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Electronic Musician

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Neo Soul 2

New

WAV/REX/Apple Loops



Platinum **Essentials 2**

1691 WAV/REX/Apple Loops

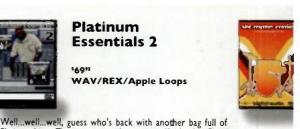
Platinum hits. The west coast phenomenon Keith a.k.a Clitark can't be stopped. We snatched him outta Snoop's studio to finish

down west coast style like Clizark.

chil

this sequel. Loaded with more Hip Hop and R&B construction kits, Platinum Essentials 2 contains all the sounds you've been askin' for, completely broken down. From bangin' beats and nasty bass samples to wicked synth and vicious sounds, nobody's puttin' it

10011



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19915 WAV/REX/Apple Loops

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Off The Hook Hip Hop: East Coast HIP-HOP

> 1001 WAV/REX/Apple Loops

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Bill Brown

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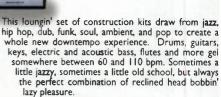


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-WAV/Acid/REX/ NNXT/HALion/ Kontakt/EXS24

and all manner of chemical are the mainstay of this truly sample collection, which Polyester' samples, 500 ni-velocity super-funked

Rotation

WAV/REX/Apple Loops

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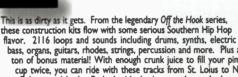
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Off The Hook Hip Hop: Dirty South 1992

WAV/REX/Apple Loops



bass, organs, guitars, rhodes, strings, percussion and more. Plus a ton of bonus material! With enough crunk juice to fill your pimp cup twice, you can ride with these tracks from St. Loius to New Orleans and back. Packed with the beats and sounds that make hits, this library is a must. 101 Below

1001

Bunker 8 Digital Labs has coaxed the body electric with this smoothed out offering. With over 4GB consisting of over 4,300 pieces of content, this DVD-ROM is unrivaled in its examination of the mellow,

trip hop, ballads, instrumentals, and sometimes a dose of the lighter side. If you live to emote in

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WAV/Acid/Kontakt/Battery

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METAL CITY.

WAV/REX/Apple Loops

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Electronic Musician

INSIDE

FEATURES

35 MASTER CLASS: GAINING TRACKTION

These advanced tips and techniques will help you take full advantage of the important new features in version 2 of Mackie's popular digital audio sequencer. By Jim Alkin

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COVER STORY

44 HIRED GUNS

If you want your commercial song demo to reach the ears of top-tier executives, it has to sound as close to a major-label release as possible. Part of getting that big-time sound is having access to ace session players. We show you how to plan a trip to a major recording center—in this case, Nashville—record with great session players, track in a professional studio, and edit and mix the tracks in your studio. The results can be a million-dollar sound on a budget you can afford. By Michael Cooper

65 PRODUCTION VALUES: HOUSE OF SOUL

Daniel Lanois's productions are known for their genuine performances and unusual ambient effects treatments. In this story, Lanois discusses his production techniques, his recording philosophy, his gear, and his enigmatic career. By Paul Tingen



DEPARTMENTS

10	FIRST TAKE
14	LETTERS
18	EMUSICIAN.COM TABLE OF CONTENTS
20	WHAT'S NEW
133	AD INDEX
134	MARKETPLACE
138	CLASSIFIEDS

Electronic Musician

INSIDE



- 90 M-AUDIO ProjectMix I/O control surface/audio interface
- 96 IMAGE-LINE SOFTWARE FL Studio XXL 6.0.4 (Win) digital audio sequencer
- 102 IK MULTIMEDIA Miroslav Philharmonik 1.0 (Mac/Win) orchestral sample plug-in

REVIEWS

8

32

COLUMNS

- 30 **TECH PAGE Synesthis** A new technology re-creates the synesthetic experience.
- 32 **PRO/FILE Restless in Seattle** Chris von Sneidern uses a portable rig for tracking in any available space.
- 76 MAKING TRACKS Listening to Monitors Selecting monitors requires understanding how they will affect your mixes.
- 80 SOUND DESIGN WORKSHOP Xtreme Processing Use multiple instances of the same effects plug-in to achieve more realistic result:
- 82 SQUARE ONE Absolutely Sound Essential facts about close-field monitors.
- 86 WORKING MUSICIAN Label Enablers New DIY labeling solutions for CDs and DVDs.
- 146 **FINAL MIX Digital Marketing** Distinctions between *analog* and *digital* are confused by marketingspeak.
- 112 NATIVE INSTRUMENTS Bandstand 1.0.1 (Mac/Win) software synthesizer
- 118 SEQUIS Motherload speaker simulator



126 QU

QUICK PICKS

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FIRST TAKE

The Expedition

Back in October 2004, I took a road trip up to central Oregon to visit friends, including EM contributing editor Michael Cooper. After we took our dogs for a relaxing woodland hike along the stunning Metolius River, we settled back in the control room at Michael Cooper Recording to listen to some recent tracks. Among them were a couple of tunes that Michael had written and produced, which I enjoyed thoroughly.

That's when Michael told me about his big plan. He had finally realized that to get his country demos heard in the right places, he needed to give them the signature Nashville sound, which is largely the product of using ace Nashville session players. To accomplish this, he was planning to go to Music City to record a few tunes in a major studio, using A-list Nashville hired guns. That was a big commitment, financially and logistically, and it represented a major step in his career, even though he had been composing, playing sessions, and operating a professional



project studio for many years.

The more we discussed the plan, the more excited we became. Years ago, I played recording sessions in Nashville, and I learned that magic is often in the air when the top pros get cooking. Observing my response, Michael suggested that we might use his experience as the basis for an article about how to plan and pull off this sort of expedition.

We wanted to include information about budgeting, studio selection, preproduction, scheduling, Nashville studio procedures, and the Nashville chord-numbering system, among other things. Michael noted the potential for problems after the tracking sessions, so he suggested sections on transferring tracks between systems and studios, time-stamping, and evaluating the tracks

once you get them back to your home studio for editing and mixing.

Before we knew it, we had planned this issue's cover story (see "Hired Guns" on p. 44). Best of all, the final article exceeded our high expectations, thanks to Michael's excellent work and polishing by Senior Editor Gino Robair and Copy Editor Marla Miyashiro. Even if you never record outside of your personal studio, you'll learn a lot about how top pros produce major-league work.

Like Michael Cooper, most of our best authors come from the ranks of our loyal readers. Those folks live and breathe recording and sound design, and it's no surprise that their article ideas often turn out to be right on target for EM. So when potential new authors ask me what they should write about, I tell them to bring their own ideas to the table first. That way, I know they will write about topics they are interested in and care about. Later, when I get to know their capabilities and interests better, I can offer my topic ideas and those of our staff editors. But as our cover story demonstrates, many of the best ideas come right from the authors.

So if you think you have the right stuff to write for EM, email me at soppenheimer@prismb2b .com. Include background information on your recording experience, a writing sample, and several detailed article topics. Check out our free back-issue list and Web archives at www.emusician.com to make sure we haven't recently covered the topics you have in mind. I hope to hear from you soon!

Steve Oppenheimer Editor in Chief

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In Summation

With regard to "The Sum of All Tracks" (February 2006), you had a good idea in writing an article about the controversy surrounding analog summing, but it's necessary to examine the entire issue. I understand what your point was, but you owe it to your readers to make your point in the proper context.

The point of this exercise should be to compare the quality of tracks in the digital domain (in a digital console or DAW's internal mixer) with those in the analog domain, not the varying degrees of digital muck. The issues with the digital domain involve, as you know but failed to mention, DSP latency and the summing bus. In my opinion, the baseline of your comparison should have involved routing individual direct outputs (not groups) from a DAW to an analog mixer, and then to ½-inch tape, and then to a 16-bit audio CD.

My point is that the "choke point" of the system lies in a DAW's mixer, and in digital mixers in general. Your panel of experts said that they heard differences (but not profound ones) in the three signal paths they listened to. That's because they needed to compare those three signal paths to the one that I just described. So, yes, record your tracks onto a digital format, but then be careful about what you do with them after that.

The collapsed stereo image is present in all the digital domain mixes, whether summed or not, compared with an analog domain that includes a console and outboard processors. I'm sure that such

Letters

a comparison would result in more pronounced differences. It's no wonder there is so much disagreement on this issue.

Bill Winn via email

Author Orren Merton replies: Bill-Thanks for your thoughts on the article. As I mentioned in the Sum Caveats section, there were a lot of variables. and we could have run around in circles trying to eliminate all of them. In fact, your suggestion of running each DAW track out to a large-format analog console channel, and from there to tape as our baseline, introduces its own set of problems. We would have been hardpressed to create a comparable mix in a DAW because of the inability to match the pan law of the mixing desk with that of the DAW. Moreover, most (if not all) dedicated analog summing devices are designed to receive stereo pairs, not mono channels. In any case, that is all completely outside the scope and intent of the article.

After much discussion among the panel, we decided that the most important goal for us was to test the summing processes that readers of EM would most likely use, implementing the equipment that an EM reader might reasonably have available or be able to afford for their personal studio. The documentation for those analog summing devices either implicitly or explicitly states that simply summing a project that was recorded, processed, and submixed completely in the computer through their hardware improves the sound. Therefore, we took pains to test that premise as meticulously as we could, using the equipment at hand.

Under the Spotlight

I thoroughly enjoyed reading John Diliberto's interview with Robert Fripp (see "Zen and the Art of Fripp's Guitar" in the June 1987 issue of EM and at www .emusician.com/em_spotlight). I've always enjoyed Diliberto's interviews on his PF.I radio program, *Echoes* (www.echoes.org). He has a keen sense of the music that feeds into the conversations he has with musicians and producers. Diliberto's submissions are an asset to *Electronic Musician*.

On a negative note, I found the flashing animated images used in the EM Spotlight section to be very distracting while trying to read the articles. Please stop using such attention grabbers.

> Floyd Miller via email

Seeking Protection

I subscribe to EM and I love the magazine, particularly the reviews and the articles that deal with software. I have one suggestion, though. I'd like to see a "copy-protection factor" rating integrated into your software reviews. I can't be the only musician and computer user out there who thinks that those schemes are getting a little ridiculous.

I'm a legitimate, bona fide user who respects digital rights and "buys the software I use," to paraphrase the International Music Software Trade Association (IMSTA). I'm not a pirate, and I think that people should pay for other people's hard work.

However, I won't give my money to any company that incorporates a

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GENERATE THE FUTURE OF SOUND

Next Month in EM

Condenser Mic Roundup

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EM evaluates seven largediaphragm, multipattern, solidstate condenser mics costing between \$599 and \$999.

Creating Impulse Responses

EM explains what impulse responses are and provides an overview of techniques for creating IR recordings.

Better Safe Than Sorry

Without a comprehensive backup strategy, a crash or other malfunction will eventually wipe out irreplaceable music files. We explain your file-backup options.

Production Values: Geoff Emerick

Renowned engineer Geoff Emerick tells about the recording techniques he used with the Beatles and other luminaries, his views on today's recording methods, and more.

Making Tracks: The Art of the Pad

A noted arranger shows how to create interesting synth pads.

Sound Design Workshop:

A New Look at Vocoding

Get unusual results using the same signal as carrier and modulator while applying insert effects in the program path.

Square One:

A Beginner's Guide to Clocks EM looks at the types of clocks and other forms of timing references that desktop musicians use.

... and much more

Letters

copy-protection scheme into their software. I understand that the software industry must deal with licensing, legal, and moral issues. But there is also common sense, which most of these software developers seem to have lost.

It all boils down to whether the company trusts me to do right with the product that I purchase from them. I respect licensing issues. I won't give my friend a copy of something that I paid big bucks for. But on the other hand, I shouldn't have to ask permission from some server or telephone representative to reinstall something for any reason whatsoever! And I won't live out my days wondering if I'll ever lose or break that \$1,000 dongle.

This issue is that important to me, and yet most reviews devote only a mention or two about the copyprotection scheme when describing installation procedures. And notice that I'm not even referring

We Welcome Your Feedback

Address correspondence to: Letters Electronic Musician 6400 Hollis Street, Suite 12 Emeryville, CA 94608 or email us at emeditorial@prismb2b.com. Published letters may be edited for space and clarity.

> to "hassle"; activation can go very smoothly if programmed correctly (the first time, anyway). I'm referring to the irritation I feel whenever I think about how I spent money on a piece of software that works only as long as I've been given permission to use it after the purchase. I'd like to see some major points deducted in reviews for companies that incorporate a copy-protection scheme into their software.

> Companies like Cakewalk and Propellerhead Software have not yet taken that step, and I use their products. I think their review scores

should rank higher than their competitors' simply because those companies are being reasonable. The music software they make just happens to be some of the best out there, but even if it weren't, at least they have the common sense to treat me as a reasonable end user rather than as a potential software pirate who needs to adhere to strict antipiracy measures.

I appreciate your taking the time to read this and to consider my suggestion. Thanks!

Mike via email

Mike—Nobody likes copy protection. It makes development more complicated, expensive, and time-consuming, and we end users dislike the hassle and the feeling of not being trusted. On the other hand, many musicsoftware companies believe that they could not remain in business without copy protection. The market for musicproduction software is relatively tiny, and a lot of developers have concluded that piracy seriously impacts sales. As you may know, piracy is a problem in the United States, but it's far more so in Europe and Asia.

Each of us has our priorities. Yours include avoiding copy protection at all costs. In my experience, most copyprotection methods work reasonably well, and although annoying, they won't keep me from using software that I like in other respects. If one does lose or break a dongle, the replacement cost isn't prohibitive; for example, an iLok dongle costs \$39.95. The hassle is getting the replacement immediately and, in the case of iLok, restoring all the licenses, some of which are easier to restore than others.

I don't see the point in discussing copy protection in every review. When we encounter problems due to copy protection, we report them, as we do other problems. But there is no point in bashing a specific program for having a protection scheme that is found in the vast majority of music-production software. —Steve O EM

The Fantom-X8 Workstation Keyboard.

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EMspotlight

Totally Wired with Tangerine Dream

Since releasing their first LP in 1970, Tangerine Dream has been one of the most influential German synth bands, gaining

recognition for their inventive studio albums and their innovative live shows. In this interview from the EM archives, Edgar Froese and Christoph Franke discuss film scoring and offer insights into their first 15 years as a band. By John Diliberto. emusician.com/em_spotlight

On the Home Page

EM Web Clips

A collection of supplemental audio, video, text, graphics, and MIDI files that provides examples of techniques and products discussed in the pages of *Electronic Musician*.

EM Guides Online

Get detailed specs on thousands of musicproduction products with our free online Computer Music Product Guide and Personal Studio Buyer's Guide.

Show Report

The 2006 Winter NAMM show is the biggest annual musicalinstrument expo in the United States. Visit emusician.com



for our report on the exciting new recording gear, music software, and electronic musical instruments unveiled at this year's show.

EM seminars on demand

The EM Seminars on Demand offer an exciting way to see new products and learn new applications and techniques online and at your



leisure. Korg USA's top sound designer, Jack Hotop, shows you how to customize a variety of synth sounds to suit your performing and compositional styles. emusician.com/editorspicks

EMnews

A weekly update on new hardware and software releases, manufacturer contests, and pertinent industry news. emusician.com/news

EMnewsletter

Sign up for our free online newsletter, eMusician Xtra, for



up-to-the-minute information about new products, software upgrades, and more. emusician.com

Others have copied the legend. We've improved it.

Oxygen 61

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Dxygen 8 va

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The Oxygen8's combination of mobility, control and affordability forever changed the way people make music. Now there's a complete line of Oxygen MIDI controllers to meet the needs of even more musicians. Chose either the 61-note or 49-note model for two-fisted action, or the new improved Oxygen 8 v2 for the ultimate mobile studio controller. Onboard memory, assignable transport buttons and expanded MIDI control add to the original's compact creative power. While others have been copying the legend, we've improved it.

- 25-, 49- or 61-note velocity-sensitive keyboard > solutions for any situation
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- up to 32 fully assignable MIDI controllers > gain tactile control of complex soft synths and DAWs
- free Enigma librarian/editor > store and manage unlimited presets
- class-compliant with Windows XP and Mac OS X > no drivers required



Daygen 8 v2. Oxygen 49. Oxygen 61. Oxygen USB MIDI Chromiters, Mi Audia and the Mi Audia logic on trackmarks of registered trackmarks of Aud Technology, bit, in the United Brites & Nor other Excesses. All other the

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WHAT'S NEW

By Geary Yelton

Sony PCM-D1

Designed for musicians, journalists, and anyone else who wants to capture sound on the go, the PCM-D1 (\$1,999.95) from digital pioneer Sony (www.sony.com/proaudio) records 16- and 24-bit audio at rates as high as 96 kHz. The pocket-size mobile recorder is made of scratch-resistant titanium and weighs 18.5 ounces. It comes with four rechargeable AA batteries and features a pair of built-in electret condenser microphones that are mounted in an XY configuration.

If you need more than the included 4 GB of built-in flash memory, a Memory Stick Pro expansion slot gives you even greater storage

capacity, and a USB 2.0 port lets you transfer WAV files to and from your Mac or PC. Onboard signal processing consists of a 200 Hz highpass filter, a digital limiter, and a noise-shaping algorithm called Super Bit Mapping. The PCM-D1 also has analog level meters, a stereo minijack line input, a stereo minijack headphone output, and another minijack that serves as an optical digital and analog line output.





Cakewalk Rapture

For years Cakewalk (www.cakewalk.com) concentrated exclusively on creating PC software, but recently it has become serious about crossplatform instrument plug-ins. Rapture (Mac/Win, \$199), immediately following Cakewalk Dimension Pro, is a soft synth for Audio Units, DirectX, RTAS, and VST formats. Rapture's nonaliasing sound engine lets you layer as many as six stereo parts called Elements, each with a multimode wavetable oscillator. You can multiply each oscillator as many as nine times across the stereo field and apply LFOs and envelope generators to each Element independently.

Rapture's extensive modulation capabilities give you up to 42 Step Generators for each patch—ideal for creating rhythmic sequences. Two resonant filters have 16 modes, and you can use as many as 42 complex envelopes and 42 LFOs simultaneously. Additional features include a large selection of insert effects, three bands of parametric EQ, and compatibility with rgc:audio's sfz format. More than 600 programs are included, delivering leads, basses, sequences, and textures.

Studiologic VMKplus Series

Answering the demand for responsive MIDI keyboards, Studiologic (www.studiologic.net) has announced three new controllers that mimic the feel of a grand piano. The VMK-161plus (\$749) and the VMK-176plus (\$849) are the world's only 61- and 76-note keyboards with graded hammer actions. At the top of the line is the 88-note VMK-188plus

supplies bus power, and three programmable pedal inputs (a sustain footswitch is included). Nine sliders, eight rotary encoders, and eight buttons—all user-assignable—supplement five transport buttons for controlling external instruments and software. You can store 30 presets, and 12 factory presets support soft synths from MOTU, Native Instruments, and others.

(\$939). All three feature Fatar's Grand Touch action, which is progressively heavier toward the low end, just like an acoustic piano. They also support Velocity and Aftertouch and have a pitch-bend and modulation joystick.

Each of the VMKplus keyboards has a lightweight metal chassis, two MIDI outputs, a USB port that



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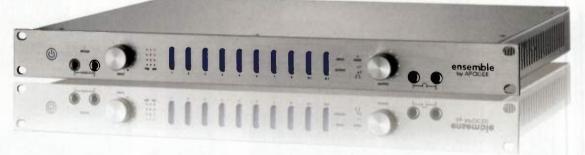
www.audio-technica.com

Apogee Ensemble

At the 2006 NAMM show this past January, Apogee Electronics (www.apogeedigital.com) unveiled its first multichannel FireWire audio interface specifically for Apple Macintosh computers. Designed for full integration with Apple Logic Pro 7, the Ensemble (\$1,995) gives Logic users 36 simultaneous audio channels that include 8 channels of 24-bit, 192 kHz A/D/A conversion and 4 digitally controlled mic preamps. If 36 channels aren't enough, you can use 3 Ensembles at the same time.

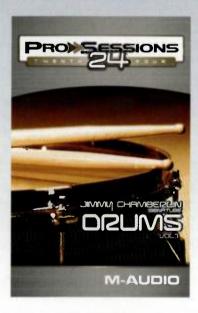
In addition to balanced XLR mic inputs, channels 1 and 2 have two balanced send and return inserts, with highimpedance instrument inputs on channels 3 and 4. Two more instrument inputs are mounted on the front panel, along with two independent ¼-inch headphone outputs. On the rear panel, four line inputs are supplemented by word-clock I/O and optical and coaxial S/PDIF I/O. The optical ports also handle eight channels of ADAT Lightpipe I/O, and eight balanced TRS jacks provide analog outputs.

The 1U rackmountable Ensemble offers several Apogee innovations, such as SoftLimit, which allows maximum input level without overs; UV22HR, for dithering 24-bit audio down to 16 bits; and Intelliclock dual-stage jitter reduction. You can control the Ensemble natively from a control panel within Logic Pro 7.2, and the included Maestro (Mac) software lets you control signal routing and additional functions for other Core Audio–compatible applications. Maestro also gives you two low-latency 20×2 mixers.



Sound Advice

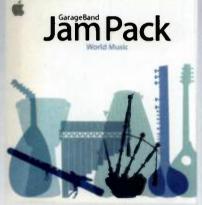
One of the newest titles in the ProSessions 24 series from M-Audio (www.m-audio.com) is *Jimmy Chamberlain Signature Drums*, vol. 1 (\$49.95), a DVD-ROM with 112 MB of REX files and 1.3 GB of Acidized WAV files. Best known as the original drummer for the



Smashing Pumpkins and later for Zwan, Chamberlain delivers plenty of variations on three rock grooves played at 119, 123, and 150 bpm. For every variation, the disc supplies 24-bit files for each of 15 separate tracks, allowing you to assemble multitrack drum mixes to suit your needs. Also included are QuickTime and Windows Media Player video clips in which Chamberlain documents the process of creating the sound

library and discusses his career and music technology.

Apple Computer (www.apple.com) has released the fourth in its GarageBand Jam Pack series of content libraries for GarageBand, Soundtrack Pro, Logic Express 7, and Logic Pro 7. World Music (\$99) supplies more



than 12 GB of data, 40 Software Instruments, and 3,000 Apple Loops for creating music indigenous to almost every civilization. Software Instruments include exotic strings such as guzheng and balalaika, ethnic winds such as shehnai and dizi, and a huge variety of drums and percussion. Afro-Cuban upright piano, Tibetan singing bowls, and South African choirs are other standouts. All are extensively layered, and many offer a variety of articulations. Loops range from Greek dumbek and klezmer drums to African chants and Indian ragas.

Apogee Quality, Apple Integration, Absolute Simplicity.



ensemble

Introducing Ensemble, The first all digitally controlled, professional audio interface, designed specifically for the Macintosh.

Ensemble features 36 channels of simultaneous audio, including 8 channels of Apogee's legendary A/D and D/A conversion, 4 transparent, digitally controlled 75db mic preamps, 8 channels of ADAT I/O, 2 channels of S/PDIF coax and optical I/O, and FireWire connectivity to and from the computer. Ensemble also includes premium Apogee technologies such as "SoftLimit", "UV22HR", and "Intelliclock". These technologies combined with converters that set the standard for the audio industry make Ensemble an ideal choice for professionals seeking a high-definition, integrated solution that's incredibly easy to use.





The sound quality and versatility of Ensemble, combined with your favorite Core Audio application provides the most complete, FireWire-based digital audio workstation available.



www.apogeedigital.com/ensemble

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Korg padKontrol

Korg (www.korg.com) is shipping the padKontrol (\$299), a USB-powered MIDI pad controller with 16 Velocitysensitive trigger pads, two assignable knobs, and an x-y touch pad derived from the KAOSS Pad controllers. You can use the padKontrol to trigger sampled loops or video clips, play realistic drum parts, or send MIDI Control Change messages. The x-y pad lets you create flam and roll effects in real time. To add visual interest to your performance, the trigger pads illuminate as you play. An assignable input lets you connect a footswitch or pedal to function as a kick drum trigger or a continuous control source. The padKontrol also operates as a USB-to-MIDI interface.

The padKontrol stores controller assignments in 16 Scenes for instant setup changes, and it comes with 30 preloaded

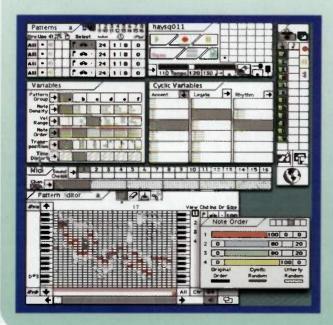


Scene templates for popular audio software. An editor/ librarian (Mac/Win) is bundled with the hardware, along with a special version of Toontrack's dfh Superior instrument plug-in, which features Velocity layering, a choice of mic positions, and 250 MB of drum kit samples. Additional software from Ableton, IK Multimedia, Propellerhead, and others is in the included Creative Kontrol Pack, vol. 2.

Download of the Month

M 2.6 (MAC)

M 2.6 (\$74) is the most recent and probably final incarnation of an algorithmic composition program developed in 1986 by Joel Chadabe, John Offenhartz, Antony Widoff, and David Zicarelli. The program has had a checkered development history and owes its continuing existence to Zicarelli, who markets it through his company Cycling '74 (www.cycling74.com). M's user interface is showing its age, and some important features were omitted from the Mac OS X version, most notably tempo synchronization with other software. Nonetheless, M offers an unusual and compelling approach to algorithmic composition.



At the heart of M lies a pattern sequencer that can hold six 4-track note patterns. You can enter notes into patterns on a piano-roll display using the mouse, or you can play them in from a MIDI keyboard. For MIDI entry, you can play in real time or step time. You can also import patterns from the first track of any Standard MIDI File. But patterns are only the fodder; it's what M does with them that makes it interesting.

M can mess with your patterns in several ways. It can alter the note density, leaving out some notes. It can change the MIDI channel assignments of the tracks. It can vary note Velocities, durations, and timing within user-specified ranges. It can transpose the pattern. It can distort time by, for example, delaying the second of each pair of eighth notes for a swing feel. Most interestingly, M can reorder notes, either randomly or by creating a new, repeating sequence. In a clever and apparently nontrivial piece of programming, you can set up reordering to honor rest positions and, therefore, preserve rhythm (see Web Clip 1). Each of the above processes can be applied with individual settings for each of the four tracks within a pattern. As with patterns, M can store six setups, called Variables, for each type of alteration.

At a higher level, M allows you to save snapshots of pattern and Variable selections as well as of other critical M settings. You can recall those in real time as M plays, and snapshot sequences can even be recorded as Slide Shows. You can also capture M's MIDI output in Movies, which you can then export in Type 0 (single track) Standard MIDI File format. Because M can send and receive MIDI on any Core MIDI bus, you can use M to play standalone virtual instruments or plug-ins running in your DAW. If you're intrigued but aren't sure whether M is for you, download its

save-disabled demo from the Cycling '74 Web site.

-Len Sasso

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—Derek Bristow

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Yamaha MW10 and MW12

Now available from Yamaha (www.yamaha.com) are two new mixers specifically designed for computer-based audio production. The MW10 (\$249) and the MW12 (\$379) are versatile and portable, each delivering a plugand-play USB audio interface with features such as 3-band EQ and highpass filters on each channel strip. The MW10 has 10 inputs, 4 mic preamps, and 2 insert patch points, and the MW12 has 12 inputs, 6 mic preamps, and 4 inserts. The MW12 has two group buses, and its aux sends have separate knob controls; you can configure the aux 1 bus either pre- or postfader. Both models supply 48V phantom power. Whereas the MW10 provides knobs for con-

> trolling channel and output levels, the MW12 has long-throw faders. Each mixer has two aux send/return buses and inputs on ¼-inch, RCA, and XLR jacks, as well as main, control room, recording, and headphone outputs. You can keep an eye on the output levels using the 12-segment meters. Steinberg Cubase LE (Mac/Win), which gives you 48 audio tracks, 64 MIDI tracks, and more than 40 VST instruments and effects, is bundled with both mixers, furnishing a comprehensive desktop studio setup.

AudioWarrior Kreator

Soundware developer AudioWarrior (www.audiowarrior.com) is shipping its first software instrument, Kreator (Mac/Win, \$499). Kreator is based on a custom version of Steinberg's HALion Player, which runs standalone or as a plug-in, and it includes a Steinberg Key.

At Kreator's heart is 2.7 GB of 24-bit content that encompasses electric and acoustic guitar, bass, drums, choir, piano, organ, synths, and Mellotron samples, as well as REX files, MIDI files, and loops. Bryan "Brain" Mantia, drummer for Primus, Guns N' Roses, and BucketHead's Giant Robot, has supplied an assortment of beatsliced drum grooves. Kreator also features sampled guitar chords with notes mapped to successive white keys for easy strumming on the keyboard.

