REVIEWS: APPLE LOGIC STUDIO | PRESONUS STUDIO LIVE | ANTARES AUTO-TUNE EVO | AND MORE
OCTOBER 2009

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WHERE IS THE RECORD INDUSTRY HEADED?

Imogen Heap

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em ELECTRONIC MUSICIAN

OCTOBER 2009 VOL. 25, NO. 10

>> FEATURES

COVER STORY:

24 THE ELLIPTICAL WORLD OF IMOGEN HEAP

In this revealing interview, songstress and multi-instrumentalist Imogen Heap discusses the prolonged construction of her home studio and her unique approach to producing her new album, *Ellipse*. BY GEARY YELTON

20 INSIDE A GAME SOUNDTRACK

Ever wonder what goes into composing a videogame score? *EM* talks to Howard Mostrom, composer for the game *Demigod* (among others), who gives a step-by-step account of how he wrote the music, the tools he used and more. BY MIKE LEVINE

30 BEEFING UP THE BEAT

This fresh approach to drum mixing offers a variety of tips and techniques for making your DAW drum tracks sound as big as possible. Compression, EQ, panning, transient manipulation, re-pitching and drum replacement are just some of the topics covered.

BY MICHAEL COOPER

>> REVIEWS

- 44 APPLE **LOGIC STUDIO** sequencing, editing and performance bundle
- 50 PRESONUS **STUDIOLIVE 16.4.2** digital mixer
- 56 ROLAND **JUNO-STAGE** keyboard synthesizer
- 62 QUICK PICKS
  - EVENTIDE **PITCHFACTOR HARMONIZER** multi-effects stompbox
  - ANTARES **AUTO-TUNE EVO** software effects plug-in
  - SHURE **SM27** cardioid condenser microphone

>> COLUMNS

- 16 **PRO/FILE:** One-Man Garage Band
  General Elektriks uses non-standard production techniques to craft his catchy, kitschy new CD.
- 18 **TECH PAGE:** Holostorage
  Need a lot of data storage? I got your storage right here!
- 36 **MAKING TRACKS:** Screencast Audio Editing
  Use your DAW to clean up and edit screencast soundtracks.
- 38 **SOUND DESIGN WORKSHOP:** Clean Sweep
  Build your own flanger from a basic delay plug-in.
- 40 **INDUSTRY INSIDER:** Q&A: Jim Donio
  The president of NARM, a major record-industry trade association, offers his views on the changing music business.
- 74 **IN SESSION:** Memories and Fortune Telling
  Thinking about past and future AES shows.

>> DEPARTMENTS

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Are They or Aren't They?

Recently, I was talking to a musical associate, and we got on the subject of people who produce tracks using prerecorded loops but don't necessarily play an instrument. He said that while he respected their abilities, he didn't consider such folks to be "musicians." I disagreed, saying that what matters is the end result, whether it's played on conventional instruments, or programmed using loops and MIDI, or by tapping on the pads of a groove box.

I realize that our disagreement could be viewed as merely a semantic one, but to me there's more to it. Today's music technology offers many tools that don't require one to play a traditional instrument to use them (turntables, groove samplers, etc.), yet they can yield excellent musical results. Don't get me wrong: I'm not saying that musical ability isn't important—it is. Whether you're playing a violin or producing a track with only samples and loops, you need to be musical or the result will not be favorable.


MARLA COHEN

What I am saying is that even if one's musical expression is limited to dragging loops into a DAW and then editing and mixing them, coming up with a successful result still requires musical chops—even if they're innate. It's not something just anybody can do well; it takes talent. You need to know what makes a track groove, you need to understand mixing and dynamics, and you must have the ability to arrange, even if that knowledge isn't of a formal nature. Bottom line: If you're producing great-sounding tracks, you should be considered a musician (as well as a producer, of course).

A related and perhaps more contentious topic relates to the digital tuning of vocals. (See our review of Antares Auto-Tune Evo on page 64 to read about the best-known product for this purpose.) Some people object to fixing the tracks of singers with bad pitch because they feel that it is somehow cheating. Again, I don't agree with this point of view. If the final result is brilliant, do you really care what tools were used to put it together? Does it really matter if the singer has some pitch problems if he/she has a compelling voice? If you're against pitch correcting, then are you also against comping a vocal track? If you're surgically putting together a track with a word from here and a line from there, is that really so different from tuning the singer's bad notes? If you're drawing in volume-automation curves to compensate for a singer's lack of dynamics, is that cheating?

To me, the real problem is not with the digital manipulation of recordings, but rather that too many songs are boring, formulaic and soulless to start with. That's what happens when music is born out of purely commercial motivation rather than artistic expression. In such cases, whether the vocal has been digitally tuned or not isn't really the issue. Conversely, if you're creating something from your musical heart and soul, does it matter what tools you use to achieve your vision?

I realize that there are likely plenty of divergent opinions about these issues, and I would love to hear your thoughts. Please send your comments to emeditorial@emusician.com.

Mike Levine
Editor

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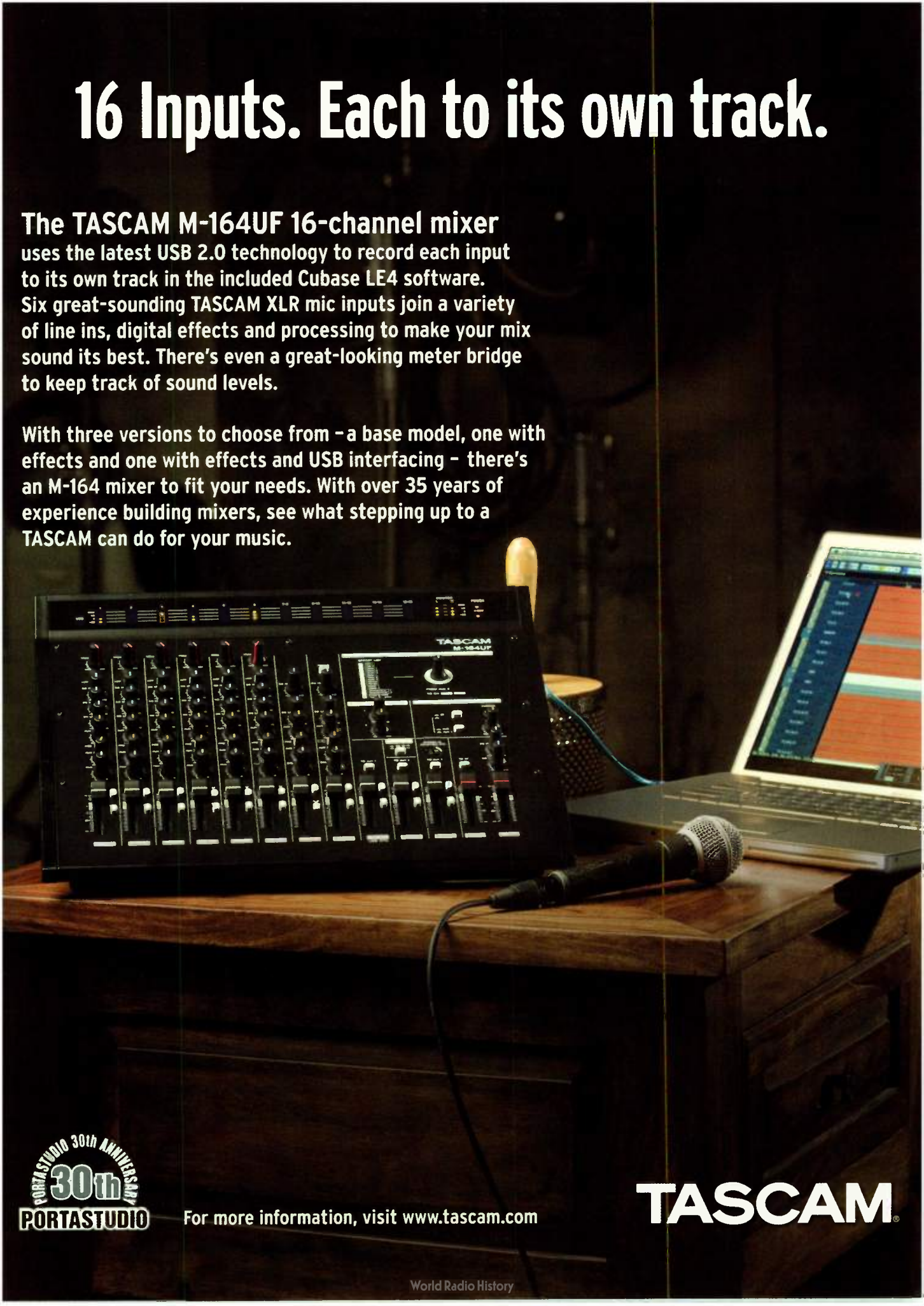

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FRONTPANEL

Download of the Month

Submersible Music DrumCore 3 Free By Len Sasso

Instead of the more typical time- and feature-limited demos, Submersible Music (submersiblemusic.com) offers a free, downloadable version of its new DrumCore 3 plug-in, which is limited only in content. You get AU, VST and RTAS versions of the plug-in for both Mac and PC, but you don't get the stand-alone DrumCore 3 Toolkit, which lets you add and customize content. Instead of the 16 GB of content in DrumCore 3 ($249) and the 30 GB in DrumCore 3 Deluxe ($599), the free version offers 1 GB of pop/rock and hip-hop drum kits and groove sets, as well as a smattering of Latin percussion. But that's enough to be of real use, and the program has plenty of tricks up its sleeve to add variety.

DrumCore offers audio drum loops and 48-piece drum kits, along with MIDI loops to play them. You can, of course, play the drum kits live, as well as swap individual kit pieces between any of the kits. The kits used for the audio loops are among those provided, which lets you easily augment the audio loops with MIDI-driven additional kit pieces. Most of the kit pieces are velocity layered. When you type in or step-sequence your MIDI grooves, use DrumCore's LiveDrummer slider to introduce velocity variations and associated layer switching.

ONLINE BONUS MATERIAL

One of my favorite DrumCore features is the Gabrielizer. It alters both audio and MIDI loops in a rule-based manner that produces much more useful results than randomly suppressing, adding and shifting hits. Clicking the Gabrielizer button produces a new loop; you preserve the keepers by dragging them to your DAW host. The Gabrielizer first slices the loop and then shifts, reverses (audio only) or suppresses some of the slices. Because of the absence of reversing and bleed-through, the results are a bit more realistic with MIDI loops, but they're useful in both cases (see **Web Clip 1**).

OPTION-CLICK By David Battino

Right Time, Right Click

Discover unexpected features in popular hardware and software

Pointing with dBpoweramp installed reveals this WAV to be a 6 channel surround file. Right-clicking brings up a handy format-conversion menu.

A fast (and often free) way to speed up your computer music-making is to add commands to the Context menu, the little list that pops up when you right-click on a file icon. In Windows, the software that adds these features is called a *shell extension*. On Mac, it's a *contextual menu plug-in*. Googling those phrases will turn up thousands of options.

On my OS 10.4 Mac, I use the QuickPlayCM plug-in (free, pixture.com) to preview audio and video files without launching programs. (Hitting the spacebar offers similar functionality on newer Macs.) On the PC, dBpoweramp Music Converter (free, dbpoweramp.com) offers helpful information when you hover and rapid format-conversion when you right-click. The YouSendIt extension (free, yousendit.com) provides one-click Web uploading.

CM plug-ins and extensions can also slow your system, so don't install them wantonly, but a few good ones will make things click. —*David Battino, Batmosphere.com*

This Month on Emusician.com

GUEST BLOGGER: MATTHEW RYAN

Get dispatches from the studio as he self-produces his latest album.

IPHONE APPS

There are so many iPhone apps being released each week, it'll make your head spin. The *EM* editors let you know the coolest audio iPhone apps on this special site. emusician.com/ms/iphone

THIS MONTH'S SOUNDTRACK

By Mike Levine

This batch of releases comprises a range of musical styles, including hard-driving prog rock, heavily processed electronic textures, slick dance pop, a mix of acoustic roots and world music, and intelligent pop rock.


ANDREW WHITTON

GARY GO: *GARY GO* **(DECCA)**
Well-crafted and accessible British pop rock. Go, who recently recorded a song using iPhone apps to create the tracks, has generated a ton of interest even before the release of the CD.


JIM MCGUIRE

BÉLA FLECK, EDGAR MEYER, ZAKIR HUSSAIN: *THE MELODY OF RHYTHM* **(E1 MUSIC)**
Three virtuoso musicians (Fleck on banjo, Meyer on double bass and Hussain on tabla) collaborate on a riveting and unique album that mixes elements of traditional Indian, classical and American roots music. The title cut is actually a three-movement concerto that the trio recorded live with the Detroit Symphony Orchestra.

AMBROSE FIELD, JOHN POTTER: *BEING DUFAY* **(ECM)**
This unusual album combines the purely electronic sound and heavily processed field recordings of Ambrose Field with fragments of ex-Hilliard Ensemble tenor John Potter performing songs of 15-century Flemish composer Guillaume Dufay. Produced by Manfred Eicher, the result is quite striking and almost surprisingly effective.

—Geary Yelton


PENELOPE WALBOURN

PORCUPINE TREE: *THE INCIDENT* **(ROADRUNNER)**
Steven Wilson and friends are back with an impressive, energetic 14-song prog-rock song cycle. A second CD with five additional but unrelated songs is also included with the physical product.

ERIKA JAYNE: *PRETTY MESS* **(E1 MUSIC)**
Catchy dance-pop tunes, strong vocals and impeccable production mark Jayne's debut CD. A Prince influence runs throughout the album, including an Apollonia 6 cover and a guest appearance by Sheila E.

Hear song excerpts from many of this month's artists and watch a video clip from Porcupine Tree in the "Online Bonus Material" section at emusician.com.

ONLINE BONUS MATERIAL

EM CAST:

Dream Theater's Jordan Rudess on the band's new CD, his new iPhone app and his solo piano CD that used Synthogy's Ivory as its soundsource.


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FEATURED VIDEO

Get inside the *Demigod* videogame.

By Len Sasso

NATIVE INSTRUMENTS AUDIO 2 DJ

IN THE POCKET

Audio 2 DJ (Mac/Win, $119 MSRP) from Native Instruments (native-instruments.com) delivers the acclaimed sound quality of its Audio DJ line of audio interfaces to your shirt pocket and recession budget. The deck-of-cards-sized, bus-powered USB 2 device features the same studio-grade 24-bit, 96kHz Cirrus Logic converters and offers high-powered amplifiers capable of delivering 9.7dBu output. Dual stereo outputs let you route two decks to an external DJ mixer or output independent master and cue signals when mixing in software. Purchase includes Traktor Pro Demo and Kore Player software, along with 600 MB of production-ready sounds.

ANTARES AUDIO TECHNOLOGIES AVOX EVO

OUTSIDE THE VOX

Antares (antares tech.com) has unleashed the next evolution of its vocal toolkit, Avox. Avox Evo (Mac/Win; $399, upgrades from $59) incorporates Antares' new Voice Processing Technology introduced in Auto-Tune Evo (reviewed on page 64). At the tame end you get four vocal-enhancement and -repair plug-ins: Punch, Aspire, Warm and Sybil. For thickening and voice multiplication, you'll find Duo and Choir, as well as Harmony Engine Evo (available separately for $199) for generating five-part vocal harmony. When you need to take it to the extreme, apply physical modeling to your singer's vocal tract with Throat, pitch-shift and ring-modulate it to oblivion with Mutator or create talkbox-like effects with Articulator.

APOGEE GIO

PEDAL TO THE METAL

If you use Logic Pro 9, MainStage 2 (see Logic Studio review on page 44) or GarageBand '09, Apogee (apogee digital.com) will get your feet into the act with its new USB-powered hardware controller and audio interface, GiO ($395 MSRP). Plug your guitar into the ¼-inch instrument input for clean recording through Apogee's preamps and converters. Control the software transport with its top-row buttons and switch plug-in presets with its bottom-corner footswitches. Use the five Effects Stomp buttons to manage stompbox effects like Logic's Amp Designer and Pedalboard, MainStage's Playback and Loopback, and GarageBand's built-in amps and stompboxes. For unparalleled monitoring through Apogee converters, hook up headphones, powered monitors or your instrument amp to the ¼-inch stereo output.

FXPANSION DCAM SYNTH SQUAD

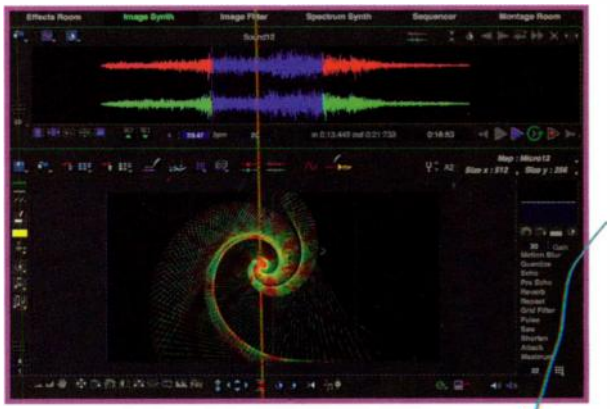
FXpansion (fxpansion.com) puts the analog back in your sound with three modeled virtual instrument plug-ins in DCAM Synth Squad (Mac/Win, $249). Strobe is a classic, easy-to-program, one-oscillator subtractive synth. Cypher's three-oscillator design with audio-rate modulation routings, dual filters and waveshaping takes you to the next level. For vintage string machine sounds, Amber's divide-down architecture has you covered. A fourth plug-in, Fusor, puts it all together by letting you host up to three synths and add step sequencing, keyboard mapping and global modulation. All synths feature the flexible TransMod modulation routing system and allow processing of external audio (see Web Clip 1).

ON THE JOB

U&I SOFTWARE METASYNTH 5

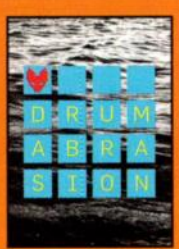
PICTURE PERFECT

With the release of MetaSynth 5 (Mac; $599 MSRP, upgrade pricing available), U&I Software (uisoftware.com) adds full Mac OS X Leopard compatibility and multiprocessor support to its image-based audio processing software. MetaSynth features six "rooms": effects processing, image synthesis, image filtering, spectrum analysis and resynthesis, piano-roll-style sequencing, and multitrack sequencing and mixing. The image rooms feature 14 new graphics tools and 11 new instruments. Each room provides access to MetaSynth's sample editor, and you can now record audio into both the sample editor and the multitrack sequencer. Most aspects of the program have been streamlined.



Sound Advice

Dark Side of the Tune MPC Kits



Seattle sound designer Dark Side of the Tune (darksideofthetune.com) has released three dirt-cheap downloadable Akai MPC percussion libraries ($7.99 for MPC 500, and $8.99 for MPC 1000, 2500 and 5000). Each library includes WAV audio files, so those without an MPC can easily bring these kits into their own sampler. *Drum Abrasion* features acoustic drums and found sounds. *Lost Percussion* delivers synthesized analog drum sounds but avoids clichéd samples like the TR 808 and 909. *Bent-o-Box* is a sampling of squawks, words and noises from circuit-bent toys. The company says it draws its inspiration from "...a place where hibernation, gray skies and heavier attitude often lead to innovation."

PowerFX New Club Producer

PowerFX (powerfx.com) has set its sights on producers and DJs with its latest construction kit, *New Club Producer* ($59). The 1.26GB (655MB download) collection comprises bass, drum, percussion, synth and effects loops in funk, dubstep, house, hip-hop and club styles. Tempos range from 80 to 125 bpm in a variety of keys. PowerFX throws in its new *Grimebient* sample pack. All files are in ACIDized WAV format, giving you a no-redundancy collection of 865 loops.

