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RECORDING THE SCORE FOR LOTR: THE TWO TOWERS

World Radio History

Ed Cherney has engineered for some of the biggest music artists of the last two decades – and is still going at it. Cherney's engineering credits are literally a Who's Who of the music industry: Jackson Browne, Eric Clapton, Bob Dylan, The Judds, Bette Midler, Iggy Pop, Bonnie Raitt and The Rolling Stones – to name only a few.

World-renowned producer Don Was has worked with Ed on numerous projects over their long and prolific partnership. Was has produced an impressive number of major recording artists including The B-52's, Barenaked Ladies, Bob Dylan, Elton John, B.B. King, Willie Nelson, Randy Newman, Bonnie Raitt and The Rolling Stones.

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VOLUME 14 • ISSUE 1

CONTENTS

EQ (ISSN 1050-7868) is published monthly by United Entertainment Media, Inc., a CMP Information Company, 2800 Campus Drive, San Mateo, CA 94403. Periodicals postage paid at San Mateo, CA and additional mailing offices. POSTMASTER: Send address changes to EQ, P.O. Box 0532, Baldwin, NY 11510-0532. SUBSCRIPTIONS: U.S. $29.95 for 1 yr. (13 issues); CANADA add $10.00 per year for surface; other countries add $15.00 per yr. for surface; all add $30.00 per yr. for airmail. Registered as CMP Media LLC, GST No. R13288078, Customer No. 2116057, Agreement No. 40011901. All subscriptions outside the U.S.A. must be pre-paid in U.S. funds by International Money Order, checks draw from a bank located in the USA, Visa, Master Card or American Express. Back issues $5. Printed in the U.S.A.

FEATURES

51 **HOW TO BUY GEAR**
Including:
Tech Gear Roulette (p.52)
How To Choose An Audio Interface (p.58)
How To Choose A DAW (p.66)
The Price Versus Value Equation (p.70)
10 Commom Gear-Buying Mistakes (p.72)

77 **MIDI IN THE STUDIO**
It was 20 years ago today....
by Craig Anderton

82 **THE TWO TOWERS**
The making of the towering soundtrack for the second *Lord of the Rings* movie
by Will Romano

DEPARTMENTS

4 EDITORIAL
8 AES REPORT: LIVE SOUND PRODUCTS
10 PRODUCT VIEWS
18 FIRST LOOK: CAKEWALK PROJECT 5
20 FIRST LOOK: PRINCETON DIGITAL REVERB 2016
24 ROOM WITH A VU: BASEMENT BEATS
26 ROOM WITH A VU: DIGITAL IN BLUE STUDIO
28 SESSION FILE: THE VINES: VOCALS
32 DAW WORLD: CLOCKING THE DAW
113 AD INDEX
128 ACROSS THE BOARD: THERE'S NOTHING TO DO

REVIEWS

93 **DISC MAKERS ELITE-PRO1 CD/DVD-R DUPLICATOR/PRINTER**
By Mitch Gallagher

94 **SUMMIT AUDIO TLA-50 MONO TUBE LEVELING AMPLIFIER**
By Mitch Gallagher

96 **BENCHMARK DAC1 TWO-CHANNEL D/A CONVERTER**
By Mitch Gallagher

98 **STUDIO NETWORK SOLUTIONS FIBREDRIVE FIBRE-CHANNEL HARD DRIVE**
By Mitch Gallagher

100 **WAVES MAXXBASS 101 BASS ENHANCER**
By Mitch Gallagher

102 **CREST X-RACK XR20 RACK MOUNT MIXER**
By Steve La Cerra

104 **PRESONUS DIGIMAX LT 8-CHANNEL MIC PRE WITH ADAT OPTICAL OUTPUT**
By Craig Anderton

106 **LINE 6 PODXT GUITAR AMP/SPEAKER MODELER**
By Craig Anderton

110 **SHORT REVIEWS**

114 **SAMPLE CD REVIEWS**

TECHNIQUES

36 **ADRENALINN HOT TIPS**
More than just a guitar processor
By Jerry McPherson, Roger Linn, and Craig Anderton

40 **LET'S GET LOOPED, THEN MAKE SOME BUCKS**
Loops move from the groove to the tube — and beyond
By Craig Anderton

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EDITORIAL

Anniversaries

As I write this, it's the anniversary of the United States' last manned visit to the moon. Pretty wild to think about setting foot on another celestial body — and an even more miraculous accomplishment when you consider the technology that was available at the time. The computer power that most of us use for balancing our checkbooks and surfing the Net dwarfs what was available back then.

This is also the anniversary of another marvel, the Musical Instrument Digital Interface (MIDI). While perhaps less earth-shattering than setting foot on lunar soil, MIDI has nonetheless produced profound changes in the way in which many styles of music are created. But that's not the *really* amazing aspect of MIDI's story. Yes, it has changed music production. But the really amazing thing about MIDI is how an industry came together — competitors and allies alike — to settle on one standard.

That's one thing we have no shortage of — standards, especially in the computer-based audio production world. How many standards can we possibly support? Whether plug-in formats, audio interface driver protocols, operating systems, platforms, software synthesizer standards, audio file formats, whatever; the list goes on and on. And it continues to grow, with new formats emerging on an all-too-frequent basis.

Just keeping up with all the "standards" is a full-time job. I'm quite impressed that, for example, some plug-in developers are able to keep their products current. But I have to wonder if all these standards and protocols aren't ultimately slowing development. Even if the company that develops a specific "standard" is focused on it, they still must provide support for various other standards in order to remain compatible with the rest of the world. It would seem to me that this can only lead to dilution of effort — how much more could a developer accomplish if it was focused on supporting just one standard or protocol?

Unfortunately, we're probably saddled with this situation. I'm not naïve enough to believe that any of the existing "standards" are going to go away just so that I can be satisfied that developers are staying focused on one protocol. But my hope as we launch into the New Year is that we can, as an industry, move away from the ever-proliferating list of standards and collectively get behind those that promise the most benefit to end users. Let's follow the example of the fathers of MIDI and work together to our mutual gain.