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Best Service String Essentials

Containing 17.6 GB of 24-bit content, Peter Siedlaczek's String Essentials (Mac/Win, \$399) from Best Service (www .soundsonline.com) is a virtual string orchestra built around Native Instruments' ubiquitous Kontakt Player. It provides



an all-new sample collection comprising 14 violins, 10 violas, 8 cellos, and 6 basses. The instruments were recorded using three different mic setups, resulting in Normal, Dry, and Ambient samples. The Normal and Ambient versions can be

combined for natural-sounding surround applications.

Keyswitching, in combination with preassigned MIDI controllers, provides instant access to a large selection of articulations, such as tremolo, legato, and pizzicato performance. MIDI controllers alone modulate real-time parameters such as dynamics, bow attack, and portamento. For optimum expressivity, multisamples offer a selection of various lengths, each with three or four Velocity layers. Release triggers are activated by default. Samples stream direct from disk to conserve RAM, and for users with limited resources, String Essentials provides a light version of every patch.

Rev Up



APPLE LOGIC PRO 7.2

Apple Computer (www.apple.com) has upgraded its flagship musicproduction application Logic Pro (\$999) to version 7.2, which runs natively on PowerPC- and Intel-based Macs. Logic Pro 7.2 allows direct playback of compressed file types such as AAC and is compatible with Digidesign Pro Tools | HD hardware using DAE 7.1. New features include Ducker and Speech Enhancer plug-ins, support for M-Audio's iControl and Serato Pitch 'n Time, expanded ReWire support, and dozens of other enhancements.

Apogee Ensemble users can manipulate parameters such as mic input gain, output levels, and metering source using a control panel from within the sequencer. In the Arrange window, a new Track Control Bar indicates tracks that you access with your control surface. MIDI Program Change messages can now switch Channel Strip settings, and MIDI commands can also toggle the bypass status of Audio Objects. In addition, the jingles and sound effects library that ships with iLife '06 is bundled with Logic Pro 7.2. Logic Pro 7 and 7.1 owners can order an upgrade for \$49, and owners of previous versions can upgrade for \$299.

VIRTUOSOWORKS NOTION 1.5

North Carolina-based VirtuosoWorks (www.notionmusic .com) has announced Notion 1.5 (Mac/Win, \$599), an updated version of its EM Editors' Choice Award-winning music com-



position software. Notion interprets standard music notation to play back scores using sampled notes and articulations performed by the London Symphony Orchestra. Previously available only for Windows 2000 and XP, Notion now supports Mac OS X. Special pricing is available for Notion 1.5: \$299 for anyone cross-grading from another popular scoring program such as Finale or Sibelius, and \$349 for academic, theological, or nonprofit customers.

Notion 1.5's most significant feature is NotionPlayer, which allows you to control playback tempo dynamically in real time, making it possible for the software to accompany live performers. Additional new features include MusicXML import and enhanced MIDI entry. Also new from VirtuosoWorks is *Expanded Strings 1* (\$49), the third in its series of instrument expansion libraries for Notion.



PG MUSIC BAND-IN-A-BOX 2006

Band-in-a-Box 2006 (Win, \$88), from PG Music (www.pgmusic .com), has more than 50 new features that encompass notation, live playback, vocal harmonies, and more. The program now supports VST instruments and effects, and it has three new DirectX plug-ins. Fatten your vocals with unison voices, and even add four unison voices to each harmony voice. Play back WAV, MP3, or WMA audio at slower speeds without affecting pitch. During playback, hotkeys let you change the tempo, load the next song, and control which section is playing and whether it loops.

Enhanced notation capabilities support slurs, accents, crescendos, and other symbols. You can record 16 tracks on the Melody part and display each channel separately. Additional new features include 11th chord support, quantizing by percentage, batch conversion of songs to MIDI files, and notation print templates. Band-in-a-Box 2005 owners can upgrade for \$49, and owners of previous versions can upgrade for \$59. New Style Sets and MegaPak upgrades are also available.



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Turning a great idea into brilliant music takes a lot of inspiration and a solid workstation. You'll find both in the new TR Series – powerful, versatile, and exactly what you need to take your music from all right to extraordinary. It's full of new samples and sounds, intuitive sequencing features, has USB computer connectivity, an SD card for storage, optional sampling capability, and much more. It's even compatible with many TRITON sounds and songs. Best of all, the TR Series has rich, brilliant sound for musicians who may not be rich, but just might be brilliant.

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• Keyboard Magazine

The OASYS is blowing away musicians and critics alike, with stunning sounds, inspiring musicality, and its exclusive forward-thinking open architecture. Dream Theater's Jordan Rudess explains, "Sure it has lots of power, but OASYS brings it all together into a real musical instrument. Nothing else does that for me." Proud OASYS owner Herbie Hancock

is also a believer. "The feel and touch of an instrument is first and foremost for me. The feel of the OASYS is just right. And I find that the onboard sounds are just SO playable!" Find more info, complete interviews, reviews and your local OASYS dealer at www.korg.com/OASYS. Experience OASYS for yourself. Prepare to be wowed.

Making good on the promise of open architecture, the new STR-1's plucked-string physical models deliver realistic guitars, clavs, ethnic sounds and unheard-of textures and timbres. And this latest EXi is being offered free to current and future OASYS owners! Go online to check out STR-1 sound clips.





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 The Keyboard Magazine review by Ken Hughes appears in the October 2005 issue. www.herbiehancock.com • www.jordanrudess.com

Synesthis By Scott Wilkinson

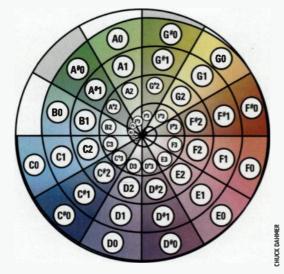
Hearing music has never looked so good.

O ne of the most fascinating anomalies of human perception is a phenomenon called synesthesia, a word derived from the Greek for "joined sensation." For those who experience it, stimulating one of the five senses—sight, sound, smell, taste, and touch—causes a distinct perception in one or more of the other senses. For example, a synesthete might hear the color red or taste the touch of leather on their skin.

Among the famous historical synesthetes was Russian composer Alexander Scriabin (1872–1915). In an effort to express his own synesthetic experiences, Scriabin often used "light organs" to control beams and clouds of colored light during his performances. He even experimented with wafting scents through the audience to coincide with specific moments in the music. Unfortunately (or fortunately, depending on your point of view), he died before completing his magnum opus, *Mysterium*, a seven-day-long piece to be performed at the foot of the Himalayas in India, after which, he believed, the world would dissolve in bliss.

Dr. Spanakopita "Spanky" N. R. Ganglia, of Callosum

FIG. 1: Basil Ganglia mapped 128 MIDI notes to the visible color spectrum and programmed the synesthizer to respond to notes by generating signals that mimic the brain's EM patterns when perceiving the corresponding colors. Synesthis is a big hit with the heads at Callosum Corp. U.S. Corp. U.S., has recently turned his attention to this phenomenon and how it might be directly stimulated in nonsynesthetes, not merely simulated as Scriabin sought to do. You might recall his previous invention, the Mindophone (see "Tech Page: Music on the Brain" in the April



2000 issue), which led to the astouncing discovery that the Internet had achieved independent consciousness (see "Tech Page: Cybersinger" in the April 2004 issue).

Ganglia, aided by his musician brother Basil, began his latest research by recording and analyzing the brain activity of synesthetes undergoing various sensory stimuli. He found that areas of the brain involved with one type of sensory perception emitted specific electromagnetic (EM) patterns when another sense was being directly stimulated.

The next step was to find a way to incite the synesthetic experience in nonsynesthetes. Ganglia decided to start with the simplest and most common case: seeing colors in response to hearing sounds. He built a device he calls a synesthizer, which generates signals that match those he recorded from the visual cortex of synesthetic brains responding to sound. Then, Basil mapped the range of perceivable pitches to the visible colors (see Fig. 1) and programmed that mapping into the device, which includes a MIDI input. As different notes are played on any synthesizer, the synesthizer produces a signal that mimics the EM pattern of the visual cortex when perceiving the color mapped to that note.

Stimulating a nonsynesthetic brain with those signals turned out to be the easy part. Ganglia simply modified his Mindophone headpiece, which was originally designed to detect EM activity in the brain. In the adapted version, the sensors were converted into EM transmitters and placed at the back of the headpiece, where they would be in close proximity to the visual cortex. The signals from the synesthizer are converted into harmless EM radiation and projected into the occipital lobe of the brain, causing the visual cortex to behave as though it's processing colors in response to the music being played by the synthesizer.

The initial experiments were a big success, with many Callosum colleagues lining up to try it after disappearing briefly into the restroom and emerging with red eyes and goofy, giggling grins. "Oh, wow, man!" was a common refrain heard in the test chamber, a clear indication that they were, indeed, seeing colors along with hearing music. Of course, that could have been because of the preparation they underwent beforehand, but Ganglia confirmed that the effect was not chemically induced. He concluded that synesthis, as he calls the technology, could be the Next Big Thing in the evolution of consciousness. Just don't bogart that headpiece! EM

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Restless in Seattle By Heather Johnson

Chris von Sneidern perfects migrant recording.

nspired by British Invasion artists, Chris von Sneidern's power-pop music invites comparisons with Badfinger, Big Star, and even the Beatles. Von Sneidern's songs are notable for their heart-tugging verses, winsome melodies, and soulful vocals. Since 1993, von Sneidern—CvS for short—has self-produced his solo albums by playing nearly every instrument and singing all vocal parts himself. However, for his ninth solo release, *California Redemption Value* (Mastromonia Records, 2006), circumstances required him to develop a different approach.

Von Sneidern started operating his studio, the Ordophon, in his former San Francisco apartment in 1992. In 1999, he moved his equipment into the city's Hyde Street Studios, setting up shop in Studio E. A few years ago, he gave up Studio E and moved his essential gear into a 7×15 -foot isolation booth. He was without



a living space and, accepting an invitation from a friend, moved to Seattle, where he began writing his new album.

Von Sneidern composed nearly 30 songs while traveling between Seattle and San Francisco, where he spent about a week each month work-



California Redemption Value/Chris von Sneidern

ing as a session musician and an engineer. "I would come to San Francisco with three to six songs written and get basic drum tracks or bass overdubs recorded," he says. "Then I'd go back to Seattle and almost finish them."

Drummer Derek Ritchie recorded his parts for several songs during a three-hour session in Studio E. Von Sneidern miked the drums with Shure SM57s, SM58s, and AKG C 12s, tracking them onto 24 tracks on an Alesis ADAT. In addition, he taped a PZM mic to the wall behind Ritchie, just beneath Ritchie's seat, to give the drums more bottom end. For "Symphony of Love," von Sneidern tracked guitar, keyboard, and vocal parts in his basement in Seattle, which he treated with acoustic foam and blankets to tone down the reflective nature of the wood paneling. His vocal chain started with an AKG C 12 that he ran through a Neve V72 mic preamp and a UREI LA-4 compressor/limiter.

Von Sneidern recorded additional overdubs onto ADATs with bassist Rob Douglas and keyboardists-pianists Khoi Huynh and Christie Winn, using "any quiet space" he could find at Hyde Street—an available studio, the hallways, the kitchen, or the bathroom—as well as his reduced recording space, which he nicknamed "the Study." "It isn't big enough to be called a studio, and calling it a closet is bad for business," von Sneidern says. He also assembled a portable rig stocked with the V72, LA-4, a 1970s Maestro Echoplex, and Siemens, Audix, and Grace preamps.

Toward the end of the album's production, von Sneidern switched from ADATs to a PC running Steinberg Nuendo 3.0. After transferring his existing tracks into Nuendo, he took his laptop to Tacoma, Washington, to record keyboardist and vocalist Gavin Guss in Guss's personal studio, and to vocalist Rachel Flotard's house to record backing parts. For an artist who often works alone, the collaboration was a welcome change. "With this record I thought, 'I don't need to hear the sound of my voice 15 times," von Sneidern says. "So now I bring in people to do backup vocals. But I still write all the parts."

Von Sneidern, who has fully relocated to San Francisco, edited most of the album in the Study and mixed it in Hyde Street's Studio A, using its automated Neve 8048 console. "It's like watching a movie in the theater versus watching TV," von Sneidern says of mixing on a high-end console rather than on a computer. "It makes all the difference." EM

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Gaining Tracktion

By Jim Aikin

Discover the hidden features of Mackie's bold new digital audio sequencer.

Then Mackie unveiled Tracktion in 2004, more than a few industry veterans scratched their heads in perplexity. There were already several good digital audio sequencers for the Mac and Windows; why bring out a new one?

Sometimes industry veterans are wrong. Tracktion has been winning legions of converts thanks to its fresh, clean user interface, its surprisingly deep feature set, and its modest price. Version 2 adds important capabilities, ranging from ReWire support, track freezing, and MIDI Time Code (MTC) generation to a QuickTime movie window, loop recording of multiple takes, and a 64-bit audio mixing engine. (You'll find a full list of new features at www.mackie.com/ products/tracktion2/index.html.)

In this article I'll cover some techniques that can help you work more efficiently in Tracktion and make better music with it.

Using Multitimbral Synth Plug-ins

Tracktion normally inserts synth plug-ins (which Mackie calls *filters*) at the right ends of individual tracks. But what if you want to use a multitimbral synth? In fact, Tracktion's tracks can contain MIDI clips assigned to many different MIDI channels simultaneously. The clips can overlap, and they'll all play. So you could insert a multitimbral synth on one track, and then sequence all of its MIDI data on that track. But for several reasons, that would be a poor way to set up your sequence. It would be incredibly messy, for instance, to edit overlapping clips. Never fear: there's a better approach.

The first step is to click on the Racks button in the upper right corner of the main edit window.

That opens an empty rack in the area below the tracks. Click on the New Rack button at the left end of this area, and select Create New Empty Rack. You'll see an area called New Rack Filter, which has audio and MIDI inputs and outputs but nothing in it. Rename it in the Properties panel. For example, I'm using Spectrasonics Stylus RMX, which is 8-channel multitimbral, so I'll rename mine "RMX Rack."

Next, drag the New Filter icon down into the new rack, and select your multitimbral synth from the pop-up menu. When Tracktion asks if you'd like to autoconnect it, click on Yes. (The No option works, too, but it requires that you create input and output connections by hand.) The Properties panel for the rack contains a Tracktion icon that says Drag Here To Insert An Instance Of This Rack. Drag this object to as many tracks as you plan to use with the plug-in or, alternatively, drag New Filter to the desired track and choose your new rack filter from the Rack Filters folder in the menu that appears.

If you route MIDI data into a track where the rack filter is installed or record MIDI data into a track and play it back, it will reach the plug-in. But Tracktion's MIDI tracks don't have MIDI channel designations, so another step is needed to use the plug-in multitimbrally. If you're recording external MIDI data, select the desired MIDI channel for the MIDI input object when attaching it to a given track. That ensures that any data recorded into the track has the correct MIDI channel assignment. For example, set the input object to channel 1 before recording into track 1, to channel 2 before recording into track 2, and so on. (Clips can also be reassigned to other MIDI channels after recording.)

FIG. 1: The central area in Tracktion's main window shows the rack, which contains a multitimbral synth with eight stereo outputs (four are in use). You can hide the rack and the track input and output areas to provide more room for viewing track data. Note the MIDI data close-up in track 4 and the automation envelope in track 1.



Stylus RMX is generally used by dragging MIDI files from its browser window into the host sequencer's tracks. RMX *tags* the MIDI notes in each MIDI file with the correct channel designation. After you select a beat for RMX's slot 3, for instance, you can drag it into any Tracktion track whose output is the RMX rack,

> and it will play back the expected beat. Good housekeeping, however, dictates that you drag the MIDI pattern from slot 1 into track 1, from slot 2 into track 2, and so forth.

If you play the plug-in at this point, you'll discover that its audio output is being sent simultaneously to all the tracks where the rack filter has been installed. To send the audio from each multitimbral part to a different track, which is useful for independent level and pan control, adding insert effects, and so on, several steps are needed. First, select the rack itself and click on the New Output Channel button. Assuming that you're working in stereo, create two new output channels for each track in which you plan to use the plug-in, and give them appropriate names. Attach the outputs of the synth to those channels, as shown in Fig. 1. Then select the instance of the rack filter in each track by clicking on it, and choose the desired audio outputs in the fields that say Left Output Comes From and Right Output Comes From. Presto—you have a multitimbral plug-in synth that's assigned to several tracks at once.

Crisp Time-Stretching

Tracktion gives you two methods of stretching audio clips, both of which are under Stretch in the Properties panel of the clip. One method raises or lowers the pitch but preserves the attacks of drum loops. The other method is a granular process that preserves the original pitch but smooths out attack transients. This smoothing process blurs the attacks of drum sounds, which is not usually desirable.

If you need to change the tempo of a drum loop but also want to keep it at the original pitch *and* keep it crisp, there is a work-around. It's a bit time-consuming, but in many cases the results are worth the effort. The idea is to do by hand what Propellerhead ReCycle does automatically when it creates REX files: snip the loop apart into individual hits that can be aligned with Tracktion's Tempo grid.

First, separate the drum hits so that each is in its own clip. After inserting the original audio clip in the desired track and selecting it, switch off Enable Snapping in the Snapping menu. You can also do that by clicking on the Snap button in the transport section or by pressing the Q key. Position the play cursor near the beginning of the second drum hit, as shown in Fig. 2a, and zoom in by right-button dragging (Control-clicking on the Mac).

Move the play cursor as close as possible to the beginning of the second hit in the clip. Use the Split Clips At Cursor Position command in the Split Clips menu to split the original clip at this point (see Fig. 2b); alternatively, you can press the Slash key (/), which does the same thing. Zoom out, move the play cursor to just before the start of the third drum hit, zoom in again, and repeat. Repeat the process until each drum hit is in its own clip.

Position the play cursor at a zero-crossing in the waveform before you use the Split command because a waveform that starts at a non-zero-crossing will click. Doing so is not essential, however, because Tracktion gives you two ways to fix any clicks later. You can create a short fade-in on the clip, or you can slide the contents of the clip to the left or the right so that there's a zerocrossing at the start of the clip.



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FIG. 2a: This image shows the original 2-measure drum loop at 100 bpm. The song tempo is 95 bpm, so the beats visible in the waveform don't line up with the time ruler.



FIG. 2b: Using a zoomed-in view, you can easily identify the beginning of each drum hit, where the clip will be split.



FIG. 2c: The original loop has been split apart and snapped to the beats on the time ruler. It looks as if there is a bit of high-level audio at the ends of some of the clips, but that is an artifact of the way Tracktion draws zoomed-out waveforms. In fact, each clip ends with low-level audio.



FIG. 2d: In this figure, you can see a subtle roughening of the waveform in the middle of the boomy kick drum where a shaker hit enters.

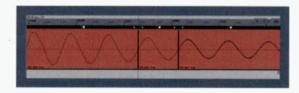


FIG. 2e: The beginning of the shaker hit (right) has been split apart, and a single cycle of the kick, which can be repeated, has been isolated.

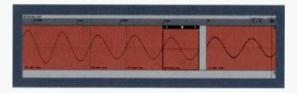


FIG. 2f: Here, the shaker hit has been snapped to bar 1, beat 3, and two additional copies of the single-cycle waveform have been created by Ctrl-dragging.

Zoom out far enough to look at the first few beats of the drum loop, which is now split into a number of clips. Switch Snapping back on, and drag each clip to the left or the right so that it snaps onto a beat. If you're slowing down the tempo, you'll drag to the right, as seen in Fig. 2c; if you're speeding up the tempo, you'll drag to the left. If you drag clips to the left, they'll overlap one another.

Overlapped audio clips don't pose a problem in Tracktion, as they do in many other such programs. It will play all the audio, even if several clips overlap. However, you wouldn't usually want to overlap audio clips on a single track, because they'll all be processed by the same track filters. With a split-up drum beat, though, that won't matter.

Once each clip is positioned on a beat, you can change the tempo of your sequence as needed, and the loop will stay in sync. However, you may find that you've missed some of the low-level hits, such as a hihat or hand-percussion hit that's layered in immediately after a big, boomy kick (see Fig. 2d). When the tempo is changed, these hits will be out of sync with the rhythm. This type of problem is not always easy to deal with, but here's an approach that sometimes works when the tempo is being slowed down:

Find the low-level hit by inspecting the waveform visually, and snip the clip at the beginning of the hit, as before. Then move slightly to the left. isolate a section of the waveform that can be repeated to fill in a gap, and snip it apart (see Fig. 2e). Turn Snapping back on and drag the low-level hit to the desired beat. Turn Snapping off, select your repeatable clip, which might be a single cycle of a wave as in Fig. 2e, and Ctrl-drag (Command-drag on the Mac) copies of it to fill in as much of the gap as you can (see Fig. 2f). Finally, drag the low-level hit back to the left if necessary so that there won't be any gap in the audio. The hit may be a little early, but it wor.'t be nearly as early as it was before (see Web Clip 1).

If the waveform edges don't quite line up, you may hear a little crackling at the joints between short clips that have been manually looped in this way. That can be fixed with Tracktion's Clip Crossfade feature. Extend the beginnings and ends of the short fill-in clips so that they overlap slightly, and then add crossfades, as shown in Fig. 2g. A bit of fiddling may be required, but it's not hard to create a smooth sound. And if a little crackling is still audible, who's to say it's not vinyl?

MIDI Controller Edits

After selecting a MIDI clip, you can use the playbackonly quantization settings in the clip's Properties panel. In Gaining Tracktion, however, this quantization will also be applied to the Control Change and Pitch Bend data in the clip, which is not usually the desired effect. Two work-arounds are available:

First, you can use destructive (data-altering) quantization. Open the MIDI clip for editing, select the Arrow tool, click on a note, press Ctrl + A (Command + A on the Mac) to

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FIG. 2g: After you drag the shaker hit slightly to the left to fill in the gap, enlarge the short clips so that they overlap, and create crossfades so that they blend smoothly.

select all the notes, and then click on Quantise in the note's Properties panel. The commands in this panel aren't applied to the controller data.

Second, if you want to use playback-only quantization of the notes, you can record the controller data on a separate track. In the controller track's Properties panel, select the track where your MIDI notes are located as the output for the controller track. That will merge the controller data with the notes and send them all to the same destination (which could be either a soft synth or a hardware synth).

If you've already recorded the controller data when you recorded the notes, you can accomplish the same thing by copying the clip to an empty track. Delete the controller data from one clip and the note data from the other, and then apply playback-only quantization to the clip that holds the notes. Tracktion won't let you select a bunch of controller data and drag it to a different time location within the clip. (You might want to do this, for instance, if you've played a Pitch Bend contour that you like and you want to apply it to a different note.) But again, there's an easy way to get the desired results:

Set the play cursor just before the beginning of the data you want to move, make sure the clip is selected, and use the Split Clips At Cursor Position command. Do the same at the end of the data. Ctrl-drag the clip that you've isolated to an empty track, thus making a copy of it. Delete any notes from the copy. If your goal is to move the controller data rather than duplicate it, delete the controller data from the original clip. Then drag the clip containing only the controller data back onto its original track at a new position.

Finally, select all the relevant clips by Shift-clicking and click on the Merge MIDI Clips button. That will give you a single MIDI clip in which the controller data is in a new location.

Polyrhythmic Percussion

After importing a sampled beat into Tracktion, there are two ways to loop it so that it plays continuously throughout a section of the song: you can use Ctrl-dragging to make actual copies, or you can use the Loop This Clip

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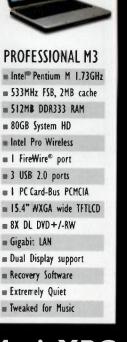
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command in the clip's Properties panel. (That command is available only for audio clips.) If you loop the clip, the entire loop is treated by Tracktion as a single long clip, which can be handy if you need to select or move it, or fade it in or out using the fade tools over a longer period of time than one repetition of the loop.

If the edges of the original, short clip have been moved so that it's no longer an exact number of measures long, the repetitions when it's looped will be the same odd length. This is a useful feature. After creating or importing a basic beat that's an exact number of 4/4 measures long, try importing a hand-percussion loop of some sort, put it

on a new track, and change its length (perhaps to a bar of 7/8 or 5/8) using one of the hollow-end triangles. Then loop it. This will give the hand percussion a polyrhythm that crosses the bar lines against the basic beat.

The solid square handle in the middle of the clip's top bar can now be used to slide the polyrhythm back and forth against the basic beat, which will give you a variety of rhythmic textures to choose from.

Quick Tips

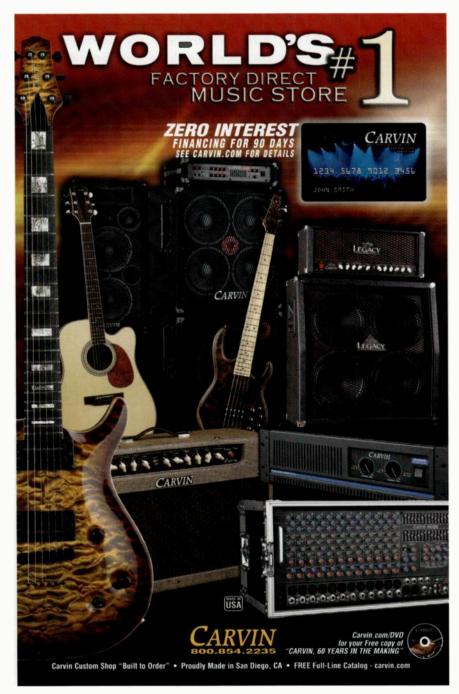
Running out of CPU power? Tracktion provides several solutions. First, you can select any track and use the Freeze Track or Render Track command. Alternatively, you can render your entire mix in its current state using the Export menu, and then drag-and-drop the resulting stereo file back into a new audio track in Tracktion. At this point you can right-click on the plug-in synths and effects that appear as filters in any of the source tracks and choose the Disable command. The filters will remain in the edit, ready to be reenabled should you want to edit their tracks further, but they won't use any CPU power.

If you're having trouble getting Tracktion to do something, rule number 1 is, Click on the object you're trying to work with, and then look in the Properties panel. In most cases, the commands that can be used on the object will be visible in the Properties panel as buttons.

Rule number 2 is, Keep an eye on the hint line. This line of text at the top of the screen often contains useful information. If the hints don't solve the problem, go to the Help menu and turn on Pop-up Help.

If you have a vocal track that's a little rough, or, worse, if you're trying to assemble a decent vocal from several takes that were recorded in different rooms using different mics, you may find it incredibly useful to drag a filter such as an EQ or compressor onto an individual audio clip. Each clip in a track can be processed by its own filters. This is also a good way to add distortion to a snare backbeat within a drum loop.

Tracktion's Settings page contains a Key-Mappings tab (see Fig. 3). Even if you're not planning to customize the keyboard commands, spend a few minutes reading the long list of commands. You'll probably learn about a few Tracktion features you missed in the manual, and you'll also find out how much you can accomplish without touching the mouse. And note the Save Key-Mappings and Load Key-Mappings buttons. These let you create different sets



of commands for different working situations.

For a faster program launch on systems that have a lot of plug-ins, go to the Plugins tab in the Settings page and deselect Always Check For New Plugins At Startup. But make a mental note that you did this. When you later install a new plug-in, it won't show up in Tracktion until you select that item and restart the program.

If you're hearing digital distortion in a series of inserted plug-ins, try inserting an extra level meter or two at various points in the signal chain. That will help you figure out where the overload is occurring.

Using Tracktion's ability to include multiple "edits" in a single project file, you can develop several independent versions of a song, switch back and forth easily, and cut and paste clips from one to another as needed. Take advantage of the Description text field in the edit's Properties panel to make notes on each alternate version.

A Star Attracktion

Tracktion is still a young program, and Mackie is working hard to add the kinds of features that musicians have come to expect. If you're already using Tracktion as your main recording platform, get in touch with the company and tell it which enhancements are important to you. (I



FIG. 3: Tracktion's key commands are extensive and can be configured by the user.

want a numeric readout for the loop start and end markers, but I'm one of those clueless industry veterans. Your needs may vary.)

If you're new to computer-based music making and are considering which midpriced digital audio sequencer to invest in, you may want to drop by the Mackie Web site (www.mackie.com) and download the demo. If you have little or no previous experience with this type of software, you may be pleasantly surprised CLOPS by Tracktion's user interface. EM

Jim Aikin writes about music technology and plays electric cello. Look for a new fantasy novel from him later this year.





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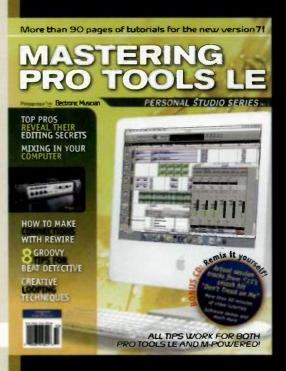
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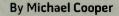
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Producing the killer song demo with ace session players and singers.



A couple of years ago, on the advice of famed producer Byron Gallimore, I began tracking my country-music song demos in Nashville. My Oregonbased studio offers full-production capabilities, but I just couldn't find the same level of musicianship in my area that the best of Music City had to offer. Gallimore had told me that publishers, producers, and A&R staffers in Nashville were used to hearing song demos steeped in the area's signature sound, and demos that didn't have that sound were at a disadvantage. The Nashville sound is, I found out, largely attributable to a relatively small cadre of ace session players.