Wave Alchemy SFX Collection 01

Wave Alchemy (wavealchemy.co.uk) has taken a break from creating house-oriented loop and sampler libraries to bring you *SFX Collection 01*, a $69.95 download available from Big Fish Audio (bigfishaudio.com). The 1.5GB collection of 24-bit, 44.1kHz WAV files is spread across eight categories: Cymbal FX, Downlifters, Impacts, Short FX, Stabs, Sweeps & Drones, Textures and Uplifters. For convenience, a sampler instrument for each category is supplied in EXS24, HALion, Kontakt, NN-XT and SFZ formats. Although designed with dance producers in mind, the collection provides an excellent toolkit for film and multimedia sound design em

Home base: Berkeley, CA

Key software: Digidesign Pro Tools 7.1

Keyboards include: Hohner Clavinet C, Roland Jupiter 6, Fender Rhodes Stage 73, Hammond L-100

Website: www.general-elektriks.com

FRANÇOIS BERTHIER

One-Man Garage Band

General Elektriks combines soul, pop and hip-hop in a quirky lo-fi landscape

Hervé Salters (aka General Elektriks) knows his vintage keyboards. As a session player in his native Paris, with the likes of Femi Kuti and DJ Mehdi—and for the past few years in the San Francisco Bay Area with Blackalicious and various members of the Quannum label family—Salters has carved out his own sound as a musician and producer. He draws from the funky pop-psychedelia of the '70s, but also embraces a way-out future seeped in crackly, chopped-up beats; fuzz-wahs; and Whammy pedals.

By Bill Murphy

"It's a taste thing really," Salters explains. "When I started playing music, I was an acoustic piano player. Then I switched to electronic keyboards, and the ones that really spoke to me the most had a strong personality like the piano. So the clavinet, the Fender Rhodes, the Hammond organ, the Wurlitzer—they're all going to take your songs into the analog realm whatever you do. That said, I do dig the idea of using these rich, old-school textures and trying to push them into some new territory."

GoodCityforDreamers (Quannum, 2009) is Salters' second album under his nom-de-guerre General Elektriks, and at first blush he seems to have dialed back the freaky collage-based curves of his 2005 debut, *Cliquety Kliqk* (Quannum), in favor of a much catchier agenda. From the sustained clavinet chords and insistent Roland SH-101 bass line on "Raid the Radio" (see Web Clip 1) to the lush strings, bubbly Rhodes and oddly Daryl Hall-ish vocal of "Engine Kicking In," kitschy pop sensibilities abound. Still, Salters clearly relishes the unexpected, whether it's slamming an SH-101 solo through a pair of guitar pedals (the Foxx Tone Machine and RMC Wizard Wah on "Raid the Radio") or dousing a run of notes on clavinet in the wash of a DigiTech Whammy pedal (at the opening of "You Don't Listen").

"I don't have a decent preamp or compressor," Salters admits, "so I'll also end up using my guitar pedals as outboard gear. The reverbed vocals on 'Raid the Radio' are going through an Electro-Harmonix Holy Grail, and you can hear an acoustic piano going through the Whammy on 'Little Lady'—that's actually one of four layers of keyboards on that. First I tracked it clean into Pro Tools, then ran it back out through the pedal into a Fender Princeton amp. Basically, I'll try anything until I get a sound I like."

Salters might have made all of *Dreamers* in his garage if he hadn't felt the need for live strings and horns, which he recorded at an out-of-the-way space in San Francisco called The Studio That Time Forgot. He demoed the string arrangements on a Roland Juno G (the only synth he owns that isn't from a bygone era)—in one instance even layering the demo underneath the string quartet, which creates the Mellotron effect in the latter-half of "La Nuit Des Ephémères." But the real standout is "Engine Kicking In," where the strings and horns mesh seamlessly with complex drum programming by Salters (slicing and dicing entirely in Pro Tools) that sounds remarkably human (see Web Clip 2).

"You have to be ready to go without sleep," Salters quips, "because it's very time-consuming. The drums on that took me almost a week. If you get into all the little ghost notes on the snare and variations on the hi-hat, and you want it to sound like someone is actually playing, then it's going to take awhile because all you've got is a mouse to work with. But the organic aspect of your drums will really start shining if you go deep enough. In that sense, it gets you much closer to the sound of an old-school record, and the strings and horns, with all the air around them, just enhance that feeling." em

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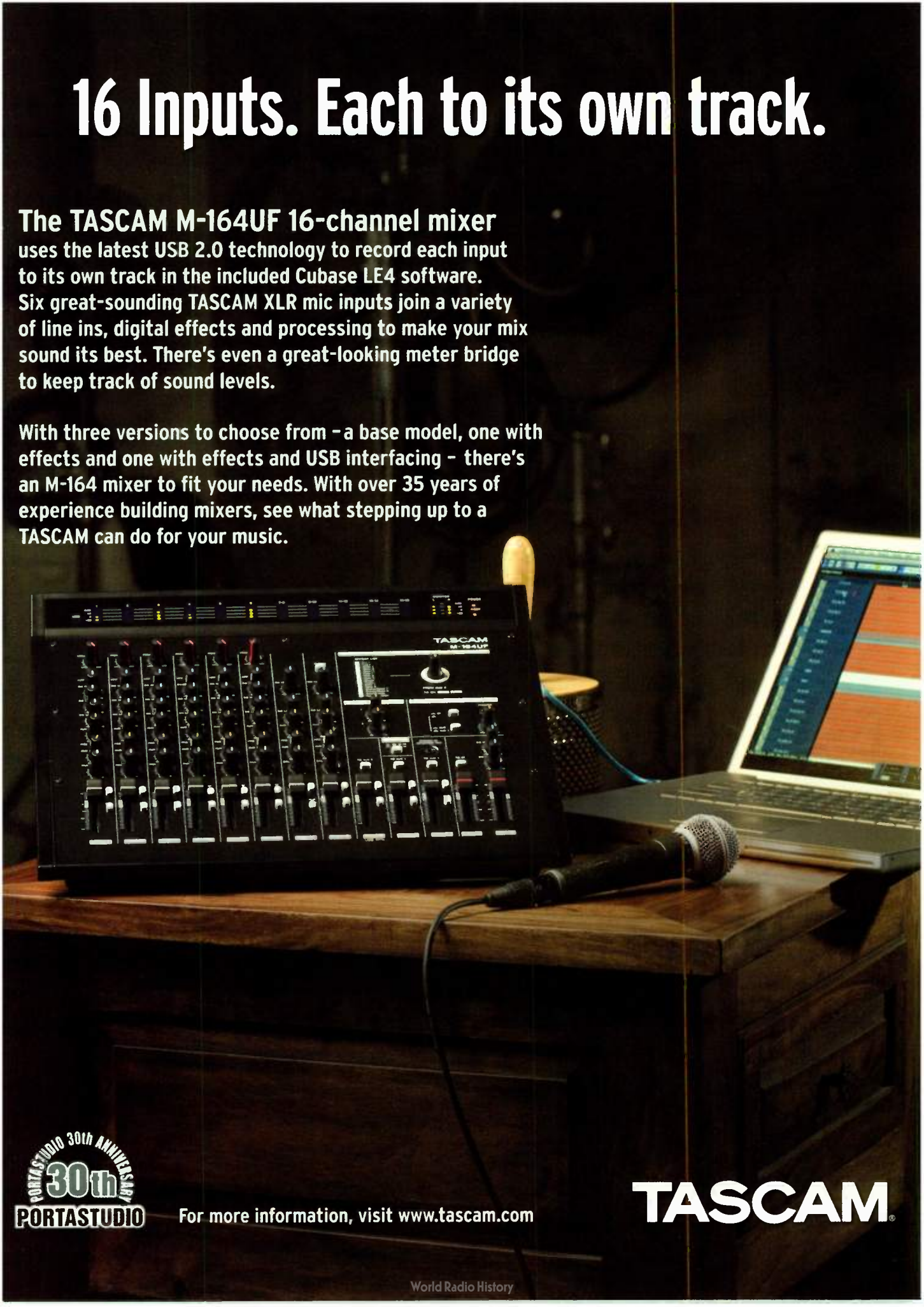

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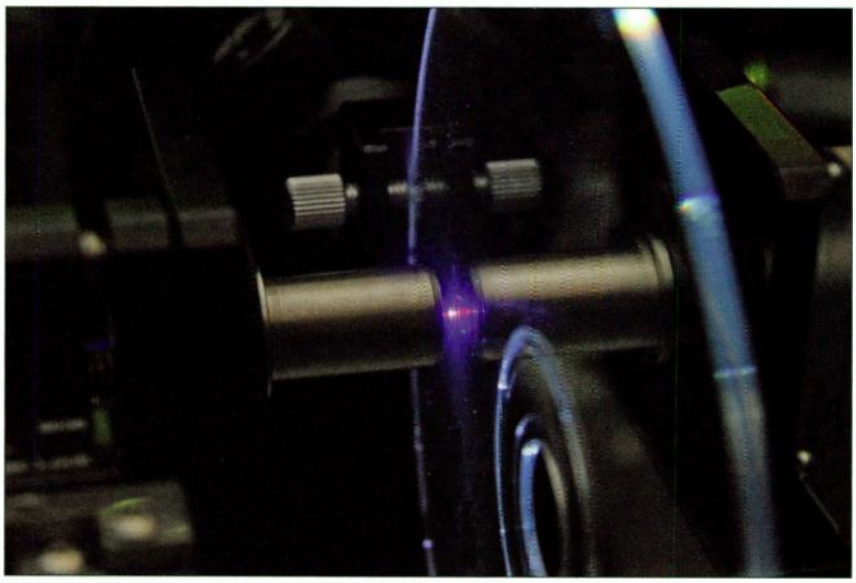

COURTESY GE RESEARCH

>> Overlapping blue lasers record holographic interference patterns in GE's new polycarbonate material, which has been fabricated into a disc the size of a CD, DVD or Blu-ray. This technology will allow capacities of 500 GB to 1 TB on such a disc.

Holostorage

GE makes a breakthrough in holographic data storage | By Scott Wilkinson

Electronic musicians and other media mavens have an insatiable appetite for data storage. Digital audio consumes more and more as sampling rates and bit depths increase, and high-definition video is a real data hog.

Hard disks and solid-state memory are getting cheaper all the time, but what about optical discs? The best we have at the moment is Blu-ray, with 25 GB per layer and a maximum of two layers. Even when more layers become feasible, the capacity of a Blu-ray disc will probably top out at 100 or 200 GB.

If recent experiments at General Electric Research (ge.com/research) are any indication, the next generation of optical discs will far exceed this limit. GE scientists have developed a new material that can store data holographically, leading to a capacity of 500 GB on a disc the size of a DVD or Blu-ray. This is equivalent to the capacity of 20 single-layer Blu-ray discs or more than 100 single-layer DVDs. Even better, the GE disc can be recorded and read by optical systems that are very similar to current read/write technologies.

"GE's breakthrough is a huge step toward bringing our next-generation holographic storage technology to the everyday consumer," says Brian Lawrence, who leads GE's holographic storage program. "Because GE's micro-holographic discs could essentially be read and played using similar optics to those found in standard Blu-ray players, our technology will pave the way for cost-effective, robust and reliable holographic drives that could be in every home. The day when you can store your entire high-definition movie collection on one disc and support high-resolution formats like 3-D television is closer than you think."

According to GE's Website, "The average company's data-storage needs triple every 18 to 24 months, and the worldwide data-storage capacity has grown from 283,000 terabytes in 2000 to nearly 5 million terabytes in 2005. Couple that with the average person's data-storage growth of 250 megabytes per year and the fact that 75 percent of all IT spending is for data storage, and you have one enormous data-storage challenge."

CDs, DVDs and Blu-rays store data as essentially two-dimensional "pits and lands" on the surface of the disc. Digital 1s and 0s are distinguished by a difference in reflectivity between the pits and lands. Higher storage capacities have been achieved by making the wavelength of the laser shorter, allowing smaller pits and lands and thus more data in a given area.

By contrast, holographic storage uses the entire volume of a specialized polycarbonate material that undergoes a change in refractive index when bombarded with two high-power lasers to write data as a holographic interference pattern. A low-power laser is used to detect the changes in refractive index and read the data represented in the pattern.

Even though data is stored within the entire volume of material instead of on the surface, the system still depends on differences in reflectivity. At the start of 2009, the GE material could be written with 405-nanometer (nm) blue lasers, and data areas exhibited a reflectivity of 0.005 to 0.01 percent, which is too low to enable the high capacities sought by the team. Six months later, the material has been enhanced to provide a reflectivity as high as 1 percent, which will allow capacities of 500 GB to 1 TB on a 5-inch optical disc.

GE intends to concentrate first on commercial archival applications, and such products could become available by 2012. After that, we could see consumer products such as disc players and computer drives, which would be a huge boon for media users of all types. EM

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CASIO

Inside a Game Soundtrack

How the music for 'Demigod' was

By Mike Levine

There are many similarities between composing music for films and for videogames, but there are also significant differences. Because game composers generally don't get the notoriety that their film-scoring peers do, the procedures involved in writing game music are less well-known.

To help shed some light on the process, I spoke with Howard Mostrom, staff composer at Gas Powered Games, a developer in Redmond, Wash. Mostrom has scored a number of games for Gas Powered, including the recently released *Demigod*, which will be the focus of this story.

Getting In the Game

Mostrom is a sax player who cut his teeth in the commercial music field working as a staff engineer at Triad Studios in Redmond. "We'd have a wide variety of clients," he says. "One day we'd do a TV spot, the next day recording orchestra for a WB [network] trailer, a rock band or whatever; it was all over the place. I would write, produce and perform music whenever there was a need. We also did some game stuff. And that was kind of my introduction into games."

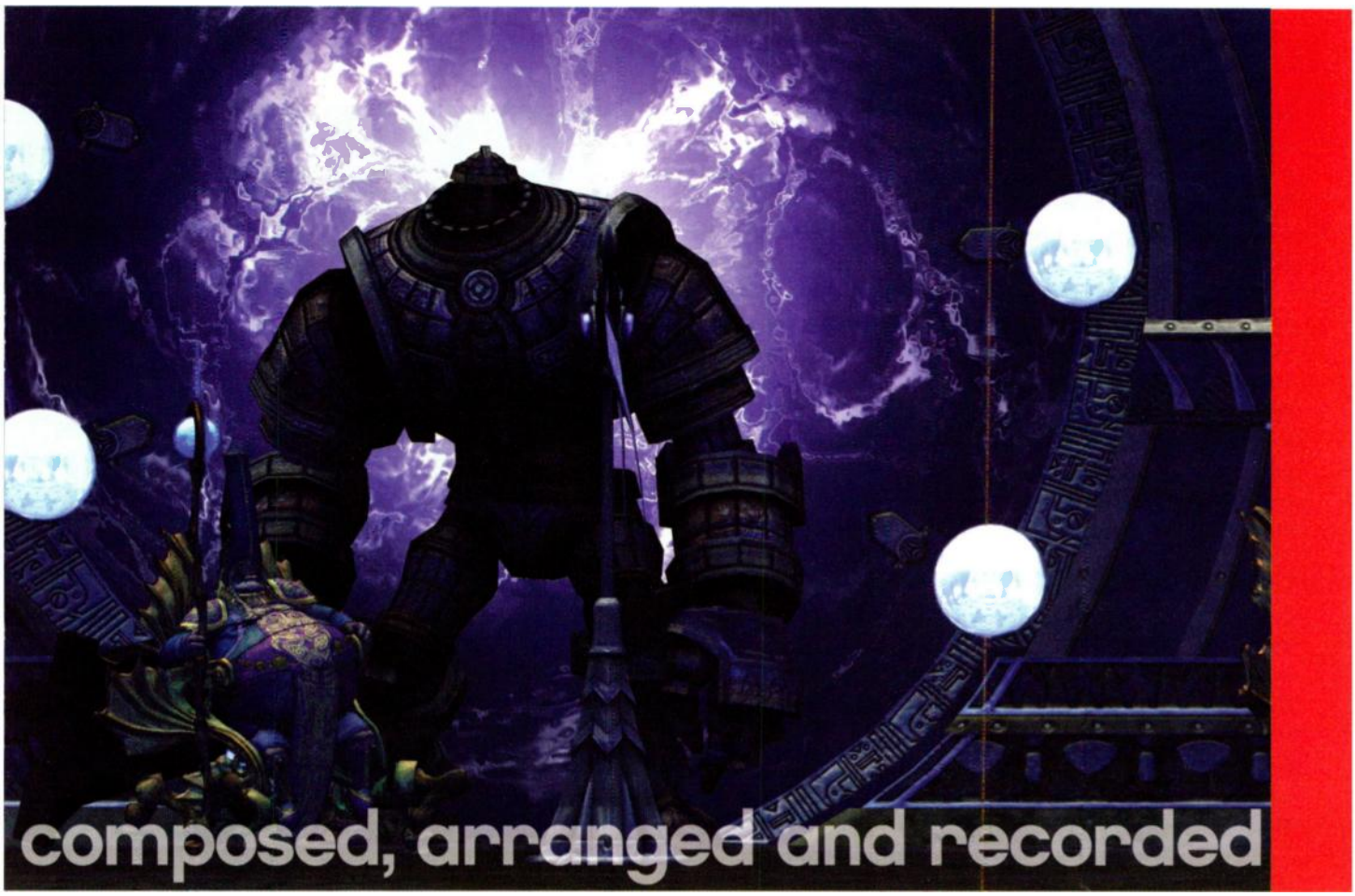
One of the Triad clients was Frank Bry (pronounced "Bree"), the audio director at Gas Powered Games. Bry, says Mostrom, "kind of coaxed me into game audio. When we worked together at the studio, he was always trying to get me into games because we worked really well together. I made the switch, and I've been loving it ever since."

Early Stages

Because Mostrom is on staff at Gas Powered Games, he's involved in projects at an earlier stage than a freelance composer might be. In the case of *Demigod*, a game in which the player (or players, as it's often a multiplayer online game) chooses to be one of the eight "Demigods" and fight it out for who will "join the Pantheon of true gods," Mostrom familiarized himself with the game—which was still a work in progress—by playing it.

"I started playing the game as much as I could so I could get the pacing and the overall feel of where things should go," he says. When I ask him if it is typical for a composer to play the game before writing the music, he replies, "I know it *should* be. I'm not sure how typical it is. I know some people do and some people don't. But for anyone who was integrated as I was into the project, it's a necessity."

After getting a sense for how the game worked, Mostrom began working on some of the sound-design elements. (Throughout the project, Mostrom, along with Bry, developed the numerous sound effects for the game.) "I would put sound effects in place, even if they were just temp," Mostrom recalls, "so that they



COURTESY GAS POWERED GAMES

could give me feedback for the game's soundscape and pacing. I like to do that before I write so I know what frequencies to work off of, and I'm not fighting with the sound effects as much."

At that juncture, the working version of *Demigod* not only had temp sound effects, but also a lot of temp graphics. At the point at which composers do much of their work on a game, the art elements are frequently still being hashed out. "You're working off of concepts, so it can be vague," he says. "Sometimes there will be different phases of the art in place. Usually, it's just like a block, or a very vague form of what the creature is. And it will be working in the game, but it doesn't have all of its art facets in place."

Getting Musical

The first decision for Mostrom was the score's musical direction. "Choosing an instrument palette was probably the toughest thing to do in the process," he explains. "If you listen to the music, there's not much brass at all, and there's no choir either."