—Mitch Gallagher
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EQ

Vol. 14, No. 1
JANUARY 2003

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WWW.EQMAG.COM
WEB EDITOR: Mitch Gallagher

Published By
UNITED ENTERTAINMENT MEDIA, Inc.
a CMP Information Company
PRESIDENT/CEO: Tony Keefe
SENIOR VICE PRESIDENT: Martin Porter
BUSINESS MANAGER: Doug Krainman

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WEB SITES: **www.eqmag.com & www.keyboardonline.com**

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AES Live Sound

By Steve La Cerra and Craig Anderton

There was plenty of live sound gear at AES (in fact, too much to fit in our December issue report), with a surprising number of digital console introductions...like the *très* cool **DiGiCo D5 Live.** Based around a mixing surface with four TFT screens and moving faders, the D5 Live boasts total recall, built-in dynamics and (optional) digital effects. The system includes local and stage-side DigiRacks that connect to the mixing surface via fiber optic cable. **Innova SON's Compact Sy40** is a 40-input desk with 24 mono and eight stereo channels; **Sony's DMX-P01** is a lightweight, portable digital field mixer with 24-bit AD/DA conversion, four analog mic/line inputs with 48V phantom, and analog and digital two-channel outputs. **Soundcraft** upgraded the 328 to the **328DX,** adding enhanced dynamics, configurable direct outs, two onboard Lexicon effects processors, and optical S/PDIF output. **Yamaha** announced **PM1D System Software V 1.5,** containing features specifically designed for theatrical and broadcast applications

Analog introductions included **Allen & Heath's Xone:V6,** as well as the **PA12-CP** and **PA20-CP** powered mixers. **Alesis** weighed in with the **MultiMix 6FX, MultiMix 8FX,** and **MultiMix 12FX** (each with 24-bit digital effects). **Cadac** debuted the **S-Type** mixer featuring four-band parametric EQ, balanced direct out, and 100-mm P&G faders; **Soundcraft** showed a 56-channel version of the **MH-4.**

JBL announced three compact additions to their **VerTec** series of line arrays, including the **VT4887** (dual-8-inch), **VT4888** (dual-12-inch), and **VT4881,** a compact subwoofer with response down to 18 Hz. These compact VerTec systems shrink line array technology down to a size appropriate for the smallest of venues, so club owners: *repent!*

New from **DAS: Compact 1,** a three-way, self-powered cabinet with Class D amplification and protection against over/under voltage or thermal runaway. **EAW's JFX Series** consists of the **JFX88, JFX100, JFX200, JFX260/290,** and **JFX560/590.** Each features hanging points, pole cups, and Baltic birch construction. A major surprise came from **QSC,** who dove into the loudspeaker market with their **ISIS** Series of two-way cabs with active or passive crossover operation: the **101M, 102M, 102W, 122M,** and **152M.** Each works with the ISIS **215PCM** subwoofer. QSC also introduced the **PL6.0 II PowerLight** and the **RMX 4050HD** power amplifiers.

New speakers were unveiled by **Electro-Voice (Sx600** dual-12-inch vertical array), **Radian (MicroFill** compact multipurpose loudspeaker), **L-Acoustics (112XT** and **115XT** active two-way loudspeaker enclosures), **Renkus-Heinz (STX5, ST5)** and **Yorkville (NX88).** Propagating the line array trend, **SLS Loudspeakers** unwrapped the **RLA/1** ribbon line array intended for large-venue sound reinforcement. The RLA/1 utilizes the SLS planar ribbon as well as 15- and 6.5-inch drivers to produce a coherent wave front.

Meanwhile, **Gibson Labs** introduced a sound reinforcement line **(SUB 215** subwoofer, **MA 215-3** three-way main array, **M 115-2** two-way system, **SM 115-2** two-way floor wedge system), and an amplifier product line ranging from the **GL1200** (600W/ch) to the **GL3200** (1,600W/ch).

Crest Audio fired up the **Pro 200 series** of amplifiers consisting of the **Pro 8200, Pro 7200,** and **Pro 5200,** each with a bandwidth from 10 Hz to 100 kHz and a noise figure of –110 dB; another power amp, **MC^2 Audio's** analog **T2000,** delivers 1,000W/ch.

There were several new wireless systems on display, notably **Audio-Technica's Artist Elite 5000** and **4000 Series, Electro-Voice's RE1** UHF system, which features real-time PC monitoring and control via USB, and **Sony's UMP series** of transmitters and receivers. One of the most exciting developments came from **Sennheiser,** who joined forces with **Neumann** to develop the **KK 105-S** capsule for the Sennheiser SKM 5000 N handheld transmitter. The KK 105-S is based on the capsule used in the Neumann KMS105 vocal microphone.

In network-land, **Symetrix's SymNet Designer V 2.0** upgrades the Windows-based SymNet audio routing and digital signal processing software, **Electro-Voice's Precision Series DSP Controlled Amplifiers** offer remote control and supervision of up to 250 amplifiers via one or multiple PCs, and **Yamaha's** networked amplifier technology includes the **PC Series** power amplifiers, **NHB32-C** Cobranet Network Hub Bridge, and **ACU16-C** Cobranet Amplifier Control Unit.