These are the players who appear on the overwhelming majority of country singles and album cuts. With the exception of a few artists such as Tim McGraw, most country artists don't use their road band when cutting their records. Instead, a wrecking crew of top country players is brought into the studio to learn and perform the songs together on the spot, a process that usually takes only a few hours per song to complete (a whirlwind pace compared with what it takes to produce most pop records). I was surprised to learn that many, if not most, of these same musicians routinely play on demo sessions in the Nashville area.

In addition to world-class session musicians, Nashville also offers a bounty of incredibly gifted demo singers. The cost of using all this unmatched talent on your song demos can be quite expensive, but that's the cost of being a contender in this highly competitive business. Consider this: Lee Ann Womack and her producers (Byron Gallimore and Greg Droman) listened to *thousands* of demos in the course of choosing the dozen songs they would cut for Womack's most recent album, the award-winning *There's More Where That Came From* (MCA Nashville, 2005). Such intensive screening is standard operating procedure for superstar albums, and the demos that are pitched for them are typically fullproduction works using top-drawer session players and singers. That's your competition.

It's a similar story in the pop world. Back when I wrote pop songs (which was up until a few years ago), I was told by creative managers at leading musicpublishing companies that a demo had to sound "like a record" in order to have a shot at getting the underlying song cut. To a record label exec, a great demo takes the guesswork—and therefore, considerable risk—out

Hired Guns

of expensive studio production. Put another way, a producer or A&R executive who hears a demo with a great production knows they can get the same arrangement and sounds simply by mimicking them, perhaps using the same players on the "real" record as appeared on the demo.

On one hand, it's ridiculous that songwriters now have to produce the equivalent (or near equivalent) of a record in order to get a record deal, but that's the reality. On the other hand, once you hear world-class talent delivering the mojo on your songs—and completing killer tracks in a fraction of the time it might take you or your band to arrange, rehearse, and record as many parts—you'll be hooked.

In this article, I'll share my step-by-step road map for producing stunning song demos using

FIG. 1: The Nashville Number System is used in chord charts, in lieu of standard notation, on virtually all Nashville-based tracking sessions. The system uses numbers, letters, symbols, and bar lines to denote the harmony structure and important rhythmic articulations of a song. ace session players and singers. The main focus will be on how to tightly control expenses and get great results through intensive preparation and efficient production techniques, and by using your own studio for self-contained tasks such as editing and mixing. In par-



FIG. 2: Session players listen to a songwriter's work demo in the main control room at County Q Productions while reading the song's chord chart. Seated from left to right are Billy Panda (acoustic guitar) and John Jarvis (keys). Standing from left to right are Troy Lancaster (electric guitar), Paul Scholten (drums, County Q Productions owner), Alison Prestwood (bass guitar), and Karyn Rochelle (singer-songwriter).

ticular, I'll show you how to organize and budget for your project.

In addition, I will cover how to import, export, and synchronize audio files for use in both studios (yours and the "outside" studio you'll book), and how to safely transport the media containing all your precious tracks when you're traveling. Although I will include some engineering tips and techniques, I'll mostly emphasize production considerations and methods that ensure your money is well spent and you get the musical results you are seeking. And while much of what I will cover also applies to producing other styles of music—rock, pop, R&B, and so on and records intended for commercial release and distribution, I'll specifically discuss producing countrymusic song demos.

I Have Your Number

The first decision that you will need to make during preproduction is the number of songs you will attempt to produce within the studio time you will book. To choose wisely, you need to know how things are done in Nashville. Studio sessions—for tracking instrumental parts—in Nashville are not openended affairs but are scheduled according to policies established by the musicians' union, Local 257 of the American Federation of Musicians. Sessions are usually booked in two- or three-hour blocks, typically beginning at 10 a.m. or 2 p.m., with provisions for overtime pay, should the session go longer. Weekend and evening sessions are relatively rare in Nashville,

ELECTRONIC MUSICIAN APRIL 2006



Hired Guns



but they sometimes can be accommodated.

Many songwriters try to cram the tracking of four or five songs (not including lead vocals, which are typically overdubbed after the instrumental parts are all laid down) into a three-hour session. To obtain quality results, I generally plan to track only three songs in a three-hour block. That said, I may try to track more than one song per hour if most of the songs are three-chord wonders in the traditional-country style; it has been my experience that Nashville session players can knock these out in onehalf or even one-third the amount of time it takes them to nail a contemporary country or pop-crossover song containing a lot of key changes. For example, I've witnessed session players deliver an absolutely killer version of a traditional-country song within 25 minutes of hearing it for the first time. On the other hand, I've spent well over an hour and a half getting the results I needed on an edgy country-pop song that had many key changes, chord extensions, and stops.

Another strategy—and my preference—is to book two back-to-back two-hour blocks (four consecutive hours total) for tracking four songs. The aim here is to maximize my productivity for the same amount of travel expenses, which is fixed. In case the sessions proceed faster than I had expected, I'll have a fifth song ready to track in any remaining time. But because I'm a stickler for getting magical tracks, I'm

FIG. 3: Veteran session player Troy Lancaster sets up one of his electric guitars in County Q Productions' tracking room before a take. usually hard-pressed to finish just four songs in four hours. I'd rather have outstanding tracks for four songs than mediocre tracks for five songs that I can't use. Nashville's



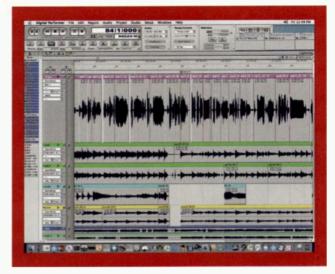


FIG. 4: This is an example of how I edit a composite lead vocal using Digital Performer to build a flawless, captivating track with all the best phrases. Even with a superb singer, a difficult song may require one or more edits per bar of music, each consisting of a region as short as a single syllable of lyric. Instrumental tracks typically require far fewer edits.

top session players are incredibly efficient, but they aren't superhuman. Great productions take time.

Where To?

After I've chosen the specific songs I'll produce, I determine which studio I'll work in. The *Mix Master Directory* (email address: mmd@prismb2b.com) is a good place to find studio listings for the Nashville area. If you have any friends or industry contacts who live or work in the Nashville vicinity, they may also be able to make some recommendations.

I like to work in a studio that has a lot of iso booths so I can get good isolation between tracks. County Q Productions (615-298-1434) in Nashville offers a good-size tracking room with four adjoining iso booths (one with a tuned grand piano and organ) and a control room, all having good sight lines. By putting drums in the main room, taking the bass direct, and putting the pedal steel guitar's amplifier in an isolation box with a mic, I can effectively produce a 7-piece band at County Q. The studio complex also offers three smaller suites for overdubs, nonensemble productions, and mixing.

I prefer to hire an engineer for my Nashville-based sessions rather than taking on that role myself, so I can focus completely on producing. Hiring a skilled, efficient engineer typically adds only a few hundred dollars to the cost of the project and makes the sessions go more smoothly. I often produce while engineering in my own studio, but I don't want to waste any time in another studio fiddling with an unfamiliar console, tie lines, and patch bays while creative energies wane

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and production costs mount. I may request changes in microphone choice or placement if I feel it is necessary, but otherwise I'd rather not be distracted.

Travelin' Man

Once I've chosen the studio to track in, I work out my travel arrangements and fine-tune my production schedule. I like to book my flight so that I'll have one full day in Nashville before my sessions begin. Jet lag is a recipe for disappointment in the studio, so a day of rest and recuperation before tracking is a good idea. Besides, with fewer flights and airport hubs for most airlines these days, bad weather or mechanical problems could cause missed connections that could wreak havoc on too tight of a schedule.

I track the instruments on all my songs on my second full day in Nashville and book lead vocals for the following day. I like afternoon sessions for recording vocals because it gives singers time to clear morning mucus out of their throats and warm up their vocal chords with some light singing.

Most Nashville-based demo singers are not union members and will work for a flat fee of roughly \$100

FIG. 5: Grouping together the imported audio files from your Nashville-based sessions inside your DAW project will make it easier for you to quickly distinguish them from your work-demo files so the former can easily be found and dragged into blank tracks. In this figure, files are viewed by source type in Digital Performer's Soundbites window, causing all imported files to be listed together. Different instruments' files from the same take have the same numeric suffix (for example. .01_03) in their names that was created in Pro Tools, making it easy to know which files to drag into which of the new, blank takes you created for each track.

per song, with the understanding that they expect to work for an hour to an hour and a half per song. They will usually sing background vocals in addition to leads, if requested, at no extra charge in the same one-hour-plus time slot. I've never requested my hired singers to perform background vocals, however, for reasons that I'll get into when I discuss production techniques.

I will typically schedule and book back-to-back hour-and-a-half vocal sessions for each song. Four songs, therefore, require six hours of time, as well as roughly another

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half hour for file consolidation. Depending on how you like to work, you may be able to get the lead vocals for each song done in as little as an hour and reduce your studio bill.

When budgeting the sessions for your project, be sure to also include the costs of a hotel room, rental car, food, and incidentals (such as gas for the car).

Talent Search and Budget

It's advantageous to work with a Nashville studio that does a lot of demos for music publishers, because the studio manager and engineers will be plugged into the music community and will be able to recommend—and possibly schedule—singers and players to use on your project. (County Q Productions excels as a liaison.) You can develop your own list of players that you would like to use simply by looking at the credits on the albums you own and listening to cuts to familiarize yourself with each player's strengths and style. Another good source for song credits—with limited audio excerpts is allmusic (www.allmusic.com).

For each instrument I want played in my productions, I'll give the studio a wish list of my first, second, and third choice for the player (if I've developed that many preferences). The studio serves as my liaison and attempts to schedule the players for the sessions I've booked.

Here's where things can get dicey. It is understood and accepted that a session musician may cancel playing on your demo project in the eleventh hour if they get an offer to play on a "master" project (that is, one intended for commercial release). Master projects offer players over twice-sometimes over four times-the pay of demos (see the sidebar "Money Matters" for info on union rates), as well as notoriety and, arguably, more satisfying work. So it's understandable that in-demand players universally insist on this caveat when agreeing to work on a demo project. It's been my experience that around half the musicians I request will already be booked for another project or will be lured away to play on a master project before my tracking date arrives. A studio that has regular contact with many top session musicians will be able to book substitute players in the final hours before your session begins and keep things on track for you. Late-hour cancellations are another good reason to give the studio a list of your second and third choices for players.

Most session players earn regular demo scale, but the requisite bandleader—who is typically one of the players—usually earns double the demo scale paid to a sideman. The most in-demand sidemen may also charge double scale, or they might not even be available for demo work because they're too busy doing master projects. That said, you might be surprised at the country royalty you can have perform on your demos for the





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standard demo rate. Besides their hourly wage, you'll also need to pay for each musician's instrument cartage. Cartage is usually a small expense (typically \$6 per player, per session), but some pickers who play multiple instruments may charge you \$50 to transport a large case containing their instruments to the studio, unless you instruct them to limit what they bring.

Demosinger.com (www.demo singer.com) is a fantastic resource for hearing audio clips of and contacting demo singers in the Nashville area for your project. Alternatively, ask the studio (or friends in the business) for a list of demo singers who have impressed them the most, including their phone numbers. Call each singer you're interested in and ask them to send you a copy of some of the demos they've sung on. Most professional demo singers will have the means to email you MP3s, which is great for doing fast research. Others may only be able



FIG. 6: After you've dragged-and-dropped each imported file in turn into its proper blank track and take, move all the files to their original time stamps in order to sync them up properly. In this figure, all imported sound bites for a given take are selected in Digital Performer 4.61. The Move To Original Time Stamp command (Audio \rightarrow Time Stamps \rightarrow Move To Original Time Stamp) is used to automatically return them to the start points at which they were originally recorded in Nashville.

to send you a CD by snail mail. In any case, make sure you specify what musical style you're looking for (for example, traditional or contemporary country, a crossover ballad, or edgy or mellow vocals) so they send you material that will give you a good idea if they're right for a particular song. You may end up hiring a different singer for each song.

One other point: try to get the singer to send you at least a few songs, even if they don't all fit the style you're looking for. Almost anyone can sound good on one demo, but consistency indicates you've found someone who can likely deliver the goods.

We Can Work It Out

With the talent chosen and booked for your sessions, it's time to produce a work demo for each song. I usually choose a key signature that is comfortable for all the major-label artists I feel the song is suited for (the key can be determined simply by listening to their records), but occasionally I'll have to raise or lower the key by as much as a major second so that it optimally fits the demo singer's range. Because the power, intonation, and feel of the lead vocal is absolutely critical to a demo's success, I feel it's most important to ensure that the work demo fits the demo singer's range: most people agree that a recording artist will transpose a song into their favorite key, if necessary, if they like it enough to cut it.

Many female demo singers, for example, are used to accepting a work demo sung by a male songwriter and transposing it into their favorite key (or the key the songwriter specifies). However, I prefer to produce the work demo in the key in which it will ultimately be performed. That way, there is no chance of confusion that may require last-minute transpositions, which eat up studio time and cost money. This also allows me to use my work-demo vocal as a scratch-vocal track during the actual session. If I need to sing the song's melody on a work demo meant for a female demo singer, I'll typically sing the song an octave lower than it was written and simply instruct the singer to sing it an octave higher than I did. Of course, male demo singers receive a work demo with me singing the melody in the correct key and range.

In most instances when producing a work demo, a simple guitar or keyboard arrangement and a click track will suffice as an accompaniment to your scratch vocal. I include a click track for a few different reasons. First, it obviously helps me to lay down my instrumental and vocal tracks. Second, a click—mixed low so as not to be obnoxious—helps the singer discern and learn the melody's rhythmic articulation in the absence of drum or percussion tracks. And third, I will want to import my click track into the real session for the musicians to play to. (I'll discuss why and how to import tracks shortly.)



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Sometimes in the work demo I'll include guitar or keyboard hooks that I want the session players to hear and learn. I may even keep my own instrumental hooks in the final production in some instances, and have the session musicians play to those imported tracks during the tracking session. But I won't let any of the musicians hear these hooks unless there is a strong likelihood they will ultimately be used, because I don't want to box in better players than me with ideas they may easily trump if left to their own unfettered creativity.

Once I've recorded a song's work demo, I'll mix three different versions to send to the hired singer for that song. The first version has a basically balanced mix, so the singer can hear how the vocal melody relates to the harmony structure and rhythm of the song. In the second version, the vocal is mixed a lot more out front than any other elements, allowing the singer to readily hear and learn any subtle pickup notes to phrases, quick melodic runs, and so on. The third mix has all vocals muted, so the vocalist can use it to practice singing their part along with the music.

Care Packages

Along with an audio CD containing the work demo (all three mixes), I also send the singer a few lyric sheets. Two are for the singer's use to mark up however they want in preparation for the session. The third sheet may include some notations of unusual or quickly articulated musical notes that I want sung on select lyrics and that may be hard to learn from the work demo alone. For this purpose, I'll simply circle the relevant lyrics and write the letter names of the desired notes above each word. In a cover letter to the singer, I'll explain that I want them to sing the melody as I wrote it but also do some wild-card takes in which they present their own ideas. A great singer's economically placed improvisations can really bring a song to life, after first presenting the basic statement of the verse and chorus melodies to the listener.

Although I always send the singer of each song a work demo, lyrics, and a cover letter, the session musicians won't hear the songs until the tracking session actually begins. They wouldn't want to practice for a session they may be pulled off of to play on a master project, and they don't need the rehearsal

MONEY MATTERS

Critical to the success of your demo project is having a realistic budget. The table "Aiming at Expenses" shows a sample budget for a three-hour tracking session and subsequent lead-vocal-overdub sessions to produce three songs in Nashville. The sample budget assumes six musicians will be used to track six instruments: drums, bass, keyboards (piano or organ), acoustic and electric guitars, and either fiddle or pedal steel guitar. (If you can afford to, and the songs warrant it, spring for both fiddle and steel guitar for a bigger and more idiomatic sound.)

Note that the musicians' wages cited here are for demo productions and are set by Nashville Local 257; union scale will differ in other locales and for other uses. For example, Local 257 sets union scale for a three-hour session at \$217.84 per sideman for a "limited pressing" of up to 10,000 copies, and \$399.48 per sideman for masters. Also, demos that later get placed in films or TV commercials, for instance, will be subject to significant union "new use" fees, an important consideration if you negotiate a synchronization license through your selfowned publishing company. All the union rates I've cited include required payments into pension and health and welfare funds for members of the American Federation of Musicians (AFM), which Local 257 belongs to. For more information on current union rates in Nashville, call Local 257 at (615) 244-9514.

If the songs you will produce are all simple traditional-

country tunes, you may be able to track four or even five songs in a three-hour block, in which case you may need to adjust the sample budget for voca -overdub sessions by roughly 33 percent (for four songs instead of three) to 66 percent (for five songs) higher. The test approach, however, may be to commit to recording vocals on only three or four songs (regardless of how many ycu end up tracking) and finish up vocals on your next trip to Nashville for any additional songs tracked. That way, if tracking gets bogged down, you won't have to cut corners just to keep your work commitments to all the singers you hired.

The budget estimates for the vocal sessions assume you will be working in a smaller room at a slightly reduced rate. It also assumes you'll hire three singers who will each devote roughly an hour and 15 minutes of studio time to singing their assigned song. (The costs work out to be the same if you use the same singer for two or three songs, unless you can negotiate a multisong reduced rate with the singer.) An extra half hour of studio time is budgeted for consolidating and exporting files.

The sample budget also includes estimated travel and related expenses for a three-day stay in Nashville. Of course, these expenses can vary widely depending on where your travel originates and what kind of accommodations you need to feel comfortable. Songwriters who live in the Nashville vicinity can obviously subtract these travel expenses from their budgets.

can

- :: record
- :: arrange
- :: edit
- :: process
- :: mix





Thomas

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Hired Guns



anyway. But I do bring the work demo (the balancedmix version) for each song to the session along with chord charts—using the Nashville Number System for the musicians to reference (see Fig. 1). If you don't know how to write charts using the Nashville Number System, make sure the bandleader for the session agrees to do this for you (and make enough copies for all the players) before the session date arrives.

One note of caution: make sure you protect your songs before sending out work demos to hired talent. Most people are honest, but it's good to play it safe. See the sidebar "Guarding Your Songs" for more information.

Talkin' 'Bout My Generation

Most songwriters instruct the studio they'll be working in to generate a click track at a specified tempo for each song for use during the tracking session. Then, during the session, the songwriter sings a scratch vocal to guide the players in laying down their tracks. However, I have a different approach.

I don't want to be distracted from producing by having to sing a scratch vocal during the tracking session, and my live vocals could never be as inspiring to the players as something that I fashioned from multiple punches. Therefore, I elect to import the scratch vocal from my work demo into the hired studio's DAW for the tracking session.

AIMING AI	EXPENSES		
QUANTITY	DESCRIPTION	PRICE	TOTAL
TRACKING:			
1	Bandleader, union scale, for 3 hours	\$369.58	\$369.58
5	Sideman, union scale, for 3 hours	\$184.79	\$923.95
5	Cartage fee	\$6.00	\$30.00
3	Studio hours	\$70.00	\$210.00
3.5	Engineer wages per hour (incl. setup)	\$25.00	\$87.50
Subtotal:			\$1,621.03

VOCAL OVERDUBS	:				
3.75 Studio hours		\$60.00	\$225.00		
4.25	Engineer wages per hour	\$25.00	\$106.25		
3	Singer's pay	\$100.00	\$300.00		
3	Back up project files to DVD	\$5.00	\$15.00		
Subtotal:			\$646.25		
TRAVEL:					
1	Round-trip flight to/from Nashville	\$300.00	\$300.00		
3	Day's car rental (compact car, incl. taxes)	\$28.00	\$84.00		
3	Day's hotel charges (room rate and taxes)	\$80.91	\$242.73		
3	Day's meals at restaurants	\$40.00	\$120.00		
•	Days means at restaurants	• • • • • • •			
1	Tank of gas for car	\$40.00	\$40.00		

Total:

\$3,054.01

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I also want to make sure that all the tracks I record in Nashville will line up later with my click track, the bar lines in my DAW's sequence for each song, any keeper instrumental hooks I've recorded, and scratch tracks I might want to use as timing or pitch references. So I also plan to import the click track (with spoken count-off) for each song into the hired studio's DAW. If the session musicians lock to my click track, their tracks will be perfectly synced to my work-demo tracks once the musicians' tracks are imported back into my DAW. (That is, as long as the same sampling frequency is used in both project files and all files are time-stamped.)

To make sure file importing into the Nashvillebased studio's DAW happens without a hitch, I first bounce each track containing multiple regions ("sound bites" in MOTU Digital Performer) to a new continuous track beginning at 0:00:00.00 and let it play to the end of the song. I then export each of these bounced files to a separate folder—one for each song—on my hard drive or desktop, making sure they are named for easy identification and exported in a format that is compatible with the hired studio's DAW. I then burn all these folders and the files they contain onto a CD-ROM.

Next, I mail the CD-ROM to the studio in Nashville with instructions to import the files into their DAW importing the audio files for each song into a separate sequence—and to confirm that the files all sync up before the tracking date arrives. I burn a separate copy of the CD-ROM for myself and also back up the files to a new external FireWire hard drive, both of which I bring with me to the tracking session as backups to use should the mailed files self-destruct at the last minute and the mailed CD-ROM be misplaced. That's never happened, but I have too much at stake to blindly trust it won't.

CD-ROMs and hard drives can go through bombscanning machines at the airport without compromising data, but I take all media onto the plane as a carry-on to avoid loss, misrouting, or damage en route. With preproduction finished and my butt in Nashville, I'm now ready for the tracking session.

Making Tracks

Before the tracking session begins, I have a clear plan for which order I'll track the songs in, which player will take how many bars to solo on each break, and where the solos will occur. I'll typically track the least complicated song or the one with the slowest tempo first, so the players can warm up before performing the tougher tracks.

Before we track each song, I play a balanced mix of the song's work demo for the players in the control room as they read the accompanying chord chart (see Fig. 2).

I give the players limited direction initially so I don't inadvertently stifle their creativity. I may tell them that the production style should be contemporary country, referencing a certain artist or hit song, and that I want

GUARDING YOUR SONGS

An inexpensive and lightning-fast a ternative to copyright registration for your songs is the Web-based Songuard service, offered by MasterWriter (www .masterwriter.com). Songuard is a date-of-creation registration service designed to protect your lyrics and melody in their development stage. Songs are registered by uploading your lyrics and work demo (the latter in the form of a WAV, AIFF, or MP3 audio file) to MasterWriter's Web site, using MasterWriter software (Mac/Win, \$289). (MasterWriter is an outstanding songwriting tool—visit www.emusician.com for a full review.) Songuard is free for one year with your purchase of MasterWriter and costs \$30 per year thereafter.

Although copyright law is beyond the scope of this article, I will mention here that Songuard does not replace the need for copyright registration of *published* works (that is, those commercially sold and distributed). Copyright registration is required within three months of publication in order to recover statutory damages and attorney fees in infringement suits. For more information on copyright, visit www.copyright.gov.

a specific subdivision feel. I may also suggest a possible capo position for one of the guitarists to use (see Fig. 3) or ask the drummer to play aggressively right out of the chute. But mostly I keep specific musical ideas to myself until I've heard the band run through the song at least once. Often, if left to their own devices, the players will take the song in a wonderful direction I hadn't thought of, so I like to cut them loose for the first take or two.

From what I've been told, the overwhelming majority of tracking sessions for demos in Nashville proceed by picking the best of a few takes and then punching in for solos and to fix flubs on the chosen take. I find that I get much better-and faster-results by doing four to six takes of each song, skipping punch-ins altogether, and editing all the takes for each track into monster composite tracks back at my studio. In the time it would take to laboriously construct solos and fix "clams" using punch-ins, I can usually get at least two more complete takes accomplished with the entire ensemble. That gives me the opportunity to try some different approaches to the song's production and amass more licks for editing into super arrangements back at my studio. And by forgoing punch-ins, all tracks for a given song start at the same exact timecode position and proceed uninterrupted to the end, making reassembly back at my studio much simpler.

By the way, I keep every single take, no matter how lame. On my last trip to Nashville, the very first phrase electric guitarist J. T. Corenflos played on one of the songs—during the first take when everyone was just learning the chart—became the great instrumental



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Hired Guns



hook I pasted into all the other breaks. He never played that same phrase again.

As the tracking session progresses, I'll make sure I have enough material for each song to build great composite solos later on. I'll also note which were the overall best takes for each song so I can use them for the vocaloverdub sessions the following day.

Sing to Me

At the start of the vocal session, I'll have the singer run through the song from start to finish a couple of

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times, singing it however they like. These are often the most magical takes in terms of vibe, but they can also be the most pitchy. For that reason, and to ensure that I have plenty of material to build a killer composite vocal track, I'll then go through the song section by section with the singer to make sure I end up with at least a few great takes of each line of lyrics before moving on to the next section. (If the singer gets hung up on one particular line, we'll put it on the back burner and return to it later.) Back in my studio, it's not uncommon for me to combine individual words, and even syllables, from

> different vocal takes to build a virtuoso performance; there can be as many as 70 to 100 vocal edits in one song (see Fig. 4).

> I don't like to record background vocals (BVs) immediately on the heels of leadvocal overdubs. I'd rather focus all my time with the singer on getting the best leadvocal track I can, as that is by far the most important aspect of a demo. And until I edit together a composite lead-vocal track back at my studio, the BVs won't be able to lock to the "finished" lead. For this reason, I overdub BVs back at my studio, after all the tracks I produced in Nashville are composited.

Pack a Punch

When the vocal sessions are over, I instruct the engineer to consolidate all the punches for each take into one continuous file and name it according to its take number (for example, voc_01). Then I have them dump all the files to the FireWire drive I brought to the session. (If necessary, I'll have them export the files in a file format that is compatible with my DAW, before they put them on my drive.)

If you elect not to bring a hard drive to the hired studio, have the engineer burn the data to DVDs. With all the takes I do, this is not that practical, because over 20 GB of data may be involved.

Whatever file format is chosen for export, make sure that it supports timestamping. A time-stamped audio file has its original SMPTE timecode start and end points embedded in the file. The Sound Designer II (SDII) format, for instance, automatically time-stamps audio files as they are created. This allows you to drag all time-stamped SDII files from your Nashville-based sessions into your SDII-format work-demo sequences and move them to their original SMPTE locations so that all tracks sync up exactly with the click tracks you used throughout production. Using time-stamped files relieves you of the burden of having to start all your Nashville-based tracks at 0:00:00.00 in order to preserve sync with your work-demo tracks. (That would be a nightmare requirement if, for example, you wanted to overdub a solo in Nashville in the middle of a song.)

In addition to exporting all the audio files for your tracking and vocal sessions onto your FireWire drive, make sure the studio backs up all the files to DVD-R, Exabyte, or other media for safekeeping at the studio. That way, if the worst should happen and your hard drive gets damaged during your trip back home, you won't lose all your precious tracks. Remember, don't put your hard drive in checked luggage when you fly. Take it as a carry-on.

Get Back

Once you're back in your own studio, import all the audio files from your Nashville-based sessions into the corresponding work-demo projects for each song. Opening the project file for the first song you want to continue working on, create enough tracks—or enough takes within each track—to accommodate all of the takes you did in Nashville for that particular song. Do this same

REDISCOVER THE CLASSIC RIBBON

thing for each instrument and the lead vocals in turn.

Sort all the files for the project so the imported files are grouped together and are easy to locate. For example, in Digital Performer you can view all the sound bites in the Soundbites window by source type, which will result in all the imported files being listed next to one another (see Fig. 5). Next, drag-and-drop each file in turn into its proper blank track and take. As long as each file is timestamped, there is no need to worry about where (that is, at what SMPTE time position) you drop the files in each track. After the files have been dropped into their proper tracks and takes, simply select and move them to their original time stamps using the appropriate DAW command (see Fig. 6 or consult your DAW's manual for how to do this). Everything should line up perfectly.

After confirming that all the tracks for a song sync up, it's time to create a composite edit for each one as needed. Although composite editing is worthy of an article on its own, I will briefly summarize and oversimplify the process here.

Play each take from the tracking session in Nashville and decide which take is the best overall. Be sure to listen to all the instruments at once, perhaps using one of the lead-vocal takes as a melody reference. Then, starting with



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www.openlabs.com tel: 512.444.6222 the rhythm section for that take, find any weak points in the performance and paste in better material from the other takes. The better material may simply be played tighter or comprise great arrangement ideas and licks you'd like to use.

Once the rhythm tracks are edited to the point that the groove is really solid and infectious throughout the song, composite edit the other tracks in turn until you've pasted together an arrangement that flows and excites you from beginning to end. With painstaking appraisal and selective assembly of all the considerable material you have spread out across all your takes, the end result should be incredible composite tracks and song arrangements that blow away what any one unedited take could ever offer.