Instead, Mostrom combined elements of orchestral and ethnic instrumentation (see Web Clip 1). "I didn't want it to sound like I was featuring any ethnicity," he says. "I wanted it to sound like it was another world. Instruments included Duduk and Tambura [wind instruments]. "A lot of the stringed instruments are ethnic, as well," he says. "It's kind of all blended together."

At first, Mostrom had to submit ideas to higher-ups at the company for approval. "Once they knew my general direction, they were very happy with where I was going with it." At that point, he was able to continue without needing constant sign-offs.

Although he eventually mixed the game music in Digidesign Pro Tools, much of the composing and arranging work was done in MOTU Digital Performer, and was often in the MIDI realm. His instruments included those in the Native Instruments Komplete bundle, as well as Submersible Music's DrumCore, among others. He used orchestral sounds from a range of collections, including those from EastWest and the Vienna Symphonic Library.

Mostrom, who was a music major in college, deftly handled the classical orchestration. Although there were some live recorded wind and percussion parts on the soundtrack, the strings were all programmed, yet sound very realistic (see Web Clip 2).

He played many of the MIDI wind instrument tracks using an Akai EWI. "It was really fun using it," he says, "because you can be so much more expressive than with a regular controller."

Mostrom also created custom instrument

sounds to help create the feeling of otherworldliness that the game required. "I did a lot of custom sound design work for the drums," he says. "I actually went out and recorded a bunch of crazy things: Axes hitting a huge garage door and stuff like that."

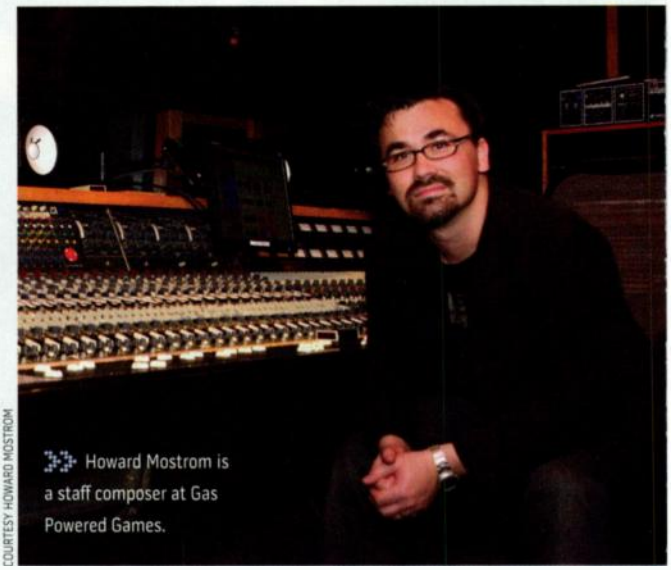
Many of the percussion sounds ended up being heavily layered (see **Web Clip 3**). "I wanted those big hits to be their own and not sound like anybody else's," he says. He would often pitch the samples down to make them sound even bigger. "I would treat the drum hits more like a sound effect. Some of the drum hits would have 30 different elements for the hits themselves."

Don't Annoy Me

One of the differences between game and film/TV composing is that in a game, a piece of music often repeats numerous times. Therefore, composing themes that won't become tiresome when heard over and over is an important consideration. "If the themes are too dumbed down and you can't get them out of your head," Mostrom says, "it gets kind of annoying."

So does that mean he is trying *not* to write memorable themes? Well, not quite. "For me, it's all about choosing your moments for where you want your themes to stick out," Mostrom says. "And then trying to make it so those themes aren't repeating so much that they get annoying. It's a very competitive game, and some players play it so much that if they're hearing the same theme over and over, they'll just turn it off."

In a videogame, different music gets triggered depending on what's happening in game play. "I wanted the overall match [the fight between Demigods] to have different intensity levels," Mostrom says. "I wanted it to have a climax at the end so it really fluctuates depending on what's going on.



COURTESY HOWARD MOSTROM

Howard Mostrom is a staff composer at Gas Powered Games.

"Because I didn't want there to be a lot of repetition, I have alternate mixes that I'm triggering, as well as different themes that I would use throughout," he continues. "But the overall pacing and shape to the match was important to me because it's not a game that really has a lot of downtime, you could say. It's pretty much nonstop action (see **Web Clip 4**)."

This Year's Mod

Demigod's audio engine comprises third-party software—referred to as "middleware"—called Fmod from Firelight Technologies. "Middleware is software," explains Mostrom, "that interacts with the game. So instead of writing a sound system in code from scratch, you buy this piece of software and you use that in the game. And it's very, very flexible." With Fmod, Mostrom says, he has "the ability to control every aspect of the audio of the game."

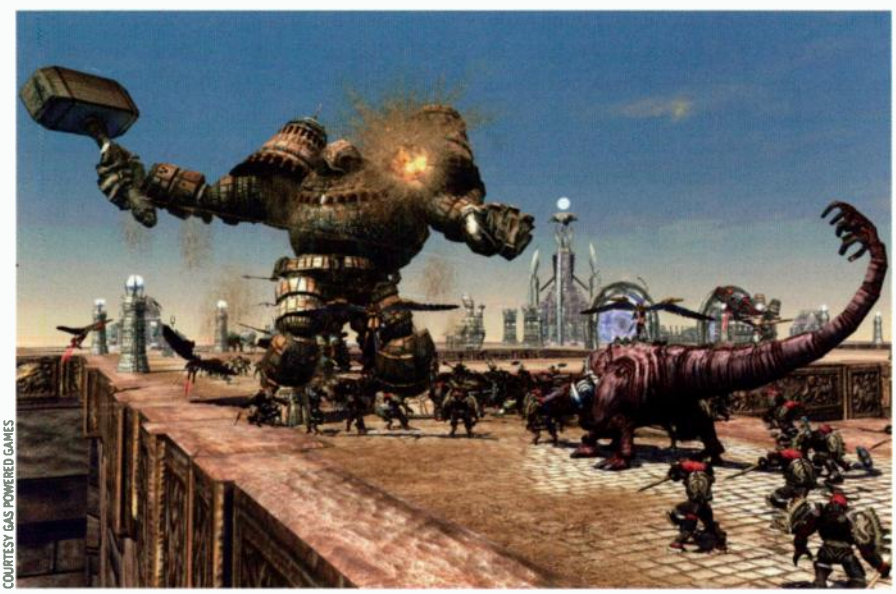
Among the many sound-related tasks that Fmod takes care of in *Demigod* are converting the audio to the correct format for output and triggering sound effects. "It can have multiple alternates, so we could have 20 different sounds that trigger and each time it's different," Mostrom adds. It also helped him set up the game for surround sound.

"I didn't do separate surround mixes," he explains, "as much as I defined how things would be treated in Fmod. So in Fmod I can determine, basically, 'Have the music play in the front, and have reverb from the music playing in the rears,' and things like that."

Keeping Track

Mostrom has a Pro Tools HD setup with a Digidesign D-Command mixer at his studio at Gas Powered Games. He used it for some of the live instrument tracking, but there is no live room so he could only do basic overdubs there that didn't require a dedicated recording space. As a result, some of the audio tracks were recorded elsewhere.

"I went to London Bridge Studios in Seattle and recorded percussion and drumset," he says.



COURTESY GAS POWERED GAMES

Most of the game action comprises fights between the various Demigods, and Mostrom's music ratchets up the intensity as the action progresses.

COURTESY GAS POWERED GAMES

With so much action in the game, sound effects are triggered constantly. One of the challenges was to write music that didn't conflict sonically with the effects.

"We did some really crazy stuff with the percussionists, like recording bowed broken cymbals and things like that. The room sounds really great. I was able to get really huge sounds there."

Mix and Match

After months of composing and tracking, it was time for the mixing phase, which Mostrom handled entirely separately. Mixing for a game has some additional considerations as compared to a traditional song mix.

For one thing, he had to do separate mixes for the *Demigod* soundtrack CD and for the music going into the game itself. For the latter, Mostrom had to be careful about the music competing, from a frequency standpoint, with the many and varied sound effects. "There are potentially thousands of sound effects playing at the same time," he points out. In the game mixes, "Some of the EQ is a little brighter on the top end because I wanted certain elements to pop out more and really cut through."

He also had to take into account the numerous speaker types that gamers might be using, a difficult factor to consider as there is no hard data available on end-users' speaker choices. "There seems to be a lot of people with really low-end PC speakers," Mostrom says, "but there are a lot of people who have 5.1 systems, as well."

To handle this wide variation, Mostrom has eight pairs of speakers in his studio that he switches between while mixing, ranging from a Genelec 5.1 system featuring 8030A monitors and a 7060A subwoofer to a "horrible-sounding" pair of 2-inch computer speakers. Of the latter, he says, "If you make it sound good on those, it will sound good anywhere."

Finish Lines

Mostrom says that composing and mixing the *Demigod* score took about six months to complete. "It's hard to say, precisely, because I was also busy with other audio responsibilities at the same time," he says. All told, he did about 100 minutes' worth of music as well as a lot of sound design and voice-over work.

Mostrom was surprised by how much response he received from his *Demigod* music. "When we put out the first trailer [the game composer frequently scores the trailer, whereas in a film it's usually handled by someone other than the main composer], I was actually shocked by how much e-mail I got in my personal inbox. I don't even know how they tracked me down."

As for whether he had any additional advice for readers about game composing, Mostrom says one of the most important traits to have is adaptability. "Be flexible for whatever the scene is, and make sure that the music fits the game." Imbuing the score with a distinctive sound is also important. Speaking of the *Demigod* music, he says, "I really wanted you to hear it and recognize, 'That's from this game.'" EM

Mike Levine is EM's executive editor and senior media producer and the host of the monthly Podcast, "EM Cast."

THE ELLIPTICAL WORLD OF IMOGEN HEAP

The studio-savvy singer/multi-instrumentalist records her new album in her childhood home.

By Geary Yelton

Imogen Heap may not be a household name, but that could soon change with her latest release. *Ellipse* (RCA, 2009) is a stunning album produced in the recording studio she recently built in her home outside of London. Just 31 years old, she is an accomplished singer, songwriter, producer and multi-instrumentalist who has been nominated for two Grammy Awards, one for Best New Artist in 2007 and another for Best Original Song Written for Film.

Two years ago, Heap bought and moved into the house she grew up in and announced that she would soon start recording her next album there. She began by refurbishing the home and converting what had been her childhood playroom into a recording space built to her specifications. She uploaded the first of 40 video clips to YouTube, detailing her struggles and accomplishments in roughly 10-minute installments. Devoted fans tuned in regularly to check on her progress. Heap expects these clips and some additional material to soon be released as a DVD detailing the making of *Ellipse*.

PHOTO: JEREMY COWART

Her following on the Web is especially impressive, with nearly 1 million followers on Twitter and more than 350,000 MySpace friends on the day of the album's release. As the songwriting and recording of *Ellipse* progressed, Heap often turned to her fans for advice, soliciting their opinions about whether she should include a song on the album, for example, or which version of a recording they preferred. She streamed live piano performances on Ustream.tv and invited anyone following her Tweets to collaborate on her official biography (see Web Clip 1). She even asked fans to submit samples of their artwork and photography, and then chose the most impressive to contribute to the album art and packaging. All of this group participation gave her audience a sense of ownership and personal investment in *Ellipse*.

I interviewed Heap on the same day that she performed at TEDGlobal (July 21 to 24, 2009; Oxford, England), a gathering of movers and shakers in the worlds of technology, entertainment and design.

PHOTO: JEREMY COWART

One of Imogen Heap's goals in converting her childhood playroom into her personal studio was to avoid the sterile environment she perceives in most other recording studios.

Did recording *Ellipse* take longer than you had expected?

Actually, no, it didn't. What took me longer was getting in the studio; actually doing the work was less time. Deciding to move into the old family house was quite a big financial decision, and then building the studio took eight months. The plan was to take one month, and I naïvely underestimated the time it would take to build the studio because I project-managed it myself and just had a few people working on it.

What can you tell me about your studio?

Well, you walk into the room and you'll notice that it's curved. I live in an elliptical-shaped house—hence, the title of the album. [The studio] was my old playroom. I didn't want you to feel like you're in a sterile environment, which I feel when I go to a lot of studios. [That] always baffles me because music is not about clean lines and flashy silver things. Music, when you get creating it, is kind of messy and a little bit higgledy-piggledy.

There's a massive [Digidesign] ICON desk when you walk in that kind of dominates the room, which I don't tend to use very often, but I do like sitting at it because it makes me feel like a professional. On the left of the ICON desk is my Perspex piano, a clear plastic piano I built for my live shows. That's what [holds my computer display], my Nord and my little looping thing. On the right is the vocal booth, with multiple instruments.

Did you consider other mixing desks before you decided on the ICON?

I've used unautomated mixing desks, a Neve, like when I was 17; that's what I learned from. I've never actually considered having a desk again until I went into Jed Lieber's studio in the Sunset Marquis, and he sold me his ICON. I just fell in love because I thought it was so beautiful. It had all these beautiful sparkly lights, and it looks really nice, aesthetically. So I just thought, "If I'm going have a desk, it would be that because I want to keep it digital." The whole record is all digital, even the mastering. I don't really want to affect the sound using a desk. I like knowing that what goes in, that's what it is and it stays there.

I [record] a lot of acoustic instruments and just process them as audio [data] in [Digidesign] Pro Tools, and manually toy with them like Play-Doh. I don't use much outboard gear at all. You go into some studios and you see racks and racks and racks of gear, but all I actually use is my Avalon 737 for any singular mic stuff, and then if I'm miking up anything else, I use my Focusrite Liquid Channel.

I don't like reverb very much; I much prefer delay. You put loads of reverb on everything and it just fills up the track. I can't get the detail that I like when I'm working with so many tracks. I just try to get the sound right before I put things like reverb on. As far as vocals go, I'll process it if I want really long, backward, messed-up vocals. Then I might use a bit of reverb, but I generally use Waves [SuperTap] 6-Tap delay. I'll make a copy of the lead vocals, and then go in and manually take out every single sibilant, even single *t* and *s* and *d* and anything that will sound like a delay when you hear it in the mix. It basically does what a reverb does, but it has more space and more structure to it.

What microphone did you use for vocals on *Ellipse*?

Always the same one: a Neumann TLM 103.

That's the same mic you've used for your previous albums.

Yeah, exactly. The last three records—the Frou Frou one, this one and *Speak for Yourself*—all the same mic. And then the same preamp/compressor, the Avalon 737.

What synthesizers do you use?

I don't have that many. I've got my trusty Ensoniq TS-12, which occasionally I might fire up. I've got a little Nord Rack 3 and the [Korg] Electribe MX.

Any software instruments?

I've got Massive and all the Native Instruments stuff, and I like [Apple] Sculpture very much. I like things you can really bend and shift. I love just processing [audio] in Pro Tools. When I really start having fun with sculpting sounds, it's about 6 or 7 or 8 in the evening and everything's settled down and nobody's bugging me. I'll continue through the night if I'm having a good session. I really don't remember how I do things because I get so lost in it. It's like, if you're driving home from somewhere and you just know your way so well that you get to your front door, you've got the keys in your hand, and you're going, "Oh, how did I get here?" That's what it's like.

You're absorbed in the process.

Yeah, I totally don't remember the process. [I know I must] have some kind of process, but I'm so involved in it that I couldn't really relay it to you.

My friend Justine [Pearsall] has filmed me on and off over the last couple of years, as I've been building the studio and as I've been making the record. That's not going to be available [on DVD] until November because she's only just started editing it and she's got 350 hours of footage. That won't be like a super-techie, what-plug-ins-type thing. It's more like the building block of an album—[from the] seed of a song to building a studio to then finally staying up late at night and picking out all kinds of random sounds.

[She filmed me] going through the house and recording everything from the tap dripping to the banisters, and using that as my starting point. There are a few songs, like "Canvas," where I really started on the computer, building sounds inside Logic, but then mostly I start with something that's acoustic, like the hang drum or the mbira or the piano or banisters or the light ceiling panels in my studio—which make a very nice timpani sound—and wine glasses at the beginning of "First Train Home." And then it's really the way that I process them, edit them and mess with them [that] makes it sound not like where it started.

How do you go about writing songs?

With this album, I took a different approach. The last album, I built sounds in [Steinberg] Nuendo and in Pro Tools, and then wrote the song over the tops of tracks I'd built with loops and things. But with this one, I made a conscious decision to write the song first, in the old-school way, because I didn't want to get into the issue of writing a backing track and then spend two months trying to crowbar in a melody over the top of this thing I built that I loved, only to just take it all apart anyway to fit a vocal in. I really tried to get the song first, which is very different from the way I've been working for the last eight years. I wanted to just go and write the songs, which is what I did.

I went on a little writing trip, and I wrote most of the songs. The songwriting, in the beginning spark of the idea, that's really exciting because you're inspired to get in the studio and get working on it. But then there's the slog of writing the lyrics. Sometimes they don't come easy. I wanted to do that side of it in a beautiful place so I wasn't frustrated. I did all the writing away so I could just get to the fun bit of making the music when I got into the house.

That's why you've been traveling so much?

Yeah, well, partly because I needed to get my head emotionally around the fact that I was going to take on the family house. I didn't have a workable studio at the time, and I've never actually traveled, outside of work, on my own and gone to places I've actually wanted to visit. I've done touring—lots of Japan, lots of America, lots of Europe—but it's just the same routes that you go on. I just thought, well, I was 29, and I really haven't been anywhere on my own and just traveled.

Accompanied by a few parts played by half-a-dozen other musicians, Heap wrote, sang, played, programmed, edited, produced and engineered all 13 songs on her third solo album, *Ellipse*.

It worked out great because I was in quite remote places. I'd have to figure out the language because I was sometimes in the middle of nowhere in, like, the countryside of Japan and trying to find food that I recognized from the local shop. In a way, that was great because it took the pressure off of me just sitting in a room every day, saying, "Right, I've got to write a song." It was like, "Right, I've got to go down and get some breakfast; how am I going to do that?" (To hear Heap explain the inspiration behind the song "Bad Body Double," see Web Clip 2.)

The instrumentation on the song "Earth" is absolutely stunning. It sounds as if all the instruments, including the bass and drums, are your voice.

They are indeed, yes. I could have gone the route of really processing the vocals to make them not sound like vocals, but I just thought that defeats the object. I spent quite a bit of time trying to get the best sound out of my voice. And I spent *ages* editing them together. There's over 100 tracks of vocals on it, and it was absolutely completely doing my head in, just hearing the sound of my own voice for, like, three weeks nonstop. But I really had this vision, what I wanted it to be. It was really good fun to write that one.

I wrote the song called "Aha!" and I needed something to go after it because I felt like, in the running order of the album, it wasn't really working. So, I thought, I'm going to listen to "Aha!" and then I'm going to the first instrument that feels like it wants to be on the record. I went straight to the mbira and I played a chord. It started off being something *completely* different, but I knew I always wanted it to be vocals because I needed an a capella [track] on the record. So the vocals were written really, really quickly, and I went back and kind of perfected the sound of them.

That's where the [sings] "Da-da, da-da-dah" comes in. I wrote that in the shower. And then I was going, "Da-da, da-da-dah" as I was getting dressed and running down to the studio. A lot of really good ideas happen in the shower. I think it's the only time where, because you can't be in your studio, you're not distracted by all the other millions of things

you have to do. Long showers—not very good for the environment, but good for creativity.

You orchestrate your vocals in more intricate detail than any singer I've ever heard. Are you more influenced by your knowledge of orchestration than by other singers?

I was never really interested in vocal music as a kid. I learned the piano, so I learned harmony [and] counterpoint through that. And then I learned the clarinet [and] cello, so I understood different parts of the orchestra and how they work with each other. And I studied composition and arrangement, not to a great degree, not even to degree level, just for the love of it.