Regarding cool toys, **Gold Line's DSPCI** is a Palm-based analyzer with a color display that

▶ continued on page 117

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HARDWARE

Hosa. The **FXT-401 Firewire Extender** system ($995, cables sold separately) allows transcending the usual 15-foot length limitation inherent in the Firewire cable spec. It features two send/receive units that connect to the source and destination using standard Firewire cables, then connect to each other via a long duplex fiber optic cable. **www.hosatech.com**

HOSA FXT-401 FIREWIRE EXTENDER

Crown. The newly re-engineered **XLS 202, 402** and **602** power amps offer compact 2U (instead of 3U) designs, lighter weights, and lower price points than their predecessors. Power ratings per channel and prices are: XLS 202, 200 watts @ 4 Ohms, $409; XLS 402, 400 watts @ 4 Ohms, $495; XLS 602, 600 watts @ 4 Ohms, $619. **www.crownaudio.com**

CROWN XLS POWER AMPS

Kenton. The **Spin Doctor** (approx. $170) basic MIDI controller features 16 programmable knobs and 25 program memories (compatible with Control Freak profiles). Controllers are assignable from the front panel, and a software editor is available; the unit can send controllers, NRPNs, SysEx, program changes, notes, etc. **www.kentonuk.com**

Mixed Logic. The **M24** remote control surface hardware now supports Mark of the Unicorn **Digital Performer 3** software, as well as **Cakewalk Sonar 2.1.** The M24 control surface features 24 touch-sensitive motorized faders, and 53 assignable encoders. **www.mixedlogic.com**

Steinberg. The **VSL2020** digital audio card for VST System Link Networks ($399, including V-STACK software) features 32 ADAT channels (two optical ADAT I/O with S/MUX support), S/PDIF I/O, analog I/O, SuperClock (FS 256) and WordClock I/O with BNC connector, and MIDI I/O; 24-bit audio up to 96 kHz is supported. **www.steinberg.net**

Edirol. The **PCR-50** (49 key, $295) and **PCR-30** (32 key, $225) USB MIDI keyboard controllers for Mac or Windows feature 25 fully assignable controls (continuous controllers, SysEx, RPN, NRPN, etc.), MIDI Interface (in/out), USB interface, pitch bend/modulation lever, and presets for Cubase, Digital Performer, Pro Tools LE, and Sonar, with more to come from the Edirol web site. **www.edirol.com**

M-Audio. The **USB MIDISPORT 2x4** ($179.99) is a compact, multi-port MIDI interface for USB-equipped PC/Mac computer. Two separate 16-channel input ports allow systems to accept up to 32 discrete MIDI input channels, while four individual 16-channel output ports can address up to 64 discrete MIDI output channels. The unit includes MIDI activity indicators for each port. It ships with drivers for Windows 98/Me/2000/XP, as well as Mac OS 9.1 and higher (including OS X) and OMS. The package also includes a 6-foot USB cable. **www.m-audio.com**

MediaFORM. The PC-based **SCRIBE EC** ("Endless Configurations") line is available with one, two, or four 40x CD-R or 2x DVD-R drives and, depending on the configuration selected, provides up to a 600-disc capacity. Additionally, the SCRIBE EC accommodates most popular inkjet and thermal printers, including the Spectrum 2 thermal printer, and the Signature IV and Signature Pro inkjet printers. The SCRIBE EC Series is available through MediaFORM's dealer network at an suggested list price range of $2,299 to $9,999. **www.mediaform.com/SCRIBE**

MARCAN. Two new CD/DVD label printing options are available: **Prism Plus** ($3995), the next-generation Rimage thermal CD/DVD printer; and **Everest** ($5,995), Rimage's photographic quality printer. Previously these were only available as an integrated part of

EDIROL PCR-50 USB KEYBOARD

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M-AUDIO MIDISPORT 2X4

the Rimage Producer II duplication system. www.marcan.com

SOFTWARE AND DAWS

Mackie Designs. HDR Pro ($399), a hardware and software upgrade package for the Mackie HDR24/96 (HDR), provides in-depth file compatibility with any Mac-based Digidesign Pro Tools digital audio workstation (Versions 3.x through 5.x). The HDR Pro package includes a copy of HDR Pro software, as well as an outboard Mackie Media M90 drive bay that can be connected to any Mac-based Pro Tools workstation via an on-board FireWire interface. www.mackieindustrial.com

TC Works. 24/7-C (free download to PowerCore owners) for Mac or Windows brings a modeled classic dynamics processor to the PowerCore platform. At least four (maximum six mono) instances of 24/7-C can run on one of PowerCore's DSPs, bringing the total count up to a minimum of 16 on one PowerCore card, without taxing the CPU. www.tcworks.de

Cakewalk. Sonar 2.x now supports ASIO hardware, including Digidesign's 001, 002, and Mbox interfaces. www.cakewalk.com

Ableton. LIVE 2.0 ($399), an upgrade to the original sequencing instrument for Mac OS 9/X and Windows, allows tempo-setting any time during recording, performance, or playback. In addition, users can drop in recordings, loops, and complete songs, which will play in sync, direct from disk; timestretching is no longer limited to loops, but can apply to any audio material. www.ableton.com

M-Audio. LIVE Delta, an entry-level version of the LIVE program for Mac OS 9, Mac OS X, and Windows, is being bundled with M-Audio's **Delta** Audio cards. Users can upgrade LIVE Delta to the full version of LIVE 2 to take advantage of LIVE's more

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STEINBERG STRING EDITION AND VIRTUAL GUITARIST (ELECTRIC EDITION)

advanced features, such as Rewire support and MIDI sync...***Producing Music With Reason*** ($39.95), an interactive CD-ROM providing extensive tutorials covering Propellerhead's award-winning Reason software, contains three hours of tutorials and resources for beginning through advanced users. www.m-audio.com

Steinberg. **HALion String Edition Vol. 1** ($299) is a string orchestra (eight double basses, 10 cellos, 12 violas and 16 violins), playable with the included HALion String Player (a VST/Direct X instrument for PC/Mac that's a specialized version of the HALion sampler). The 5 GB sound library includes multiple playing styles, with natural room ambience and authentic note decay...The **Virtual Guitarist "Electric Edition"** VSTi features 29 different "players" from the '50s to the present day, along with a full-featured multi-effect virtual pedalboard that can serve as a separate plug-in in any VST audio path or part of the "Electric Edition" instrument...**V-STACK** ($59) is a virtual 32-bit mixer and rack for studio or stage use. It hosts up to 16 VST, VST 2.0, or DirectX plug-ins and features eight effects sends, five effects inserts per audio channel, four master effect sends, and VST System Link support...**WaveLab Essential** ($299), a "lite" version of Wavelab 4.0, retains its most essential features for mastering and editing. It supports VST and DirectX effects, ASIO/WDM/MME drivers, and MP3 encoding and decoding. www.steinberg.net