Once all the instrumental and vocal tracks are composite edited to your satisfaction, overdub any BVs and new instrumental parts you feel the song needs to bring it to its highest potential. But be sure the song really needs your extra parts. You used all those world-class players and singers for good reason. You don't want to dilute the impact of their performances with any additional tracks that don't enhance what they already gave you.

After your overdubs are finished, take plenty of time to mix each song. Even the best performances can be sullied by a bad mix. Remember, your goal is to create a demo that sounds like a record. A kiLer mix is critical.

Endgame

Your song demo is the calling card that lets industry pros know you are on top of your game and your songs deserve to be heard. While pitching material can be a frustrating endeavor, great demos will eventually open up doors and build important relationships for you.

You may have only one shot to impress, however, so make sure you've got the goods before you stick your foot in the proverbial crack in the door. Having ace session players and singers layin' it down like there is no tomorrow increases your odds of success. EM

Michael Cooper is a contributing editor for EM and Mix. His company Michael Cooper Recording provides out-of-area clients flatfee mixing and mastering services via Fea Ex delivery. He can be reached at coopermb@ bendbroadband.com.

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"Finally, someone has it right! This is the final chapter for me when it comes to the piano. I feel like one of the lucky ones. I know the secret." – KEITH CROUCH, songwriter/producer for Brandy, Deborah Cox, Toni Braxton, Boyz II Men, CeCe Winans, Chaka Khan



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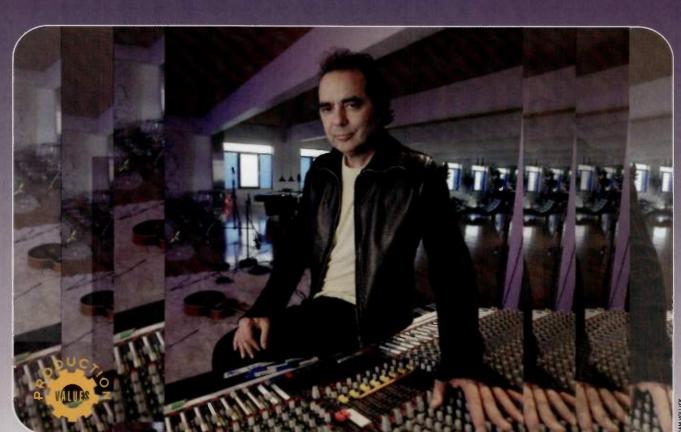
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House of Soul

By Paul Tingen

In Daniel Lanois's studio, the performances are hot and the textures are cool. aniel Lanois is an enigma with a long and interesting history. The 54-year-old Canadian has produced a staggering list of classic recordings from artists such as Bob Dylan, Emmylou Harris, Peter Gabriel, Willie Nelson, and U2 (see the sidebar "Daniel Lanois: A Selected Discography"). These productions are high on grit and atmospherics, short on bombast and high-tech gloss, and have earned Lanois much critical praise. *Rolling Stone* called him "the most important record producer to emerge in the '80s."

Since the release of his first album, the introverted and lyrical *Acadie* (Warner Brothers, 1989), Lanois has also conducted a highly respected solo career. *Acadie* is widely regarded as a masterpiece, but its successor, *For the Beauty of Wynona* (Warner Brothers, 1993), is more uneven and was followed by a decade-long hiatus on the solo front. Nevertheless, Lanois is one of those rare musicians who have had a career filled with commercial and critical success.

More recently, however, there were indications that all was not well in Lanois's world. For example, his steady stream of productions had almost dried up. Since his most recent major U2 project, *All That You Can't Leave Behind* (Uni/Interscope, 2000), all he had produced was Harold Budd's *La Bella Vista* (Shout Factory, 2003).

In 2000, he sold his legendary Kingsway studio in New Orleans. It was located in a 19thcentury house full of high ceilings and carpets. The studio exemplified the two production approaches for which Lanois has become best known: recording in unusual, atmospheric locations, and recording without a separate control room.

Around that same time, Lanois began to lead a more nomadic lifestyle, moving to a small village on the west coast of Mexico called Todos Santos. After a year, he packed up and headed for Oxnard, north of Los Angeles, where he set up shop in an old Mexican cinema called El Teatro.

Before long, he relocated again, to Silver Lake, California, where he set up his current studio.

Lanois also created a second private recording facility in Toronto. Those changes occurred along with the rekindling of his solo career. He has gone on several live tours in the past two years and has released three albums—*Shine* (ANTI, 2003), *Rockets* (daniellanois .com, 2004), and *Belladonna* (ANTI, 2005). Although this wealth of activity is a sign of an artist on a creative roll, the sense of melancholy that dominates his recent records is unsettling.

"I kind of went to a bad place emotionally," admits Lanois. "I dropped out of sight for a while. I have been in the machine since I was a kid. That's fine as long as you have your nose to the grindstone, but I have taken a lot of punches [laughs], and I am not taking it anymore. I got sick of the business; it felt like quicksand. So if I see hypocrisy walk through the door, I just turn away.

"I have become a lot more spiritual about the whole thing. I just follow my musical instincts—my heart these days. And I don't have the itch right now to produce other people's albums, so I am not going to do it. I'm happy to be working on my own music. The melancholy that you hear is there, but it has always been in my work. I have just surrendered to the fact that I am who I am, and I do what I do."

Sound Laboratory

Lanois has always been on a journey of inner healing and rediscovery and is known as a very soulful musician. That trait is apparent in his production approach,

FIG. 1: Lanois has been playing more pedal steel and says that he'd like to put out a pedal steel record. his singing, and his guitar playing—especially when he plays his pedal steel, which he features on *Belladonna* (see **Fig. 1**). Although





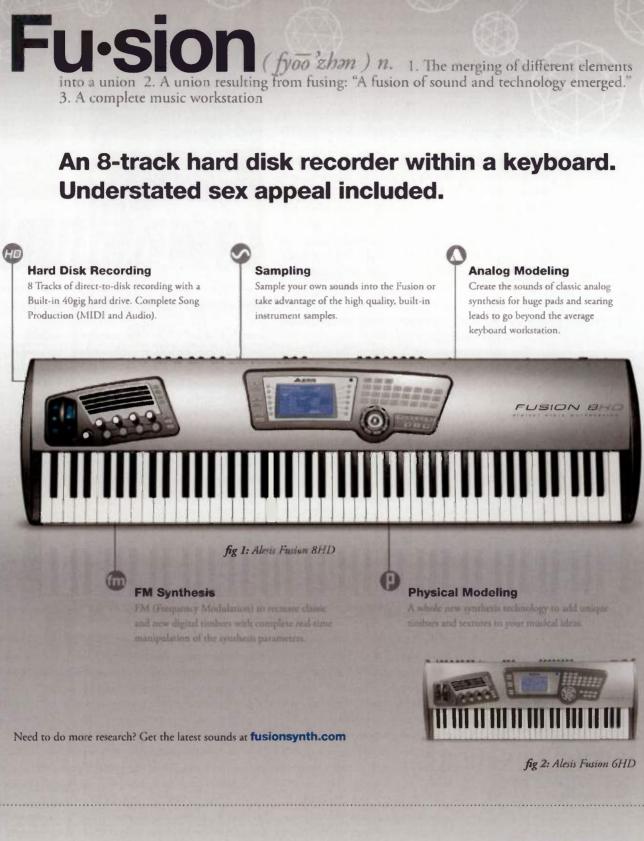
After a long dry spell in his solo work, Lanois has lately been focusing on it exclusively.

Lanois puts a heavy emphasis on organic musicianship, he's also a master at using the tools in his studio (which he calls his "studio laboratory") to come up with interesting new sounds.

At the heart of Lanois's approach, though, is his favoring of performance and atmosphere over technical perfection. When he emerged as a producer in the '80s, mixing desks were being automated. Lanois, however, highlighted the performance aspect of mixing, insisting on mixing by hand. While most producers were going for the glossy sound of digital reverbs and the sonic "perfection" of digital recording and of sequencers and drum machines. Lanois preferred low-fi analog effects and treatments, imperfect but soulful performances, and the warmth of analog tape recorders.

"A good performance will override any production idea or sonic idea that you can have," says Lanois. "If you have a vocal that's strong and transports you as a listener, you're not going to worry what kind of EQ you've got on this drum or what sound you've got from that guitar. The delivery will override whatever small changes you can make in the sound. And the place where you record can make a huge difference. Unusual locations have much to do with creating a recording environment. We're talking here about creating spontaneity and performance in whatever way one can."

Lanois's approach was effective and has become part of mainstream producing. It's at the heart of his two studio laboratories. "The house here in Silver Lake is a trilevel house," explains Lanois, "and the studio is on the lower level. I still work with everyone in the same room together. I don't think of the recording



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equipment as something for other people in another room—although the house in Silver Lake has lots of little labyrinths, side rooms, and hallways, so there are some rooms I can use for isolation. I keep the drums in a separate little room, behind a Plexiglas door, so you can still see the drummer. The house setup in there is a couple of Neumann U 47s above, kind of like jazz miking, and the bass drum mic is either a [AKG] D 12 or a Coles.

"I have a 38-channel Neve 8068 desk here in Silver Lake that I have been restoring for years. It is a sweetheart. I also have loads of other small Neve desks, like the BCM10, the Kelso, and the Melbourn, which get used as microphone preamps. My favorite is the Neve 1066. I also like my API preamps. I've gotten some great vocal sounds from them. My main recording tool now is the iZ Technology Radar, a Canadian computer-based machine. It's in a similar league as [Digidesign] Pro Tools. Its sound is so transparent that it's not a vital link in terms of personality. I don't know what the sampling rate is, and it's not a great concern for me. The personality of the work comes from the source of the sounds, the players in the room, and the microphones used.

"I've built the Toronto studio since I finished *Shine* in 2003," adds Lanois. "It is in a penthouse loft, which is about 5,000 square feet in size. It's big, like a dance studio, but it's not a crazily reverberant place. The sound has a lovely way of resolving itself, as if you were on the wooden stage of a beautiful old theater, where you have a great sense of space. There are no acoustic treatments; it has just a hardwood floor, loads of windows, and a wooden ceiling.

"The studio is in a corner of a big, open room, where I have a 40-channel Amek Tac SR9000 console and another Radar. I have almost every Studer tape recorder ever made, including an A80 in Toronto and in Los Angeles. Although I mainly use the Radar, the Studers are still there. I have to trust them, because I have made so many records that sound great on them.

"The secret of my studios is that I keep everything

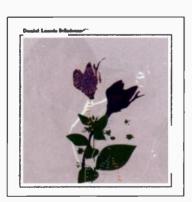


FIG. 2: *Belladonna*, Lanois's most recent solo CD, features 13 instrumental songs.

68

plugged in all the time. You pick up the bass, and it automatically shows up on a certain channel. It's like a throwback to the '50s, when studios would have a drum kit nailed to the floor and several amplifiers ready to plug your guitar or bass into. So each studio would have its own house sound. I am a bit of a romantic in that respect; I never liked a studio that neutralizes itself at the end of a workday. There is a spirit to each of my studios, and they happen to sound great. Toronto has a more open



A cornerstone of Lanois's production philosophy is that getting a good performance is a higher priority than achieving perfect sonics.

sound, whereas Silver Lake is more dense with more control. Microphones in both studios include AKG C 24s for piano and Shure SM57s and Sennheiser 409s for guitar combos. I also like the RCA 44 and the 77—I love ribbon microphones."

Power and Punch

Not surprisingly, given Lanois's emphasis on recording in locations where musicians feel at home, he welcomes the exponential rise of the home studio. "It is fantastic that you can walk into a music store and come out with a full studio for not that much money," he says.

"Some great records will come of that, because people who can't afford to go into large studios but who are really talented and have great visions can now express themselves. The downside is that when recording to hard disk, you can keep putting off decisions and people become precious and don't want to chop things down. It is the curse of the modern world. Records have become longer, at a time when people have less listening time.

"My recommendation for home recording is to have lots of instruments and not so many microphones. Just have three microphones active, get a beautiful sound on each one, and move them around as you need to.

"Here is Daniel Lanois's tip for a great acousticguitar recording: leave the guitar in the case! Put up a couple of nice microphones—whatever you have in your studio that you think sounds great. I usually use a Neumann U 47 and a Sony C37a. Go to the console while you have one of those microphones in your hands, turn up the speakers, and get a really nice

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"Now go to the other microphone and do the same thing. Then put the two microphones on stands in the neighborhood of the acoustic guitar, put some headphones on, shut off your speakers, and make the microphones sound nice and hot in the cans. Now, finally, take your guitar out of the case, go to the vicinity of the microphones, and start strumming and picking whatever you are going to play. Find the sweet spot on each of the microphones. Choose the one that sounds best to your ears, and put the other one away. In my case, my Sony C37a is often magic.

"As an added bonus, put a good magnetic pickup on the acoustic guitar, like an old Lawrence from the 1980s, and put that signal into a small guitar amplifier like a Fender Champ or a baby Peavey. A battery amplifier is preferred, so you don't have any ground problems. Just bring up the volume of that little amplifier (but not to the point where it is blaring in the room), hang a microphone right on the speakers, and either put a bunch of pillows around it or put it behind a sofa to muffle the sound.

"Track the pickup and the main microphone separately. In the end, you have that really great recording [from the mic], and then you have the pickup sound coming through the amplifier, which is the cherry on the cake. The amplifier sound is mixed in low, only for seasoning, just to add a little bit of guts in the midrange. Played together, those two tracks should give you a beautiful sound."

Crank Up the Bass

In expressing his discomfort about records getting increasingly longer, Lanois walks his talk. His latest effort, *Belladonna* (see Fig. 2), clocks in at 38:44, with some tracks shorter than 2 minutes. In recording the album, which is his first entirely instrumental record, Lanois tried to apply what he considers the all but lost art of capturing the peak moments that occur when the red light is on.

"We live for those moments," notes Lanois, "and when they come, I thank my lucky stars and try to have the wisdom to pick them and put them on records. It's the way things should be, and it is the way rock 'n' roll started. It began in the streets, and the record companies couldn't help but notice and record the stuff. It cannot be surpassed. It's interesting how everybody references Led Zeppelin records today, but nobody wants to make them anymore.

"Instead, they go into the studio and choke the bass drum to death, make sure it sounds ticky with no roundness whatsoever, and God forbid it should ever resonate. So that's where we're at today; we have our references intact, but we are not brave enough to do anything with them.

"The greatest folly of modern times is to try to make things sound small, so they occupy a tiny space in the picture and can cut through the mix or something. It is crazy. Engineers will cut down everything below 400 Hz from an acoustic guitar because they think it's booming. But 90 percent of the body of the guitar is in that range. If you kill that, you're left with the scratchy-nails-onthe-blackboard sound. Or people use transducers that sound like crap. Or you get the flunky engineers (who all end up doing work for television) rolling off the bottom end, because TV sets aren't supposed to have the capacity to reproduce that.

DANIEL LANOIS: A SELECTED DISCOGRAPHY

Producer

Bob Dylan, Oh Mercy (CBS, 1989) Peter Gabriel, Us (Geffen, 1992) Peter Gabriel, So (Virgin, 1986) Emmylou Harris, Wrecking Ball (Asylum, 1995) Jon Hassell, Power Spot (Uni/Ecm, 2000) Luscious Jackson, Fever In, Fever Out (Grand Royal/Capitol, 1996) Willie Nelson, Teatro (Island, 1998) The Neville Brothers, Yellow Moon (A&M, 1989) Robbie Robertson, Robbie Robertson (Geffen, 1988)

Artist and Producer

Daniel Lanois, Belladonna (ANTI, 2005) Daniel Lanois, Acadie (Warner Brothers, 1989; daniellanois.com, 2005 reissue) Daniel Lanois, Rockets (daniellanois.com, 2004) Daniel Lanois, Shine (ANTI, 2003) Daniel Lanois, For the Beauty of Wynona (Warner Brothers, 1993)

Composer and Producer Sling Blade soundtrack (Island, 1996)

Coproducer

Bob Dylan, *Time Out of Mind* (Columbia/Sony, 1997) Brian Eno, *On Land* (EG, 1982) U2, *How to Dismantle an Atomic Bomb* (Interscope, 2004); coproducer on selected tracks U2, *All That You Can't Leave Behind* (Uni/Interscope, 2000) U2, *Achtung Baby* (Island, 1991)

- U2, The Joshua Tree (Island, 1987)
- U2, The Unforgettable Fire (Island, 1984)

Additional Production and Mixing Scott Weiland, 12 Bar Blues (Atlantic, 1998)

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sake, roll off everything in the low midrange and don't have any bottom. And then go home and listen to old Led Zeppelin records for inspiration! The only records that sound good these days are hip-hop records, because the producers understand something about bottom end."

Magic Sounds

Lanois has become famous for his "treatments" the intricate and often atmospheric application of electronic effects. One striking aspect of his recording approach is his use of treatments to stimulate per-

> formances, rather than adding them later on. "It can be exciting if processing allows you to look at a song in a different manner," he says.

> "It's nice if it can drag you out of your usual habits. It's like being introduced to a new kind of food that you wouldn't know unless someone had turned you on to it. But processing shouldn't be the domain of just the engineer or the producer. I like the idea of giving everyone a little workstation and seeing what they come up with. I also encourage musicians to have their own effects-to have their own rig. If it's great, you record it. In my experience, when musicians play off processing, that processing should not be separated from the performance. It's all one and should be documented that way, even if you track the processing separately."

> Lanois goes on to elaborate on his favorite processors, offering some of the tracks on Belladonna as examples. "The Lexicon Prime Time is an old favorite: I know how to get results on it. It delays and it wobbles. I used it on the track 'Two Worlds.' It opens with my friend Bill Dillon on guitar and with me manipulating the sound through an AMS Harmonizer, an EMT 250, and the Prime Time. The effects were set very high and were all interlooping and feedbacking off each other while he was playing, giving it a psychedelic sound. The amplifiers were in the control room, and there was so much volume that we got a lot of feedback, which gives it a tormented sound. We recorded the track in Toronto, to 2-inch tape and via an MCI desk that has since died.

> "On "The Deadly Nightshade,' I plugged a Les Paul Junior straight into a Korg SDD3000 digital delay. The Korg has two outputs—a clean output and an effect

output—and I then found the sweet spot on the effect side. The guitar was so heavily treated that I didn't add any more effects during the mix. 'Dusty' also features my Les Paul and a Boomerang Phrase Sampler box, which is a kind of cheap selfoverdubber. You put your guitar through it, and you stack up some sounds. I laid down an initial take, and then played on top of it. I didn't add any effects.

"For me, the mix is usually just a matter of bringing up faders and balancing things. I hardly ever use reverb; I haven't since the early '80s. My tracks have just echoes slap echoes like in Jamaican music. It may be the Lexicon Prime Time. If you notch it in such a way that it has two, four, or eight repeats, you don't get much high end on your return. So you're creating the illusion of distance.

"On 'Sketches' I also did a guitar loop on the Boomerang pedal. Brad Mehldau played a beautiful cascading piano, and we found an effect that gave it a watery sound. It was a custom-made Eventide H3000 effect that we called Purple Vista. I think it's a short delay that's tripped onto itself so it generates internal feedback. It is one of those magic sounds that we store and keep in the box. In that case, the effect was added in the mix.

"The final track of the album. 'Todos Santos,' is a 'studio laboratory' piece. The only sound source is an old Yamaha CS80 polyphonic synthesizer that I put through an AMS Harmonizer, on which I came up with various pitches that I liked. Each time I found one I liked, I stored it. The AMS has nine stores in it. and I would then play its keypad. I made the sound weird with all kinds of effects. That took days and days of processing. When you're into that, it's like an incredible vortex that you fall into and you become a mastermind of that technique for the time that you are in the vortex. And then you document it, and when you leave, it is like 'Oh my God—this sounds so amazing!"

Lanois continues to be full of enthusiasm about working in his studio laboratory and offers one more tip for those who record at home. "It's important to become a master of a few boxes, rather than to dabble in too many that you don't fully understand. Whether it's a Pro Tools box that you're excited about or something else—it doesn't matter. What's important is to become really good at using it; become a master of something. That requires a lot of discipline in these modern times, because there is so much equipment available. So find something that you believe in and go after it. That way you have a chance to develop a sound, and your records will have a more unique personality."

Pedal Tones

Lanois reflects for a moment, then says that he has become rather good at playing the pedal steel guitar, and that he'd like to put out a pedal steel record. "I am always tempted to do that," he remarks. "I have enough pedal steel recordings to be able to put it out pretty soon. Aside from that, I have a bunch of nice songs."

Lanois sets himself behind the piano at his Silver Lake studio and performs a song called "I Am Leaving Tonight." He sings enigmatically, "Gonna leave this place, don't want to run this race, yes, I am leaving. I want to feel the dirt running through my fingers, where I can't get hurt. Yeah, I'm leaving tonight, I'm leaving the gold, I'm leaving in search of a house of soul. A house of soul."

Lanois's latest record may have been instrumental, but his songs still speak louder than anything else. EM

Paul Tingen is a writer and musician living in France. He is the author of Miles Beyond: The Electric Explorations of Miles Davis, 1967– 1991 (Billboard Books, 2001), a book on early weird funk experimentation. For more information, visit www .tingen.co.uk.



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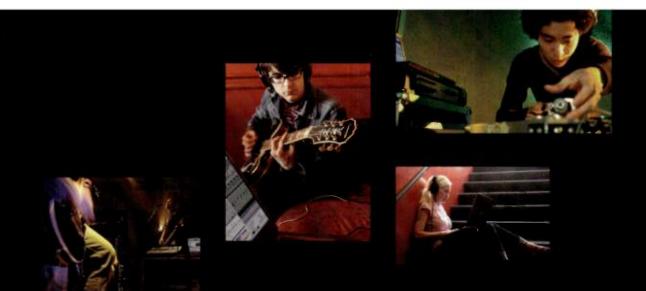






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Listening to Monitors By Rusty Cutchin Advice for picking your studio speakers.

f you're thinking about buying your first set of dedicated studio monitors or about upgrading the ones you have, it can be daunting to try to assimilate the wide range of speaker configurations and products available. There's a lot of confusion out there, even among veteran musicians, about how to select the best monitor for a particular small studio. Here's a quick primer and a checklist of considerations to help you put the right monitors into your studio space.

Close-Field Classic

For years Yamaha's NS-10M (see Fig. 1) and its successors set the standard for close-field monitors. But it wasn't because the monitor sounded great. Even the most consistent supporters of the speaker looked at it as a necessary evil for mixing. The NS-10 emerged as engineers began to appreciate the advantages of close-field monitoring, which included minimizing room characteristics when they were listening to the high output required for rock music. The NS-10 was widely adopted by studios because of its ability to represent the typical home-stereo speaker of the

FIG. 1: Yamaha's discontinued NS-10M became a standard for studios around the world. Many speakers can do a reliable job today, because close-field monitors have improved in quality and have become more affordable. 1970s without adding excessive coloration.

Never mind that many engineers decided to drape tissue over the NS-10's tweeters to limit audible high frequencies. That trick



helped control the tendency to limit highs in the mix, which could result in some dull-sounding recordings. (You can check out a serious analysis of that technique by acoustician Bob Hodas at www.bobhodas .com/tissue.html. Sample conclusion: "We can see that, at times, two layers of T.P. can simulate tissue curves, but [we] cannot draw positive conclusions about the effect of ply number.")

So reliable was the NS-10 that it became the de facto standard for close-field monitoring for more than two decades, and it's still unusual to find a pro studio without a working pair in place. Modern monitor technology, however, has raised the quality of consumer audio speakers and close-field studio monitors. But the essential quality of the NS-10—reliability at all volume levels—is still the primary necessity for a small-studio monitor. Contemporary monitors achieve that in a number of ways.

Power to spare. Modern close-field monitors are typically of the powered variety, and many are biamped. Giving the speaker its own power creates many advantages over the design of a traditional passive speaker such as the NS-10. Like a traditional home-stereo speaker, passive monitors are connected by speaker cable to a separate power amp that is usually positioned in an audio rack far away from the monitor positions. With powered speakers, internal amplifiers can be matched more closely to the monitor's woofer and tweeter. For the novice, powered monitors eliminate the need for impedance matching. ("Let's see. If I have two 8Ω monitors, and my power amp puts out 800Winto 4Ω ...") Because powered monitors use line-level signals and typically require high-quality cable with either XLR or TRS connectors, they reduce the chance of interference, hum, and line loss associated with speaker cable.

Material gain. The raw elements that make up monitors have changed over the years. Silk ferrofluid-cooled soft-dome tweeters, MDF cabinets with rounded corners, neodymium magnets, and polypropylene cones have helped monitors such as Mackie's HR-624s (see Fig. 2) put out much higher audio quality at a much lower cost. (That so many models are manufactured in other countries also keeps costs down.) Those elements are also present in home-audio systems, and so the public's

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familiarity with high-quality audio is higher than it used to be. High-quality components are much more common and affordable than they were at the beginning of the home-studio revolution.

Quality of sounds. The monitor's job is also easier today, because more high-quality sound is going into it. Whereas most studio production depended Know your room. The greatest monitors in the world can sound horrible in a bad space, and taming a problematic room isn't that hard, unless you are creating finished mixes that are ready for mastering. The typical bedroom is not a bad place to do basic recording. Carpets, curtains, and furniture can control reflections. Speakers can be set up at an angle to

Listen for definition in the fingering of various electric-bass playing styles.

help avoid creating standing waves from parallel walls. And careful listening to professionally produced CDs of the style in which you usually work, as well as spoken-word and test-tone recordings, can

on careful recording and processing of analog instruments until the 1980s, the vast majority of recorded projects today are made up of at least a few elements that were previously recorded and processed, such as digital instrument samples or pristine electronic signals such as those from digital synths. Those conveniences make it much less likely that your mix's flaws will be betrayed from one monitor system to the next. In the past, it was harder to tell if an overly loud and muddy bass guitar was poorly recorded or handled poorly by bad monitors. Digital technology and new

FIG. 2: Most modern powered monitors, such as Mackie's HR-624s, use materials such as ferrofluid-cooled soft-dome tweeters, polypropylene cones, and neodymium magnets.



manufacturing techniques have brought about major improvements in music production and reproduction gear such as studio monitors.

System Strategies

Now that you're armed with the knowledge that monitors and musicproduction tools are better than they used to be, how do you pick the right system from the scores of reasonably priced monitors available today? Here are some suggestions that can help you narrow the choices.

Know your mission. Recording hip-hop or club music? You'll want to hear louder and deeper bass to get a feel for the mix in a large space (even though you probably shouldn't rely on that bass during a mix). That will mean larger woofers, with around eight-inch drivers, or a 2.1 system with a subwoofer. Singer-songwriter demos?

A smaller monitor with clean reproduction will do the job. Many different projects for many clients? A system designed for heavy-duty use and with highquality components makes sense here. Make sure that parts and service are readily available, or keep a backup set. reveal problem areas of your room—especially bass buildup in the corners and overly live or dead spots. More-detailed acoustic tweaking requires an investment that may not be worth the cost, unless your studio is very busy with acoustic recording projects.

Know your material. Audio engineers, even the ones who have vast experience, understand the need to A/B, or compare, their mixes with professionally finished CDs. Comparing helps reveal problem areas in a mix and also acclimates the engineer's ears to his or her own work space. A hit recording sounds different from one pro studio to another, even when both have been adjusted to the highest acoustic standards. If you're a novice and the best-sounding mix from your studio has way too much bass sound when it is played on a car stereo, don't be alarmed. Spend more time listening to the same professional CD in the two environments while A/B'ing it with your own mix. With a more even playing field for monitor components, understanding your listening environment and how your monitors respond to different source material becomes more important.

Sound Suggestions

It can be tough to recognize that a good-sounding monitor is actually not good to work with and that a "bad-sounding" monitor such as the NS-10 (which tended to fatigue engineers after a lot of use) can make your mixes competitive with major-label releases. It often takes years of listening to recognize weaknesses in a model that sounds wonderful at first listen. (My personal trick is to listen for definition in the fingering of various electric-bass playing styles. Muddiness in the low midrange on classic funk records disqualifies a monitor from my studio.)

There are many worthy monitors out there. Listen to as many as possible, take into account the preferences of the producers you admire, and learn how the speaker you choose handles other people's music—the good, the bad, and the ugly—as well as how it handles your own. EM

Rusty Cutchin is an associate editor of EM. He can be reached at rcutchin@comcast.net.



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Xtreme Processing By Eli Krantzberg

Plug-ins in series offer greater transparency.

ou can often use several instances of the same plug-in to achieve realistic-sounding effects. The cumulative result of serial processing with subtle settings or of parallel processing with slight variations can be well worth the added CPU cost. And because you aren't restricted to hardware, the sky's the limit. Here, I'll discuss some examples applicable to tracking, mixing, and mastering.

Tune Up

Chorus units are often used to thicken a solo vocal performance by creating a doubling effect. Chorusing is a delay-based effect and doesn't allow for intonation differences between vocalists. You can achieve results that are more natural sounding by using parallel pitchcorrection plug-ins that have differing amounts of detuning and, perhaps, different formant settings (if your plug-in offers that). If you can spare the CPU resources, follow each pitch-correction plug-in with a short, variable delay.