I like creating something with lots of personality, lots of depth and lots of things that you can hear over and over—things that you don't notice at all until the 50th listen, that most would say, "Why are you still in the studio working on that damn song?" I want to get the detail that you couldn't possibly take in on your first, second, third, fourth listen. And I'll probably forget that they're there. In five years' time, I'll go, "Ooh, that's a nice sound! How did I do that? I forgot about that." I want to be able to experience music like that, because otherwise people just go, "Okay, I've got that." Well, I would, anyway. I like music I can listen to over and over again. I don't listen to my own music, but that's the kind of stuff I like, with details and lots and lots of parts going on, but at the same time trying to keep a focus.

That's why I always record the vocals first, try to put as little music behind me as possible, record the vocals so they sound amazing, do all the harmonies and make all the parts, even before there's any music—just the bare bones. Then, and only then, start creating the music around it. I spent about a month just doing vocals. I didn't do anything else. I did 10 tracks of vocals when I got into the studio. It was absolutely maddening, but I just wanted to get it out of the way because for me, that's not really the fun bit. The fun bit is making sounds and just getting lost in the audio.

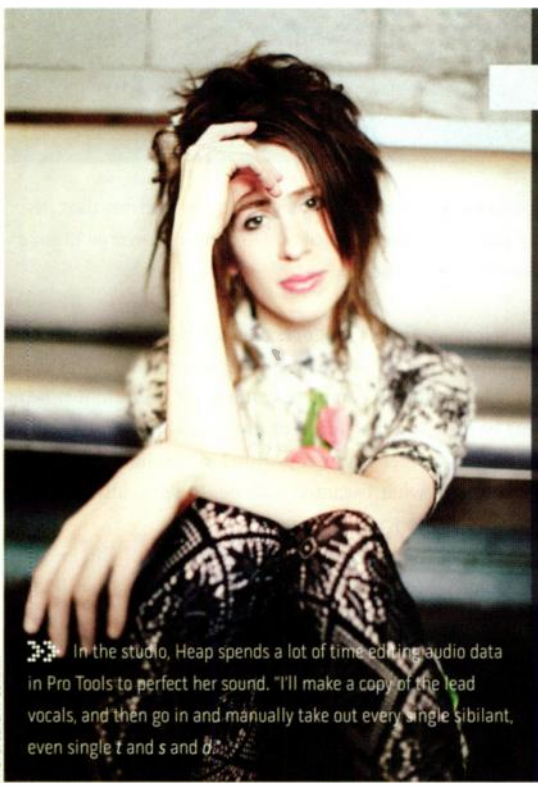


PHOTO: JEREMY COWART

In the studio, Heap spends a lot of time editing audio data in Pro Tools to perfect her sound. "I'll make a copy of the lead vocals, and then go in and manually take out every single sibilant, even single *t* and *s* and *d*..."

Career Highlights

After recording her critically acclaimed debut solo album, *i Megaphone* (Almo Sounds, 1998), Imogen Heap teamed with producer Guy Sigsworth (Björk, Madonna, Britney Spears) to form Frou Frou and release the duo's only album, *Details* (MCA, 2002). Her second solo album, *Speak for Yourself* (Megaphonic, 2005), reached Number One in *Billboard*'s Top Heatseekers chart and number two in *Billboard*'s Top Electronic Albums chart, and yielded a string of popular singles such as "Headlock," "Goodnight and Go" and the Vocoder-infused "Hide and Seek." Her songs have appeared in movies such as *Garden State* and *The Chronicles of Narnia: The Lion, the Witch and the Wardrobe*, and on TV shows that include *The O.C.* and *Heroes*. Heap is also in demand as a guest performer, singing with Jeff Beck on the DVD *Performing This Week: Live at Ronnie Scott's*, for example, and on IAMX's album, *Kingdom of Welcome Addiction*.

It sounds like you have a very strong sense of balance on *Ellipse*.

Every song is in a different key, and there's six major, six minor. One of them is improvised; six of them were written on the writing trip; six of them were written in the house. Tempos range from 54 to 177 [bpm] because I wanted to get a full sweep of tempos. It's also trying to find spaces to be creative within because if I just had an empty canvas, it's absolutely impossible to do anything. Where do you start? What color do you use? What kind of brush do you use? It's overwhelming. So I needed to make myself have these bookends to work within, so I'd choose, like, I have to have this kind of tempo and this kind of key, and this type of major-minor whatever because I haven't got it on the record. And sometimes that would be what decided the tempo or key of the beginning of an idea.

With all the work you've been doing wrapping up *Ellipse*, have you found time to get involved with any film projects lately?

No, I haven't had any time at all to do anything. I've had very little sleep. I came straight out of the record, and I got thrown into the album art [and] press images. The only thing I'm doing tomorrow and the day after is TED[Global], and I'm so looking forward to just taking in what's happened for the last two years because it's been absolutely nonstop. The kind of weight and the pressure of this album, waking up every morning, going, "Oh, I've got to do the record," you know. It still hasn't really sunk in. I still feel like I wake up in the morning, and go, "Oh! No, I don't have to do it." But I've got to do everything else. So I'm really looking forward to these next few days.

Congratulations on making it this far.

Thank you. I didn't think I was going to for a while there. EM

Senior editor Geary Yelton has been writing for EM *since its first issue in 1985. He lives in North Carolina and commutes downstairs.*

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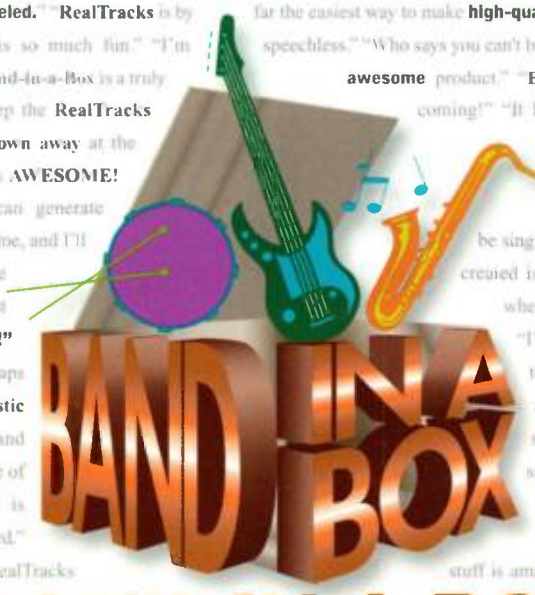

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"Wow, I'm learning tunes fast with help of your Audio Chord Wizard." "It finds the exact chords to the song... perfectly." "Wow!" **"I am blown away!** The jazz-swing RealTracks stuff is amazing." **"Awesome."** "Is this cool or what?" "I'm in seventh heaven" "You won't regret it (and if you do, there's the **30 day money back guarantee**)." "I never thought I'd see the day this was possible." "I know it's been said before, but you guys are **incredible.**" "This is **gonna set the world on fire!**" "I'm so stoked about how good everything sounds I can hardly stand it." "This is just killer." "Amazing, simply amazing." "[RealDrums] is really awesome sounding. Good work!" "Many kudos all around." "You never cease to **amaze** me. You got it." **"Wow and Double Wow."** "The **RealTracks** and **RealDrums** sound awesome." "Long live PG Music!" "Mind bending." "I am frankly amazed at most of the styles." "I am absolutely delighted with this new BIAB 2009 for Mac. ***Kudos*** to you and your team!" "First time I did a song with **Band-in-a-Box**. I couldn't **believe it!**" "I use it in the classroom and also in creating music in my studio. It is a fantastic piece of music software to own. I am greatly impressed." "I use **Band-in-a-Box** regularly. It has improved my musical talents by far and I enjoy it very much. Thanks to all who have helped make this program so **fantastic!!!**" "I am very impressed with your fantastic ***improvisational*** program." "It's a great ***educational tool***." "This is the most powerful, cost effective, user friendly music software I have seen." "BIAB is my best **learning tool.**" "J'ai la premiere version de **Band-in-a-Box** et *j'aime beaucoup.*" "A truly **great product!**" "It's just incredible! I am a practicing jazz musician and was absolutely dazzled by your soloist feature." 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Beefing UP THE BEAT

Tools and techniques to make your drum tracks sound huge in the mix

By Michael Cooper

Much has already been written about mixing drums, so rather than restating the basics, I'll share with you tips and advice that you're less likely to have read about elsewhere. The focus will be on mixing real trap drums, but much of what I'll cover applies equally to sampled drums.

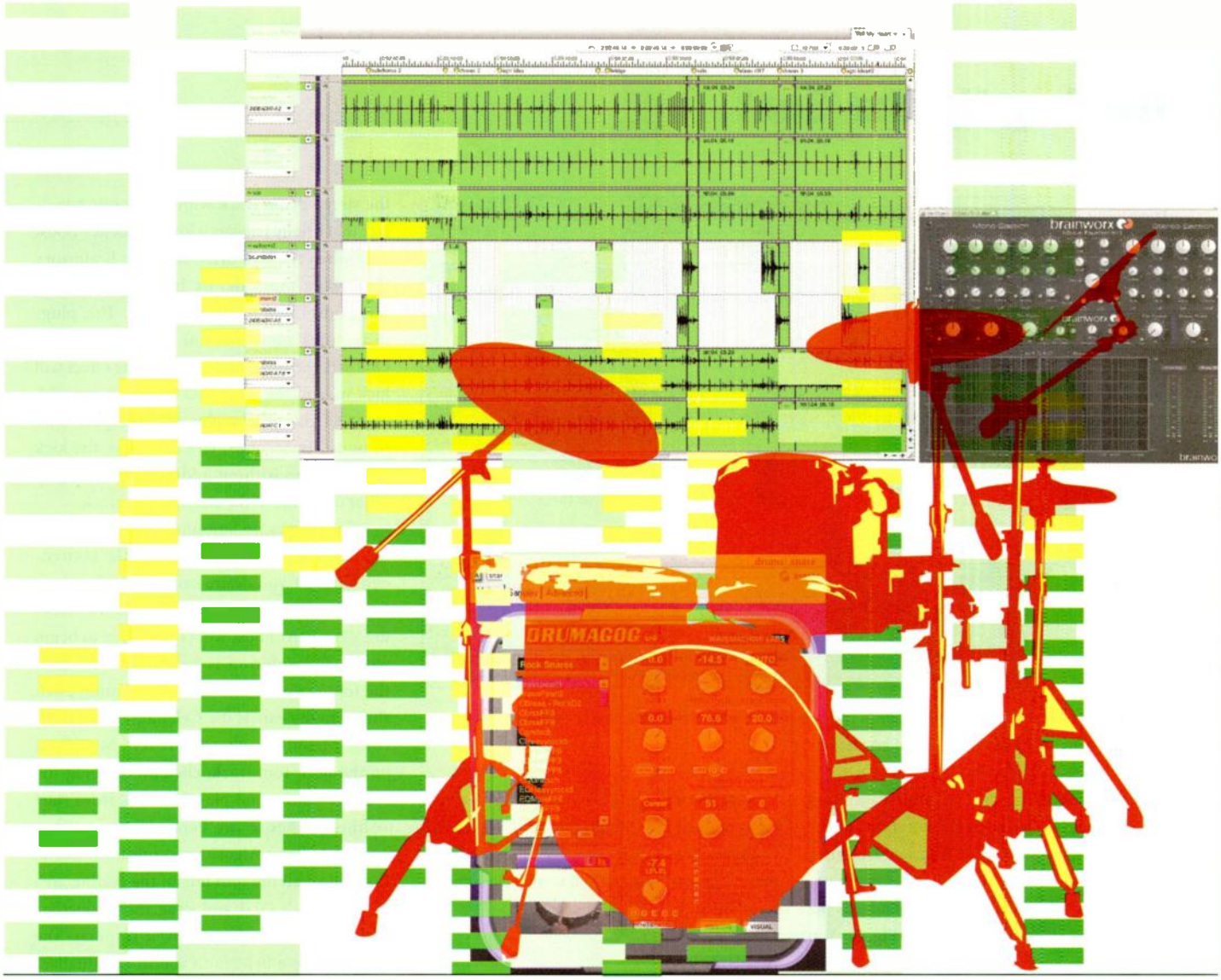
There are many strategies to mixing (and tracking) drums. I'll mostly talk about my own approach, in which the close mics in a multi-miked drum kit are used as the foundation of the overall sound, and overhead and room mics are added to achieve the proper balance of cymbals, inter-mic bleed and room ambience. Most of the discussion will assume the kick, snare and individual toms were each recorded to a separate track prior to mixdown. I'll include DAW techniques everyone can use and reveal my favorite plug-ins for processing the kit. I use these plug-ins on my Mac, but all of them also run on Windows and are available in a variety of formats.

Ground Control to Major Toms

While a healthy amount of drum bleed between the close mics on various kit pieces is key to preventing the drums from sounding like a canned drum machine, too much bleed can lead to unfocused and thin-sounding kick and snare drums. The first places to reduce excessive bleed are the tom tracks. In most arrangements, the toms are the least often played parts of the kit, so it makes no sense to have their mics always "open."

Some engineers use expanders or noise gates to reduce bleed of other kit pieces into tom mics, but I never use them for that purpose. Expanders don't provide enough attenuation for my tastes, and gates can chatter or cut off the attack and natural sustain of toms. The best solution is to simply erase the tom tracks along your DAW's timeline wherever they're not playing (see Fig. 1). The occurrence of tom hits in a track can be readily ascertained by slightly zooming in on the track's waveform(s). Delete the track from its start up to the beginning of the first tom fill. Then resume deleting after the tom fill ends—after the toms have stopped ringing—all the way up to the start of the next fill. For the most transparent results, resume deleting immediately before a quarter-note beat; a kick or snare hit there will mask the sound of the tom track "shutting off." Continue deleting to the end of the track wherever a tom fill isn't happening. Do this for every tom track.

Make sure that all tracks for individual kit pieces are phase-aligned with each other. For example, if you've miked the kick drum both inside and outside the shell with separate mics (each recorded to a separate track), make sure that the peaks of their waveforms line up perfectly along the timeline. If they don't, slide the outside mic's track forward (earlier) in time so that the two tracks align. (You may also need to flip the outside mic's phase 180 degrees.) For all kit pieces recorded with mul-



tiple mics to separate tracks (kick drum miked both inside and outside the shell, and toms and snare miked from the top and bottom), use the track for the side of the drum that was closest to the stick (or beater) hit as your phase reference and slide its companion track earlier in time to align the phase of the two tracks. Doing so will increase the bottom-end punch for each phase-aligned kit piece, sometimes dramatically.

Don't forget to also align the phase of the overhead and room mics to the close mics on the kit. My mixing style often entails EQ'ing out some of the kick drum bleed on these tracks during mixdown so that their sonic focus is on the snare and toms (and, for the overheads, on the cymbals). For this reason, I align the overhead and room tracks to peaks on the snare track, not to those on the kick track.

At this point, your trap drums should already be sounding more powerful and focused. Let's take the whole kit to the next level by adding some processing.

Trap Attack

Many engineers use separate compressors on kick, snare and toms to increase their attack. For each track, the basic approach is to adjust the compressor's attack time so that compression doesn't begin until just after the stick (or beater) hit has passed. (Because every type of compressor has different attack characteristics, you'll need to set the attack time by ear.) When the compressor kicks in immediately after the stick hit, the level of the ringing drum shell is lowered. This has the effect of emphasizing the attack portion of the drum hits. A compression ratio of around 5:1 usually gets the job done. A fast release time of about 20 ms will usually return levels to unity gain before the next hit occurs, thereby preserving its attack.

Another approach is to send each drum to a stereo subgroup—with each drum panned in the stereo field as desired—and apply compression to the subgroup instead of to individual tracks. The compressed subgroup is typically then blended in with the original, uncompressed tracks. Combining the density of a compressed subgroup with the unfettered dynamics of the unprocessed original tracks better preserves the fundamental drum sounds.

All that said, applying compression on close-miked drum tracks seems like a backward approach to me, and I never do it. I prefer boosting the attack (isn't that the goal?) rather than squashing the sustain to put a point on kick, snare and toms. The Sonnox (sonnoxplugins.com) Transient Modulator, SPL (spl-usa.com) Transient Designer and Waves (waves.com) TransX plug-ins all provide controls that boost (or attenuate) the attack portion of a sound and are awesome processors for drums (see **Web Clips 1a and 1b**). Transient Modulator and TransX offer far greater control over the attack envelope as compared to Transient

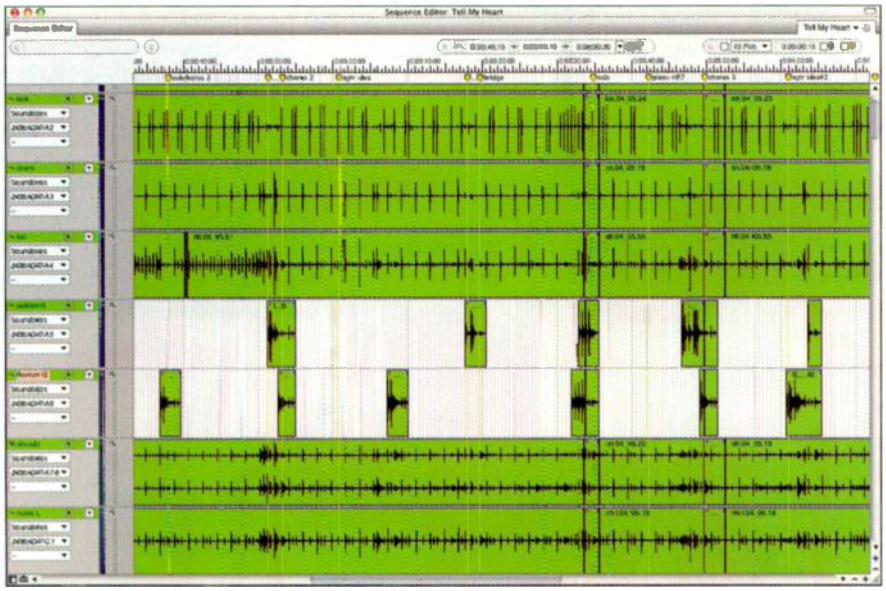


FIG. 1: The tom tracks (in the middle of this screenshot) were erased wherever the toms were not sounding, eliminating bleed from other kit pieces.

Designer, allowing you to adjust—among other things—how much (in duration) of the transient will be processed. Transient Designer, however, offers something the other two plug-ins don't: an additional control that adjusts the sustain portion of the sound (see Fig. 2). You can use it to lower the level of a snare drum's decay, for example, to reduce hi-hat bleed. Or radically increase the sustain to give the snare drum a trashy, more ambient sound.

Although I avoid using compressors on close mics for traps, I love using them on tracks for room (and sometimes overhead) mics. Used in this way, certain compressor plug-ins can make a tame drum kit sound downright raucous. On room mics, set the attack time to roughly 30 microseconds to clamp down quickly on the drums. The release time should be set to about 100 ms to have the compressor recover quickly after each strike. With a high ratio of around 10:1 and between 10 and 20 dB of gain reduction applied during peaks, the compressor will dramatically boost the room ambience and make the drums pump. Blending this processed track in with those for the close-miked traps is a recipe for explosive drum sounds. The Waves API 2500 stereo compressor (see Fig. 3 and Web Clip 2) is my favorite compressor plug-in for room mics—it sounds as good as any analog compressor I've heard for this application. The PSP Audioware (pspaudioware.com) VintageWarmer2 and Xenon limiter, Softube (softube.se) FET Compressor and Waves SSL G-Master Buss Compressor are other compressor and limiter plug-ins that sound awesome on room mics.