Anwida Soft. The **L1v 1.0** limiter/maximizer VST plug-in (PC) supports 24-bit/96KHz audio, parameter automation, and stereo outs. www.anwida.com

WaveArts. Effective immediately, the company is replacing their challenge/response form of copy protection with a simple serial number unlocking method for registration. www.wavearts.com

Bitshift Audio. **pHATmatik** (free), the first virtual instrument that can extract the "groove" information from a REX (1) file and export it to a Standard MIDI File (allowing users to reconstruct the original groove in their MIDI-capable VST host without a REX authoring tool), is now available for OS X in both AudioUnit and VST formats. In addition to REX load/export/playback support, pHATmatik provides sampler-like tools for creatively modifying the loop, including an ADSR envelope and two-pole multimode resonant filter. www.bitshiftaudio.com

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software synthesizer company has announced OS X compatibility for their Modularing system. **www.milprod.com**

Ohm Force. The **OhmBoyz Delay, Predatohm Distortion, Hematohm Frequency Shifter,** and **Mobilohm Phaser** plug-ins are now available in **MAS** format for Digital Performer, as well as for MacOS 8, OS X, VST2, Direct X, BeOS, and Winamp. **RTAS** versions are currently under development. **www.ohmforce.com**

Tracer Technology. **Diamond Cut Audio Restoration Version 5** features easier-to-use declick and decrackle, multi-tiered editor, live feedthrough mode (passes clean audio to the sound card output without recording to disk), declipper (distortion minimizer), sample rate converter, time stretching, MP3 conversion, de-esser, dithering, and more. Upgrades are available. **www.tracertek.com**

IK Multimedia. **T-RackS** "analog" mastering software is now available as an HTDM plug-in for Pro Tools Mix and HD systems for MacOS ($399; upgrade free to registered users). It also supports all Digidesign control surfaces, including the 002 system, Control24, and Pro Control...New SampleTank LE sound modules ($99 each) include **Axé** (Brazilian construction set of rhythms and sound) and **Trance Grid** (trance construction set with separate rhythmic elements which can be played as single instruments). Both include ReCycle files with accompanying MIDI SMFs, and include the SampleTank LE plug-in. Available formats are VST, MAS, and Digidesign RTAS, for both Mac and Windows. All versions are included in the same box...**RT Player LE,** a stand-alone ASIO host application developed by IK Multimedia and DSound, hosts and controls the AmpliTube guitar amp and effects simulator in real time, for live use, via standard MIDI foot controllers. **www.ikmultemedia.com**

X Vision Audio. X Vision is now the exclusive North American distributor for the MAGIX **Samplitude** hard disk recording program and **Sequoia** mastering software. **www.xvisionaudio.com**

Elemental Audio Systems. AudioUnit-compatible versions of three plug-ins, **Firium** linear phase equalizer ($99), **Eqium** unlimited-bands, fully sweepable, surgical EQ ($99), and **Inspector** spectrum analyzer (limited time free download) are now included with each product along with VST for Mac OS 9 and OS X. The AudioUnit version is free to registered users. **www.elementalaudio.com**

Digidesign. The **Line 6 Amp Farm** is now available for **Windows XP**-based Pro ToolsIHD Systems in addition to MacOS 9. All customers who are registered for both Amp Farm and Pro ToolsIHD will be mailed the Amp Farm v2.01 update kit...An **ASIO driver for Windows XP** enables software that supports the ASIO standard to be used with Digi's HD, MIX, PT24, Digi 002, Digi 001, Mbox and AudioMedia III hardware on systems running Windows XP. **www.digidesign.com**

SOUNDS AND SAMPLES

PrimeSounds. **Methods Of Mayhem 2 — Damage Control** is a double sample CD with audio, WAV, and RX2 files. It includes 100s of drum and noise loops, 300 drum sounds, more than 270 savage guitar and bass guitar riffs, eerie soundscapes, and ugly sounds effects. **www.primesounds.com**

Native Instruments. **Absynth Sounds Volume 1** ($49) contains 256 sounds, including evolving soundscapes, evocative pads, authentic marimbas and vibes, robotic sequences, loops, basses, and synths. All patches were sculpted to take full advantage of Absynth's multiple synthesis techniques as well as its modulation and performance capabilities. **www.ni-soundline.com**

Discrete Drums. Based on the Discrete Drums Series 1 multi-sampled drum library, **Turbulent Filth Monsters** ($79.95) applies extreme, innovative processing and remixing techniques to transform the original acoustic drum parts into cutting-edge, twisted electronic styles. TFM contains almost 700 MB of expertly acidized, stereo WAV files. **www.discretedrums.com**

Sonic Stop. **Superscapes** ($53.91) is a 24-bit double-CD of loop textures. It features over 700 MB of sustained textures, leads, and rhythms, and features extensive work in subtractive, FM, granular, and modular synthesis techniques. Sample formats provided include Reason Refill, Acidized WAV, and RX2. **www.sonicemulations.com**

Sonic Network. The Sonic Implants sound library, **Silk Road,** containing a wide variety of Middle Eastern instruments, is now available as Sound Fonts in both downloadable (packages vary from $29.95 to $59.95) and CD-ROM ($249.95) versions. Seven pages of printed documentation explain the history and use of these instruments; the CD also includes percussion loops and melodic improvisations. **www.sonicimplants.com**

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Studio Cat. Purrrfect Brushes ($99) is a sample CD that complements the Purrrfect Drums set with brush drum hits. Also, **Purrrfect Cymbals** ($129), a stand-alone version of the cymbals from Purrrfect Drums, is now available. **www.studiocat.com**