I've illustrated that process in Web Clip 1, giving three versions of the same vocal take. The first version is dry. The second is processed through a typical chorus plug-in. The third routes the vocal track through two auxiliary buses panned hard left and hard right. Pitch-

FIG. 1: This is one of five compressors connected in series. Each compressor has slow attack, long release, 2 dB of gain reduction, and 3 dB of makeup gain.



correction plug-ins have been placed on the main bus and on each auxiliary bus. One auxiliary plug-in is set to detune a small negative amount, while the other detunes a small positive amount. In-tune pitch correction is applied to the main vocal. A short delay plug-in has also been inserted on each of the auxiliary buses.

Squeeze Me

One of my favorite hardware compressors, Really Nice Compressor from FMR Audio (www.fmraudio .com), has a mode called SuperNice that passes the signal through the compression network three times. Each stage adds a small amount of compression, and the overall effect is more transparent than using one stage of heavy compression. That's especially useful on mix buses during mastering.

When using several compression stages with low threshold and ratio settings, no single stage compresses the signal very much. The cumulative effect of the multiple stages achieves a high level of compression while avoiding the pumping and breathing artifacts associated with extreme compression.

Start by inserting a compressor plug-in with long release and slow attack times on your master bus. Adjust the threshold to trigger 2 dB of gain reduction with a ratio of 2:1 and 3 dB of makeup gain. Place a copy of the plug-in in two additional insert slots on the master bus. Each stage of compression is fed a slightly hotter signal, and no single stage is working particularly hard (see Fig. 1 and Web Clip 2).

Stretch Out

Some high-end compressors offer a dual-release mode, which has a slower release on long, loud passages but applies a fast release to retain control over quick transients. You can emulate that effect by routing the master audio stream through two auxiliaries placed before the master bus. Insert a compressor in RMS mode with slow attack and long release times on one of the auxiliaries, and insert another compressor in peak mode with quicker attack and release times on the other auxiliary. Mix the outputs of the two auxiliaries to achieve a nice balance between the two forms of compression.

Reverb plug-ins offer another opportunity to go beyond conventional hardware paradigms. Many reverb plug-ins allow you separate access to their early-reflection and reverb-tail stages. Early reflections with no reverb tail provide a useful alternative to panning when you are placing instruments within the mix. You can use the earlyreflection settings of different rooms and halls to place instruments in the front-back and left-right dimensions, and you can even adjust the width of the space. Use separate early-reflection plug-ins for individual instruments or subgroups; then send the entire mix to a shared reverb plug-in with its reverb tail on and its early reflections off. EM

Eli Krantzberg is a drummer, vibraphonist, bandleader, and personal-studio owner in Montreal. Visit his band's Web site at www.nightshiftorchestra.com.

80

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Absolutely Sound By Brian Smithers

How to choose a pair of close-field monitors.

ew things can get a room full of engineers into a heated debate as quickly as the subject of monitors. Which are the best? Should they be extremely accurate or should they sound like a typical home stereo? Do you carry your speakers with you from studio to studio? Do you mix on closefields or on the room's mains?

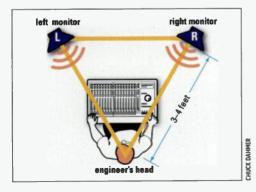
Even for a professional engineer, listening is a highly subjective experience. The hearing mechanisms of our ears are as unique as our fingerprints, and the relationship between the acoustics of our pinnae, the electrochemistry of our auditory nerves, and the psychology of our brains is absurdly complex. Pity the poor speaker charged with delivering audio to such a setup!

There are, nevertheless, some objective truths about the way speakers are designed, the way they interact with a listener and a room, and the way to use them wisely in a typical project studio. Armed with these facts, you can decide for yourself which ones will work best for you and, just as important, which side you'll take the next time you're locked in a room of bickering engineers.

High Fidelity

A high-fidelity audio system is one that delivers the sound of a CD or other playback source with extreme accuracy. Ironically, the term *hi-fi* has come to mean a playback sys-

FIG. 1: Close-field monitors should be arranged in an equilateral triangle with the engineer's head at a distance of approximately one meter. That arrangement makes the direct sound more prominent than room reflections, minimizing the influence of room acoustics on the engineer's judgments.



tem that simply sounds pleasing to the listener; when you're listening recreationally, if your home-stereo speakers sound great to you, that's good enough. They may be deliberately designed to enhance bass and treble and give the overall sound more kick and sizzle. They may compress a recording's dynamic range, emphasiz-

> ing its ambience, which isn't necessarily a bad thing in a living room filled with sound-sucking sofas and carpeting.

> When you're tracking and mixing, however, it's your job, and not your speakers', to make things sound good. Most engineers feel they need a monitor system that gives

them the aural truth. Many novices who try to save a few bucks by using their home-stereo speakers in a home studio are ultimately frustrated by mixes that never sound as good in other rooms. It's a simple equation—if your playback system emphasizes bass, your mixes will sound thin on speakers that don't have that same characteristic.

The quest for accurate monitoring is complicated by the fact that once the sound leaves the speakers, it bounces around the room on its way to our ears. Actually, our ears expect and depend on reflected sound to give shape and space to what we hear. (In an anechoic chamber, where there are no audible reflections, nothing sounds natural.) The problem is that reflections can combine to create standing waves and comb filtering (see "Square One: Standing Tall" in the January 2005 issue of EM). The best speakers will sound awful in a room with poor acoustics.

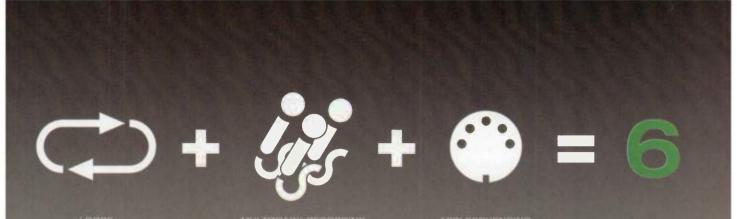
The proper solution, then, is to build a room and a speaker system that match each other perfectly. That is the approach taken by major recording studios. The mains are ordinarily large speaker systems set into the walls of a custom-built and carefully tuned room. Most project-studio owners don't have the budget or physical space for that, so most of us use close-field monitors.

Nearer My Heart

The term *close-field*, or *near-field*, refers to speakers in relatively close proximity to the listener. More specifically, close-field monitors are intended to be placed about a meter from your ears.

The theory behind close-field monitoring is that direct sound will prevail over room sound when speakers are closer to your ears than they are to any reflective surfaces. That is a tremendous benefit in a typical small room, in which acoustic disasters often occur. Note, however, that having close-field monitoring does not entirely remove the room factor from the equation. It is still important to position the monitors correctly and to treat the room's acoustics (see "A New Approach to Personal-Studio Acoustics" in the April 2004 issue of EM).

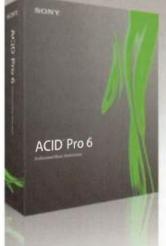
Close-field monitors should form a triangle, with your head at the bottom point (see Fig. 1). The distance between the monitors should be approximately one meter—the same as the distance from each monitor to your head. The monitors should be far enough away from the walls to avoid bass buildup, and they should be



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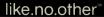
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equidistant from the side walls, because asymmetric reflections would cause the two speakers to have different effective frequency responses. If the room is too small to allow the monitors to be placed far enough from the front wall, it may be best to place them very close instead. That will at least cause the bass buildup to be more evenly distributed.

Two Ways or Another

Close-field monitors commonly use separate *drivers*, or speakers, for high and low frequencies, and may sometimes use a third for midrange. Those 2- or 3-way designs, as they're called, are more costeffective because of their use of specialized components. It's far easier and cheaper to build a small tweeter to handle the high end and a larger woofer to cover the low end than to build a single driver capable of covering the entire audible spectrum.

The signal is split into complementary frequency bands by a *crossover*, a combination of a lowpass and a highpass filter (and a bandpass for a 3-way design). If the crossover acts on the amplified signal, that's called a *passive* crossover. In an *active* design, the filtered signals feed separate amplifiers. The design of the filters and the choice of crossover frequency are key factors in the smoothness of the monitor's frequency response.

Even with 2- and 3-way designs, close-field monitors are generally incapable of reproducing low bass

The hearing mechanisms of our ears are as unique as our fingerprints.

content, ordinarily rolling off below 50 Hz to 60 Hz. To cover the bottom octave and a half, engineers often add a subwoofer. Another crossover redirects the lowest part of the audible spectrum to the subwoofer. Although it's possible (and advisable, in the view of some experts) to set up stereo subwoofers, it's more common to sum the left and right channels to a single sub (see Fig. 2).

Conventional wisdom says that since bass frequencies are less directional, it doesn't matter where you position a subwoofer. But if you close your eyes and listen carefully, you can almost always locate a subwoofer by ear. For that reason, it's better to place the subwoofer between the left and right monitors at the same distance from the mixing position when possible.

Devil in the Details

Quality monitors are built of nonresonant materials, most commonly medium-density fiberboard, to ensure that the box itself doesn't color the sound. Designs with

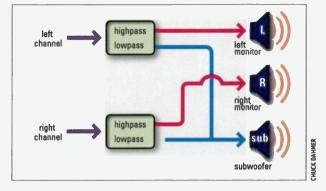


FIG. 2: A subwoofer can be used to extend the low-frequency response of compact close-field monitors. A crossover redirects low bass from the left and right monitors and sums them together to be reproduced by the subwoofer.

rounded edges and smooth surfaces help the sound disperse evenly. Although you are meant to listen from the sweet spot at the point of the aforementioned equilateral triangle, the sound shouldn't change too much when you reach left or right for a fader or mouse. A monitor's off-axis response, like a cardioid microphone's, should change smoothly and only slightly from on-axis.

If a tweeter and a woofer are attached directly to the front of the speaker cabinet, the smaller tweeter is closer to your ears by at least a couple of centimeters, causing high frequencies to arrive earlier than the lows. To

> compensate, some monitor designs align the signals, either by recessing the tweeter or electronically delaying its signal.

> Increasingly, monitors are being built with integrated amplifiers. Although some engineers favor unpowered monitors driven by exter-

nal amps, these powered monitors offer the convenience of matched amplifiers and drivers. If you take your own monitors to different studios to ensure a consistent reference, built-in amplifiers remove one more variable.

Concurrent with the popularity of the project studio, the market for close-field monitors has grown, and their quality has improved greatly. Many respectable models are now available in a variety of price ranges. The irony is that close-fields originally provided a "real-world" reference that engineers used to see whether the work they'd done on the mains would translate to a home system, and now we expect them to provide the accuracy required for critical work. Fortunately, well-chosen and well-placed close-field monitors are a viable solution. EM

Brian Smithers is Course Director of Audio Workstations at Full Sail Real World Education in Winter Park, Florida, and the author of Sonar 5 Ignite! (Thomson Learning, 2005).

24

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Label Enablers By Jeffrey P. Fisher

New options for labeling your DIY CDs and DVDs.

n an ideal world, every musician would have professionally printed, slick-looking labels for the CDs and DVDs they record. But the reality is that when you're producing only a small run of discs, it's often not feasible—either economically or logistically—to go the pro route for your disc labeling.

What other options do you have? You can hand label your discs with the ubiquitous Sharpie, but unless you're System of a Down, that won't make for a very professional presentation. You can also print out adhesivebacked labels. But even though today's color printers can produce great-looking labels, the tedious process of applying them one at a time, and the risk of them coming loose, renders that approach less than perfect.

Recently some new disc-printing methods have emerged for DIY disc labeling. They include inexpensive thermal and ink-jet printers that print directly onto discs, and a technology called LightScribe, which uses the same laser that burns the data to etch images into the disc's opposite side.

Going Thermal

Thermal-based printers such as the Primera Signature Z1 (\$139.95) and the Casio CW-75 (\$149.99) let you add type and simple graphics to standard lacquer-

reliable than a label.

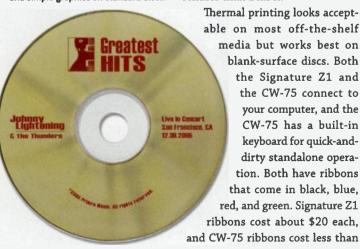
surface discs. Although it's only a

one-color process, the print quality

is clean (see Fig. 1). It's far better

than the felt-tip look, and more

FIG. 1: This CD was printed on a Primera Signature Z1, an inexpensive thermalbased disc printer that lets you print type and simple graphics on standard discs.



\$10. Blank-surface media sells for around \$50 for 100 CD-Rs or 50 DVDs.

Here Come the Jets

Several manufacturers make ink-jet printers that print directly onto discs. You burn the data separately in a suitable drive and then feed your completed CD or DVD through the printer. You can print only one disc at a time, and the cost of ink cartridges can escalate quickly. This is especially true if you print full-color graphics that have high ink coverage (that is, that require a lot of ink per disc printed). Manufacturers usually rate their printer's ink usage based on 5 percent coverage estimates, which are much lower than those for typical CD-cover graphics. Therefore, you should expect to use more ink per page than what those estimates indicate.

The Epson Stylus Photo R200 (\$99) prints up to 20 discs per hour (its "throughput") at an impressive $5,760 \times 1,440$ -dpi resolution. A special plastic caddie moves a single disc through the printer. (The R200 doesn't allow for unattended printing of multiple discs.) It features a 6-color ink palette (cyan, light cyan, magenta, light magenta, yellow, and black), and cartridges cost about \$13 for *each* color cartridge and \$18 for black.

The Epson Stylus Photo R800 (\$399.99) prints up to 25 discs per hour at the same resolution as the R200, using the same single-disc tray. The R800 features an 8-color ink palette (cyan, magenta, yellow, red, blue, black, matte black, and a gloss optimizer). The ink cartridges list for \$15 each. This printer has a very fine inkjet that produces stunningly photo-realistic output, **an**d it's ruggedly built for extended, heavy-duty work.

Primera's Signature Z6 (\$1,495) prints at up to $4,800 \times 1,200$ dpi in six colors (the same as the Epson R200) and uses two high-capacity ink cartridges that cost \$60 each. The Z6 uses a tray similar to an optical drive to load the disc for printing, and requires manual intervention to swap out media. However, the Z6 can be part of an automated duplication system.

Seeing the Light

HP's LightScribe technology offers a novel twist. First, burn your latest opus onto a disc in a LightScribeenabled drive. Once it's done, flip the specially formulated disc over, and the same laser burns your graphics

"We Had a Hit Single with Jesse McCartney, and it all Began with TAXI"

Andy Dodd and Adam Watts – TAXI members www.reddecibelproductions.com www.adamwatts.com

Adam and Andy's success through TAXI is a little bit different from all the other stories you've probably heard. They got their *biggest* deal after their membership ran out!

Here's how it happened: "We joined TAXI in 2001 and found that it was a great motivator for us. We were members for two years. We learned a lot, wrote a ton of songs, and got a few film and TV placements -- some through TAXI, and some on our own.

We submitted a song we wrote with Jenn Shepard called "You Make Me Feel" to one of TAXI's Industry Listings. We didn't hear anything back for a while and eventually our TAXI membership ran out. Thankfully, we began to get so busy with production and writing gigs that we decided to wait and renew our membership at a later date.

Little did we know that TAXI had sent our song to a

production/management company that was looking for material for a young, male Pop artist they were developing.

Later that year, Jesse McCartney's managers called us saying they had just heard "You Make Me Feel" on a CD they got from TAXI and wanted to have him cut the song. Although Jesse decided not to record "You Make Me Feel", his managers asked us to write more songs for him. We wrote a handful and they ended up putting his vocal on two of the tracks we produced, "Take Your Sweet Time" and "Beautiful Soul".

"Beautiful Soul" got played on Radio Disney, and Jesse's





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management got the song to a label executive at Disney. Soon after, Jesse was signed to Hollywood Records. "Beautiful Soul" became his first single, and we both signed publishing deals with Disney Music Publishing.

Jesse McCartney's album (entitled "Beautiful Soul") has gone Platinum in the U.S. and Australia.

"Beautiful Soul" went to #3 on Radio and Records CHR Pop Chart, #5 on Billboard's Top 40 Chart, #19 on Billboard's Adult Top 40 chart, it's a Platinum Digital Single Download, it's on the Gold-selling 'Cinderella Story' Motion Picture Soundtrack, the Gold-selling 'That's So Raven' TV Soundtrack, and the video was nominated for Best Pop Video at a 2005 MTV Video Music Awards."

All of this came about because Adam and Andy sent a song to TAXI. Call for our free information kit.

WORKING MUSICIAN

into the label surface. Because you must burn and then print one disc at a time, extended runs are labor intensive. LightScribe technology is also not particularly fast. For example, HP estimates that a full label can take up to 28 minutes to print at Best quality.

The good news is that no ink is involved. Text and graphics are laser etched in gray scale using the color of the disc itself. Another bonus is that LightScribe discs can be preprinted and then added to later. For example, preprint your band logo on a bunch of discs and then customize them later with the disc's title and contents.

LightScribe-enabled optical disc drives (both internal and external) are available from companies such as Alienware, BenQ, HP, LaCie, and Medion. Internal LightScribe CD/DVD drives range from \$90 to \$160, and the HP 640VE external LightScribe CD/DVD writer sells for around \$140.

The format requires LightScribe-compatible media that uses a microthin coating on the label side to absorb laser light and trigger an image-producing chemical reaction. Manufacturers BenQ, HP, Imation, Maxell, Memorex, Philips, TDK, and Verbatim all market suitable media. LightScribe costs about twice as much as standard media.

DIY'S TRUE COSTS

Taking the do-it-yourself approach has several associated costs. One is the cost of the media itself. Ink-jet-printable white or silver 52× CD-Rs cost in the neighborhood of 50¢ each in quantities of 100. The price goes down in larger quantities and with slower write speeds (for example, 48× discs cost around 35¢). White or silver 16× DVD-Rs typically cost between 80¢ and 90¢ each per 100. Then there's the often unpredictable and potentially high cost of ink when using thermal or ink-jet processes. You never really know what will be required until you start making your discs. Third, there is the cost of the printing device itself and its ongoing maintenance.

To those costs, add the fees for other packaging. CD jewel boxes cost about a dime each in quantity, and DVD-style cases hover around a quarter each for 100. Don't forget about the cost to print CD or DVD booklets and covers, CD jewel-case tray cards, and DVD inserts. Shrink-wrapping can add to the cost, too. And make sure you factor in the costs of discs that don't burn correctly or have printing errors. Finally, your time is valuable, and printing solutions that are more labor intensive cost you more.

Depending on the quantities of discs you're printing, you might forget the idea of burning and printing the discs yourself and instead get it done professionally. If your needs are in the 100- to 500-disc neighborhood, consider short-run duplication services. They give you a reasonable per-unit cost, great packaging, and a minimal investment of time and money. For example, at press time, Eastco Multi Media Solutions advertised a 100-CD package with a full-color cover, 4-panel inserts, and shrink-wrap for \$249. ELS Productions offered a demo package with 100 CDs in jewel cases with monochrome printing (black, red, or blue) for \$150.

Once your needs exceed 1,000 discs, it makes sense to go with professional CD replication, which typically includes pro-quality labeling. The perunit costs plummet dramatically as quantities go up. The Aleratec DVD/CD Copy Cruiser Pro LS (\$429) is a single-disc LightScribe duplicator. The company's 1:4 DVD/CD Tower Publisher LS (\$1,049) produces four DVD/CD copies simultaneously. Both models require manual intervention to load, flip, and unload the discs.

Duplication in the Nation

A few companies offer standalone disc-publishing solutions that combine burning and printing in compact, desktopsize packages. With CD and DVD options and ink-jet technology, longer runs are possible and more affordable due to automated, unattended printing on up to 200 discs.

Disc Makers' Elite2 (\$2,490) uses two drives and has a 175-disc capacity with a maximum throughput of 24 CDs per hour and 15 DVDs per hour. The throughput increases if you're not filling up the disc. The company's Elite4 (\$4,290) holds 200 discs and does 30 CDs per hour and 20 DVDs per hour.

The Primera Bravo II Publisher (CD-R, \$2,195; DVD±R/CD-R, \$2,695) uses a robotic arm to move discs between the burner and printer and has a 50-disc capacity. It combines the aforementioned Z6 printer and a burner in a desktop unit. The BravcPro Disc Publisher (CD, \$3,495; DVD±R/CD-R, \$3,995) holds 100 discs and burns multiple discs at once.

The Rimage 360i (\$2,495) handles 25 discs, burning and printing them individually. The Rimage 2000i (CD, \$3,495; DVD, \$3,995) has a larger, 100-disc capacity and burns or prints two discs at once. It's designed for heavyduty operation. Rimage claims that the 2000i can output 35 to 40 CDs per hour (assuming full 700 MB capacity and color printing) and 12 to 15 DVDs per hour (4.7 GB and color). Lower-capacity projects should yield higher throughput. (For links to the manufacturers mentioned in this story, see Web Clip 1.)

The Write Choice

So how do you decide which, if any, of these options work for your disc-labeling needs? If you're just doing short runs, such as for demos or for handing out or selling at gigs, then a single computer and either an integrated LightScribe drive or a separate ink-jet or thermal printer will serve you well. Your costs per disc will be reasonable, although your time investment may be rather high. You won't need a large cash outlay to get started.

When your quantity needs go up, the automated burner-and-printer combinations become more attractive. They are expensive initially, but your costs per disc and time invested will be less in the long run. What's more, in-house duplication could be a decent revenue generator for a studio. EM

Jeffrey P. Fisher has updated his best-selling book Ruthless Self-Promotion in the Music Industry (ArtistPro, 2005) to a new second edition. Get more information from www .jeffreypfisher.com.

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M-AUDIO ProjectMix I/O

A powerful control surface for any DAW. By Rusty Cutchin

-Audio's ProjectMix I/O combines an 18 × 14 FireWire interface with a full-featured control surface that can operate all of the major software audio applications. The unit is compatible with Macs (OS X 10.3.9 or later) and PCs (Windows XP with Service Pack 2) and supports Mackie Control, Logic Control, and HUI protocols, as well as WDM, ASIO 2, CoreAudio, and GSIF 2. The ProjectMix provides a surprising degree of analog input capability,



FIG. 1: M-Audio's ProjectMix I/O provides a wide range of control surface features and I/O options, including eight mic preamps and an instrument input as well as ADAT Lightpipe, S/PDIF, and FireWire. making it possible to digitize multiple mics and instruments for simultaneous multitrack recording.

However, like other multifunction control surface/ interfaces, the ProjectMix does not have analog mixing capabilities. It's strictly designed to pass input signals to your DAW, and control the app's functions, including routing and mixing of digital signals. With its dedicated modes for just about every popular audio application, the ProjectMix provides an awesome amount of control for that job.

Total Package

The ProjectMix I/O (see Fig. 1) uses nine touch-sensitive moving faders—eight for the channel strips and one master fader. The moving faders disengage from automatic control when you touch them and remain under manual control until you release them. Bankselect buttons allow the eight channel faders to control multiple tracks of a recorded project. Each channel strip features buttons for record enable, mute, solo, and select functions. A rotary encoder knob on each channel gets its assignment from one of 15 dedicated buttons that include EQ, aux send, and other functions. Information

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

90

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The Fast Track Pro gives you the power to make music at the speed of life. This USB bus-powered audio/MIDI interface is equally at home on stage, on the road and in the studio-perfect for the new mobile artist. The A/B source switch and dual output pairs even provide for DJ-style cueing. A single USB cable gives your computer easy, professional connections for condenser and dynamic microphones, instruments, effects inserts, monitors, digital gear and MIDI. Of course, it delivers M-Audio's legendary ease of use, pro audio quality, reliability and affordability. The Fast Track Pro lets you record and produce on your terms-anywhere, anytime.

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- dual mic/instrument preamps with phantom power > accepts pro mics

M-AUDIO

- multiple outs, headphone out and A/B source switch > flexible monitoring
- balanced/unbalanced analog, S/PDIF and MIDI I/O > total connectivity
- includes Ableton Live Lite 4 and GT Player Express > start recording now

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PRO TOOLS

PROJECTMIX I/O

is displayed in an excellent highcontrast LCD directly above the encoders, which can also control plug-in parameters.

The control surface includes illuminated transport controls for record, play, stop, fast-forward, and rewind, as well as a jog/scrub wheel and locate buttons. Sets of keys handle punch-in and -out points, zooming, region nudge, looping, and other functions.

Eight analog input channels feature preamps with individual mic/line switches and balanced ¼-inch TRS and XLR inputs (see Fig. 2). Phantom power can be switched in globally for all eight inputs. Input 1 features a front-panel instrument input. A nice touch is the two ¼-inch headphone outputs with separate volume controls-a useful aid for collaborating while playing or when you can't monitor loudly. Two stereo output pairs give you choices for routing to monitors, processors, and mixdown devices. There's also an A/B headphone source-monitoring switch for DJ-style cueing.

The ProjectMix's digital implementation includes ADAT Lightpipe, S/PDIF, and word clock. The versatile options allow for feeding higher-quality analog signals to the unit from multichannel mic pres with digital outputs or other devices.

Connectivity

The unit also functions as a 1×1 MIDI interface. Using the included ProjectMix Control software application (Mac/Win), you can assign special MIDI commands to the control surface faders, encoders, and buttons, which will let you access outboard sound modules, effects processors, or virtual instruments. You enter this separate

FIG. 2: The ProjectMix I/O's rear panel hosts eight mic and line inputs, four assignable outputs, a footswitch jack, and Lightpipe in and out, optical S/PDIF, word clock, and FireWire connectors. MIDI mode by pressing the MIDI button in the Encoder Operations section of the top panel.

M-Audio's FireWire Control Panel, which monitors and controls any of the company's connected



PROJECTMIX I/O SPECIFICATIONS

Analog Inputs	 (8) balanced XLR mic, (8) balanced ¼" TRS line, (1) unbalanced instrument 					
Analog Outputs	(4) balanced TRS line, (2) ¼* headphone					
Digital I/O	optical S/PDIF; Lightpipe					
Other I/O	MIDI In/Out; word clock; FireWire					
Input Impedance	3.4 kΩ					
Maximum Input Level	-3 dBu					
Crosstalk	<-110 dB @ 1 kHz					
SNR	-104 dB (A-weighted)					
Dynamic Range	104 dB (A-weighted)					
THD+N	0.00188% (-94.6 dB) @ -1 dBFS, 1 kHz					
Frequency Response	20 Hz to 20 kHz (±0.1 dB)					
Preamp Gain	55 dB					
Phantom Power	48 VDC @ 16 mA					
Resolution	24-bit; 44.1, 48, 88.2, 96 kHz					
Dimensions	20" (W) × 4.25" (H) × 18.5" (D)					
Weight	27.8 lbs.					

FireWire products, becomes a ProjectMix Audio Interface control panel upon installation. This software (see Fig. 3) is integral to operation of the control surface and provides full control over level matching and signal routing.

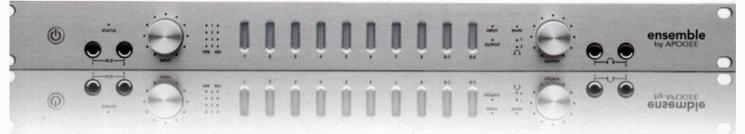
The panel consists of four tabs: Mixer, Output, Hardware, and About. Each provides status information about signals moving to and from the computer and within the interface. The panel can be used to assign analog and digital inputs to your chosen outputs, select sync ports and settings for monitoring, and set overall panning and level settings for output and aux sends. In the Output section you can assign the master level pot on the control surface to handle the input bus, output bus, software return bus, or aux-send level. The panel can also be resized to fit in just about any space in your DAW's screen.

Setup Project

Setting up the ProjectMix for audio was somewhat less than intuitive. After connecting a FireWire cable and outputs 1 and 2 to my Mac, I was able to confirm audio communication quickly by selecting the ProjectMix option in the Sound control panel and playing iTunes. But listening to some plugged-in keyboards through the unit required a careful reading of the PDF manual that was included on the installation discs. To complicate matters, the manual included with the review unit I received had been updated and expanded, yet there was no clear notice about checking the company's

92

Apogee Quality, Apple Integration & Sweetwater Expertise. The Native Dream Team.



The promise of a fully native pro audio production system has finally been realized. With the legendary sonic quality of Apogee's audio interfaces combined with the power of Logic Audio and the computer audio expertise of Sweetwater, there is nothing standing between your Mac and sonic perfection.

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- 8 channels of premium 24-bit 192K AD/DA conversion
- 8 channels of ADAT I/O
- 2 channels of SPDIF I/O
- 4 digitally controlled 75db mic preamps

4 Hi-Z instrument inputs

- 2 individual assignable headphone outputs
- Core Audio compliant FireWire 400 1/0
- Apogee exclusive "Soft Limit" and "UV22HR" technologies



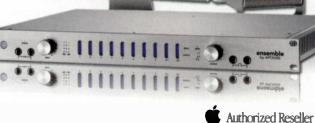
Apple Logic Pro 7 - Everything you need for creative audio production. Once your audio reaches your Mac, you need a powerful, flexible application to

turn your musical vision into reality. That's where Logic Pro comes in. With more than

30 software instruments, over 70 effects and distributed audio processing, Logic Pro is the choice of musicians, engineers and producers the world over.