Set the Tone

Many other articles have detailed how to apply EQ to drums, so I'll just mention a few special considerations. There are applications where precise digital filters excel, but EQ'ing traps, in particular, is not one of them. You want analog character and color. The Waves Studio Classics bundle provides dynamite models of vintage analog hardware equalizers that are the best I've heard yet for beefing up drums. In particular, the Waves SSL G Equalizer has an extended low end that's great for creating punchy kick tracks. For a raspy snare drum with rocking midrange definition, the Waves API 550A 3-band parametric can't be beat. And the Waves VEQ4 (which models the vintage Neve 1081) excels at shaping round, colorful toms.

As a mix engineer, I sometimes receive projects in which the drum kit was recorded using only two mics set up as a stereo spaced pair. In this case, the kick drum usually doesn't have enough low-end punch. Boosting the low end with a static equalizer (one that is continuously active) can make the entire kit sound rumbly or boomy. The solution is to process the stereo drum track with a dynamic equalizer that briefly triggers a low-frequency boost only when the kick drum hits. The Brainworx (brainworx-music.de) bx_boom plug-in is an idiot-proof tool for this purpose. This plug-in requires adjustment of just two controls: One sets the threshold at which the effect will kick in, and the other sets the frequency (32, 48 or 64 Hz) for the plug-in's bandpass filter to boost. In seconds, you can make the kick drum thump without adding rumble to any other elements of the stereo drum track.

Sometimes no amount of low-frequency EQ boost will give the floor tom the bottom-end thunder you desire because the low-bass frequencies just weren't captured while tracking. (You can't boost what's not there to begin with!) The solution is to shift the pitch of the tom downward. The best-sounding pitch shifter to my ears is the Celemony (celemony.com) Melodyne plug-in. Insert Melodyne on the floor tom track, click on the plug-in's Transfer button and play the track from start to finish. Choose the Percussive algorithm from Melodyne's Algorithm drop-down menu. Then select all the tom hits in the editing area of Melodyne's GUI and drag them together three or more semitones lower in pitch. The result will be a behemoth sound no equalizer can produce. It usually sounds best to use just the pitch-shifted track instead of blending the processed and unprocessed sounds together. Blending them together can cause wobbly

FIG. 2: The SPL Transient Designer plug-in offers independent controls for boosting or attenuating the levels of the attack and sustain portions of a sound.

sounding beat frequencies to occur.

If EQ and pitch shifting don't perk up dull, lifeless drums, try adding some harmonics and analog-modeled saturation. The SPL TwinTube plug-in offers controls for adding harmonics in one of four selectable frequency bands. This is a fantastic way to bring out the beater slap on a kick track or the stick hit on snare and toms. Another TwinTube control lets you independently dial in the amount of tube-type saturation you desire, adding girth and richness to thin, sterile traps.

On the other hand, you may prefer to make your drum tracks sound like they were recorded to tape. The DUY (duystore.com) DaD Tape plug-in does a wonderful job emulating the tape-compression effects of analog multitracks from different eras. Simply select the type of tape machine you want the plug-in to emulate, and adjust your input and output levels.

Image Conscious

The panning of each of your drum tracks has a major impact on how focused and powerful your drums will sound. Don't automatically assume that overheads should be hard-panned left and right. Pay special attention to how panning toms and overhead mics in combination affect the imaging of each trap drum. For example, a slight pan adjustment on a rack-tom track or moving one side of a stereo overhead track slightly toward center can improve the pinpoint imaging of the rack tom considerably.

Mid/side (M/S) techniques—commonly used in mastering—are also a boon to improving the imaging and clarity of room mics while mixing. M/S processing separates a stereo track into discrete mid and side channels. The mid channel comprises everything that is common to both channels of the stereo track (mono signal). The side channel contains all elements of the stereo track that are dissimilar in the left and right channels, such as room ambience.

If you hard-pan room mics left and right to make the ambience sound wider, their tracks may have too much low-frequency content (from the kick and toms) spread across the stereo field. This can compromise the clarity and imaging of the entire kit. Rather than just thin out the room mics by cutting low frequencies, the Brainworx bx_digital plug-in (see Fig. 4) offers a more elegant solution. Among its many features, this stereo and mid/side equal-

FIG. 3: The Waves API 2500 Compressor plug-in models the compression curve and character of the critically acclaimed API 2500 hardware bus compressor.

FIG. 4: In addition to conventional M/S equalization facilities, the Brainworx bx_digital plug-in provides a one-knob solution for centering bass frequencies in the stereo field.

izer includes separate mid and side output-level controls and an innovative Mono Maker control. The Mono Maker control essentially converts stereo bass content to mono by simultaneously applying shelving cut to bass frequencies in the side channel and boosting the same frequencies in the mid channel. Set the Mono Maker control to between 60 and 100 Hz to center the low-bass content of drums in the room mics. (The higher frequencies that largely give directional cues will remain in the drums' panned positions.) You can also cut the mid channel's output level and boost the side channel's output level in the plug-in. That will reduce the level of the kick and snare, raise the volume of cymbals and room ambience, and widen the stereo image (see **Web Clip 3**). Brainworx's bx_control and bx_hybrid plug-ins also each include a Mono Maker and stereo-width controls.

Of course, adding reverb to snare and tom tracks is also key to giving your drums extra dimension, especially if the kit was recorded

in a small room. Much has been written about this in other articles, so I won't rehash it here. For general guidelines on adding reverb to trap drums, see the **Online Bonus Material** at emusician.com/bonus_material.

I'm Slammed

When time is of the essence, the Waves Maserati DRM Drum Slammer plug-in provides macro-parameter controls for lickety-split, idiot-proof operation. DRM sounds especially flattering on kick and snare, adding low-end thump to the former and transient-enhancing definition to both.

If you're still not happy with any of your drum sounds after applying all of the tools and techniques mentioned above, you can use drum-replacement software such as WaveMachine Labs (drumagog.com) Drumagog to replace real drum sounds with samples. Drumagog can be quickly set up to trigger a multisampled snare, for example, every time your real snare is struck (see Fig. 5). The triggered snare sounds can either replace your tired acoustic snare drum completely or be layered with it to create a beefier tone.

FIG. 5: WaveMachine Labs' Drumagog can be used to replace or beef up lifeless drum sounds with multisampled drums.

The Pro and Platinum versions of Drumagog have yet another trick up their sleeve. Say you're mixing a song in the key of E and your kick drum lacks bottom-end thump and sustain. Drumagog's Synth section can make your kick track briefly trigger a sine wave along with a multisampled kick. Tune the sine wave to 41 Hz (a low-E tone). Every time the kick hits, the 41Hz sine wave will voice—at the volume and for the duration you specify—the root of the song's key and add deep sustain to the layered kick drum sound. With Drumagog, you're never stuck with the drum sounds you've tracked. The sky is the limit.

Michael Cooper recently had one of his songs cut on Dave Russell's new project, produced by Jerry Cupit for Cupit Records. Hear Cooper's drum sounds at www.myspace.com/michaelcooper recording.

Screencast Audio Editing

Use your DAW to fix those breaths, slurs and flubs | By Eli Krantzberg

Screencasting programs such as ScreenFlow for the Mac and Camtasia for Windows let you simultaneously capture screen movement and audio. Here's how to use your DAW to edit and polish your screencast's audio track. I'll cite Digidesign Pro Tools 8 in my examples, but most DAWs offer similar techniques (see "Step-by-Step Instructions" below).

Separated at Birth

It's often difficult to use a pop filter when creating screencasts. It can block the view of your monitor and obscure any printed text you're using. A windscreen is less visually obtrusive, but it will provide only limited protection from plosives. Fortunately, you can correct those and other inherent problems after the fact.

The first step is to temporarily export your captured material and import it in your favorite DAW. Low-resolution QuickTime output will do fine visually, but make sure to export the audio at full fidelity. In your DAW, extract the audio to its own track and, below it, create four extra audio tracks for your edits (see Fig. 1).

Because screencasts primarily contain dialog, the imported audio will serve as your main dialog track. Insert a low-cut filter with a moderate slope and set it to about 100 Hz. This should catch most of the plosives that have sneaked past your windscreen. Nasty peaks will most likely have to be dealt with at the waveform level or with fades.

Heavy Breathing

Reducing the level of breaths on the main dialog track greatly enhances the overall quality of the finished product. The goal is to reduce, not eliminate. Set the level of the first extra audio track to between -12 and -16 dB, depending on how heavy a breather you are. Use your DAW's selection tools to select and cut the breaths on the main track and then drag them to the track below. They will instantly be reduced by 12 to 16 dB.

It may be necessary to add slight fades before and after the cuts to smooth the transitions. Pro Tools' Separate Region function (Command + E on the Mac; Control + E on Windows), along with the Smart Tool, lets you switch between these tasks with minimal wasted movement. It's easy to uninten-

STEP-BY-STEP INSTRUCTIONS

STEP 1: Import the QuickTime video into your DAW. Place the audio on its own track with a low-cut filter set to about 100 Hz.

STEP 2: Set up additional tracks for breaths (lowered between -12 and -16 dB), room tone, music and dialog replacement.

STEP 3: Select and split the breaths and music contained in the main track onto their own tracks.

tionally cut off the ends of words, but with experience you'll learn to visually recognize when consonants are fully completed and to establish your selections efficiently.

Trim the Fat

Tightening up dead spaces and eliminating hesitations or unintentional mouth noises in the original performance will improve the overall presentation. These are easy to select and delete, but you may need to tighten up the holes that are created. Because screencasts generally don't contain mouth movement on camera, slipping dialog out of sync by small amounts usually won't cause a problem. But when shifting any of the dialog in time, check it against the video to make sure it is consistent with the visuals.

Tightening up loose dialog in this fashion may lead to small but extremely conspicuous amounts of dead space. To fill this sonic vacuum, record some room tone with your mic set in its original position and the signal path settings exactly as they were. Create a recording of 30 seconds or so, place it on the second spare track and loop it for the duration of the session. Trimming a second or two from the head and tail of the room tone file will help avoid any glitches at the loop point.

Use that track as "sonic glue" where empty spaces occur on the main track.

Separate Tables, Please

Use the same select and cut techniques you used for the breaths to isolate any music or other non-dialog audio. Place this on the third additional track to allow for sonic manipulation to match the EQ and levels with the rest of the content.

Set the record path on the final spare track to match your original recording. Use that track for the dialog replacement that will inevitably be necessary. Match the record levels as closely as possible with your original recordings, and re-record or punch in bits that are not salvageable or that you want to perform better. You can move those fixes to the main dialog track, but treating them separately allows for more accurate sonic matching.

Once all the audio has been separated and edited, the next stage is sweetening. Use EQ, compression and limiting as necessary to even everything out for a balanced mix. Finally, bounce all tracks of edited audio to a stereo file and bring it into your screen-capture program. Mute the original audio track and output your final version.

FIG. 1: Add polish to the mix by splitting the breaths and music from the dialog and placing them on their own tracks for individual processing.

Eli Krantzberg is a Montreal-based bandleader, musician and sound engineer. You can find his training DVDs at www.groove3.com.

STEP 4: Add fades where the breaths are split from the main track and loop a short recording of room tone throughout the session.

STEP 5: After sweetening the tracks with EQ, compression and mix-bus limiting, bounce the final edit down to a stereo file.

STEP 6: Bring the edited audio track back into your screen-capture software, mute the original and output your final version.

Four delay lines are swept by the LFO in Propellerhead Reason's Subtractor synth to process a sampled string patch in the NN-19 sampler.

Clean Sweep

Create moving filter effects with short delay lines | By Len Sasso

The familiar sweeping effect known as flanging takes its name from the way in which it was originally produced using a pair of analog tape machines. The machines were fed the same input, and the signals from their playback heads were mixed and recorded while someone pressed lightly on the flange of the feed reel of one machine to slow it down relative to the other. That caused an increasing delay between the two output signals. Before the delay became recognizable, the pressure was switched to the feed reel of the other machine, decreasing and eventually reversing the relative delay.

In the digital world, it's a simple matter to re-create this setup with a pair of delay lines in place of tape recorders. That's an amusing exercise, but you can accomplish the same thing more easily with a single feedback delay plug-in inserted as a 100-percent-wet send effect. Map a convenient MIDI controller such as a mod wheel to the delay time and set it to range from 1 to 10 ms or so. Feed it white noise and listen to the effect of moving the mod wheel: Increasing the delay sweeps down and decreasing it sweeps up. Feedback is the other critical setting; more feedback yields a more pronounced effect (see **Web Clip 1**).

Taking Your Time

Using a delay line makes what's going on in flanging transparent. A delay of a few milliseconds shifts the sine wave components that make up a sound (pitched or otherwise) from a fraction of a cycle to several cycles. Some frequencies cancel and others are reinforced in a comb-filter-like pattern in which the combs are harmonically spaced (see **Web Clip 2**).

If you use a sine wave or something similar like an electric piano patch and slowly move the mod wheel, then you'll hear the level rise, indicating reinforcement, and fall, indicating cancellation.

To calculate the lowest cancellation frequency in Hertz, divide the delay time in milliseconds into 500. Even multiples of that frequency are reinforced while odd multiples are canceled. Conversely, to calculate the frequency-cancelling delay time, divide the frequency into 500.

Sweeping the delay time by hand has a number of advantages: You control the range and can vary it with each sweep, you're not limited to a constant speed and, instead of sweeping, you can use the controller to lock in different timbres created by the aforementioned reinforcements and cancellations. But for two-fisted playing, use your DAW's automation options, use a delay with a built-in LFO or use a MIDI LFO output from a soft synth to modulate the delay time. Use an envelope or envelope follower instead of an LFO for a triggered sweep (see **Web Clips 3** through **5**).

As an alternative, try modulating the delay times in discrete steps, for example with a step sequencer like Propellerhead Reason's Matrix module that sends out control signals. With high feedback, the resonances at the reinforcement frequencies produce an audible pitch sequence.

More Is Less

You can thicken the flanging effect by using a multitap delay or multiple delays in parallel. To retain the sweeping sound, modulate each of the delay times from the same source. You have several alternatives for setting the delay ranges. To best preserve harmonic relationships, use the same ratio of maximum to minimum delay time for each delay. For example, if you set one delay to range from 1 to 2 ms, then you might set others to range from 2 to 4 ms, 3 to 6 ms and so on. Try panning half of the delays hard-left and the other half hard-right. Then swap the maximum and minimum settings for the delays on one side so that one side sweeps up while the other sweeps down (see the figure above and **Web Clip 6**).

Flanging is typically applied to a single track to produce its signature sweeping sound. For an alternative that is not as pronounced and works well on mixes and submixes, try low feedback and different non-proportional modulation ranges for each tap. That masks the sweeping while adding depth and motion to the sound. Long sweeps of four or eight measures often work better in this case (see **Web Clip 7**). EM

Len Sasso is an associate editor of EM. *For an earful, visit his Website, swiftkick.com.*

There's Power in Numbers

Yamaha's MSR-Series powered loudspeakers, to be exact... MSR100, MSR250, and MSR400. Subtle, professional appearance, high-performance drivers, stand mount/floor wedge capability, fly points, and unparalleled audio reproduction are shared by all. See each model's specifics detailed to the right. So, regardless of how critical your application, there's definitely an MSR model to more than meet the challenge. Stop by your favorite Yamaha Live Sound dealer for a wallet-opening demonstration.

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YAMAHA

COURTESY JIM DONIO

Jim Donio is the president of the National Association of Recording Merchandisers.

Q&A: Jim Donio

The president of a major record-industry trade group assesses the future

Many musicians are unfamiliar with NARM—the National Association of Recording Merchandisers—and its annual convention. Yet that organization and event are responsible for launching many well-known acts. I know from personal experience: I was playing guitar with Hanson at the 1997 convention, which was our major-label debut. It was our opportunity to show trade members exactly what the group would soon sell to millions of teenagers worldwide.

I recently had a chance to speak with NARM president Jim Donio, who's been with the organization for 21 years. He offered his insights into the complex and ever-changing record business and the role of the organization.

By Ravi

What is NARM's mission?

We provide an intersection between content, commerce and consumers. NARM has changed significantly over the past decade due to how people discover and acquire music, and determine whether they will own it forever or just experience it. Therefore, dynamics shifted because of who is involved in the association. We're unique in that as members, we have labels, distributors and others on the content/supplier side, but now the commercial community has really diversified. There is everything from independent stores and small entrepreneurs—online and offline—up to iTunes, Amazon, Best Buy and AT&T.

It's a very different NARM than when you performed here. In fact, iTunes, Amazon, Verizon and Nokia are on the board. If you even suggested to me six months ago that we'd have two mobile companies on our board—the sheer speed of change in the industry has made that happen quickly and now such companies have a strong voice in how content is delivered to consumers. The core mission remains the same: to support all aspects in the industry to advance the business of music, and to have music be a viable, fruitful and profitable enterprise, however consumers pay for it. Of course, the unspoken goal is to make sure that people pay for music and that there is a way to help the industry monetize the various experiences that people can have with music.

Nielson/SoundScan reports digital album sales up 26 percent this year, yet 77 percent of albums purchased are physical—perhaps the operative words are "albums" and "purchased." Moreover, vinyl is making a comeback, having grown 90 percent in 2008 over 2007, and being up 65 percent in the first seven weeks of 2009 over 2008 with an estimated 2.8 million sales in 2009. Will it

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WAVE DISTRIBUTION

ever just be downloads or streams?

Some people will want physical product; others will want virtual, digital or online purchasing experiences. Some will just want the experience, and the monetizing will be [based] around that in terms of concerts, merchandise and so forth. I don't see the industry vertically with physical stores at the bottom and "cloud experiences" on top, but horizontally where any consumer at any time might choose a physical manifestation, digital manifestation, a combination or just an experience—one where they would not actually own anything, but be willing to pay for that experience or something around it. That can be a stream, social media platform, music video model that can be monetized through views or advertising around those views and so on.

At the core, it circles back to the art form itself. For some, it goes back to wanting to own that music and support the artist or the art itself. They may just love a genre irrespective of the artist—jazz, soundtracks, et cetera. Will there ever be a point without a physical manifestation of music? I don't think so. Look at the resurgence in vinyl. It won't replace the CD in numbers, but when you look at the growth and how companies like Best Buy are going to experiment with vinyl, there will always be a segment interested in collectability. Even if they never listen to vinyl, it may be bundled with a digital album card or CD and they'll play the CD, but love having the vinyl as the collectable manifestation of the art. It doesn't feel "disposable"; music isn't homogenous, it's not a one-size-fits-all product. Now with all these choices—physical, digital, mobile, streaming, subscription, a la carte and any combination—why would we suggest that people will want to do 100 percent of one thing?

So the CD is here to stay?

I think for many years to come, but we'll reach a point where digital and mobile probably begin to eclipse it. There will be a balancing out, and for certain artists and genres, you will want the totality of the music. Jazz, soundtracks and cast recordings are very tied to the experience of a performance, so I don't see an elimination of CDs for certain genres. Looking at the tween generation—a manifestation of TV shows, movies, brands, dolls and whatever goes along with that—I think you may see more unique bundling. What constitutes an album? There may be a new name or modeling where you get a physical manifestation of the music—perhaps you purchase a T-shirt or doll and get a digital album card or CD as part of that bundle. It will be a choice you make as opposed to CDs being the only choice.

What about the future of digital distribution? Should artists place most of their efforts there? Does TuneCore replace the need for conventional distribution?

