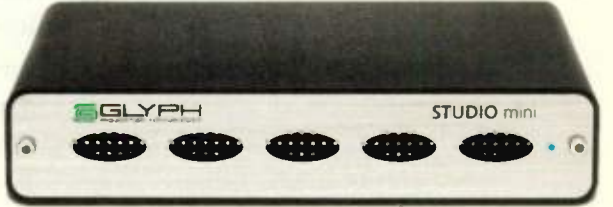
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The 5 Stages of Software Updating

Credit where credit is due: One could say that Elisabeth Kübler-Ross wrote the first Craig's List, with her Five Stages of Grief. But few know about her rumored earlier work on software updating, which we are both proud and humbled to be able to share with you.

BY CRAIG ANDERTON

1

Anticipation. A new version of your favorite software is coming soon! (Well actually, it's been "coming soon" for six months, but now it's really coming ... really. Honest.) The sky becomes bluer, food tastes more tantalizing, even fluffy little kittens are cuter. After the update, nothing will crash, your inspiration will soar to new heights, and amazing new features will unlock your Inner Genius. Is this kewl, or what?

2

Installation. The fateful day has arrived. You locate your original serial number (FE&FD#IOUWE578W%˚ 9FHDS˚894) and password (password), then join 10,487 other people slamming the company's Pentium II servers to download the 45GB update. Three days later, your download is complete! Time to update your authorizations, authorize the authorization updates, and download the dongle drivers *du jour*... almost there ... unfortunately, you collapse from exhaustion before you can do anything.

3

Frustration. Malicious, sadistic programmers from North Korea who hate musicians have rearranged the UI so nothing is where you expect it to be. New features have been designed solely to enrage existing users. Confused, indignant, and disoriented, you rush to the program's community forums where you vent your hatred of the company, their cavalier dismissal of their loyal user base, and make ominous threats (as if anyone cared) about how you're going to switch to Reaper.

4

Elation. *Eureka!* You stumble across a mind-boggling new feature you had somehow missed before called "documentation." You discover the changes are even more welcome than CNN's cancellation of Piers Morgan's combination talk show/sleeping aid, your workflow has become playflow, the program is as stable as the rock (*and* roll) of Gibraltar, and fluffy little kittens not only seem cuter than ever but communicate their joy to you telepathically. You are so happy you upgraded!

5

Anticipation. A new version of your favorite software is coming soon ...