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PROJECTMIX I/O

REVIEW

download page on its Web site for the newer version of the manual.

A red insert card included with the application CD made it clear that a firmware update would be required for certain apps that weren't directly supported in the original release. One of these was MOTU Digital Performer, my main DAW. However, after I spent the time downloading and launching the firmware update, it turned out that it was already installed. Much time and confusion could have been

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FIG. 3: The ProjectMix Audio Interface control panel governs digital I/O configurations, output assignments, and other global functions.

saved with an updated—and printed—manual in the box. A device this complex calls for a hard-copy manual, and you could reasonably expect one for the ProjectMix's price. It's cumbersome to switch between a PDF reader, the ProjectMix's software control panel (which shows up in the Others section of System Preferences), and a DAW just to ensure that audio is moving back and forth properly.

For example, if you want to hear an input source (as anyone might on a device with eight mic pres and a frontpanel instrument input) before setting up your audio app for recording, you must assign the input channel to an output in the software control panel. Although the flexibility and features of the ProjectMix make some detailed setup unavoidable, anyone trying to configure the unit without the correct manual will have a tough time. After I contacted M-Audio and the company informed me of the updated manual, the ProjectMix became fun to work with. (According to M-Audio, the updated and expanded manual is now included on the installation disc that comes with any currently shipping unit. If you have the older manual, there's a link to the current one at www.m-

PRODUCT SUMMARY

M-AUDIO ProjectMix I/O

control surface/audio interface \$1,599

PROS: Boot-up configurations for popular DAW apps. Multiple analog and digital I/O options. Dual headphone jacks. Highcontrast display.

CONS: PDF manual only. Analog monitoring requires control panel setup.



audio.com/products/en_us/ ProjectMixIO-main.html.)

Project Performer

With the correct manual, it was easy to establish full communication among the Mac, the ProjectMix, and Digital Performer 4.61 (DP), which I was running on a Mac mini with a 1.33 GHz G4 processor and 512 MB of RAM.

One of the most attractive features of the ProjectMix is its ability to boot into dedicated modes for specific applications. By pressing predetermined button combinations and hitting the power switch (assuming your firmware is updated), you can boot the unit into preset configurations for Digidesign Pro Tools LE and Pro Tools M-Powered, Ableton Live 5, Apple Logic, MOTU Digital Performer, Steinberg Cubase, and Cakewalk Sonar.

I added a Mackie Control device in the Mac's Audio/ MIDI control panel and loaded a country-rock project with about 20 combined audio and MIDI tracks. When I set all the audio tracks and master fader to output to the ProjectMix's outputs 1 and 2, the faders snapped to their mix positions, and it was fairly smooth sailing from that point on.

The ProjectMix handled all the tracks in my song file without a glitch, and once I had the navigational controls down, I could move around the project as quickly as I did onscreen with a mouse. I could easily discern functions beyond track names in the LCD. It was easy to select effects on individual tracks. You select the track by using the bank buttons and the Sel button on the corresponding fader channel, push the Plug In button, and presto-the first effect in DP's list for that track appears, with an asterisk indicating the effect is loading. Turn the encoder pot at the top of the strip to scroll through the other effects. Press the down arrow button to pick an additional effect for that track. In terms of basic control-surface functionality, the ProjectMix was able to access every parameter in DP that I looked for, and controlled it with very little noticeable lag. And that was only one audio application.

Of course, trying to be all controls to all DAWs is tricky, and despite the ProjectMix's thorough command set, its button layout doesn't work elegantly for every function. As I checked out the ProjectMix's performance while listening to my country project in DP, for example, I often wanted to play back the song from the beginning. It took a while to find the Return to Zero function in the manual (it's the very last entry in the list of DP button assignments). If the ProjectMix is configured for DP, you must press the Alt and rewind buttons on the control surface to return to zero. Because of the distance between the two buttons, you'd have to be a contortionist to manage this with one hand. It's much easier to use the computer keyboard's numeric keypad (dot-0-enter) for this function in DP.

Session in Progress

I overdubbed some parts onto my country-rock opus to check routing and ease of integration with Digital Performer, and was impressed with the ProjectMix's smooth handling. For a lead guitar part, I added an audio track in DP and set up channel 1 on the ProjectMix to receive input by putting the Mic/Line button into line input and then pressing the Instrument button. Then I hit the channel strip's Rec button, confirmed that DP was getting the signal, hit the Record button on the ProjectMix transport control, and started jamming. DP recorded the signal with the right amount of gain; the ProjectMix's signal and clip LEDs at the top of the channels were clearly well calibrated to DP's. Using the bank buttons, I scrolled over to my new audio track and processed the overdubs using only the control surface.

A vocal overdub went just as smoothly. The ProjectMix's mic preamps are serviceable, but they seem best suited for basic digitization only. For a serious project, I would recommend, as I would with just about every computer interface, a multichannel outboard mic pre connected by line outputs or Lightpipe to the ProjectMix. The ProjectMix's interface, routing, and control surface features are well implemented and performed flawlessly in my sessions, and they are clearly the strong suits of the unit.

Projected Mix

M-Audio's ProjectMix I/O is a versatile control surface and interface that handles digital audio functions expertly and without any apparent degradation of signal quality. It could use some more-obvious level indicators in hardware and some additional analog functions to make it a more convenient audio processor. Its price, which was recently raised after an introductory discount, seems based on its mic pres and versatile I/O options. But its input section is not likely to appeal to pros who work with analog a lot, and the appeal of its clearly well-done implementation of various DAW control schemes depends totally on a user's desire to not work with a mouse or trackball.

However, the ProjectMix has a lot going for it, and as a digital controller and signal router, it works extremely well. It would make a great complement to any of the major DAWs in a studio where engineers and producers need an all-in-one interface with moving faders.

Rusty Cutchin is an associate editor of EM. He can be reached at rcutchin@comcast.net.

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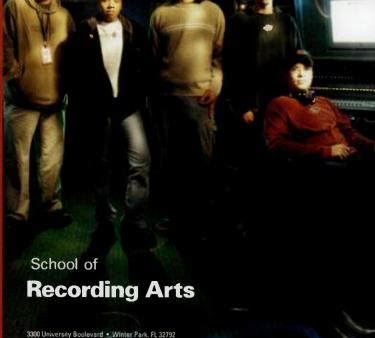
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 Rolling Stone Magazine August 11, 2005



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FIG. 1: The new mixer in FL Studio 6 includes an assignable output routing for each channel (lower right).

IMAGE-LINE SOFTWARE FL Studio XXL 6.0.4 (Win)

Powerful features enhance a popular synth-sequencer.

By Jim Aikin

very digital audio sequencer has its own vibe. For all its power, few of us would describe the monolithic gray Pro Tools interface as fun.

FL Studio is fun. It's an amazingly powerful program, fully capable of professional-sounding results, and it's a kick to use.

I reviewed FL Studio 5 in the June 2005 issue of EM. Version 6 adds numerous forward-looking features, from a redesigned mixer and some new effects plug-ins to a couple of inspiring software synths, one of which specializes in 3-D animated video. This review will concentrate on the new features of FL 6. (For a more comprehensive look at FL Studio, read my earlier EM review, which is also available online at www.emusician.com features covered in that review, such as the speech synthesizer, won't be discussed here.)

FL Studio is a pattern-based sequencer that has a built-in suite of sound makers (Generators, in FL-speak), along with some unusually powerful automation utilities. Audio tracks, beat-slicing, and compatibility with VST, DXi, and ReWire are also part of the package.

FL Studio is available in several configurations. The Express edition costs only \$49. But even if you're on a tight budget, the \$99 Fruityloops edition is a better buy, because it adds automation and a piano-roll editor and can function as a VSTi or ReWire client. This review covers the XXL version, which includes most of the available Generators and other advanced features.

New Mixer

FL Studio has a mixer with 64 main channels and 4 auxsend channels (see Fig. 1). Each channel can hold as many as eight insert effects and a 3-band EQ. Plug-in delay compensation has been added to the mixer in FL 6.

The new mixer is resizable, allowing you to view more than 16 main channels at a time. Each channel now has its own record-to-disk button, which is handy when you need to freeze a track as audio, and its own output selector, which makes surround mixing easier. Cute little icons can be added to the channel-strip name area, making it faster and easier to find channels in a complex mix.

Any channel can now be used as an auxiliary channel, which makes it easy to create mix subgroups. The master output is treated as just another send, so you can have a channel fader up (so as to give the channel plenty of signal in a subgroup) and still turn its output to the master channel all the way down, so that the subgroup fader ultimately governs how much of the channel's signal is heard in the master output. Prefader sends are available,

96

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Bank switches allow instant access to 16 knobs and 24 faders

. . .

8 easy to program knobs for realtime control of any DAW parameter. 9 faders offer hands-on control of s DAW mix levels or drawbars for softsynths

tor reatiline control of any Plenty of front panel swi offer hands-on control of to instanthy control splits, rs for softsynths transposition, layer, etc.

Plenty of front panel switches Large LCD & data entry to instantly control splits, wheel make the UF series transposition, layer, etc. a breeze to program

The most important feature on a controller keyboard is the keyboard feel—and the CME keyboards not only feel great, they all feature aftertouch for more expressive control

In a world of me-too, copycat controllers, the CME UF series MIDI Master controllers stand out with features that you can't find anywhere else. The rugged dura-aluminum design, extensive expressive control via aftertouch and breath control, and professional quality keyboard action are all unique in their price range. The UF8 features a patented hammer-action weighted keyboard for a true piano touch. The UF5, 6, 7 all feature a semi-weighted synth action that feels better than anything else on the market. So if you're looking for a MIDI controller—it's time to start looking at the world a little differently. It's time to look at the new leader in MIDI controllers—CME Pro, the computer music experts.

The UF Series 411...

- 49/61/76 key keyboards with aftertouch (UF5/6/7)
- 88 key hammer-action weighted keyboard with aftertouch (UF8)
- Pitch bend and modulation wheels
- 8 assignable control knobs
- 9 assignable control faders
- 6 sequencer remote buttons
- Breath controller port
- 1MIDI out port
- Sustain pedal and volume pedal jacks

The World's First...

- MIDI controller in a durable aluminum case
- MIDI controller keyboard with a Firewire audio expansion option
- MIDI controller keyboard with a breath controller option
- Full-range series of MIDI master keyboards
 with aftertouch



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you have

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UF5 S229, UF6 S299, UF7 S399, UF8 S599, UF400e Firewire option S199 "Suggested retail price

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as in earlier versions of the program, by means of the Fruity Send plug-in. You can insert this plug-in in any of a channel's eight effects slots, but a Fruity Send can send to only one of the four dedicated aux channels (the name Fruity comes from FL Studio's old and now deprecated name, FruityLoops).

New Effects

EQUO, a 31-band graphic equalizer that has several standout features, is my favorite of the new plug-ins (see Fig. 2). Eight different EQ curves can be stored in EQUO's memory, and you can glide from one to another by automating the Morph knob (see Web Clip 1). The Shift knob (also automatable) slides the curve up or down through the frequency spectrum. Individual bands can be given their own panning and send-output levels for unusual spatialization and exotic processing effects (see Web Clip 2). Equalization has never been this sexy.

The Fruity Delay Bank (see Fig. 3) has eight delay lines that can be arranged in series or in parallel, or in any combination of the two. Each has its own input and feedback-loop resonant multimode filters, with a choice of three filter slopes. (The input filters can be switched to the output.) A couple of granular parameters can break up the delayed signal in colorful ways. Global wet-level and dry-level knobs round out the feature set.

FL 6 also has a new 3-band compressor. A highquality reverb is another welcome addition.

The DirectWave Sampler

I was able to set up a keyboard multisample layout in FL 5 by using the Layer Generator and a bunch of Sampler Generators, but doing so was cumbersome, and Velocity cross-switching was not possible. The percussionoriented FPC Generator allows Velocity switching and layering, but it has no filters and is limited to 32 drum pads. The new DirectWave Generator (see Fig. 4) provides a much more convenient environment in which to set up complex multisamples. DirectWave is included in XXL, and is available for \$79 to other

FL Studio owners.

Each key and Velocity zone in

DirectWave has its own envelopes,

filters, LFOs, and modulation rout-

FIG. 2: EQUO is a morphing graphic equalizer. The input spectrum is displayed as solid bars, the selected preset as bright lines, and the currently active curve as faint lines.



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FIG. 3: The Fruity Delay Bank has eight stereo delay lines, each with its own filters.

times are among the parameters that can be modulated from Velocity or key position.

Rather than bundle sounds and presets in the DirectWave download, which would be a huge file, Image-Line has developed a unique Direct Download system for downloading the presets you need from a pop-up menu within DirectWave. Guitars, orchestral instruments, ethnic percussion, and acoustic and electric piano are provided, along with hundreds more presets. The quality varies somewhat, but with the library included at no additional cost, DirectWave is an unbeatable deal.

According to the manual, DirectWave can load WAV and Ogg Vorbis samples, and preset files in various formats, including SoundFont 2.0 (though without the voicing parameters), Akai S5000 and 6000, and REX. Compatibility with Native Instruments Battery 2 presets is planned for a future update. The first RX2 file I tried crashed FL Studio, but after I restarted the computer, the same file loaded and played, as did the others I tried. (DirectWave provides no way to extract MIDI data from the REX files, so it isn't a full-featured REX player.)

Other Goodies

The Fruity Envelope Controller is a handy addition to the Generators list. It makes no sound itself, but provides four multisegment envelopes and four LFOs. Those can be used as modulation sources by any knob in any part of the program. Triggering the Envelope Controller on certain steps of certain patterns is a quick way to add rhythmic modulation to parameters in Fruity synths that lack that capability. The Envelope Controller can also modulate external hardware synths using FL's Dashboard, a Generator that transmits MIDI, as well as the parameters of most third-party plug-ins.

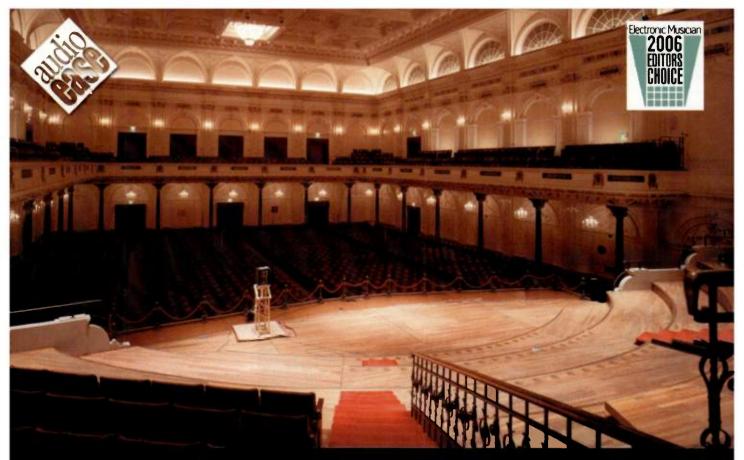
The Sytrus FM synth has been updated to include an arpeggiator (see Web Clip 3). That is implemented in an odd way, using markers on envelope segments to step through the notes in a held chord. You can set up polyrhythmic arpeggiations within a single preset by creating looping envelopes of different lengths, but prcgramming arpeggios is more difficult. Sytrus remains one of my favorite synthesizers, and it's now available as a separate VSTi and DXi plug-in.

No other sequencer has a Generator like Chrome. To get a more powerful video synthesis system for

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WRH



The Amsterdam Concertgebouw for Windows XP

The most highly acclaimed convolution reverb now comes from the Mac to Windows XP.

Altiverb was the first convolution reverb plug-in anywhere, and for its first three years it remained the only one. Those three years of extra experience translate into the largest library of acoustics-samples on the planet, ranging from Sydney Opera House to Caverns at Howe NY. Every single one of them a real recording of award winning quality.

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Sweetwater puts together more computer audio systems than anybody, and when it comes to convolution reverb, their application of choice has always been Altiverb. With their new line of Creation Station Audio PCs, they're excited to bring the power and quality of Altiverb to the PC world, along with a line of audio computers that can easily handle Altiverb and



your live shows, you'd need to work with something like Cycling '74 Max/MSP/Jitter. Chrome has several algorithms for generating images, including lightning bolts and fireworks. In addition, 3-D extruded text and modeled objects can be animated in front of that background. And naturally, the size, rotation, and transparency of the animations can be automated. Chrome can operate in full-screen mode, but its performance will be system dependent. On my 3 GHz Pentium, full-screen animation of one object on whose surface a JPEG image was projected was slow and jerky, and the CPU was working so hard I was in danger of thermal overload.

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Points" can also be added to mark important visual events in the score, making it easy for the music to track the action of the video.

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By the Slice

At \$35, BeatSlicer is an affordable and handy addition to FL Studio. The included Fruity Slicer Generator can perform the same basic functions at no additional cost, but BeatSlicer gives you a big waveform display, which makes it easier to find good slice points and to add new ones.

In the past, I haven't paid attention to the Fruity Notebook and the Fruity HTML Notebook. Both are ways of displaying text onscreen, which might be useful for making notes to yourself or collaborators during song development, displaying lyrics at a gig, or running

> animated GIFs on a second monitor. The Notebook can hold 100 pages of formatted text, which you can copy from any word processor, but it can't hold pictures. Page turns can be automated during song playback. The HTML Notebook displays standard Web pages, including graphics and active links. HTML page selection can't be automated, **an**d there is no browser bar for entering URLs directly, but you can get to any site on the Web through FL Studio if you create a local page that has a link and then click on the link.

> I also omitted FL Slayer, a guitar Generator that uses a plucked-string model (see Web Clip 1), from last year's review. Slayer has a movable pickup, its own amp and cabinet simulators, overdrive, damping, and several strum modes, among other features. Because its tone is not based on samples, small variations are often audible

PRODUCT SUMMARY

IMAGE-LINE FL Studio XXL 6.0.4

digital audio sequencer \$349 download \$449 boxed

PROS: Excellent suite of sound generators and effects. Versatile automation. Many user-interface amenities. VST, ReWire, and MIDI output support.

CONS: Audio track handling is weak.



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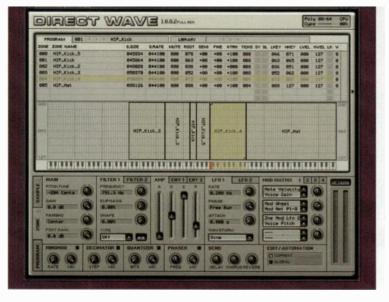


FIG. 4: The DirectWave sample player provides a graphical interface for key zones (top) and separate panels for sample editing, key zone, and program parameters (bottom).

when a loop is repeated, adding to the realism of the guitar model.

The piano-roll editor has some unique utilities. You can strum chords, pitch-bend single notes within a chord up or down to new pitches (that works only with built-in FL synths), chop notes apart rhythmically, generate random patterns that are constrained to your preferred harmony, stretch phrases with a single mouse move, and more. Very flexible groove quantizing is also provided.

Sweet and Sour

All versions of FL 6 (except the least expensive) come with 2 GB of useful samples, which can be downloaded from SampleFusion's Web site. Having a big library of percussion hits is a necessity for most FL users, so this content is a welcome addition to the program. Online purchasers of FL get lifetime free updates.

Strangely, the deficiencies in audio track handling that were noted in last year's review still haven't been addressed: you can't mute or unmute audio tracks during playback; overdubs and punch-ins can't lie end to end on the same track; and audio tracks have no names. Audio recording and playback work well enough for basic tasks such as adding vocals, and the audio track automation is excellent, but if your music requires lots of audio tracks and only a few MIDI overdubs, FL Studio may not be the right choice for you.

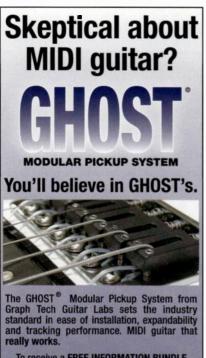
The Whole Orchard

For musicians who enjoy step sequencing and pattern-based song construction, FL Studio may be the best digital audio sequencer on the market. Once you get used to its unusual user interface, you'll be able to create complex and great-sounding musical arrangements quickly.

The program isn't just for patternbased techno, however. Recording linear arrangements into piano-roll tracks is just as easy, and you don't have to quantize anything unless you want to. Most FL users combine the two methods—sketching out drum patterns quickly, and then adding linear tracks as needed.

The audio tracks are not well integrated into the program; they still feel somewhat tacked on. But if your music is mainly about sampled and synthesized sound, and if you have a reasonably powerful Windows computer, FL Studio 6 will give you the right ingredients to knock your listeners out.

Jim Aikin is the author of Power Tools for Synthesizer Programming (Backbeat Books, 2004) and writes regularly for EM. Though he loves synthesizers, his favorite instrument is his Jensen 5-string electric cello.



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FIG. 1: Miroslav Philharmonik is a sample-playback plug-in that combines the SampleTank 2 sound engine with the world-class Miroslav Vitous sample library.





Quality and quantity in an easyto-use orchestral plug-in. By Geary Yelton

or more than two centuries, the dream that one person could command complete control of every instrument in a symphony orchestra was just that: a dream. In the past few years, though, samplers and MIDI sequencers have made the impossible quite possible and even practical. One of the first and finest sample collections to capture the richness and nuance of fine orchestral instruments and players was Ilio *Miroslav Vitous Symphonic Orchestra Samples*, a series of CD-ROMs for Akai, Roland, and other sampler formats. Originally marketed to film composers and well-heeled studio musicians, the collection cost nearly \$4,000, and chances are good that you've heard those samples used in quite a few television and movie soundtracks (see the sidebar "Where It Began").

IK Multimedia, partnering with soundware developer Sonic Reality, announced its acquisition of the sample library in early 2005. A few months later, it introduced Miroslav Philharmonik, an instrument plug-in that incorporates an enhanced and expanded version of the library at a more affordable price than the original. Philharmonik's developers edited *Vitous*'s 20- and 24-bit recordings to suit their specifications, and they added material that wasn't used in the original library. Philharmonik's 7 GB of sample data encompass string, brass, woodwind, and percussion soloists and ensembles, as well as complete choirs, harp, classical guitar, and keyboards such as piano, harpsichord, and pipe organ. IK Multimedia calls Philharmonik an "orchestra and choir workstation."

Prelude and Fugue

Minimum specifications are 512 MB of RAM in either a 667 MHz Mac G4 with OS X 10.3 or a 733 MHz Pentium III- or Athlon-based PC with Windows 2000 or XP. You'll want at least the recommended configuration, however: 1 GB of RAM in a 1.25 GHz Power Mac G4 or a PC based on a 2.4 GHz Pentium 4 or Athlon. In these days of power-hungry plug-ins, such resource requirements are very reasonable. Because Philharmonik's samples play from memory rather than streaming from disk, though, you'll need plenty of extra RAM if you want to work with large ensembles.

You'll also need a little more than 7 GB of hard-disk space to install the sample library. If you share a hard disk on a local network and each computer has Philharmonik installed, your computers can share a single copy of the library. According to IK Multimedia, sharing works even if the computers are a mix of Macs and PCs.

I ran Philharmonik as an Audio Units plug-in in MOTU Digital Performer 4.61, as a VST plug-in in



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Notation enhancements include support for symbols like section letters, slurs, legato, accents, staccatos, crescendos and more. The Ear Training feature has been enhanced with Pitch Invasion and Music Replay games. Music Replay develops pitch, rhythm, and melody recognition while Pitch Invasion helps to develop perfect pitch as you shoot down "alien" notes invading from above

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MIROSLAV PHILHARMONIK



FIG. 2: Although you can't edit Philharmonik's keyboard mapping, you can view a Part's note assignments by clicking on its Zone button.

Steinberg Cubase 3.0.2, and as an RTAS plug-in in Digidesign Pro Tools M-Powered 7.0. My computer is a 2.3 GHz, dual-processor Power Mac G5 with 4 GB of RAM running OS X 10.4.4.

As with any program that supplies 7 GB of content, it took a while to install Philharmonik, and therefore to open the plug-in and begin exploring. After connecting the included Syncrosoft USB key, I activated it using a wizard application that connected to the Web and retrieved an authorization code.

Backstage at the Symphony

Miroslav Philharmonik is built on SampleTank 2's sound engine and features a variation of its graphical user interface. Like SampleTank, Philharmonik is a 16-part multitimbral sample-playback plug-in that supports Audio Units on the Mac, DirectX in Windows, and RTAS and VST on both computer platforms. Whereas the latest SampleTank (2.1) runs standalone, however, Philharmonik does not. Its GUI offers most of SampleTank's advantages and disadvantages, with some slight improvements (see Fig. 1). One improvement is larger type; I always disliked SampleTank's tiny lettering, but that's the price you pay to be able to see all 16 Parts at the same time. Philharmonik shows only eight Parts at a time and is much more readable.

If you know your way around SampleTank, you'll feel right at home with Philharmonik. Most of the GUI is dominated by the browser, which shows Parts on the left and Instruments on the right. Each Part displays its MIDI channel, instrument name, solo and mute status, file size, polyphony, panning, output, and current level. You can change some of those parameters and delete instruments by clicking in the appropriate fields.

Philharmonik lets you save and load Combis multitimbral combinations with as many as 16 Parts. Clicking on the Load Combi triangle reveals a pop-up menu that has lists of factory presets and user Combis. The included Combis come in four varieties: Advanced Ensembles, which layer various instruments on the same MIDI channel; Multi Setups, which assign articulations of the same instrument to different channels; Dynamic Layers, which make use of Velocity switching; and Orchestral Splits, which assign two instruments to different keyboard zones. When you're editing or constructing your own Combis, you can create splits and layers using the Range controls to specify each Part's note and Velocity ranges and to transpose pitch, if necessary.

At the bottom of the plug-in window is an onscreen keyboard with pitch and mod wheels, octave buttons, and volume and pan knobs. A Zone button displays the current Part's keymap, and additional buttons enable polyphonic, monophonic, or legato performance (see Fig. 2). Two rows of soft knobs appear between the keyboard and the browser. To their left is a group of buttons for selecting the sound functions—LFO 1 and LFO 2, Env 1 and Env 2, Filter, Velocity, Tune, and Macro-and additional buttons labeled Send, Range, and Zone. Clicking on any of those buttons lets you control their associated parameters using the top row of knobs. For example, clicking on the Filter button reveals knobs for frequency and resonance, as well as additional buttons for selecting one of three filter types and one of three filter slopes. The bottom row of knobs controls effects parameters, and buttons to their right enable as many as four Send effects and four effects for each Part.

Philharmonik's Macros have predefined parameters tailored to each instrument, as determined by their programmers. There are six possible Macros, any four of which can be assigned to an instrument. Examples include Variable Speed, which uses Velocity to control attack; Aftertouch Push, which increases amplitude and brightness when you dig into the keys; and Velocity to Start Point, which moves the sample's start point in response to how hard you strike the keys. Macros simplify controlling instruments in real time and can do a lot to make your work go faster.

Although you can assign a MIDI Control Change (CC) to any knob, no MIDI Learn function is available. Rather than just clicking on a virtual knob and moving a real knob, you must enter the MIDI CC number into a dialog box. You need to do that only once for each knob, but that's still a minor inconvenience. And unlike SampleTank, Philharmonik doesn't respond to MIDI Program Changes.

A Tour of the Orchestra

In the Instruments browser, folders are divided into eight alphabetically arranged categories: Brass, Choirs,



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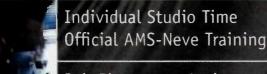


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Elements, Orchestral Sections, Other Instruments, Percussion, Strings, and Woodwinds. Each category is hierarchically divided into subcategories, and those are filled with instruments, many offering assorted articulations. Clicking on a triangle to the left of a folder name shows the next level in the hierarchy. As the Instruments list expands, a scrollbar lets you view additional items. When you find an instrument you want, double-clicking on it loads it into the currently selected Part.

All the major instrument families are available in ensembles and as solo instruments, often in looped and unlooped varieties. (You can find a complete list of instruments and articulations at www.philharmonik .com.) Because the ensembles were recorded in stereo, their imaging re-creates each instrument's original positioning in the ensemble, enhancing the realism of the samples. Ensembles come in different sizes and combinations: ensemble violins, for instance, come in groups of 4, 11, or 23. Most others are in groups of two to four, just as they're typically grouped in an orchestra. Some ensembles contain several of the same instrument, and others contain several instruments in the same family. Woodwinds, for instance, contain bassoon, clarinet, flute, and oboe ensembles. In the Orchestral Sections folder, you'll find ensembles containing All Winds within Brass Wind Sections.

Unless you run short of Parts, creating your own ensembles is a snap; just assign different Parts to the same MIDI channel, and pan them to taste. When I needed more than 16 Parts, Philharmonik was so resource efficient that I could open additional instances without any problems (see Web Clip 1).