Equate it to the economy and your 401k: Be diversified. This isn't a time to do one thing in one way. Maximize a whole range of opportunities, and, depending on the artist, project, timing, et cetera, allocate the appropriate resources and marketing approach. Even more so than physical, which has certain limitations, digital distribution is only limited to the innovation and ingenuity of young people already tinkering with something we haven't even contemplated and by our ability to execute it. However, country music, for example, is a huge genre that is nowhere near the digital and mobile numbers of some others, yet it speaks to a large consumer demographic that's still pretty attached to the physical manifestation and probably will not migrate from that as quickly. There are many models that will need to be tested over this period, and the consumer is in the driver's seat.

So much choice, but I think there will always be physical stores and distribution. We're a culture that likes to shop, and you can see the cultural and economic role these businesses play. People love being immersed in that experience and need to be reminded what that has meant and does mean to them. Artists need to come out and speak about that too. Online, you can't replicate being in a store or the parking lot with a new, established or superstar act that is communing with fans, taking pictures and signing autographs. Balance is important. There are enormous benefits and opportunities in digital and mobile music. On the other hand, I'd be concerned if I thought we were going to eliminate human contact from the experience and not have fans commune with likeminded fans for those who want to.

Equate it to the economy and your 401k: Be diversified. This isn't a time to do one thing in one way. Maximize a whole range of opportunities... and allocate the appropriate resources and marketing approach.

Is piracy an increasing problem despite the industry's efforts to fight it? Is the current economy making it worse?

It's a huge problem and has impacted the industry for a decade. Those losses cannot be replaced, which is really unfortunate for the artists, songwriters, retailers and everyone in the channel. It's stealing—no different than going into a store and saying you like a pair of shoes so you just take them. Someone made those shoes and their livelihood depends on it. It's no different from writing a song or making music and depending on it. The industry confronts this in myriad ways; consumer education and legal approaches have been taken. The lawsuits against consumers were spun negatively, but they did provide a heightened sense of awareness for millions of people who were probably never touched by it.

In terms of shaking people to understand a very difficult point, it wasn't an easy step for labels, and they'd probably be the first to say it wasn't perfectly executed. Certainly, the current economic impact of having less discretionary funds might cause people who never thought about burning a CD, or downloading illegally, to move to that behavior.

Speaking of record labels, do they have a future?

Both independents and majors bring resources that are absolutely necessary and will continue to evolve. While a major-label engagement may not be necessary or appropriate for every artist, the role of all types of labels is important in that there is financial, creative and strategic support that is very valuable in discovering, nurturing, defining and developing careers. em

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Ravi (www.HeyRavi.com), former guitarist of three-time Grammy-nominee Hanson, tours the country performing, lecturing and conducting guitar clinics. He writes for several magazines, and Simon & Schuster published his tour journal.

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Apple

Logic Studio (Mac)

A must-have upgrade to Apple's DAW and performance software bundle

>>PRODUCT SUMMARY

DAW
$499, $199 upgrade

PROS: Elegant implementation of elastic audio with Flex Time. Improved performance with MainStage. Amp Designer and Pedalboard plug-ins offer hugely improved guitar amp and effects modeling. Large amount and variety of content. Great price.

CONS: Built-in browser navigation can be cumbersome.

FEATURES	1	2	3	4	5
EASE OF USE	1	2	3	4	5
QUALITY OF SOUNDS	1	2	3	4	5
VALUE	1	2	3	4	5

apple.com

>> In our reviews, prices are MAP or street unless otherwise noted.

ONLINE BONUS MATERIAL

GUIDE TO EM METERS

5 Amazing; as good as it gets with current technology
4 Clearly above average; very desirable
3 Good; meets expectations
2 Somewhat disappointing but usable
1 Unacceptably flawed

By Len Sasso

The release of Logic Studio a couple of years ago heralded a complete graphic redesign of Logic; updated instrument and effects plug-ins; tons of new content; bundled applications MainStage, Soundtrack Pro and WaveBurner; and a variety of enhancements. (Read my review in the January 2008 issue of *EM* at emusician.com.) And all that came with a dramatic 50-percent price reduction.

Although the changes in the new Logic Studio are not quite as dramatic, it does sport the same low price tag and offers a significantly upgraded feature set for Logic Pro 9 and MainStage 2, along with improved Soundtrack Pro 3 integration and graphic automation in WaveBurner 3. Furthermore, the content is expanded, and guitar players will rightfully be jumping out of their seats to get hold of the new Amp Designer and Pedalboard (stompbox) plug-ins.

In the main part of this review I'll concentrate on the features and content in Logic Pro 9. *EM* executive editor Mike Levine will cover Amp Designer and Pedalboard in the accompanying sidebar. "Modeling Paradise," on page 46. You'll find coverage of MainStage 2's new features in the **Online Bonus Material** at emusician.com/bonus_material.

Before starting, several things are worth noting. PPC Macs are no longer officially supported, although some users have reported successful installs on those machines. Mac OS 10.5 (Leopard) is required. Due to compatibility issues, Final Cut Pro users will need Version 7 for compatibility with Soundtrack Pro 3. For this review, I installed the full Logic Studio package on a 2.66GHz quad-core Mac Pro with 8 GB of RAM.

It's a Stretch

Flex Time is probably the most far-reaching addition to Logic Pro 9. This transient-detection, time-stretching technology enables a variety of features, including the Flex Tool, audio quantizing, drum-track slicing, Speed Fades, Convert to Sampler Track and Varispeed.

Varispeed, the simplest of the Flex Time–informed processes, is similar to the classic tape-recorder function of the same name. It increases or decreases the tempo of the entire project (not just Flex-enabled tracks), and, of

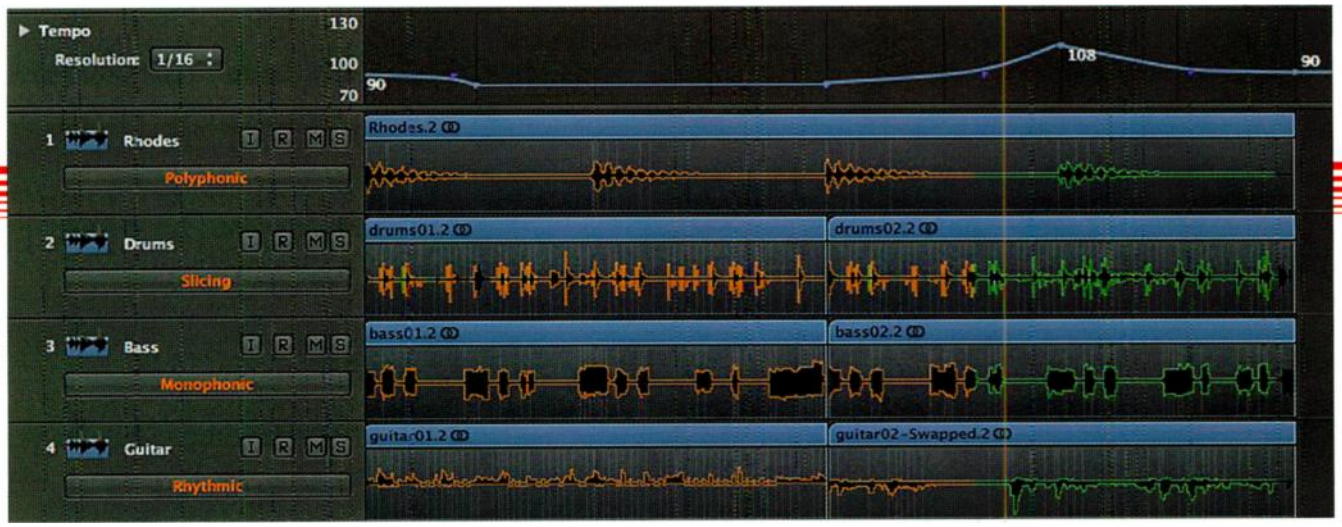

FIG. 1: Different Flex Time modes allow Logic Pro 9 to time-stretch almost any kind of audio.

course, it follows the project's tempo changes. The range is half- to double-speed, entered as either a percentage or a target tempo. Modes include speed alone; speed and pitch (like tape Varispeed); and speed, pitch and MIDI (where non-drum MIDI tracks are transposed in semitones). Although the results are less than stunning, Varispeed is quite useful for recording parts at a more comfortable tempo or for auditioning a tempo shift. Logic 9's new Speed Fades use Varispeed to create turntable-style speed-ups and slow-downs (see Web Clip 1).

Make Mine Elastic

Like other elastic audio implementations, Flex Time starts by analyzing audio files for transients—sudden audio spikes indicative of audio event onsets (think drum hits). Logic analyzes all audio regions on a track the first time you enable that track for Flex Time editing, which you do by turning Flex view on and selecting a Flex mode for the track. Three modes—Rhythmic, Monophonic and Polyphonic—indicate the material they're best suited for. Three more modes refer to specialized processes: Slicing for typical REX-style beat slicing, Tempophone for special effects similar to granular processing and Speed for tape-speed manipulation.

Audio quantizing is another dead-simple Flex Time application. Once Flex mode is enabled for a track, you select one or more regions, ensure Flex is enabled in the Region Parameters box and choose a quantize setting. Logic then automatically quantizes the appropriate transients. If you group several tracks and enable phase-locked editing for the group, then Logic will maintain the phase relation between parallel regions.

To move audio events manually, convert transients to Flex markers and then drag them in either direction to move the corresponding event, stretching the audio on one side and compressing it on the other. If you click on a transient marker in the lower-half of the waveform display, it creates Flex markers for it and the two adjacent transient markers—a nice touch. That lets you easily move an event with minimal disturbance to the rest of the audio file. You add, delete and move transient markers in Logic's Sample editor, and you can place Flex markers anywhere in an audio clip (not just at transient markers).

Creating and moving Flex markers is great for adapting the feel of one clip to another. But for adapting audio to tempo curves, you simply need to enable Flex Time and choose the mode best suited for the material (see Fig. 1 and Web Clip 2).

Flex Time also figures in two new drum-oriented features: Slice to New Sampler Track and Drum Replacer. The former creates an EXS24 sampler instrument from the slices defined by transient markers, simultaneously builds a MIDI clip to play the slices with their original order and timing, and installs the instrument and clip on a parallel MIDI track. Drum Replacer creates a parallel (or replacement) MIDI clip based on

FIG. 2: You can temporarily disable Quick Swipe comping to make edits to your takes such as the Flex Markers shown here.

Modeling Paradise

With the addition of the Amp Designer and Pedalboard plug-ins, Logic 9 has taken a quantum leap from earlier versions in its guitar-amp-and-effects modeling capabilities. The sounds produced by these plug-ins can hold their own with any third-party modeling software.

Amp Designer offers a simple interface featuring a graphic depiction of the selected amp head in the foreground, and the chosen speaker cabinet and mic model in the back on the right (see Fig. A). Pull-down menus let you swap out heads, cabinets and mic models; and by clicking on the EQ or reverb labels at the top of the heads, you can switch between many different EQ and reverb types. All of the models have tremolo.

Although the amps are all labeled "Logic," the graphics make it obvious which ones are being emulated. You get several different Fender types, as well as Marshalls, Mesa/Boogie, Vox, Orange and Hiwatt amps, and even a Sears Silvertone model. Unlike the actual amps, all of Logic's models have the same set of controls. This detracts a bit from the realism of the simulations, but it makes the comparison of tones between amps much easier, especially because the controls retain their settings when you switch models.

Overall, I was impressed with the sound of the models and the responsiveness of their knobs. I was particularly surprised at how natural the clean sounds were (see **Web Clip 5**). It's been my experience that amp modelers tend to do better at emulating distorted tones than clean ones, but Amp Designer does both well.

Kudos also for the ribbon mic emulation, which sounds round and warm. The mic model that you choose—you also get a dynamic and a condenser—can be moved around to any position within three or four virtual "inches" from the front of one of myriad modeled speaker cabinets. I wish the mic could move a greater distance back in the "room."

The Pedalboard plug-in offers 30 excellent-sounding modeled stompboxes. Choose your pedals from the collection on the right side of your "pedalboard" (see Fig. B), and then drag them to the main section to make them active. You can easily change the order.

Some of the pedals appear to be modeled from specific stompboxes (the Fuzz Face, for instance) whereas others are hybrids. You get a ton of fuzz and overdrive pedals, and lots of modulation effects like chorus, flanger, rotating speaker and ring modulator. You also get several delay models, a spring reverb pedal and a couple of wah pedals. I was a tad disappointed that there was only one compressor and no octave divider. But, as a whole, the collection is comprehensive and the pedals sound great (see **Web Clip 6**).

Routing is a breeze in Pedalboard. You can split the signal and send one feed to one line of effects (A) and the other to the opposite side (B). If you pan the outputs on the Mixer pedal, you can create huge stereo effects. You can even divide the signal by an adjustable frequency range, thereby sending only certain frequencies to the A or B effects.

Amp Designer and Pedalboard rock, literally and figuratively, and give Logic users a guitar-sound toolkit of prodigious proportions. Apple also announced Logic 9 support of the new Apogee Gio ($395), a USB audio interface and foot controller that comes premapped for the two new plug-ins.

—Mike Levine

FIG. B: Pedalboard features 30 stompbox models and flexible routing, providing you with a huge range of effects choices.

FIG. A: Amp designer offers a wide array of amp and speaker cabinet models, and lets you position one of three mic models.

an audio file's transient markers and uses it to trigger a drum sample of your choosing. It is intended for individual drum stems, but you can get some interesting special effects with drum mixes or even non-drum clips.

Second Take

Moving individual tracks and track setups (plug-ins, sends, automation and so on) between songs is much easier in Logic Pro 9 and is accomplished completely within the destination project. Locate the source project in the browser, double-click to reveal its content, select the track(s) and setup items to import, and choose to add to or replace existing content. Tempo and groove conflicts are easily solved with Flex Time.

Quick Swipe comping has been improved to let you temporarily turn it off for normal editing of takes and then turn it back on to continue creating and editing comps. For example, you can use the Flex Tool to adjust a few notes within a take and then instantly return to comp building (see Fig. 2). I did have some stability problems with Quick Swipe comping as was my experience with Logic Pro 8, but when it works it's great.

The much-requested bounce-in-place feature lets you quickly render effects and software instruments to audio. It works on a region or track basis and deposits the new audio file on an adjacent track, automatically muting the original. Bounce-in-place differs from track freezing in that it produces an easily edited audio file at the project settings rather than a hidden 32-bit freeze file.

You no longer have to use Markers to take notes about your project. The Media area of the toolbar now sports a new Notes button, which reveals a list area with tabs for track and project notes.

Sounds Abound

You'll find two important additions to Logic Pro's audio content: the *Voices* Jam Pack and a collection of 450 warped IR presets for Space Designer. *Voices* offers a broad range of vocal clips and effects from classical choirs to Bollywood to vocal percussion (see **Web Clip 3**). The warped Space Designer presets range from drones to moving textures to analog-circuit emulations (see **Web Clip 4**).

Like many manufacturers, Apple no longer provides fully printed documentation. You get a small Exploring Logic pamphlet and a PDF, an abbreviated but handy Mac Help version of the manual and the full 1,336-page manual in PDF format (downloadable from Apple's Logic Pro Support page).

Logic Studio is an excellent upgrade to all parts of this reasonably priced bundle. The new features in Logic Pro 9 and MainStage 2 are especially impressive, but the other applications in the bundle are also improved. If you're a Logic Studio user, the upgrade is a no-brainer. If you're a potential new user, you're bound to find useful features to augment your current rig.

Len Sasso is an associate editor of EM. *For an earful, visit his Website, swiftkick.com.*

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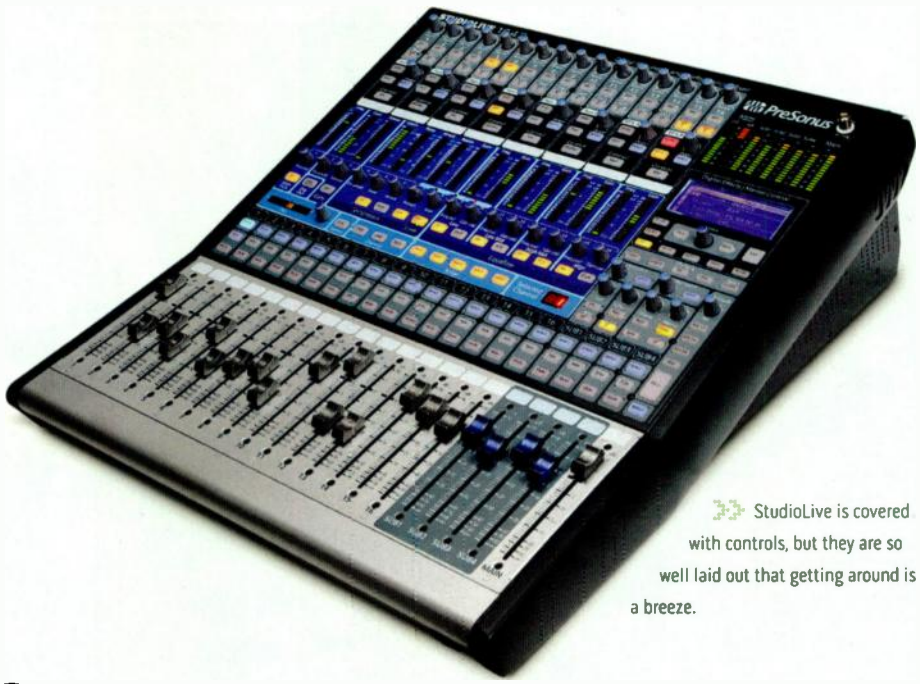


StudioLive is covered with controls, but they are so well laid out that getting around is a breeze.

PreSonus

StudioLive 16.4.2

A powerhouse multifunction console in a compact package

By Nick Peck

PRODUCT SUMMARY

digital mixer
$1,999

PROS: Incredible value for the price. Well-designed, intuitive, direct interface. Comprehensive feature set. Clean sound with lots of gain.

CONS: Faders and knobs feel flimsy. Capture software needs polish. Faders are un-motorized.

FEATURES	1	2	3	4	5
EASE OF USE	1	2	3	4	5
AUDIO QUALITY	1	2	3	4	5
VALUE	1	2	3	4	5

presonus.com

ONLINE BONUS MATERIAL

A digital mixer/audio interface designed for both project studio and live sound applications, StudioLive is a 16-input, 4-bus console packed with a comprehensive list of features. Each channel and bus include a signal chain of audio processors known as the Fat Channel. There are six aux sends for interfacing with external processing and for creating cue mixes, two onboard stereo effects, inserts and direct outputs on every channel, 100 scenes for recalling mix setting snapshots, talkback functionality, 16 high-quality mic input preamps, individual 48-volt phantom-power switches on each channel, and separate control room and main outputs—all within a compact, easy-to-transport package. [*Eds. Note: If you're running Mac OS 16.6, you'll need to download Universal Control 1.1 from the PreSonus site for free.*]

StudioLive can operate as a stand-alone mixer, but also includes FireWire 400 ports and a Mac/PC-compatible program called Capture that records all 16 channels as separate tracks. StudioLive can also function as your computer's audio interface, using PreSonus' drivers to work with most major DAWs.

Check Out the Specs

Not a square inch of available real estate is wasted, yet StudioLive is easy to navigate. The layout is intuitive and carefully thought-out, and the large numbers of buttons, knobs and faders make for a compact—but not overly cramped—work surface. The design is so good that I was able to learn 80 percent of the desk without ever cracking open the manual. The well-marked buttons and metering all feature bright and colorful LEDs that are perfect for low-light live sound situations. And two StudioLives can be linked together to create a 32-input, 8-bus console. If you're not using the system with a computer, you can link as many as four StudioLives.