OTHER NEWS

Microsoft/Panasonic. A joint development designed to improve digital media interoperability between PCs and CE devices, **HighM.A.T.** (High-performance Media Access Technology) can solve a key problem consumers face today with custom-made CDs of digital media collections (photos, audio and/or video): there is no consistent way for CD and DVD players to read this data. Each interface for finding media is different, and the viewable information, such as playlists, music metadata, and folders with photos or videos, varies depending on what each device supports. Panasonic will adopt this new technology for use in their future products and also announce that Fujifilm is supporting HighM.A.T. in future versions of its products. **www.microsoft.com**, **www.panasonic.com**

Mr. Bonzai. Every week, *EQ* Editor At Large and all-around good guy Mr. Bonzai posts **new photographs** related to the music industry on his web site. Worth the surf. **www.MrBonzai.com**

Airshow Mastering. The first comprehensive guide to producing Super Audio CDs (SACDs), *"The Artist's and Producer's Guide to SACD,"* is available for free at **www.airshowmastering.com/sacd.html**. The guide is intended to help artists and producers make optimal use of the new high-resolution format. Airshow has worked on 80 SACDs to date, including a surround reissue of Mike Oldfield's epochal 1973 New Age hit, *Tubular Bells* (EMI). **www.airshowmastering.com**.

TL Audio. The main switchboard and fax numbers have changed to the following: telephone +44-1462-492090), fax +44-1462-492097. The postal address remains the same. **www.tlaudio.co.uk**

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Cakewalk Project5

By Craig Anderton

Anyone who's used virtual studio programs (*e.g.*, Reason) knows how much they simplify the music-making process: load up your instruments, start your sequencer and/or pattern generator, and go. Cakewalk's Project5 is conceptually similar, but is also an "open" system that's compatible with a wide range of plug-ins, drivers, and file formats.

The PSYN Virtual Analog polysynth has four oscillators (with sub-oscillators, hard sync, and cross-modulation), one multi-mode and one low-pass filter, various modulators (five envelopes, three tempo-synched LFOs, external modulation, etc.), true mono mode, and portamento. Like the other instruments, you can run multiple instances.

A kit in the P5 Drum Sampler has 18 "cells" (each of which can have multiple layers). Samples can be looped and lowpass filtered, with separate envelopes for pitch and amplitude. There's also "bit decimation" and tuning, but perhaps more importantly, you can import WAV, AIF, and Steinberg LM4 samples. Project5 also provides a modular-style analog Drum Synthesizer.

The Project5 Sampler is unusually sophisticated, with layering and sample editing, dual filters with dedicated envelope generators, pitch and amplitude generators, three LFOs, and lots of import options (Akai S5000/6000, Sound Fonts 2, Kurzweil, WAV, and AIF). Also included: Cyclone DXi, which is most closely related to phrase samplers, but has extensive editing capabilities where individual "slices" of acidized files can be cut, moved into other files, replaced, mixed, copied, etc. Its loops can also be triggered via keyboard, reinforcing Project5's live performance aspect.

The roster of processors includes Cakewalk's StudioVerb, compressor/gate, envelope/LFO filter, high-frequency exciter, stereo delay, chorus/flanger, graphic EQ, and parametric EQ.

Project5 accepts DirectX and VST audio effects, as well as DXi and VSTi soft synths (note to SONAR users: installing Project5 makes all its instruments available to SONAR). DX8 automation is also supported. Project5 works with sound cards that do ASIO or WDM, accepts MFX-format MIDI FX, and can import acidized loops for Acid/SONAR-style time- and pitch-stretching. These co-exist with MIDI tracks; as the software doesn't support digital recording, this is a simple way to get digital audio into a project.

Perhaps best of all, Project5 can serve as a ReWire client. Two obvious applications are rewiring Project5 into ReWire-compatible DAWs to provide a suite of instruments and pattern generation-based sequencing, or rewiring into Ableton's Live. The latter seems particularly complementary, especially for synth duos, because Project5 is seamless enough for live work but doesn't record digital audio, while Live can loop and record digital audio but has no included soft synths or pattern generators. Project5 also supports external MIDI controllers, as well as triggering of some events via keyboard. Additionally, Project5 can layer multiple synths by velocity and key range.

The other means of controlling the instruments is via MIDI or Project5's built-in step generator, piano roll sequencer, and arpeggiator (these all function in real or step-time). And for external hardware, Project5 generates MIDI sync. Furthermore, the host page that handles all these different instruments and effects provides intuitive mixing, signal routing, and handling of automation and pattern generation.

With SONAR, Cakewalk made the DAW world sit up and take notice. With Project5, it looks like they're set to do the same thing for virtual studios. ■

CAKEWALK PROJECT5

WHAT IS IT? A sophisticated virtual studio, complete with instruments, sequencing, and acidized loop playback.

WHO NEEDS IT? Any Windows 2000/XP user who likes the speed and convenience of working in a self-sufficient, host-based environment.

WHY IS IT A BIG DEAL? Project5 applies some serious signal generating and processing horsepower, along with ReWire compatibility to the virtual studio concept — but also stakes out new ground as a highly open system.

SHIPPING: March, 2003

PRICE: $429

CONTACT: For more information contact Cakewalk at 617-423-9004 or visit www.cakewalk.com.

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Princeton Digital Reverb 2016

By Steve La Cerra

Set the Wayback Machine for 1983. Digital technology was just making its way into recording studios, Yes' *90125* was at the top of the charts, and "home studio" generally meant a 4-track cassette recorder. That year also marked the introduction of the Eventide® SP2016 digital reverb, a device that would develop quite a reputation for the distinctive, natural reverb sound of its Stereo Room, Room Reverb, and High Density Plate algorithms. Even now, many producers and engineers turn to the SP2016 for its unique reverb sound, though functioning units are becoming harder and harder to find.

At the head of the team that developed the SP2016 (as well as Eventide's first Harmonizer®, the H910) was engineer Tony Agnello. Over the years, Agnello heard requests from SP2016 owners that the reverb algorithms from the SP2016 be ported to modern hardware and software platforms. In 2001 Agnello founded Princeton Digital with the intent of using advanced DSP resources and modern hardware to provide classic (as well as new) digital effects. Princeton Digital's first product is the Reverb 2016, a rackmount processor designed to faithfully recreate the original reverb algorithms of the SP2016.