Most instruments provide articulations and other

PRODUCT SUMMARY IK Miroslav MULTIMEDIA Philharmonik 1.0 orchestral sample plug-in \$599 PROS: Excellent sample content. Impressive variety. Sounds load quickly. Versatile effects processing. CONS: Minimal use of Velocity layers. No keyswitching. No MIDI Learn. **FEATURES** EASE OF USE QUALITY OF SOUNDS VALUE MANUFACTURER

IK Multimedia www.ikmultimedia.com variations. Among the string articulations, for example, are staccato, pizzicato, tremolo, mutes, détaché, sul ponte (near the bridge, usually called sul ponticello), and sustained tones with and without vibrato. In addition to single notes, there are glissandos, trills, and the occasional double stop.

Many variations are accompanied by abbreviated suffixes that describe techniques for making the most of their expressive capabilities. Violins offer variations with labels such as AMV, Crs, and Expd. AMV lets you control brightness, volume, and attack using Aftertouch, Modulation, and Velocity. Crs lets you adjust the rate of crescendo with the mod wheel, and Expd uses the Expression Pedal to control volume. Other variations indicate playing technique (such as Slw for slow or Fst for Fast), programming technique (such as Stch for sounds using the Stretch engine), and associated expressive controllers (such as BC for Breath Controller or ExPd for Expression Pedal).

No sample library gives you everything, but Philharmonik's content makes an admirable effort. The variety of instruments and ensembles is extraordinary, and their quality ranges from good to outstanding. The strings are lush and versatile, with most of the articulations you'd hope to find in a library that isn't string specific. The solo and ensemble brass, which includes trumpet, flügelhorn, French horn, tuba, and tenor and bass trombone, has uniformly excellent tone and works very well when layered with other instruments. And although the woodwinds aren't particularly flexible, most of them sound terrific.

Choirs includes Female Choirs, Male Choirs, Mixed Choirs, and Split Choirs. The samples focus on single syllables, such as *ah*, *fa*, and *mmm*, and most are unlooped, just as I prefer. Most of the choirs sound fine, but they can't compete with dedicated vocal libraries from developers such as Quantum Leap and Bela D Media. On the other hand, Philharmonik's choir glissandos are so nice that I wish there were more of them.

The selection of six Cathedral Organs is superb, and they include barely audible bass pedals. The untuned percussion is very good and offers ample variety; a number of presets map drums and percussion to the General MIDI standard, which makes it easy to find what you're looking for. I was disappointed, however, by the lack of cymbal rolls. Several sounds in Chromatic Percussion are excellent; Vibraphone Hard Stick is a standout there. Occasionally, though, I found instruments with programming problems: Chimes Hall, for example, was so quiet that it was completely buried by other instruments, even at full volume. Chimes Studio, however, cut through loud and clear.

Mixed Orchestra layers different combinations of instruments and serves as a real time-saver, though it's most useful for creating quick sketches. Also of note are Elements, which furnish several monophonic instruments, one-shot percussion samples, instruments playing outside of their normal ranges, and extraneous noises such as coughs and squeaks.

Variations on a Theme

Like most sample-playback software, Philharmonik lets you change sound-shaping parameters such as filtering, envelopes, and assorted modulation. Either LFO can control pitch and filter cutoff, with one modulating amplitude and the other modulating pan—all simultaneously, if desired. Both envelope



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generators have a Hold stage in addition to the usual ADSR stages. Env 1 is hardwired to control amplitude, and Env 2 can control pitch and filter cutoff. I appreciated that the envelope's time parameters are calibrated in seconds and milliseconds.

Befitting a plug-in controlling the nuances of orchestral instruments, Philharmonik's Velocity routing is impressive. You can dial in Velocity control of amplitude, filter cutoff, pitch, resonance, LFO 1 depth, and Env 2 sustain—again, all simultaneously.

The Tune function makes good use of the sound engine's timeand pitch-stretching prowess. You can choose from three algorithms to change the length or the pitch of samples: one plays them faster or slower, another compresses or expands pitch and time, and another uses IK Multimedia's own brand of tempo-based resynthesis, called Stretch. (For more information on the three algorithms, see the SampleTank 2 review in the April 2004 issue of EM, which is also available online at www .emusician.com.)

Philharmonik gives you a nice selection of high-quality, orchestraappropriate effects processors. You can process either individual Parts using Part Inserts or several instruments at the same time using Send buses. You can apply as many as four insert effects to each Part and four Send effects to the entire plug-in. In both cases, however, the first effects slot will always be EQ and compression. The EQ gives you control of the gain for three bands and the mid EQ frequency. The compression gives you control of level only. The other 20 effects (12 fewer than SampleTank) range from reverb and delay to multi chorus and distortion. Among those are a compressor with Attack, Release, Drive, Ratio, and Spread controls, and 2-band parametric EQ. Philharmonik's only effect not found in SampleTank 2.1 is CSReverb, which borrows algorithms from IK Multimedia's Classik Studio Reverb and furnishes only Time and Wet/Dry controls. (A fullfledged plug-in version of Classik Studio Reverb should be available as a separate product by the time ycu read this.)

Unfinished Symphony

Unlike most modern sample players, Philharmonik's SampleTank sound engine doesn't give you access to more than one Velocity layer for each Part. IK Multimedia says that each Part supports eight layers internally, but there's no way for users to view or edit them. Because you can specify each Part's minimum and maximum Velocity, though, Philharmonik does allow you to assign different Velocity ranges to Parts within Combis. In fact, the included Dynamic Layer Combis have Velocity-switched variations assigned to the same MIDI channel.

Because multiple Velocities

WHERE IT BEGAN

Miroslav Vitous Symphonic Orchestra Samples began taking shape more than a dozen years ago, when Weather Report bassist and composer Miroslav Vitous, a native of Czechoslovakia, wanted a superior orchestral library for his own use and couldn't find a suitable off-the-shelf solution (for more information on Vitous, see his official Web site at www.miroslavvitous.com). Intent on creating a collection of samples tailored to his specifications, he hired members of the Czech Philharmonic and recorded them in Prague's Dvorák Symphony Hall. During the recording sessions, he suggested to the performers certain composers whose styles he wanted them to emulate in their playing. According to Vitous, the project proved so expensive that he decided to release it as a commercial product—something he hadn't originally considered.

were not a consideration when the Miroslav Vitous library was created, however, very few of the individual instruments supply more than a single Velocity layer, and there are no Velocity release layers. As you might imagine, minimal layering does restrict Philharmonik's expressivity somewhat. At a time when instruments with as many as 24 Velocity layers per note have become the norm, the nominal layering in Philharmonik's samples is its greatest shortcoming. On the bright side, instruments load quite quickly because they consume less RAM than if they were extensively multilayered.

If you're accustomed to controlling articulation by keyswitching (as you can with many sample libraries in programs such as GigaStudio and Kontakt), you may also be disappointed by Philharmonik's lack of keyswitching abilities. The only obvious way to instantly change articulations is to place them on different Velocity layers in a Combi. However, you could also create a Combi with different articulations on the same MIDI channel, and then assign MIDI switches to toggle them off and on using the Mute and Solo buttons; it wouldn't be an elegant solution, but it should work. Otherwise, the only practical way to switch articulations is to assign them to independent Parts on different MIDI channels and change tracks while sequencing.

Philharmonik does offer some useful real-time performance capabilities by providing Macros and lots of MIDI CC routings—allowing you to control parameters such as envelope attack, filter cutoff, and vibrato using Aftertouch, Modulation, and Breath Controller, for example. Still, those are no substitute for being able to instantly change from portato to legato to staccato by simply pressing a key. Fortunately, the manufacturer intends to offer keyswitching in a future version of the SampleTank sound engine.

Composer's Workshop

Philharmonik furnishes a nice selection of high-quality sounds in an easy-to-use plug-in. With so many orchestra libraries to choose from, though, what makes Miroslav Philharmonik special? Most important, its sampling is top-notch, and the value is terrific when you consider the variety of its instruments and articulations. The Miroslav Vitous library sounded great a decade ago, and with all the enhancements programmed into the Philharmonik version, it sounds even better today.

What's more, working with Philharmonik is faster than working with most sample players, thanks in part to its well-designed user interface and the speed with which samples load. If you're in a hurry, you can get very satisfying results from Philharmonik with a minimum of effort, unlike working with sample libraries that demand microscopic attention to detail. The plug-in's sound-shaping capabilities allow you to customize instruments to suit your needs, and its modulation capabilities allow a fair degree of real-time expression.

Philharmonik furnishes such a wealth of sounds that it will take a while to familiarize yourself with all the possibilities at your disposal. In general, the sound of the instruments is rich and satisfying. They don't sound particularly aggressive, and they won't be suitable for every occasion. Nonetheless, I expect to get a tremendous amount of use from this plug-in and its sample library. For most occasions that call for strings, brass, woodwinds, and other orchestral instruments, Miroslav Philharmonik may be CLDPS everything you need.

EM associate editor Geary Yelton recently celebrated 22 years as a Macintosh user, and he began using Windows almost 16 years ago. He lives and works in Charlotte, North Carolina.

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FIG. 1: To load Bandstand with sounds, simply drag an instrument from the Browser located just above the virtual keyboard. On the lower right you can load Standard MIDI Files. create a playlist, and render an audio file of the music.



NATIVE Bandstand 1.0.1 INSTRUMENTS (Mac/Win)

Once and for good, General MIDI goes virtual.

By Marty Cutler

ike the Rodney Dangerfield of the electronic-music world, General MIDI (GM) gets no respect. Nonetheless, many of its protocols have infiltrated electronic sound design and orchestration practices. For example, using **RPNs (Registered Parameter Numbers) and NRPNs** (Non-Registered Parameter Numbers) to tweak and animate synthesizer sounds first gained popularity with GM instruments. Consistent drum-note mapping arose from Roland, and it crystallized with the GM standard. Many readers may recall the convoluted procedural hoops you needed to jump through just to get someone else's MIDI drum parts to play back properly.

Although many musicians have offhandedly slagged the sound quality of GM modules, such instruments have the option of drawing on generous timbral resources because they are sample based. My Roland SC-55 Sound Canvas, for example, has 6 MB of sample ROM. Now Native Instruments has answered the call for a General MIDI 1 (GM1)-compliant software instrument by introducing Bandstand.

Strike Up the Band

Native Instruments, with the aid of several well-known sample-content providers, gathered 2 GB of sample data to build 128 GM instruments and 9 drum kits. That's far more data than my trusty Sound Canvas holds, but it's a relatively modest amount given some of the hard-drivebusting capacities of other sample-based plug-ins I use.

Installing from the single DVD-ROM and authorizing Bandstand was a simple process; I was set up and playing in less than five minutes. Native Instruments provides AU. RTAS, and VST versions for the Mac and DirectX. RTAS, and VST versions for Windows. I used my dualprocessor 1.42 GHz Power Mac G4 with 2 GB of RAM running OS X 10.3.9. In addition to running Bandstand as a standalone app, I hosted the plug-in in MOTU Digital Performer 4.61, Apple Logic 7.1, and Ableton Live 5.

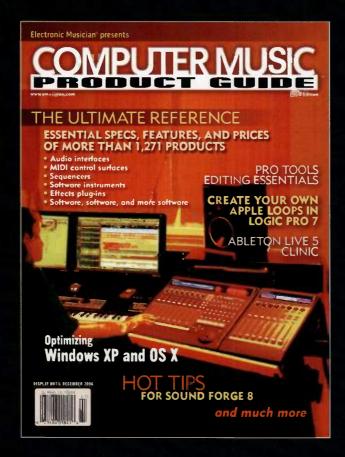
Bandstand's ability to quickly load and set up instruments in response to various MIDI commands and Program Change messages differentiates it from its software GM siblings. That ability also made it a good candidate to pair with PG Music Band-in-a-Box 12, which required a bit of additional setup, as the latter does not host plug-ins on the Mac version (instead, you must use an intermediary host such as Granted Software Rax). Another convenient feature is the software's ability to load and play Standard MIDI Files (SMFs). You can even create a playlist, potentially qualifying Bandstand on a notebook computer as a handy, all-in-one device for bands and solo performers who rely on supplemental MIDI tracks.

Bandstand is a 16-part multitimbral instrument that arranges its presets in a Browser, with 16 banks arranged

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BANDSTAND

according to GM-instrument categories and 8 instruments in each category. A button toggles between the first and second groups of 8 instrumental categories. A preset can include the instrument type, channel assignment, EQ and effects settings, transposition, and lots more. Bandstand provides none of the additional instruments that appear in related standards such as GS, XG, or GM2, although it supports some of the MIDI Control Change messages that those later standards allow.

Bandstand's two main regions are the Play page and the Mix page; each is a different arrangement of 16 slots. On either page, a strip dealing with preset management runs across the top of the screen. A pull-down menu lets you select from a library of presets; Bandstand gives you a half-dozen presets as starting points and a blank preset so you can create presets from scratch. Subsequent buttons let you initialize load and delete presets. To the right of those, a pair of buttons toggle between the Play and Mix pages, and an Options button lets you set global preferences for buffer size, overall Velocity response, latch or in-place soloing modes, and the sound library path, as well as the current preset automation choices.

On the Play page, you can load instruments by dragging-and-dropping them from the Browser section into one of the 16 cells occupying the upper half of the page (see Fig. 1). Also on the Play page, you can set up various performance-related parameters such as monophonic or polyphonic playback, tunings, and portamento time. Like hardware GM instruments, Bandstand automatically adjusts such parameters if they're embed-

PRODUCT SUMMARY

NATIVE Bandstand INSTRUMENTS 1.0.1

software synthesizer \$229

PROS: Nicely detailed sounds. Self-contained MIDI player. Automatically sets up instruments with embedded MIDI commands. Built-in convolution reverb.

CONS: Does not support multiple outputs. Some sounds are disappointing. GM1 only, with no GM2, GS, or XG variations.



ded in an SMF. The MIDI automation filter lets you filter an individual instrument's response to some performance parameters. The filter is not designed to filter out specific Control Change or Channel Voice messages; instead, it gives you checkboxes for Program Changes, mixer settings, sound settings, and so on. For more precise message filtering, you are better off editing in a sequencer application.

Using the Quick Edit Bar that horizontally divides the Play page, you can shape each instrument's response to MIDI data: set scales and tunings, humanize, and quantize (with selectable percentages). Alternatively, you



FIG. 2: Bandstand's Mix page lets you load patches and set EQ parameters from pull-down menus. Knobs let you adjust chorus, reverb, and pan amounts, and horizontal sliders adjust each part's volume.

can choose to apply your edits to all instruments; a pair of buttons let you apply edits either to a single part or to all patches. At the bottom of the Play page is the virtual keyboard with modulation and pitch-bend wheels.

In addition to EQ and master effects-send adjustments for all the individual patches, the Mix page offers Pan knobs, Volume sliders, and Solo and Mute buttons (see Fig. 2). You can load instruments for each part simply by selecting from each part's pull-down menu. Similarly, each channel's EQ has a pull-down menu with a few simple but effective presets.

The Master section and the Player section are available to the right of either page. Master section parameters include access to the master Volume slider and the built-in master effects: chorus, reverb, EQ, and limiter. Despite the pared-down programming options, Bandstand's effects sound very good. For example, the reverb section lets you choose between Small, Medium, and Large Rooms or Medium and Large Halls, and it provides an edit panel with knobs for Type, Time, and Mix. However, the big surprise is that the reverb's Type knob switches between Basic—a simple reverb—and, if you're not counting CPU cycles, Real—a fine-sounding convolution reverb. The reverbs are marginally programmable, offering only reverb time and mix parameters. You can't import your own impulse responses.

Band Auditions

Taken as a whole, Bandstand sounds crisper and more transparent than my old Roland SC-55, if somewhat thinner overall. Most of the instruments fared much better in ensemble roles than as solo instruments in exposed situations, but some solo instruments sounded quite good. The two GM acoustic pianos were very nice, with long decays and no obvious looping or split points. Acoustic Piano Two was subtly brighter than Piano One without becoming brittle. Electric Piano One had plenty of grit, with a nice mechanical *thunk* when I dug in. As always, the guitars came to life when I used my Yamaha G50 MIDI guitar converter, although I found Acoustic

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BANDSTAND

REVIEV

Steel String and Jazz Guitar a tad thin for my taste; likewise, the overdriven and distorted guitars were thin and unconvincing. The banjo was great, coming from the same sample pool as the Sonic Reality Acoustic Folk set I reviewed in the December 2004 issue of EM. The string ensemble sounds were lush, with plenty of high-end sizzle. Orch Hit sounded far less complex than even the built-in Apple DLS instrument—more like someone had layered a synth pad and kettle drums; then again, the novelty of orchestra hits as dance-tune punctuations is thankfully long dead. The tenor and alto saxophone patches were not my cup of tea, but again, they sounded fine in ensemble settings.

I should emphasize that Bandstand's sounds successfully balance against each other very well; nothing sounds out of proportion, and envelopes match those of their Roland GM counterparts. For the most part, then, if your songs sound good on antiquarian GM-compatible hardware modules such as the Sound Canvas, they will sound even better in Bandstand.

Stump the Band

When I routed Band-in-a-Box's MIDI output through Rax (as a host to Bandstand), the plug-in held up to the demands of a relatively busy and polyphonically dense big-band arrangement (see Web Clip 1). Likewise, when I loaded a commercially produced SMF with lots of Pitch Bend and Control Change data into a sequencer host, Bandstand handled all the MIDI data I could throw at it. As a standalone application, Bandstand handled dense control data and heavy polyphony with aplomb, making it an ideal soft synth for small ensembles looking for an easy-to-use playback instrument for backing tracks.

I was disappointed that at a retail price of more than \$200, neither the plug-in nor the standalone version offers more than a single stereo output. Otherwise, I found an awful lot to like about Bandstand, such as automatic setup in response to GM commands and program changes, and a built-in SMF player with many ways to customize playback. Bandstand can even render SMFs to audio. Most important, it offers a well-balanced and superior sound set. If you're looking for a good meat-andpotatoes sound module and you'd like to give General MIDI the respect it deserves, you should by all means investigate Bandstand.

In a former lifetime, Marty Cutler voiced GM software synthesizers for Silicon Graphics and Seer Systems.

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FIG. 1: For those recording with instrument amplifiers, the Sequis Motherload offers speaker simulation, speaker load, and attenuation functions.

SEQUIS Motherload

The mother of all speaker cabinet simulators.

By Orren Merton

he speaker in a guitar amp doesn't just reproduce that amplifier's tone. Its tonal characteristics and limited frequency range make it an integral part of the sound. The interdependence of amplifier and speaker is what makes it difficult to simulate a guitar cabinet.

Sequis successfully takes on the challenge of cabinet simulation—and more—with its Motherload device (see Fig. 1). The 1U unit has three main functions. The first is as a speaker simulator. In the studio, you can patch it in after your amp or modeling processor and record direct with an authentic speaker sound.

The second function is as a speaker load (aka "dummy load"), letting you run your amp safely with no speaker plugged in. In a DI-recording scenario, it lets you run your guitar through your amp's circuitry, into the Motherload's speaker simulator, and then into the multitrack, without any sound coming from your speakers.

The Motherload's third main function is as an attenuator. It lets you crank your amp (and get the sweet tone that often comes from doing so—especially with a tube amp), yet send a fraction of its normal output to the speakers. As a result, you can get ultimate tone for miking without blowing the walls out. The Motherload can also work in tandem with Sequis's standalone attenuator, the Richter Control (see the sidebar "On the Richter Scale").

Although the Motherload's primary application is to work in conjunction with electric guitar or bass amplifiers and hardware modelers, the company stresses that its filters sound great with acoustic-electric guitars, synthesizers, organs, loops, and so on.

A Load of Options

On the right of the rear panel (see Fig. 2) is the Input/ 8 Ohm Load jack, where you plug in the speaker output of your amp. From there, it feeds the Motherload's line-level speaker simulator. If you also want your amp's signal to continue unmolested to your speaker cabinet, you can use the provided Thru Out. If you use the Thru Out, your amp and speaker cabinet must have impedances that match each other, or you risk blowing an output transformer.

If you want to attenuate the signal going to your speaker cabinet, you can feed your cab with the

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ON THE RICHTER SCALE

The Richter Control (\$399; see Fig. A) is a dedicated attenuator that's similar to the one in the Motherload (the sound and controls are the same) but able to put out ten times



FIG. A: The Richter Control is a standalone attenuator that can be used in conjunction with the Motherload. as much volume. This makes it useful for a gigging situation in which you want to crank a really loud amp while keeping your stage volume under control. The unit's

minimum attenuation is 70 percent, which might not leave you enough volume on a large or loud stage.

The Richter Control's line-output impedance and signal level are an exact match for the Motherload's line in. So if you want to have an attenuator box near your amp, and a Motherload at a distant mixing board or studio control room (to be controlled by an engineer), you could connect the two Sequis units directly and they'd be a perfect sonic and electrical match.

To me, the Richter Control is not that compelling as a standalone attenuator. It doesn't allow for light attenuation, nor does it have an adjustable line out like the less expensive THD Hot Plate, or a variable impedance switch like the less expensive Weber Mass. However, if you need a separate attenuator to use in conjunction with the Motherload, the Richter Control is the logical choice.

Attenuator output rather than the Thru Out. The Attenuator output is rated at 8Ω , with a maximum power-handling capability of 100W RMS.

Keep in mind that a 4Ω speaker cabinet will double the perceived volume and load on the Motherload. That means you won't be able to turn the volume up past 50W, or you'll risk overloading the Motherload. A 16Ω amp's speaker output will be overloaded by the Motherload's

PRODUCT SUMMARY

SEQUIS Motherload

speaker simulator \$899

PROS: Excellent sound quality. Speaker load for silent recording. Highly configurable. Five presets with adjustable filter settings. Send/return loop. Chassis ground and lift. Balanced XLR and TRS simulator outputs.

CONS: Complicated interface and inadequate documentation. Limited attenuation range. No level adjustment for TRS output.



 8Ω input, which may damage the amp, the Motherload, or both. A 16Ω speaker cabinet may be used with the Motherload's 8Ω speaker output without worry, but it will seem quieter.

The rear panel also includes a volume knob to adjust the Attenuator output's signal to any value between 0 and 2.5 percent of your amp's normal output. This is probably the most useful volume range for the personalstudio recordist. For stage use, you might want a cranked amp sound with just a small amount of attenuation. I would have liked to have seen a larger range of attenuation options. The minimum attenuation is 97.5 percent.

Tapping the Load

The Motherload includes a line-level Send and a jack called Return/Line In. You can use these to connect a line-level effects device or processor between your amplifier and the speaker simulator. You can also use the Return/Line In for the Richter Control, or to insert a line-level signal from a synthesizer or amp modeler. You could even use it to patch in the line-level output from your audio interface in order to access the Motherload's filter-compensated outputs. It is that filter that shapes the amplifier's direct tone to sound like it's coming through a speaker cabinet.

The impedance of the Send is 150Ω , while the Return/Line In impedance is $2 k\Omega$. Depending on the impedance of your line-level device, you may need to use a direct box to properly match it.

The Motherload offers both balanced XLR and balanced TRS line outputs. You can adjust the level of the XLR output from the Line Out knob on the front panel. The full XLR level is approximately -18 dB, dependent on control settings. You cannot adjust the level of the TRS line output, but its signal is about 10 dB hotter than that at the XLR. I found that when recording with the Motherload, I got the best results using the XLR input into my audio interface and setting my interface's input level to -10 dB.

If you're getting hum through the balanced out from an unbalanced device such as an amp-modeling processor, the Motherload includes a stud for a chassis ground, and a 3-way ground switch. I didn't experience any hum at all, but Sequis claims that for those who do, these built-in countermeasures are successful in virtually every case.

Mother of All Filters

The Motherload's speaker simulator offers five presets intended to cover a variety of typical cabinet sounds. Presets 1 and 4 aim for a modern-rock sound; 2 and 3 for a more woody, Fender-style tone; and 5 for a more open, scooped sound.

Each preset has a miniscrew that trims the harmonics

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FIG. 2: In addition to all of the unit's I/O, the rear panel of the Motherload also features a volume knob that adjusts the output of the attenuator.

of its filter. I would have preferred small rotary knobs, but Sequis feels that screw shafts are more effective for preventing accidental adjustments. My favorite presets for high-gain sounds from my Randall RM100 and THD Flexi-50 amplifiers were 1 and 5, while I liked preset 4 for lower-gain playing.

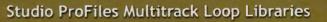
The real fun is when you build your own custom simulation using all the Motherload's filter controls. Unfortunately, the terminology Sequis has used is more akin to that used with a synthesizer filter than anything a guitarist typically deals with.

The Filter knob offers five preconfigured settings to trim the harmonics. The resonance is controlled by two knobs: one for boosting and one for cutting. The higher the resonance, the more open the sound. The lower the resonance, the more closed or woody. I like the more open sound of high resonances. Keeping the resonance too low results in a rather muffled tone. Perhaps lower settings would work better with a bright amp.

The Mid Shift knob lets you adjust the midrange emphasis. Lower mid-shift settings sound good for capturing a woody, jazz- or blues-style cabinet sound. Higher mid-shift settings give you a brighter sound.

The Bass and Treble knobs adjust the lowest and highest frequencies that a typical guitar cabinet can reproduce. These tone controls let you tailor the overall sound of the simulated cabinet. The key to success with them is subtle settings. You don't need high Basscontrol settings to achieve the Motherload's convincing and impressive emulation of the thump of a real

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MOTHERLOAD

speaker cabinet. If you set the Treble control too high, it can add unpleasant harmonics.

Hitting the Motherload

Overall, the Motherload has a lot to offer. It's versatile and it sounds great (see **Web Clip 1**). It's certainly not inexpensive, but considering that you get an attenuator, speaker load, and cabinet simulator in one package, it's an excellent value—especially when compared with buying separate components for each function.

Although the attenuation and speaker load features are easy to use and intuitive, grasping the parameters of the speaker simula-

MOTHERLOAD SPECIFICATIONS

Amplifier Input	(1) ¼" TS speaker cable			
Attenuator Output	(1) ¼* TS speaker cable			
Return/Line In	(1) ¼" TS; 2 kΩ; 2-24.5V			
Send	(1) ¼" TS; 150Ω; 0–2V			
Speaker Simulated Outputs	(1) balanced XLR, (1) balanced ¼" TRS			
Maximum Input Wattage	100W RMS at 8Ω			
Maximum Attenuator Output	2.5W RMS at 8Ω			
Dimensions	19" (W) × 1.7" (H) × 11.4" (D)			
Weight	12.1 lbs.			

tor is not so simple. It doesn't help that the included documentation is scanty at best. Because of these factors, I gave the unit a low rating in the Ease of Use category. (According to Sequis, an expanded version of the manual will be available by the time you read this.)

If your aim is to get the best-sounding recorded tones you can, and you don't mind dealing with an interface that takes some effort to learn, you're sure to be satisfied with this product. I've tried most of the current crop of hardware and software speaker simulators, and the Motherload's simulation is among the best.

Orren Merton likes to simulate being a guitar player when he's not writing.



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QUICK PICKS

DIGIDESIGN

Mbox 2 (Mac/Win) By Gino Robair

In 2001, Digidesign introduced the Mbox, a 2-channel USB audio interface that, for the first time, made the Pro Tools LE system available for under \$500. The bus-powered device included a pair of Focusrite mic preamps, TRS inserts for each analog input, and zero-latency monitoring.

Last year, Digidesign completely redesigned its popular low-cost interface. Not only is the Mbox 2 (\$495; with the Factory Bundle plug-ins, \$595) snazzier looking and more portable, but Digidesign has enhanced it ergonomically and implemented some welcome changes, thus keeping the Mbox platform competitive and taking advantage of the increased feature set of Pro Tools 7.

Four on the Floor

Among the most welcome new features is the ability to record four channels—two analog and two digital—simultaneously in supported versions of Pro Tools (6.8.1 and later). This allows you greater leeway when tracking than with the original Mbox.

Besides the S/PDIF and USB 1.1 ports, the rear panel of the Mbox 2 includes a surprise—MIDI I/O. As a laptop user, this allowed me to free up a USB port by plugging my keyboard controller directly into the Mbox 2 MIDI ports.

Instead of the Neutrik combo jacks that were previously used for the analog inputs, the Mbox 2 gives you separate jacks for each type of input: balanced ¼-inch TRS for line-level signals, unbalanced ¼-inch TS for instrument-level signals, and XLR



The Mbox 2 includes MIDI I/O and lets you record four channels simultaneously.

for microphones. I originally thought they offered the separated jacks so you could leave all your cables plugged in. However, when a TRS cable is plugged into the Line In jack, the XLR input gets disconnected internally. Unfortunately, the Mbox 2 does not include the insert jacks found on the original version, and the main analog outputs are a pair of unbalanced ¼-inch jacks, operating at –10 dBV.

Another Pretty Face

The front panel of the Mbox 2 has changed as well. Instead of the cone-shaped knobs reminiscent of the Focusrite Platinum series, the Mbox 2 has round, reflective knobs: a headphone-output level control; a source/playback Mix control; input gain pots; and a new, dedicated monitor-level control. In addition, the phantom-power switch is now on the front panel. One thing missing is a printed indication of which side is which on the source/playback control.