StudioLive's routing and conceptual layout should be familiar to those accustomed to analog mixers. Each channel has an input trim at the top

and 100mm faders at the bottom, with Solo and Mute buttons. There are no channel-specific EQ, pan or send knobs—instead, the centrally located Fat Channel serves all channels and sends. Dedicated LED meters, knobs and buttons make for quick adjustment of the parameters. Press a channel's Select button and the Fat Channel's controls are routed to that channel.

The master section includes the subgroup and main channel sections, and areas for monitoring, talkback, digital FX, setup, scene storage and metering. The dedicated meter block displays levels for the groups and main channels, as well as the level and gain-reduction amount of the currently selected channel. The Fat Channel's parameter meters double as level meters for all 16 channels.

All audio connections are laid out across the console's rear panel. Each of the 16 channels has an XLR mic in, ¼-inch TRS line ins and ¼-inch insert send/return jack. The six aux outs, four subgroup outs, two stereo aux inputs, control room outs and one pair of main outs are all ¼-inch TRS jacks. There's an additional pair of XLR main outs, a mono output, a talkback mic in and stereo tape in/out on RCA jacks. All connections except for the line inserts and tape in/out jacks are balanced (see Fig. 1).

My Big Fat Channel

The Fat Channel is truly the heart and soul of StudioLive. The effects chain is simultaneously available on all 16 channels, the subgroups, main outs, aux sends, internal FX sends and external FX returns. The chain for input channels comprises polarity (phase) reverse, highpass filter, noise gate, compressor, EQ and limiter. The subgroups, main outs and sends eliminate the phase reverse and highpass filter. The compressor includes nice touches such as a hard/soft-knee switch, and automatic or manual attack and release times. The EQ is a classic 4-band semi-parametric (Q is high/low-switchable), with shelving options on the low and high bands, and broad/narrow bandwidth selection for the midrange. All bands have ±15dB boost/cut, and there's a generous overlap of the frequency ranges between bands. The limiter is a one-button affair, designed to brickwall signals at 0 dBFS. Every element in the Fat Channel signal chain does its job admirably, with transparent compression, surgical (if not particularly musical) EQ and effective noise gating with a smooth release.

While not in the Fat Channel itself, a recent firmware update adds a stereo 31-band graphic equalizer within one of the menus.

FIG. 2: Capture is a simple but effective recording program with a few rough edges.

Capture the Spirit

Capture (Mac/Win) is a multitrack audio recording application developed specifically for StudioLive. It's laid out similarly to many other music recording programs, yet it is not intended to replace a full-fledged DAW, although it does offer some rudimentary editing capabilities (see Fig. 2). Music recorded into Capture can be mixed back through StudioLive and re-recorded back into Capture, but audio files can also be exported for further work in the DAW of your choice.

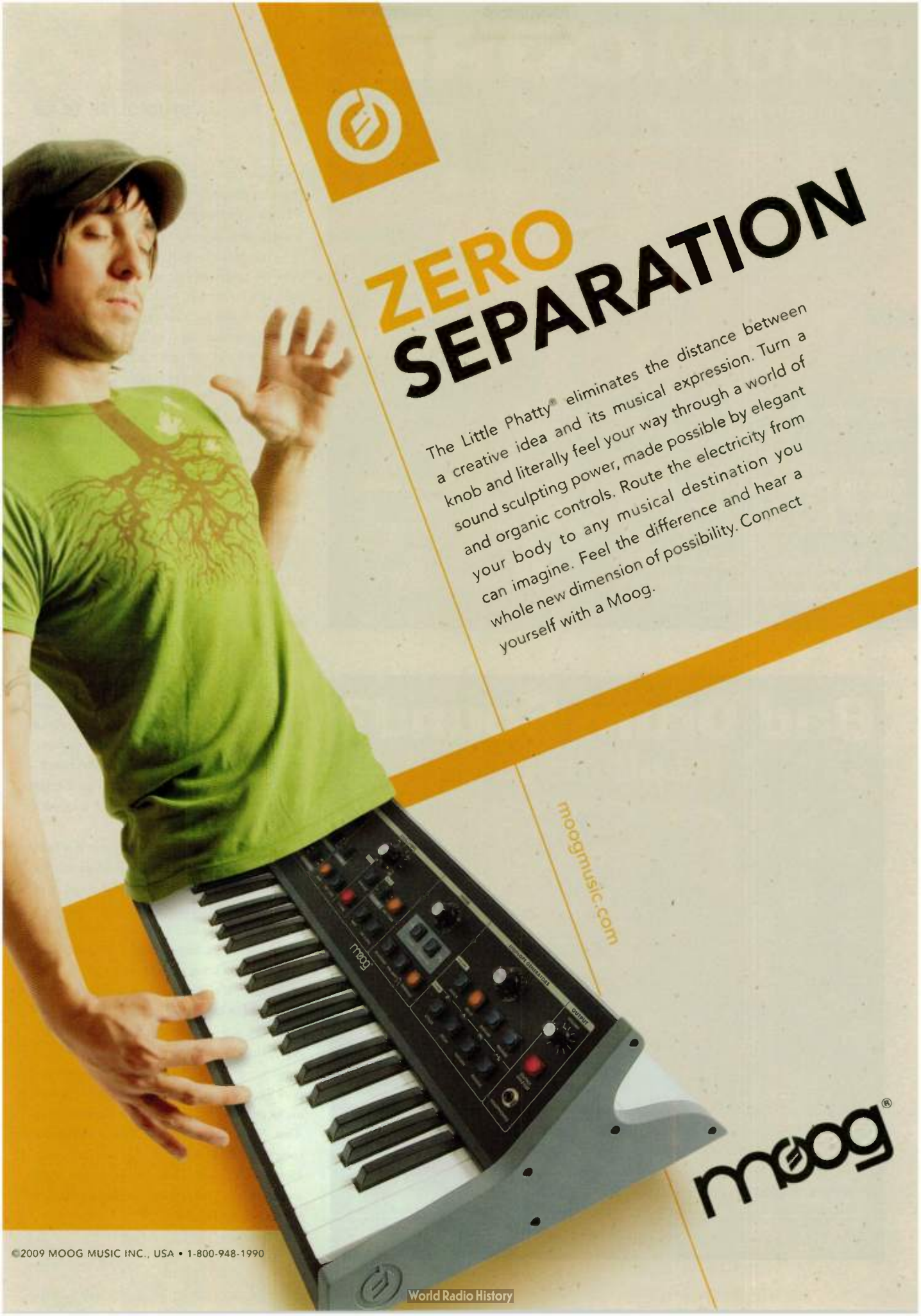
Capture is a great idea, but it's very much "rev 1" software, with some rough edges in the user interface that hopefully will be addressed in future releases. For example, I couldn't get any of the key equivalents to work, forcing me to mouse through every command. There are no fades available to smooth out edit points, and I couldn't get the loop-playback function to work. [*Note: According to PreSonus, these were addressed in software V. 1.1—Eds.*] Tracks that are stereo-linked in StudioLive still must be addressed individually in Capture.

FIG. 1: StudioLive has a comprehensive set of audio connections, including direct outs on all channels.

Is It Live, Or Is It Studio?

My organ trio recorded a song together in our rehearsal space by plugging into StudioLive. We recorded as a group simultaneously into Capture, with no effects or processing. We then mixed down the tune through StudioLive and back into Capture, exercising the Fat Channel and onboard effects processing. Other than Capture's rough edges, the process was as smooth as silk.

StudioLive excels in the sound-quality department. The Class-A XMAX mic preamps,



borrowed from the company's FireStudio and DigiMax products, are clean, fast and detailed, with plenty of headroom. The line inputs have enough gain to generate a clean, healthy level—even from instrument DI outputs. The onboard reverb and delay effects are perfectly adequate for the job, especially in a live sound context. If you are looking for a vintage vibe or a bigger-than-life sound, you won't find it here. What you will find is clean, accurate and transparent sound reproduction. That latency is so low you can use your computer DAW effects in real time for live sound gigs, so you can do all processing on a computer and fly in pre-produced tracks.

Jacob Rosenberg, a live sound mixer, took the StudioLive out as the front-of-house mixer for a weekly jazz gig. He was very impressed with the sound quality and ease of use, particularly appreciating how the Fat Channel saved him from carting his racks of analog gear.

All that glitters is not gold, and StudioLive is not without its drawbacks. While I love the buttons, I'm not a fan of the knobs and faders. The faders feel cheap, lacking the smooth movement of higher-end consoles. The knobs are a bit small and stiff for my taste. Because the faders and knobs are not motorized, scene recall is not a completely automatic process. The faders need to be manually reset by matching their position to the LED meter display above them, and mic preamp gain levels are not stored at all.

But overall, PreSonus has created a flexible, feature-rich, well-designed, good-sounding mixing desk in a manageable size and at an affordable price. While I have a few quibbles, they are relatively small potatoes in the context of the overall package. There is no doubt that PreSonus has a big winner on its hands with StudioLive. If you're involved in smaller-scale live sound or have a project studio in search of a friendly, out-of-the-box front end, StudioLive is definitely worth your attention.

Nick Peck is a composer/Hammond organist/audio engineer living in the San Francisco Bay Area. He is the audio director of a videogame company, and a proud papa of two little ones. Visit him at www.underthebigtree.com. Peck would like to thank Jacob Rosenberg for his help in researching this article.

The Juno-Stage is a versatile synthesizer that delivers the Fantom sound engine at a down-to-earth price.

Roland

Juno-Stage

The Fantom sound engine in a live-performance body

By Babz

PRODUCT SUMMARY

keyboard synthesizer
$1,395

PROS: Innovative live performance features. Robust computer integration. Killer sounds. Excellent keyboard action.

CONS: Performance mode designed for splits and layers is not so intuitive for multitimbral sequencing. No aftertouch.

	1	2	3	4	5
FEATURES				●	
EASE OF USE				●	
QUALITY OF SOUNDS				●	
VALUE				●	

rolandus.com

ONLINE BONUS MATERIAL

If you're shopping for a new keyboard, Roland's flagship Fantom synthesizers offer plenty of power, but they may be more than the average gigging musician needs. Roland recently revived the name "Juno" for a new line of more affordable keyboards based on the Fantom sound engine. They include the Juno-D, Juno-G and now the Juno-Stage, a 76-note keyboard with a focus on live performance features.

One of the Juno-Stage's live performance offerings is the Song Player, which lets you stream MIDI and audio backing tracks from a USB flash drive. You also get a built-in Rhythm Pattern machine, a special Piano mode, a microphone input for adding vocals, stage-friendly patch navigation and more—all in a lightweight, affordable instrument designed for the gigging musician.

Sounds Center Stage

To fill the keyboard spot in most working bands, an instrument needs to be able to cover the big five classic keyboards: acoustic piano, Fender Rhodes and Wurlitzer electric pianos, Hammond organ and the Hohner Clavinet. Those were the presets I checked out first.

The Juno-Stage comes with 128 MB of onboard wave memory (twice that of the Juno-D or -G), and two 64MB SRX expansion board slots let you expand it to 256 MB. The synth does an impressive job of spreading around built-in memory to cover a wide palette of instruments, including more than 1,200 preset patches, and a fair portion of the memory is devoted to acoustic pianos. That said, I was somewhat underwhelmed by the 88StageGrand, which Roland touts as its "flagship 88-key stereo multisampled piano taken from the Fantom-X." I'd have no problem using it live, but I didn't find it especially inspiring. I actually prefer the GermanGrand and Studio Grand presets, each based on separate sample sets. For even better options, two optional SRX boards are available, each devoting its entire 64 MB to a single multisampled piano.

While I'd give the acoustic pianos a solid B, the Rhodes earns an A or A+. You get a nice range of realistic and expressive Rhodes patches, including some with classic MXR-style phase-shifting, a sound heard on many hits of the 1970s and used heavily by Donald Fagen of Steely Dan (see Web Clip 1). I was less impressed with the Wurlitzers, which lacked sustain and smooth

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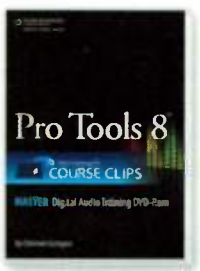

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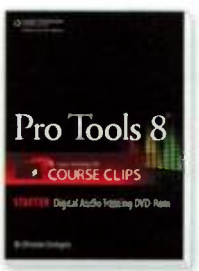

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velocity layering, though I was able to improve things with a little patch tweaking. I found greater satisfaction in the Clav department, where you get a tasty selection of tone and mute settings, as well as phased and processed patches (see Web Clip 2).

Because the Hammond organ can produce such a range of expression, it is a given that you're only going to get a smattering of snapshots. But I was happy to find some of my favorite signature sounds, including X Perc Organ, which nails that "Green-Eyed Lady" sound (although I had to tweak it to add the Leslie effect—unfortunately not programmed by default on many presets; see Web Clip 3). I also liked HardRockORG1, which uses samples from Deep Purple organist Jon Lord's Hammond. With enhancement from COSM guitar amp emulation, you're ready to rock some serious B3 power riffs.

Beyond those five essentials, you get many other high-quality sounds. The acoustic and electric guitars, bass, synths, strings, horns, sitar, harmonica, and acoustic and electronic drums were just a few of the many patches that I found highly impressive and useful as I was creating a series of demo tracks (see Web Clips 4 and 5).

Spotlight on Performance

Virtually every aspect of the instrument has been crafted for live performance needs. Seventy-six keys allow for maximum playability without transposing, and yet overall weight has been kept low for easy portability. I immediately fell in love with the feel of the keyboard itself, which may be the best semi-weighted synth action I've ever played. Unfortunately, it can't transmit aftertouch. Ten patch-category buttons simplify patch navigation. User Favorites let you set up banks of your most needed patches for instant access during a live set. Patches can also be selected hands-free using an optional footswitch. Dedicated buttons make it easy to set up two-way splits and layers.

A dedicated Piano Mode button takes you into a simplified stage-piano interface for acoustic or electric piano (with options such as a graphically adjustable piano lid). The MIDI Controller mode is designed for controlling external MIDI devices, making the Juno-Stage a suitable master controller, unless you need aftertouch.

Real-time expressive control options abound. They include the pitch-bend/mod lever, assignable S1 and S2 switches, a full-featured arpeggiator, a D Beam controller and the Sound Modify section, which provides easy-to-grab knobs for envelope, filter, EQ and reverb. Also included is a microphone channel (with dedicated volume and reverb levels) that you can use to mix in vocals or control the onboard vocoder.

The Song Player

The Song Player lets you play Standard MIDI Files, or WAV, AIFF or MP3 audio files from a USB flash drive. Copy files from your computer's hard disk to a flash drive and then plug it into a USB port, which neatly tucks away inside a little hatch. You also have the option of playing backing tracks from a portable audio device, such as an iPod, via an integrated external stereo mini input. The onboard Rhythm Pattern player holds 256 preset and user drum beats.

The Song Player effectively integrates the keyboard workstation with computer software, which makes MIDI sequencing so much easier. Bundled software includes Cakewalk SONAR LE (Win), as well as patch and playlist editors for Mac and PC (see screenshot below). However, when I tried to create sequences using the Juno-Stage as a multitimbral sound module, I discovered that Performance mode (which has been streamlined for creating splits and layers) worked differently and was not quite as user-friendly as Roland's traditional Performance mode. My confusion was compounded by a near-total lack of documentation on multitimbral sequencing in the manual. Thankfully, after I e-mailed Roland tech support, they graciously created a YouTube video demonstrating the procedure, which filled in a lot of details.

Take a Bow

With its great-playing keyboard, groundbreaking performance features and top-quality sounds, the Juno-Stage offers a unique product in the mid-range keyboard market. Even if you're not primarily a live player, it deserves a serious look for affordable access to killer Roland sounds and the world's most extensive expansion-board library. The SRX boards hold some of Roland's all-time best stuff. With 12 great boards from which to choose, I only wish you got more than two expansion slots. The Juno-Stage is a versatile synthesizer for both the live stage and the computer age at the right price. It won't break your back on the road or bust your bank balance. em

With USB ports and bundled software such as the Patch Editor (shown), the Juno-Stage comes well equipped for integration with a computer studio environment.

Babz is a composer, multi-instrumentalist and music technology writer in New York City.

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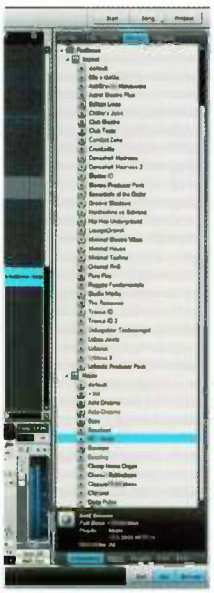

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EVENTIDE

PitchFactor Harmonizer

By Jon Chappell

The PitchFactor Harmonizer ($499) is Eventide's third release in its stompbox series, a trio of effects that get their DNA from Eventide's high-end studio processors. It retains the Time Factor and ModFactor's user interface and housing: a heavy-duty, cast-metal case sporting 11 knobs, 15 LEDs, three footswitches and a healthy complement of inputs and outputs. The PitchFactor should satisfy live performers and studio types who favor world-class sound and extensive real-time control.

Ten pitch-shifting effects include Diatonic (an intelligent pitch-shifter), MicroPitch (for chorus-like effects) and eight Eventide trademarks: PitchFlex (whammy-bar simulation), Quadravox (four-voice harmonizer), Octaver (dual selectable octaves with optional fuzz), HarModulator (twin chromatic pitch-shifters with modulation), Crystals (dual reverse pitch-shifter, delay and feedback with reverb), HarPeggiator (16-step twin pitch-shift sequencer), H910/H949 (classic Eventide gear emulations) and Synthonizer (pitch-tracking twin synths). The unit comes with 100 presets and operates in two modes: Bank (for loading complete setups and stepping through them with footswitches) and Play (for toggling a single effect's parameters on and off).

The PitchFactor Harmonizer delivers Eventide's trademark studio effects in a roadworthy stompbox form.

Pitch-shifting may be its *raison d'être*, but the PitchFactor features delay and feedback as additional sound-sculpting tools. The two effects lines (A and B) can be delayed, either for thickening or for discrete rhythmic repetitions that produce interesting arpeggiated effects. Feedback adds an additional modulation-type quality. For producing auto-wah effects, an envelope control with adjustable sensitivity causes modulation to track your attack velocity.

DIGGING DEEP

I began my explorations with the Diatonic effect, creating full-sounding harmonized lines with two-note harmonies and using subtle amounts of delay and feedback to produce a thicker, more complex sound. You can select from 13 scales and musical modes—great for creating diatonic harmonies in some novel settings. Changing keys instantly is as simple as pressing the middle footswitch and playing a new tonic note.

Quadravox lets you create full-sounding harmonies and provides terrific opportunities for arpeggiated sounds. I separated PitchFactor-generated notes into rhythmic subdivisions to produce textures that ranged from techno-robotic randomness to sparkling cascades of diatonic chord tones (see **Web Clip 1**). When you engage Tempo, the time display changes from milliseconds to beat divisions, allowing you to, say, quickly dial up discrete eighth-note-triplet repetitions. This shortcut to producing tempo-synched loops encourages experimentation within a groove, and frequently yields useful (and delightful) results.

I used Synthonizer to create some bizarre synth sounds that were a cross between a Theremin and a Minimoog. **Web Clip 2** shows two examples of a creepy melody given a sci-fi treatment while retaining a foothold with the real-world sounds of a trombone and human whistle. Also in the synthetic category is the Crystal algorithm; its dual reverse pitch-shifting lets you build haunting, multi-tiered pads that, while not rhythmic in nature, shimmer with intensity (see **Web Clip 3**). The HarModulator and HarPeggiator offer the greatest potential for creating step-sequenced patterns of impressive complexity.