Although the Reverb 2016 may not look like its namesake, every aspect of the original unit has been duplicated, including user parameters. Princeton Digital emphasizes the fact that the Reverb 2016 generates reverb, not multi-effects. Their philosophy is that reverb is almost always in use during audio production and warrants a dedicated box with an easy interface. Rotary controls on the Reverb 2016's front-panel include wet/dry mix, predelay, reverb time, position, and diffusion. Two additional knobs provide control over low- and high-frequency EQ. Turning these knobs adjusts the amount of boost or cut, while simultaneously pushing and turning the knobs selects the roll-off frequency. One of the cool aspects of the parameter controls is that — although they allow dramatic variations — they can't be set in such a way as to create an unnatural-sounding effect. A "kill" switch mutes the audio input, allowing easy audition of reverb characteristics.

While Agnello used algorithms identical to the originals, hardware implementation is state-of-the-art. Analog audio A/D and D/A conversion is 24-bit with a sample rate of 40 kHz. The Reverb 2016's coax S/PDIF input allows direct input of a digital stream, in which case the unit down-samples the signal from 44.1 or 48 kHz to 40 kHz. A coax S/PDIF output is also furnished, and outputs digital audio at 44.1 kHz when using analog input. When using the digital input, sample rate at the S/PDIF output follows the clock rate of the digital input. Rear-panel analog I/O connectors include balanced 1/4-inch TRS and XLR, with a switch for changing input level sensitivity between +4 balanced or –10 unbalanced operation.

Along with the original Stereo Room, Room Reverb, and High Density Plate algorithms from the SP2016, the Reverb 2016 features a new reverb program that capitalizes on modern DSP horsepower and picks up where the SP2016 left off. Referred to simply as the "New" reverb algorithm, this program utilizes the same basic structure as the original programs while increasing the number of complex early reflections, enhancing reverb density, and allowing finer parameter control.

Additional features of the Reverb 2016 include storage and recall of 99 preset programs, a front-panel bypass switch, MIDI I/O, and a direct input for high-impedance instruments. In the future, Princeton Digital plans to offer 2016 algorithms as plug-ins for various platforms. ■

PRINCETON DIGITAL REVERB 2016

WHAT IS IT? A modern redesign of the Eventide SP2016 Digital Reverb

WHO NEEDS IT? Live sound engineers, recording, broadcast, and production studios

WHY IS IT A BIG DEAL? The Reverb 2016 was designed by Tony Agnello, the person who wrote the original reverb algorithms for the Eventide SP2016. It features three algorithms faithful to the original unit.

SHIPPING: March, 2003

PRICE: TBA

CONTACT: The Reverb 2016 is manufactured and distributed by Eventide, Inc. For more information, call 201-641-1200 or visit www.princetondigital.com.

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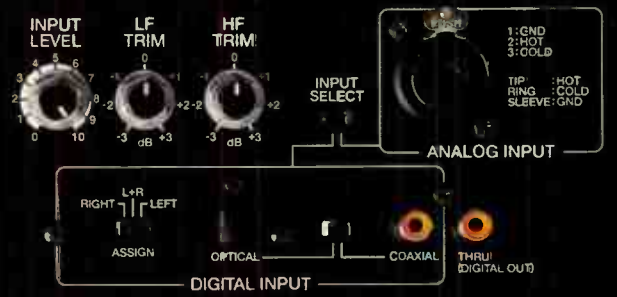

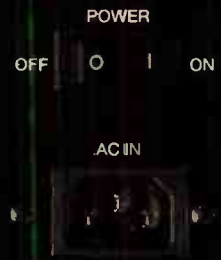

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World Radio History

By Steve La Cerra

Basement Beats

The beat goes on

STUDIO NAME: Basement Beats
LOCATION: Saint Peters, MO
KEY CREW: Jason "Jay E" Epperson
CREDITS: Jason "Jay E" Epperson has worked as a producer with artists including Nelly, St. Lunatics, Ali, Ms. Toi, Rasheeda, O-Town, and VI3, as well as on the soundtracks for *Bait* and *Training Day*.
CONSOLE: Manley 16x2, Digidesign Control 24
MONITORS: Tannoy AMS10, Yamaha NS-10M, Auratone Ultra Sound Cube
AMPLIFIERS: Hafler P1500 [2]
RECORDERS: Sony PCM-R500, TASCAM RW-200
OUTBOARD: Focusrite ISA430, Avalon 737SP, Neve 1073 [2], Summit TPA–200B, Fairchild 670, dbx 160 [2], API 525 [2], Empirical Labs Distressor [2], Teletronix LA2A [2], Manley Stereo Pultec EQ
EFFECTS: Lexicon MPX100, Alesis QuadraVerb, Digitech TSR24, TC Electronic Fireworx, Line 6 Mod Pro, Echo Pro, Filter Pro, POD Pro; Sherman Filter Bank, Moogerfooger Ring Modulator, Low Bass Filter; OhhWah, Roger Mayer VooDoo Vibe, Flip Funky Box, Flip Vintage Tremolo
MICROPHONES: Sony C-800G, Neumann U 67, AKG C414, D112; Shure SM57 [2], Rode NT3 [2]
MIC PREAMPS: Focusrite ISA430, Manley Voxbox, API 512 [8], Groove Tubes ViPRE
SAMPLERS/KEYBOARDS/MIDI: Kurzweil K2600, Alesis QS8, Andromeda; Moog Memorymoog, Micromoog, Voyager (signed by Bob Moog!), Source; Korg Trinity, MS20, Mono/Poly, MS2000, Micro Korg, Trident; EMU SP1200, Planet Phat, Mo' Phat, Proteus 2000; Roland XP-10, JV-1080, XV-3080, VP-9000, Dance, TR808, XV-1010, Juno 60; Ensoniq ASR 10, ARP Odyssey, Studio Electronics SE1, Yamaha VL70, TG500; Waldorf MicroQ, Access Virus, Virus Indigo; Sequential Circuits Prophet 600, Oberheim Xpander, OB12; AKAI: MPC4000, MPC3000, MPC60II; Linn Drum, Novation A Station, OSCar, Rheem Kee Bass, Clavia Nord Lead 3, 73 Fender Piano, Hohner D6 Clavinet
COMPUTER: Mac G4/733 MHz, with 512 MB RAM, 40 GB internal drive, DVD-RW, Marathon rack and 4-bay Glyph Trip with 18 GB drives, Digidesign Expansion Chassis, Apple Cinema Display and Sony Flat Screen monitors
DAW: Digidesign Pro Tools v5.1.1, 888, USD; Apogee AD-8000SE
STUDIO NOTES: "This is the type of studio I've always dreamed of having," reveals Jay E about Basement Beats (designed by Russ Giraud at Ozark Pro Audio). "All of my gear is hooked up to patch bays for fast and easy access. Every piece of pre-production gear is MIDI'd up to my choice of an MPC4000, MPC3000, or a MPC60II. I'm currently using the MPC 4000 a lot more then my other sequencers because it's new and it has more creative control (such as editing and effects) then my other MPC's. I still use and love my other MPC's but I'm stuck on the 4000 for the moment! The reason I don't use computer sequencers is that I grew up on the MPC's and I'm a strong believer in 'If it ain't broke, don't fix it!' I'm sure there are a lot of sequencers out there that are just as good or better then the MPC's but I'm an MPC man!"
EQUIPMENT NOTES: "I like using the Sony C800G microphone with the ViPRE, which has variable settings for input impedance. I use as little gain as possible on the ViPRE because I like my vocals to be recorded the way the artist delivers it. Then I adjust the impedance depending on the artist and style of music we're working