Each of the front-panel switches—Mono sum, 48V phantom power, -20 dB pad, and Mic/DI source—has an associated LED, and S/PDIF and USB status LEDs are also included. The Mbox 2 has only one stereo headphone output: a ¼-inch jack located on the front panel. The ¼-inch jack has been dropped, but I don't miss it.

The Mbox 2's removable handle props the interface up when it is horizontal, and stabilizes it when vertical. In the vertical position, the Mbox 2 is 2.5 inches talier than the Mbox (they had to put the MIDI I/O somewhere), as well as 1 pound heavier and nearly the same width and depth.

Notably, the Mbox 2 is easy to store when the handle is removed. (By comparison, the nonremovable feet on the original Mbox took up nearly an inch on each side of the box, making it difficult to fit in a laptop bag.) A replacement panel, which props up the Mbox 2 by 0.25 inches when the unit is horizontal, can be attached when the handle is removed.

Sound Judgment

Digidesign has replaced the Focusrite preamps with its own in the Mbox 2, as well as revamped the rest of the electronics. However, the sound of the two interfaces is remarkably similar, and a number of the specs (available on Digidesign's Web site) are very close and in some cases identical. Nonetheless, the Mbox 2 does have an increase in its dynamic range and is greatly improved in its THD+N spec. The phase characteristics in the upper frequencies are significantly better as well, which you will notice in terms of stability in the imaging of instruments such as cymbals.

My only beef about the Mbox in general is that the mic preamps have slightly more than 50 dB of gain available. I had to crank up the input when using some of my mics, which, in turn, increased the noise floor. If I had a wish list, it would include balanced analog outputs at +4 dBu, USB 2.0 support, more preamp gain, and the ability to configure four channels of output.

Mpressive

Overall, the Mbox 2 sounds very good and works equally well for live and studio recording. And although it's no longer the cheapest way to get a Pro Tools LE system—if you have an M-Audio interface, Pro Tools M-Powered gets you there—it offers a convenient I/O implementation with robust Digidesign build quality.

As it is, the added features in the Mbox 2—MIDI I/O, 4-channel recording, and a greater dynamic range—are strong selling points. Mbox owners will want to seriously consider this upgrade. But if you're shopping for your first Pro Tools system, and a 4-in/2-out audio interface with MIDI is all you need, the Mbox 2 is a great place to start.

Value (1 through 5): 3 Digidesign www.digidesign.com

ULTIMATE SOUND BANK

SonicBoomBox and EthnicBoomBox By Doug Eisengrein

Ultimate Sound Bank's SonicBoomBox (\$99) and EthnicBoomBox (\$99) furnish software instruments for Apple GarageBand and loop libraries in Apple Loops format. Each DVD-ROM contains the installer, a Documents folder, and a Loops folder. Along with a PDF manual in English, French, and Japanese, handy indexes of all the instruments and loops

126

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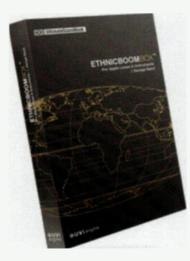
are also provided. *SonicBoomBox* contains 2.56 GB of loops and 223 instruments, and *EthnicBoomBox* contains 2.69 GB of loops and 105 instruments.

I tested the software instruments in GarageBand 2.0.2 on a 1.33 GHz Apple iBook G4. I used Ableton Live 5 on a 2.4 GHz Intel Celeron-based laptop to browse the loops straight from DVD. Installation of both packages on the Mac was easy; good documentation is included but wasn't necessary. After running the installer, you open GarageBand and drag the Loops folder into its Browser.

Around the World

Software instruments are divided by category into subfolders. SonicBoomBox categorizes instruments as Bass, Drums, Ethnic & Co, Guitar, Keyboards, Percussions, and Synthetic Sounds. EthnicBoomBox's categories are Africa, Asia-India, Balkanish, Latin Bass, Middle East, Occidental-Celtic, Spanish Guitars, and Xtra Percussions. Both collections share a graphical user interface that closely resembles that of Ultimate Sound Bank's Plugsound series of instrument plug-ins. It features synthlike controls such as ADSR envelopes, four Velocity curves, and a choice of four resonant filter types. You can customize each instrument and save user presets, and you can even create new instruments.

All of *SonicBoomBox*'s instruments sound uniformly good (see **Web Clips 1** through **10**). Some of the highlights are in



Ultimate Sound Bank packs plenty of software instruments and loops for GarageBand in its BoomBox series of DVD-ROMs.

the Bass, Ethnic & Co, and Drums categories. Acoustic, electric, and synth basses are available; the acoustics have a nice, natural pluck to them, and the synths feature some tummy-rumbling subs. The Ethnic & Co folder contains a few first-rate stringed instruments, including banjos, a rich classical harp, and some interesting Dobros, tzouras, and bouzoukis. Among the drums is an outstanding variety of MIDImapped kits covering jazz, rock, electro, and beyond.

My favorite instrument categories in *EthnicBoomBox* are Asia-India, Middle East, and Xtra Percussions. Asia-India supplies some very good sitars, as well as lamelofon, shakuhachi, and Japanese and Malaysian percussion. Along with some nice Arabic violins, the Middle East folder includes saz, bouzoukis, and ouds. Xtra Percussions covers such oddities as kachichi, cajon, flexitone, and an excellent berimbau. All of them provide multisamples with Velocity layers that enhance their musicality.

Loads of Loops

SonicBoomBox's loops cover the electronicmusic gamut (see Web Clips 11 through 14). They're divided into folders with names such as Big Beat, Funk-Groove, and Hard Techno. Each contains plenty of subfolders that reflect the collection's diversity. Some highlights include Vocal Phrases, Brass, Sound FX, and Turntable Loops. The Vocals Phrases tend toward the soulful diva-esque, and there are some interesting talkbox snippets, too. Brass encompasses musical genres from funk to big band, with trombones, sax, trumpets, and more. Sound FX offers a terrific selection of cinematic textures covering aquatic sounds, guns, ambience, and subways. Turntable Loops, which were apparently sampled from rare funk and soul recordings, are gems for their oldschool hip-hop flavor.

EthnicBoomBox's loop folders are Africa-South Africa, Asia, Balkanish, European-Celtic, Indonesian-Gamelan, Latin-Cuba-Brazil, Mediterranean-Mahgreb, Spanish-Gipsy, and Xtra Percussions (see **Web Clips 15** through 17). Each is a treasure chest of world instrumentation, percussion, vocals, and ambient sounds. Within the Indonesian folder alone are subfolders such as Ambiances, Indian Flutes, Papang, Pungi, Ravanhata, and Sitar. There are too many highlights to adequately describe here; simply put, *EthnicBoomBox* adeptly traverses the globe.

Overall, all the loops are well recorded and seamlessly looped. Many are dry, whereas some have effects artfully applied. The loops in both collections are well grouped, though unfortunately, many categories have only one selection in a given style. Like their instrument counterparts, the loops' naming scheme is succinct and descriptive; parent folder names are included.

My one criticism is the loops' lack of key or original tempo notation in their names, though tempos are notated in GarageBand's Browser. Knowing keys at a glance can be essential when matching musical loops from different directories. Although many programs do a fine job of time-stretching, keeping loops near their original tempo still produces the best possible sound. I highly recommend the SonicBoomBox and EthnicBoomBox collections, especially to GarageBand users. The instruments and their shared user interface are excellent, and the loops are tight. And if you prefer orchestral sounds, ClassicalBoomBox (\$99) is also available. Each DVD EM is an excellent value. CLIPS

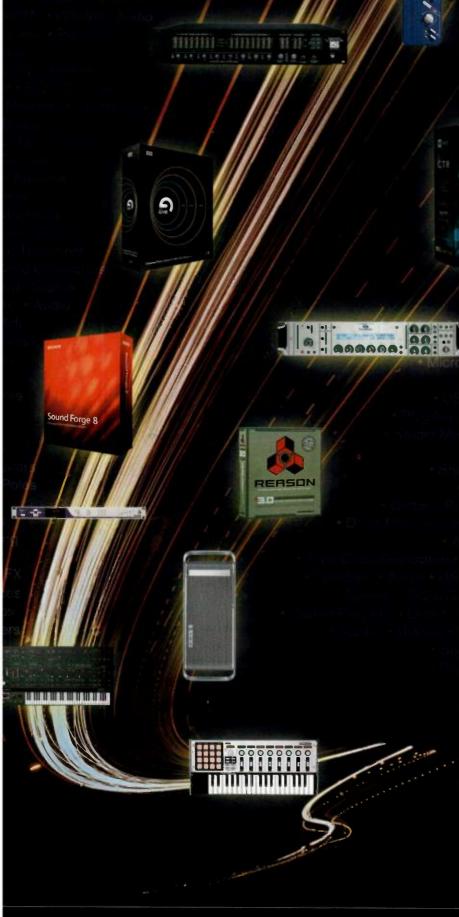
Value (1 through 5): 4 Ultimate Sound Bank www.ultimatesoundbank.com

PSP

PSP MasterComp (Win) By David Weiss

PSP MasterComp (\$249) for Windows from PSP is a VST, DirectX, and RTAS compatible compressor plug-in. The stereo-mono MasterComp has a 64-bit floating-point engine and double-sampled processing that PSP calls FAT (Frequency Authentication Technique), which is designed to operate transparently even at extreme compression settings and high sampling rates.

Installation of MasterComp went smoothly on my machine, an IBM tower with a 2.26 GHz processor, 1 GB of RAM, and Steinberg Cubase SX3. Copy protection uses a typical challenge-and-response



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scheme, which is carried out the first time the plug-in is instantiated.

What You See

The MasterComp control panel is pleasingly clean, with high-contrast control markings that pop out nicely (see Fig. 1). Two large meters with overload LED indicators fill the top third of the panel. The meters display values on both VU and PPM scales. A 3-way switch between the two meters lets you view the signal pre- and postcompression or view the amount of gain reduction.

Everything is centered around the allimportant Threshold knob, which sets the compression or expansion threshold between -30 dB and +6 dB. An 11-step, detented Ratio knob on the left offers seven compression ratios, three expansion ratios, and no compression (1:1 ratio). Attack can range from 0.01 ms to 1 second, whereas release can be set from 0.1 to 10 seconds. A Make-up knob adjusts makeup gain before the mix, output, and limit sections. Auto buttons are provided for attack, release, and makeup to achieve maximum transparency.

More unusual compressor controls grace the right side of the MasterComp control panel. An extremely handy sidechain signal processor lets you cut or boost frequencies between 25 and 400 Hz on the low side and between 1 and 16 kHz on the high end. Sidechain monitoring is also available. The Link and Tilt knobs provide

an even higher, and

subtler, degree of con-

trol. The Link knob sets

the amount of com-

pression dependency

between sidechain

channels, and the Tilt

knob adjusts the side-

A convenient Mix

knob sets the wet/dry

output mix, and an Output knob sets the

output gain between -12 and +12 dB. Four

toggle switches along the bottom turn FAT

on or off (reducing

CPU load), toggle

between hard- and

chain balance.

FIG. 1: PSP MasterComp is a highfidelity stereo dynamics processor with 64-bit floating-point, doublesampled processing.



130

soft-knee curves, select between peak and RMS modes, and engage the brickwall limiter. A preset selector and A/B comparison buttons occupy the bottom of the panel.

What You Get

I used MasterComp to master several rock and electronica tracks, and in most cases I was extremely pleased with the results (see Web Clips 1 and 2). With FAT engaged, MasterComp added significant musical depth to the mix, bringing out a wealth of details with heightened sonic clarity. Depending on how I set the attack, release, and threshold, MasterComp brought a delicious degree of sparkle to the mixes. Adjusting the makeup gain added an aggressive bite when required. The sidechain controls proved especially handy for mastering material when a dose of EQ correction was desired. That went a long way in reducing muddiness in one song, and left me free to make very fine corrections in my EQ stage later on.

MasterComp was also valuable for mixing, bringing crisp definition to an electric guitar track and beautiful squashy oomph when the Heavy Drum Kit preset was used on the drum bus (see **Web Clips** 3 and 4). Used in conjunction with PSP's other mastering plug-ins, MasterQ and VintageWarmer, MasterComp's impact was even more dramatic.

My complaints are few. MasterComp's A/B controls are not intuitive, and their operation is not explained in the manual. Few presets are provided, and they often have names that give little clue as to their actual effect. Automatic toggling between a control's name and its value worked sporadically. But these quirks are not that important, and on the upside, PSP's tech support staff always responded within 24 hours.

I've long searched for one killer compressor plug-in and have found it in PSP MasterComp. It offers great transparency or musicality as needed, its controls are flexible, and it's a very good value. MasterComp will certainly meet the needs of any discerning PC-based engineer or producer.

Value (1 through 5): 4 PSP www.pspaudioware.com WAVE ARTS

TrackPlug 5 (Mac/Win) By Mike Levine

The first thing you notice when you open TrackPlug 5 (\$199), the latest version of Wave Arts' channel strip plug-in, is its snazzy new user interface. Gone is the metallic look of previous versions, replaced by a new design scheme with a "vintage" vibe to it. Besides revamping its look, Wave Arts has added a slew of new processing algorithms and features, making it the most powerful TrackPlug to date.

The plug-in is compatible with AU, VST, MAS, and RTAS on the Mac, and DX, VST, and RTAS in Windows. TrackPlug 5 will run as either a mono or stereo processor and supports sampling rates up to 192 kHz.

Under the Hood

TrackPlug 5 has three sections: EQ, Dynamics, and Output. The EQ section can be configured with up to ten bands (the more bands you activate, the more processing it uses), and each band can be set to a wide range of different EQ types. Retained from TrackPlug 4 are basic EQ varieties like Parametric, Low Shelf, High Shelf, Lowpass, Highpass, Notch, and Bandpass. New to this version are Resonant Low Shelf, Resonant High Shelf, Vintage Low Shelf, and Vintage High Shelf.

All the EQs sound good and are easy to set. You can adjust them graphically by dragging points in a graph, by turning virtual knobs, or by typing values into fields below the knobs. I was particularly impressed with the Vintage Low and High Shelf filters, which were very warm sounding.

Also new to the EQ section are the Highpass and Lowpass Brickwall filters, which eliminate all frequencies above (in the case of the Lowpass filter) and below (in the case of the Highpass filter) what they're set for. For applications like setting up quick telephone EQs or cutting out unneeded frequencies, these filters give you results fast.

Comp Time

The Dynamics section provides a gate and two compressors. (Previous versions of TrackPlug had only one compressor.) Having two is particularly handy for vocals,

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because you can use one for dynamics and one for de-essing.

Wave Arts carried over its Clean RMS and Clean Peak compressor algorithms from previous versions of TrackPlug and added three new ones: Vintage Peak, Vintage RMS, and Vintage Warm. The Clean settings are the most transparent, while the Vintage settings are designed to impart an old-style analog sound. On a snare drum, for instance, I found the Vintage Warm setting (with hard-knee compression selected) produced a fatter sound than the Clean algorithm.

Both the compressors and the gate offer the same set of controls: Attack, Release, Threshold, Ratio, (makeup) Gain, Knee (soft, medium, or hard), and Lookahead (Off, 1 ms, 2 ms, or 5 ms). A sidechain is available for such chores as de-essing, or triggering compression or gating from a specific frequency for other purposes. There's no external key input for the gate, though, so you can't trigger gate effects using audio tracks. As in the EQ section, the dynamics processors can be controlled by dragging control points in a graph, by turning onscreen knobs, or by entering numeric values.

Reaching the Peak

The final stage of TrackPlug 5 is the Output, which

has a Gain control for boosting the overall level, and a peak limiter. The limiter lets you maximize levels, and allows you to get some heavily compressed sounds when you crank the gain. I was able to really squash some drum loops with it (see Web Clip 1).

The peak limiter's controls are quite simple. You can turn it on and off, and goose the level going into it using the Gain control. According to Wave Arts, the peak limiter is best used on individual tracks rather than for entire mixes. For the latter, the company recommends FinalPlug 5, its dedicated limiter plug-in.



Wave Arts' TrackPlug 5 is a channel strip plug-in that offers up to ten bands of EQ, a gate, two compressors, a peak limiter, and more.

A Final Plug

Overall, TrackPlug 5 is much improved from previous versions. You get a full-featured channel strip that offers good sound quality and plenty of EQ and dynamics options. The peak limiter is a nice added feature.

TrackPlug 5 is easy to use, easy on your eyes, easy on your CPU, and relatively easy on your pocketbook. You can buy it standalone or as part of a Wave Arts bundle. EM

Value (1 through 5): 4 Wave Arts www.wavearts.com

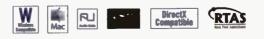


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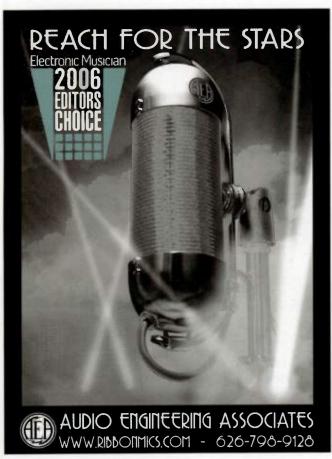
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MIDI Control from KORG

Every MOTU studio needs capable and convenient MIDI control. The new KORG K-Series USB/MIDI controllers teature solid, full-sized keys and four velocity curves to perfectly match your playing style. Available in 25, 49 and 61-key versions, each provide easy access to the full range of notes thanks to dedicated octave shift buttons, plus a host of assignable controllers including KORG's innovative ClickPoint, which performs double duty as an X/Y joystick or a USB mouse. Plus they come with the M1 Le, a soft synth version of the legendary M1 to use within DP! Now add the sleek and portable padKONTROL, with 16 extremely responsive trigger pads that can be used to perform natural sounding drum parts, trigger audio loops or video clips, and send MIDI control change messages to take charge of your soft synths, samplers and effects. Its unique X/Y pad can be used to perform realistic rolls and flams with the touch of a finger.



Authentic SSL processing

Waves dulivers the classic sound of the SSL 4000 Series to your Digital Performer mixes. To faithfully recreate the extraordinary SSL sound, Waves engineers spent more than a year analyzing and modeling the distinctive sonic characteristics of SL 4000 factory reference consoles and components provided by Solid State Logic. Extensive testing proves that the Waves SSL 4000 plug-ins sound virtually identical to their hardware counterparts. Developed under license from Solid State Logic, The Waves SSL 4000 Collection includes three meticulously modeled plug-ins based on the legendary SSL 4000 Series: the SSL E-Channel, the SSL G-Master Buss Compressor, and the SSL G-Equalizer.



Universal plug-in control

As a Universal Sound Platform, Native Instruments KORE operates not only as a plug-in within Digital Performer but also as an instrument host application. It allows you to integrate all your VST- and Audio Units-based software instruments and enects into a single, unified interface. KORE provides greatly increased control, overview and ease of use in all creative situations. Both Native Instrument's own range of instruments and effects as well as thirdparty products are supported. The seamless integration with KORE's advanced hardware controller gives hands-on control with unprecedented analog feel, finally turning today's software synthesizers and samplers from applications into true instruments.



Pro waveform editing & mastering

Your DP mastering and processing lab awaits you: BIAS Peak Pro 5 delivers award winning editing and sound design tools, plus the world's very best native mastering solution for Mac OS X. With advanced playlisting. Superb final-stage processing. Disc burning. Plus PQ subcodes, DDP export (optional add on), and other 100% Redbook-compliant features. Need even more power? Check out our Peak Pro XT 5 bundle with over \$1,000 worth of additional tools, including our acclaimed SoundSoap Pro, SoundSoap 2 (noise reduction and restoration), Sqweez-3 & 5 (linear phase multiband compression/ limiter/upward expander), Reveal (precision analysis suite), PitchCraft (super natural pitch correction/ transformation), Repli-Q (linear phase EQ matching), SuperFreq (4.6.8, & 10 band parametric EQ) and GateEx (advanced noise gate with downward expander) — all at an amazing price. So, when you're ready to master, Peak Pro 5 has everything you need. It's the perfect complement — and finishing touch — to Digital Performer 5.

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The gold standard for groove

Spectrasonics Stylus RMX v1.5, the award-winning "groove standard", gets better and better with new leatures like "Chaos Designer™ Buzz" for stuttering edits, 500 incredible new categorized Multi grooves and 250 slamming new Kits. It's even easier to learn RMX now with the new Reference Guide/Help System and hours of brand new tutorial videos - including one specifically for Digital Performer users!



Authorized Reseller

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Expand & Update Your MOTU Studio

On-demand plug-in processing

How do you conserve precious CPU cycles for the demands of your Digital Performer based studio, but also run all of today's latest plug-ins and virtual instruments? The Muse Research Receptor

is a dedicated hardware-based plug-in player for your favorite VST software. With 16 channels to run virtual instruments or effects, a built-in MIDI interface and a versatile complement of digital and analog I/O, Receptor is the ideal way to run plug-ins while keeping your host computer running smoothly. Control everything from the front panel, or simply connect a monitor to the back. Visit museresearch.com to view demos by Dream Theater's Jordan Rudess and to learn about Receptor's new

UniWire™ technology, which provides MIDI, audio, and remote control between Receptor and your computer via a single Ethernet cable. Receptor provides the ultimate in performance, stability, and sonic performance.



Control room monitoring

The PreSonus Central Station" is the missing link between your MOTU recording interface, studio monitors, input sources and the artist. Featuring 5 sets of stereo inputs (3 analog and 2 digital with 192kHz D/A conversion), the Central Station allows you to switch between 3 different sets of studio monitor outputs while maintaining a purely passive signal path. The main audio path uses no amplifier stages including op amps, active IC's or chips. This eliminates coloration, noise and distortion, enabling you to hear your mixes more clearly and minimize ear fatigue. In addition, the Central Station features a

Large capsule mic

The new RØDE NT2-A can be plugged directly into your 828mkll, Traveler or UltraLite interface. This professional large capsule (1") studio microphone incorporates three-position pick-up patterns, pad, and high pass filter switches conveniently located on the mic body. At the heart of the NT2-A is the Australian designed and manufactured HF1 dual diaphragm capsule. The frequency and transient response of this new transducer has been voiced to complement today's modern recording techniques, and yet still evoke the silky smooth character of the legendary microphones of the 50's and 60's. These features provide the flexibility and superlative audio characteristics that make the NT2-A

one of the most versatile condenser Electronic Musician 2006 mics available. The NT2-A's variable controls allow switching between Omni, Figure 8, and Cardioid polar patterns. The three position high-pass filter provides a flat response or an 80Hz and 40Hz high pass filter. The microphones Pad can be switched between 8 d8 -5d8 and -10d8. The NT2-A comes in a soft pouch with an M2 stand mount.

EDITORS

CHOICE

RODE NT2-A

complete studio communication solution with built-in condenser talkback microphone, MUTE, DIM, two separate headphone outputs plus a cue output to enhance the creative process. A fast-acting 30 segment LED is also supplied for flawless visual metering of levels both in dBu and dBfs mode. Communicate with the artist via talkback. Send a headphone mix to the artist while listening to the main mix in the control room and more. The Central Station brings all of your inputs and outputs together to work in harmony to enhance the creative process and ease mixing and music production.



Power conditioning

A large-scale MOTU-based multitrack studio is not only a finely-tuned instrument, it's an investment. Protect that investment - and get the best possible performance from it - with the Monster Pro 2500 and Pro 3500 PowerCenters, Many so-called "power conditioners" only protect against random power surges and/or voltage spikes. But AC power line noise and noise from other components is an equally harmful and constant threat to your gear's performance. To prevent this, Monster's patented Clean Power™ filter circuitry (U.S. Pat. No. 6.473.510 B1) provides separate noise isolation filtered outlets for digital analog and high-current audio components. The result is high quality sound that's free from hums, buzzes and other power line artifacts, revealing all of the rich harmonics and tone in your recordings. Get All the Performance You Paid For™. Get Monster Pro Power.



Automated mixing and control

Imagine the feeling of touch-sensitive, automated Penny & Giles faders under your hands, and the fine-tuned twist of a V-Pof[™] between your fingers. You adjust plug-in settings, automate filter sweeps in real-time, and trim individual track levels. Your hands fly over responsive controls, perfecting your mix — free from the solitary confinement of your mouse. Mackie Control delivers all this in an expandable, compact, desktop-style design forged by the combined talents of Mackie manufacturing and the MOTU Digital Performer engineering team. Mackie Control Universal brings large-console, Studio A provess to your Digital Performer desktop studio, with a wide range of customized control features that go well beyond mixing. It's like putting your hands on DP itself.

Accurate monitoring

The Mackie HR-Series Active Studio Monitors are considered some of the most loved and trusted nearfield studio monitors of all time, and with good reason. These award-winning bi-amplified monitors offer a performance that rivals monitors costing two or three times their price. Namely, a stereo field that's wide, deep and incredibly detailed. Low frequencies that are no more or less than what you've recorded. High and mid-range frequencies that are clean and articulated. Plus the sweetest of sweet spots. Whether it's the 6-inch HR-624, 8-inch HR-824 or dual 6-inch 626, there's an HR Series monitor that will tell you the truth, the whole truth, and nothing but the truth.



MOTU system expert advice

When it comes to putting together MOTU recording systems, nobody does it better than Sweetwater. Whether you're building a simple portable recording rig with an UltraLite and a new MacBook Pro or a 128-track powerhouse Digital Performer studio centered around the latest Quad Core G5, Sweetwater can help you select the perfect components for your MOTU system, from the specific MOTU audio interface model, to control surfaces and hard drives, to plug-ins and studio monitors. Even better, we can install, configure, test and ship a turnkey system straight to your door — all you'll need to do is plug in the system and start making music. Why shop anywhere else? Call the experts at Sweetwater today!



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Sweetwater music technology direct

Digital Marketing By Larry the O

S aloon keepers loved the advent of digital audio because debating whether digital or analog is better is thirsty work. The debate rages on, but instead of clarity emerging as the years go by, we instead have more confusion. And you can blame it on the marketing department.

This issue came to the fore recently when "First Take" (FT) engaged "Final Mix" in a spirited discussion about digital microphones. FT asserted that a digital microphone was merely a regular old analog microphone with an onboard analog-to-digital converter, making the term *digital microphone* nothing more than one more example of marketingspeak. Instead, a true digital microphone, were such a thing possible, would perform a direct digital conversion, rather than using a traditional diaphragm arrangement. Otherwise, the term is meaningless.

"Final Mix" countered that sound was an analog phenomenon, meaning that the first stage of digitizing would have to be some kind of analog sensor, the output of which would then be sent to a converter. This approach seems to qualify as a "digital microphone" in the minds of the Audio Engineering Society (AES), which has a standard describing these mics, and manufacturers like National Semiconductor, which makes chips for them.

The debate romped on, but the underlying point was the lack of clarity in defining what constituted a "digital" version of a device that received analog input.

Pay no attention to the words *analog* and *digital* in product descriptions.

Apparently, some see the microphone's digital output as defining it as "digital."

Now "Final Mix"'s pea brain was in gear. What about digital loudspeakers? What are they? That turned out to be a bit trickier. In the majority of cases, the term is applied to a system that keeps the signal in the digital domain as long as possible, though eventually converting it to analog at the power amplifier stage. However, there have been a few systems that never convert the signal to analog, producing a digital signal that is "converted" to analog in the ear. But this definition has been a topic of debate for years. In 1998 *Stereophile* magazine had an article exploring the definition of digital loudspeakers, while a paper presented at the 110th AES convention in 2001 defined a digital loudspeaker lacking any kind of DAC.

Is the case any clearer with digital amplifiers? Not really. The output of these devices, technically referred to as "Class D," is a pulse-width modulation (PWM) waveform, which is lowpass filtered before being fed to a loudspeaker. Sounds pretty digital, doesn't it? But a 2001 article in *Electronic Design News* firmly asserted that the signal, PWM or not, is decidedly analog.

Are we confused yet?

Now let's flip things around and take a look at analog synthesis. Not the kind you get from an analog synthesizer, mind you, but the kind you find in various "virtual instruments"—whatever those are. I've seen "analog modeling" synthesis and just plain old "analog" synthesis in these products. Are these synthesizers using analog software or something? As near as I can tell, these terms refer to a voice structure employing simple waveforms (sine, sawtooth, square or pulse, triangle, noise), feeding a filter and a gain stage, with envelopes to control filter and gain behavior. Oddly, I somehow had come under the impression that constituted subtractive synthesis.

Come to think of it, those waveforms (and more) were used in Music I through Music V, the software-synthesis

> languages developed by Max Mathews and friends in the 1950s and '60s. Bear in mind that Bob Moog didn't show his first modular analog synthesizer until the 1964 AES convention. Maybe he should have claimed his

instruments modeled digital synthesis.

Good grief! Our industry is smearing the distinction between the terms *analog* and *digital* so badly that they are rendered nearly useless. But "Final Mix" has an idea: pay no attention to any use of the words *analog* and *digital* in product descriptions. Instead, ask questions to determine how the technology actually works. Better yet, ask people at the product's manufacturer to define the use of their chosen term. It's really fun to watch them squirm as they are forced to admit that they have no idea what their terms mean. EM

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