The PitchFactor also produces equally classic and utilitarian sounds such as filter sweeps and electric bass emulations (see **Web Clip 4**). Of course, you can also use pitch-shifting for silky chorus-like effects using the MicroPitch algorithm.

THE PEDAL FACTOR

To really appreciate the PitchFactor's real-time possibilities, assign an expression pedal to control one or more parameters, and calibrate the pedal's travel to sweep any predefined value range. Virtually all presets assume you're using an expression pedal and are mapped to the most logical parameters for that setup. Programming the pedal is done entirely by moving the pedal and twisting knobs in an intuitive routine. Additionally, you can add footswitches to kick effects in and out or to operate system-related functions.

The PitchFactor's depth and versatility become apparent when you blend the dual effects lines, employ delay and feedback, and work the expression pedal to morph sounds in artful ways. The results range from liquid and flowing to hard-charging and rhythmic. But even the bread-and-butter effects that produce diatonic harmonies and octave effects—including a great bass guitar emulator—reveal the PitchFactor's core processing power.

PITCH PERFECT

Eventide may have streamlined its high-end technology and shoehorned those qualities into a stompbox form, but the PitchFactor is as complex and powerful as any time-based multi-effects unit that resides underfoot. You can invest a lot of time exploring its depths without finding the bottom. My only minor disappointments were the outlet-hogging wall wart, the lack of a dedicated editor/librarian and the absence of preset naming. None of these shortcomings affect the unit's deep programmability nor its versatile and stellar sound.

Overall rating (1 through 5): 4

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The Ohm64 has bi-directional talkback communication allowing the controller to talk to your software, and software to your device. MIDI messages can be sent to the Ohm64 to light up the buttons for an interactive performance. Completely programable and mappable, the Ohm64 provides a flexible control surface that be used with any software or setup. Completely USB powered means you don't have to worry about adapters and and power strips, and it is plug and play so no drivers are required.

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ANTARES

Auto-Tune Evo (Mac/Win)

By Jason Blum

It's hard to find a studio that doesn't have Auto-Tune somewhere in its bag of tricks. This ubiquitous plug-in, initially released in the mid-'90s, has long been the big kid on the block when it comes to pitch correction. Competing technologies from Melodyne, TC Electronic, Roland and others have all vied for Auto-Tune's crown with varying degrees of success, but the folks at Antares have given their flagship product a fresh overhaul to carry the technology they pioneered into the next decade. Dubbed Auto-Tune Evo ($399, $649 TDM), the upgrade offers significant improvements over earlier versions, and both newcomers and upgraders will find plenty to like about the latest iteration of Antares' legendary software.

Getting Auto-Tune Evo installed is simple and straightforward, but as with previous versions, you'll need an iLok dongle to run the software. Evo doesn't come with one, so if you haven't already equipped your studio with an iLok, be prepared to shell out an additional $40 or so before you are up and running.

FIRST IMPRESSIONS

Auto-Tune's Automatic mode looks largely unchanged from earlier versions. There are a few new options, including a formant processor that preserves some of the original timbre of radically pitch-shifted audio and a global transpose control that provides a two-octave range for baseline transposition of all audio passing through the plug-in. Longtime users whose feathers were ruffled when Antares buried the Tracking control in the Options menu will be happy to find it back where it belongs in the primary Automatic and Graphic workspaces.

ONLINE BONUS MATERIAL

I was particularly pleased to see an option to resize the GUI, and while three preset sizes are offered by default, Evo lets you enter arbitrary resolutions up to 1600x1200—a lifesaver when using a wide-screen monitor to edit long takes in Graphic mode (see **Web Clips 1** through **6**).

FEVER PITCH

The real meat of Evo's updates is evident in Graphic mode, where a Melodyne-style Notes mode is now available (see **Web Clips 7** through **9**). Clicking the Notes mode button drops piano-roll-style bars that track incoming audio into the Edit window, providing a quick and easy way to move or resize events. In practice, I found Notes mode easiest for making large changes of a semitone or more, or for smoothing out sustained notes over time.

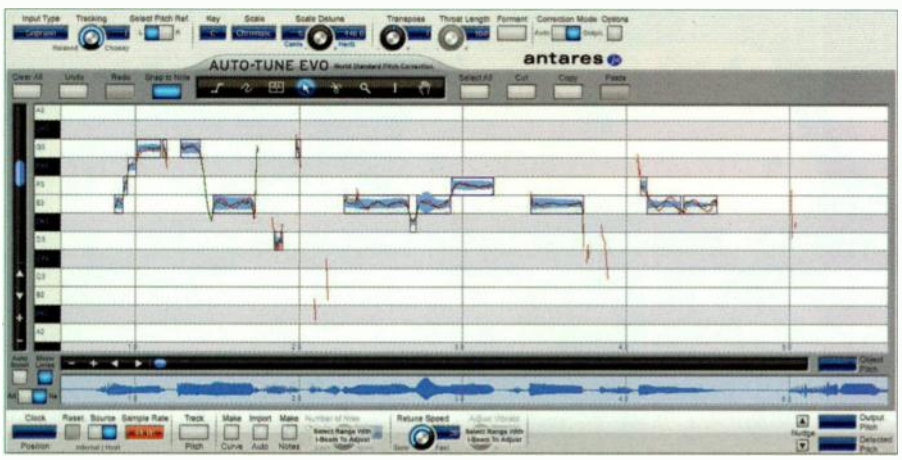
For detailed microtonal edits, Curve and Line modes are still supported, and a particularly welcome addition to all three modes is the object-based retune speeds. Previous versions of Auto-Tune used a global retune speed setting that affected the entire plug-in. Evo enables individual settings on every single object in Graphic mode so you can customize retune speeds as required at a very granular level. It's a major leap ahead in detailed editing and thankfully does away with the need to automate retune speed settings in the VST host.

WORKFLOW IMPROVEMENTS

Another outstanding workflow improvement is the real-time pitch output display. In addition to the note objects and red lines representing tracked pitch, Evo adds a line that visually previews the modified pitch of each object. Adjusting the retune speed updates this line's shape in real time so you can assess what degree of impact your adjustments will have visually rather than looping short audio segments to fine-tune settings.

Evo brings a smattering of additional conveniences to the table: You can cut and paste correction objects into other parts of the project; you can use all 10 number keys for keyboard shortcuts; you can set custom retune speeds for each object type; and you get nudge controls for pixel-level movements of selected objects. Taken individually, these seem like small or subtle improvements, but from a workflow standpoint the whole of these new features is far more than the sum of their parts, and dealing with Auto-Tune is less laborious and more enjoyable than ever.

Antares has produced a compelling update with Auto-Tune Evo, improving ease of use and providing new features such as note-based pitch processing that make working with this industry-standard pitch-processing tool even easier. The revamped core algorithm that drives Auto-Tune consistently produces better results than previous versions while keeping the application's processor footprint down to a negligible level. New users thinking of taking the plunge into Auto-Tune are coming in at the right time as the improvements bring it up to par with competitors, and upgraders will appreciate the nips, tucks and overall improvements to this indispensable application.



The Graphic screen provides detailed control over all elements of pitch data, and the new Notes mode enables piano-roll style editing for fast and accurate adjustments.

Overall rating (1 through 5): 4

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SHURE

SM27

By Babz

Shure's SM Series of dynamic microphones have been the reigning industry standards since the 1960s. The SM58 is the most widely used vocal mic in the world, and the SM57 has long been the Number One choice for guitar amps and snare drums, both onstage and in the studio. In later years, Shure introduced its KSM Series, an elite line primarily aimed at studio applications, which included a range of large-diaphragm condenser mics such as the KSM44, KSM32 and the entry-level KSM27 (reviewed in the July 2002 *EM*). The KSMs have proved to be popular in the ever-competitive field of affordable, high-quality studio microphones.

Replacing the well-regarded KSM27, Shure's new SM27 is a versatile cardioid condenser microphone that won't break the bank.

The KSM27 has been discontinued, reinvented and ported over to the SM line as the SM27 ($299). It has been made more affordable, yet boasts improved audio specs and comes with a different set of bundled accessories.

FROM K TO S

In many ways, the SM27 remains the same side-address cardioid condenser mic as the KSM27, rebranded and repositioned in the Shure line to give it more appeal for live use and recording applications. Its K-style champagne finish has been replaced with a low-profile, charcoal-gray look, making it more discrete onstage. The KSM27 came with an A27SM shock-mount, but only in a velvety bag in a foam-nested cardboard box. The SM27 comes with a right-angled hard mount and a nicely padded, soft gig case.

The SM27 retains the KSM27's size and shape, a slightly squat body with the Shure logo on the front and the same pad and filter switches on the back. You get a -15dB pad that helps prevent extremely loud sources from overloading the capsule, and a 3-position low-frequency roll-off switch provides a hard-knee 18dB-per-octave cut-off at 80 Hz and a soft-knee 6dB roll-off at 115 Hz.

Internally, the SM27 includes much of the same components as the KSM27: a 1-inch, ultrathin 24k-gold-layered Mylar diaphragm that is externally biased (making it a true condenser rather than an electret) and a discrete, transformerless, Class-A preamp. Shure has managed to improve the self-noise specs (which were already better than average) from 14 dB down to 9.5 dB, which, in turn, makes for better signal-to-noise and dynamic range numbers. Like its predecessor, the SM27 has a 3-stage wire-mesh windscreen and an internal shock-mount system to help reduce handling and stand noise.

SURELY, YOU TEST

I plugged the SM27 into the same channel strip into which I typically swap out a number of different condenser mics and found I needed to dial up a bit more gain than usual from my preamp. This, however, did not translate into increased noise. If anything, it was quieter than average. Also, the internal shock-mount system was effective, and I didn't miss the KSM27's external elastic-suspension mount.

The SM27's frequency response curve is mostly flat, with a presence boost of about 5 dB in the 6 to 7kHz range, a second bump around 10 to 15 kHz and a gentle low-end hump peaking around 50 Hz. This made for an exceptionally transparent sound, but with just the right amount of color on some sound sources, which I achieved by experimenting to find the mic's optimal placement.

I tested the SM27 with a range of acoustic guitars (small-bodied, dreadnought and nylon-stringed) and a mandolin. I also used it with two vocalists, both somewhat atypical: a falsetto male soul singer and a deep-voiced female folksinger. The flat response made it easier to get a sound I liked on instruments than on vocals, but the SM27 proved to be an excellent choice for the falsetto singer's relatively close-mic technique. I even found a placement that caught a good balance between the folksinger's voice and guitar. I normally wouldn't consider simultaneously recording voice and guitar with a single mic, but the SM27's response made it easier than with other mics.

SHURE BET

The SM27 offers an exceptionally quiet and transparent solution at a price that should make it more appealing in today's tighter economy. Its generally flat response and low self-noise make it a great choice for a true sound on acoustic instruments or vocals. Through placement and proximity, though, it also lets you add some flattering color in whatever amount you desire. Though large-diaphragm condensers are used less often in live performance than in the studio, the KSM Series has proven popular onstage for acoustic instruments, such as those in bluegrass or classical ensembles. The SM27 should offer a similar performance in a more roadworthy package. em

Overall rating (1 through 5): 4

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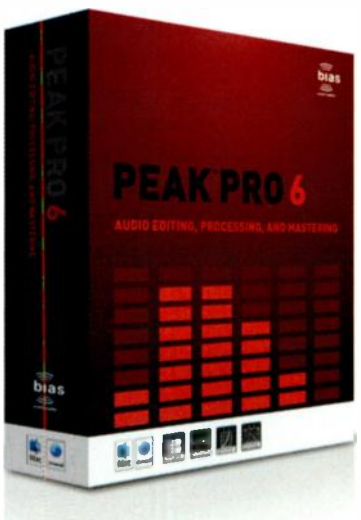

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Neumann TLM 67 Set Z

Large-diaphragm condenser microphone

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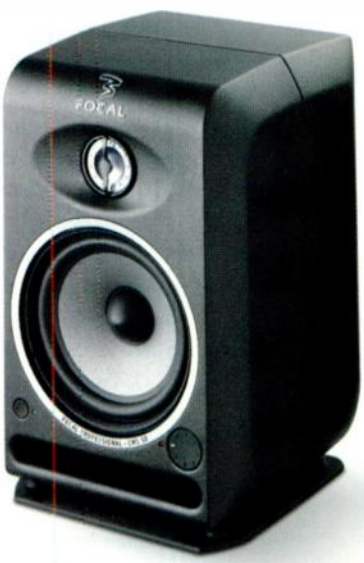

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Memories and Fortune Telling

By Nathaniel Kunkel

It's AES time in New York City (the annual Audio Engineering Society convention), and while things are surely changing for the future, thinking about where we are for AES 2009 makes me realize how far we've come.

I remember my first AES show. It was the 79th convention in New York, in 1985 I believe. As soon as I walked through the doors, I saw a huge Gauss bin duplicator running at full speed and a Mitsubishi woofer, which seemed as tall as I was, blowing tissue paper across the room. They had me from the start.

Since then, I have rarely missed a U.S. show. I remember the 1999 AES convention in New York, where Rodger Lagadec gave the inaugural Richard C. Heyser Memorial Lecture, which was entitled "Digital Audio and the Challenge of the Internet." (Lagadec received his Ph.D. in digital signal processing for telecommunications and is an AES Fellow, among many other accomplishments.) I remember my friend John Hurst gave me a copy of the lecture after the fact, and said, "Read this." I did, and I still reread it periodically. Let me briefly quote and discuss some of the prescient ideas Lagadec put forth in that lecture. (You can read the entire lecture at www.aes.org/technical/heyser/aes107.cfm.)

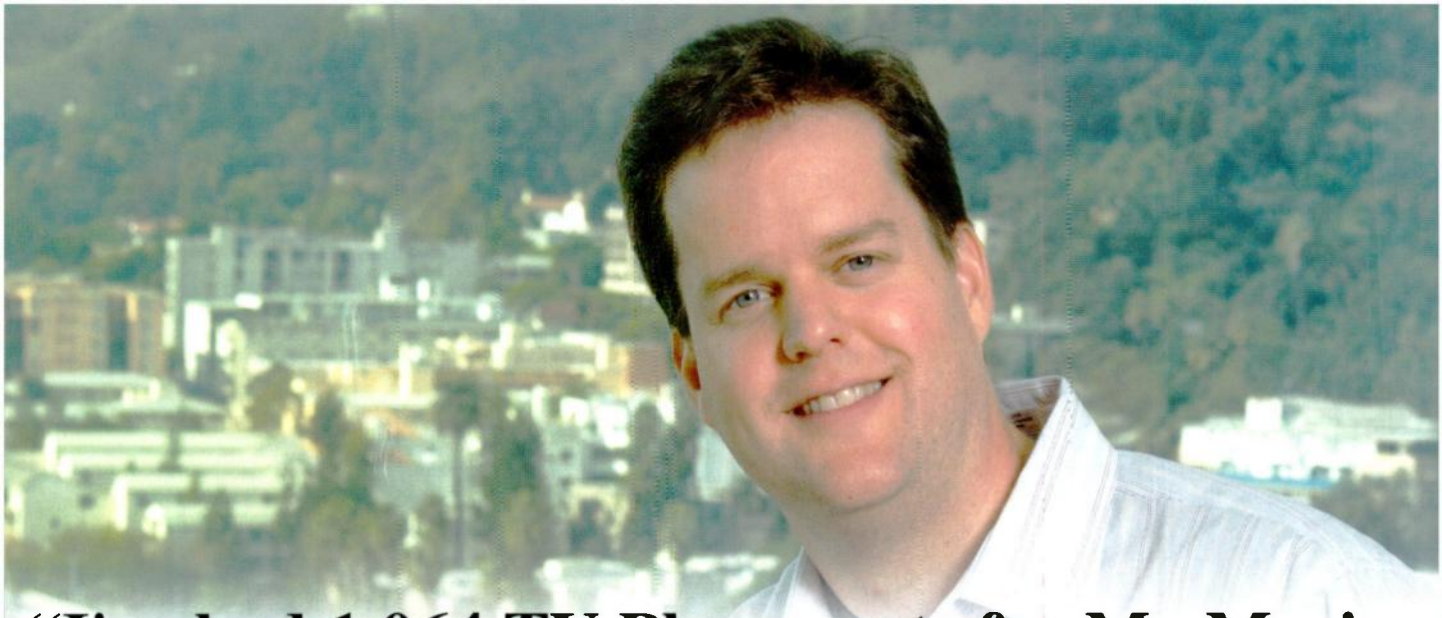
Just to help set the picture, remember this was in 1999. "A good notebook computer," he said, "may have 6 GB of hard disk space," and computers are communicating "at 56k and 128k." But Lagadec was still able to illustrate the problem that Apple would eventually solve in 2001 with the iPod. "Today's Internet is, in consumer audio terms, in the wrong room," he said. He addressed what independent labels would learn quickly, which was that, "the threatening potential of the Internet to challenge the existing business system by enabling large-scale bypassing of both the existing distribution systems and their protection of copyrights" would be the major labels' albatross.

Most importantly, for the artists and self-promoters out there, he identified the great migration that we are now witnessing: "All this must mean that all the songs on a CD will cost less than a physical CD," Lagadec said. "Somewhere in the near future, though, there will be the full CD's true successor—the full CD, with its subscription, with information services, gossip [and] online forums for those who are interested in buying more than just sound files, tailored to the user's needs and profile. Co-branded, co-marketed, profile generating, interactive, customer-driven, partly customer-defined." It's hard to imagine nailing it more on the head than he did right there.

My intention here is not to get you to print out that lecture and find an answer to all your business-model questions of 2009. Instead, I want to shed light on the fact that the professional audio community combines technological zeal with art in a way that is wholly its own. And if you're an engineer (or a recording musician), AES is your organization. There are people who are every bit as visionary as Lagadec at every AES show, and they are asking the right questions.

Go read the lecture and join the AES. It's a bunch of people you want to be associated with, and how easy is that to find these days? EM

Nathaniel Kunkel (studiowithoutwalls.com) is a Grammy- and Emmy Award–winning producer, engineer and mixer who has worked with Sting, James Taylor, B.B. King, Insane Clown Posse, Lyle Lovett, I-Nine and comedian Robin Williams.



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Stuart Ridgway - TAXI Member
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Reality TV and Royalty Checks

We struck up a good working relationship, and when the supervisor needed music for a new daytime reality show, she asked me if I would like to join her team. For the next two years, I wrote music for an Emmy Award winning show, which aired every weekday on NBC. My first royalty check *alone* covered 10 years of TAXI memberships! All in all, those two seasons netted me more than $50,000, and the company TAXI hooked me up with has hired me to write for two other shows as well.

Being "Great" Wasn't Enough

After making more than 1,000 cold calls, it dawned on me that music supervisors didn't care *how* great I was as a composer. How could they? They don't know me and that's that! I could only get so far on my own.

I realized I needed someone or something to be my champion - somebody to connect the dots. TAXI worked for me, and if you're really good at what you do, it just might do the same for you. If your music is up to snuff and you pitch it at the right targets, belonging to TAXI *can* change your life.

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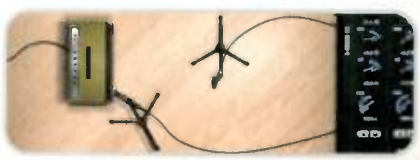

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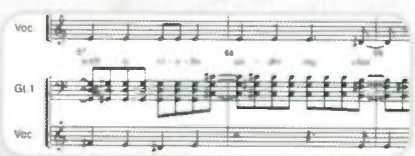

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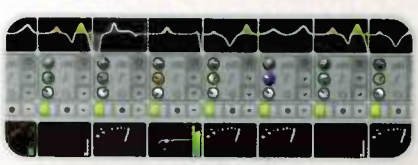

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