▶ continued on page 118

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Jay E may be reached via email at: jasepprs@aol.com

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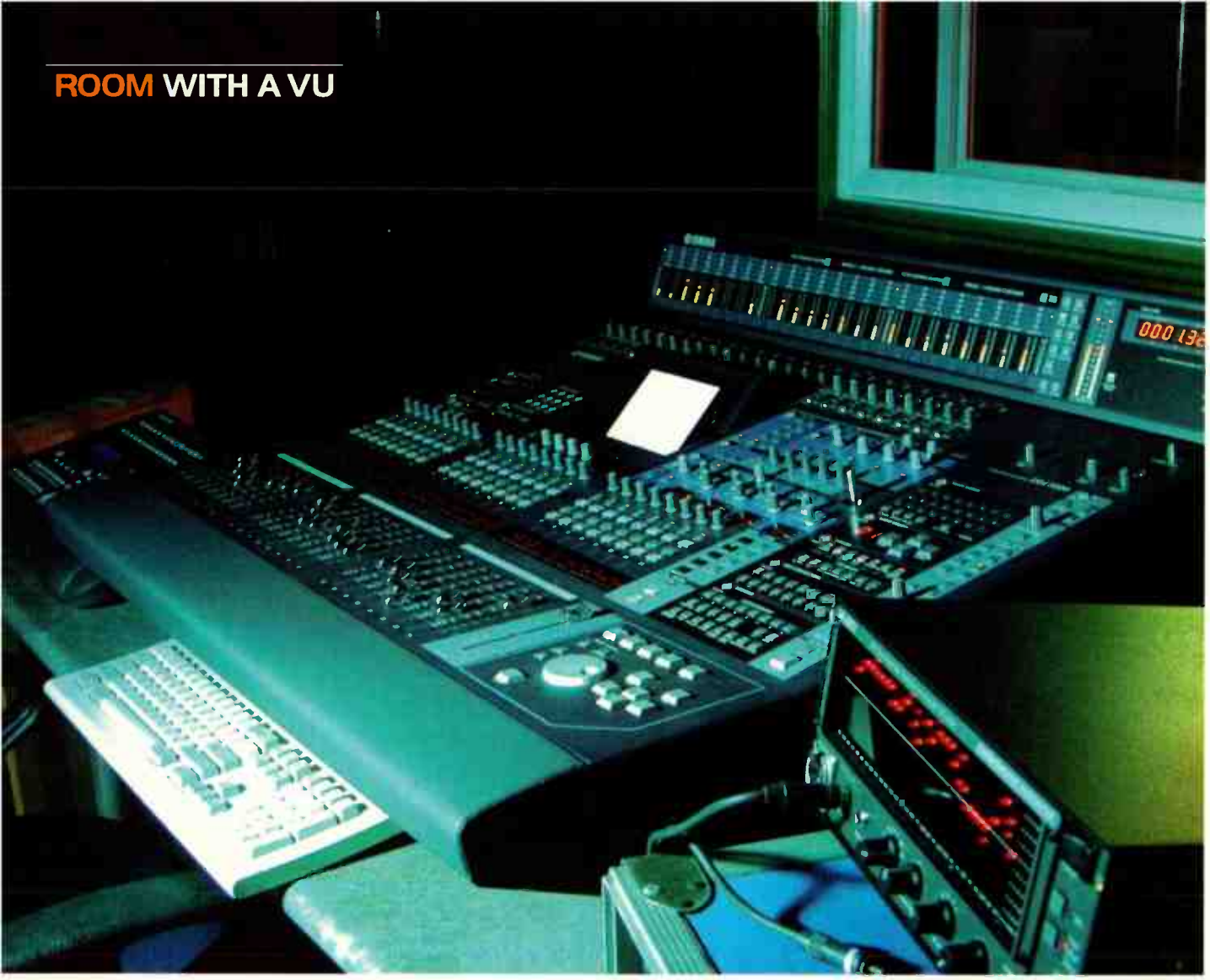

Digital in Blue Studio

By Steve La Cerra

Shape-shifting in the digital studio

STUDIO NAME: Digital In Blue
LOCATION: Troy, Ohio
KEY CREW: John Farrier, William Shoemaker, Lisa Douglas
CONSOLE: Yamaha DM2000, Allen & Heath GS3000, Mackie 1202VLZ
MONITORS: Paradigm Studio 100, Monitor 9, Titan, Servo 15 sub; Samson Resolv 65a
AMPLIFIERS: Crown 5002VLZ [3], Crown K2 [8], PowerBase 2
RECORDERS: Mackie HDR 24/96, MDR 24/96 [3]; TASCAM MS16 1-inch 16-track, DA45 HR [2], MD801R Mk II, ATR60 half-inch 2-track, 122 Mk. II cassette; Teac A3340 4-track, Marantz CDR620, Yamaha CDR1000
OUTBOARD: PreSonus ACP-88 [2], TC Electronic Finalizer, BBE Sonic Maximizer, dbx 2231 [3], Orban 672A EQ [2], Valley Dyna-Mite, Line 6 POD Pro, Bass POD Pro
EFFECTS: Lexicon LXP15, LXP15 II, PCM42; Yamaha REV5, REV500
MICROPHONES: AKG C3000, C414BULS, D202DE; Audio-Technica AT-4040, Electro-Voice RE20, Groove Tubes MD1a, Marshall MXL2001, Neumann TLM 103, Sennheiser EW365, EW535, MD421, MD441; Shure SM57, SM58, C-DUCER acoustic piano pickup
MIC PREAMPS: Drawmer 1962, MX60 [2], TC Electronic Gold Channel
SAMPLERS/KEYBOARDS/MIDI: ARP 2600, Ensoniq ESQ-1, Hammond B3, Korg DS88, M1, TR-Rack; Kurzweil K2500XS, Tama Techstar TS306 electronic drums, Yamaha DX-7, TX802
COMPUTERS: Dual Athlon MP 1800 w/2 GB RAM, 80 GB removable drives [4], (runs Windows and Linux), Leadtek GForce4 TI4600 graphics card, Viewsonic 21-inch monitor; Athlon XP 1700 w/1 GB RAM, 100 GB drive, 21-inch monitor (runs Linux); Intel Pentium II 450 MHz w/380 MB RAM, 10 GB drive, 21-inch monitor (runs Windows)

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Visit Digital In Blue Studios online at www.digitalinblue.com.

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POWER CONDITIONING/BACKUP: Furman AR-PRO, PL-Plus

ACOUSTIC TREATMENT: Sonex Classic

STUDIO NOTES: "Digital in Blue was constructed to be completely re-configurable," explains John Farrier. "It is quite easy to change the board, or run cable to any location throughout the facility to define the requirements of the studio for each project. Given that many of our recording sessions take place off-site, it helps to have everything fairly modular and easily accessible.

"Because we produce a wide variety of music, we need to be able to tune the liveness of the room according to a particular session's needs. We control reflections using Sonex Classic on the walls and use separate areas in the room treated differently to record drums, guitar amps, or vocals. When recording solo artists, we tend to place them in the center of the room for some natural reverb, throw heavy blankets over the kit to kill any ring in the cymbals, and let them play. This works well for capturing a good performance with a 'personal and present' sound."

EQUIPMENT NOTES: "The brains of the studio is a Yamaha DM2000. Not only is it indispensable for recording, mixing, and mastering, but we've found it to be a superior sound-reinforcement board as well. The automation and intuitive interface provides features we tend to miss when using our Allen & Heath GS3000. The GS3000, however, provides a sonic complement and is our main analog board.

"The Mackie HDR and MDR 24/96's are so transparent, we almost forget they are there. They do their job and don't get in the way of the process. It seems like we find ourselves collecting preamps and mics at every opportunity. Being able to choose from a variety of recording gear is great for finding the 'sweet spot' on an instrument or tuning the tonal qualities of the sound before it gets to tape (or disk, in this case)."

PRODUCTION NOTES: "Recently, we recorded a jazz quartet made up of professors from local universities. The room was great for getting separation in the tracks while letting the musicians interact. We played with mic selection on the bass, trumpet, and guitar to keep it experimental and live. Each piece had a great original quality that showed off the talent and vibe present in the live performance.

"The studio also provides a creative environment for our own creations. Currently, we are working on a Prix Ars Electronica piece that should be included in the 2003 directory. It would be quite difficult to work on such a demanding project without the a good place to lock yourself in and get down to business at 3 AM!" ■

Digital in Blue's Yamaha DM2000 (top) is combined with an Allen & Heath GS3000 for the best of analog and digital sonic characteristics. A variety of mics are available for capturing instruments (middle). The centerpiece of the studio is a Yamaha DM2000 (bottom) which provides flexibility for tracking, mixing, and mastering.

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TRACK NOTES

"The first time I heard The Vines was this 4-track demo Justin played me. It was very scratchy and distorted sounding and it just sounded great to me. It sounded like The Kinks straight out of 1964," concludes Rambo. "I thought of The Kinks right when I heard the demo and so just kept that in mind when we went into the studio.

"We overdubbed guitars, bass, and keyboards during the day and then the last two nights — first night was lead vocals and then the next night was any touch-ups, a vocal double, and then finished up the comp. A lot of the background vocals were just different takes. Each take Craig would scream differently and so Justin would just grab a few of those and turned them into background vocals and that's the different screams and yells. He stretched out "In The Jungle" for 30 seconds. That's just all different takes and Justin put it together. It seems like every one was different. Craig would go out in the studio and just relied on us to capture it.

"The Vines had recorded their album at the Sunset Sound Factory and it was the first time I worked there. It was a really great place to do rock vocals, a great vibe. Ethan Johns was working there at the same time and that was cool. These guys are true rock 'n' rollers, and anything technical, they just left to us. They're all about the music. We had a good time. They were really cool and respectful of the whole process.

"As far as saying anything else technical about recording a rock vocal other than just after doing listening tests, I've found out that you shouldn't print too hot to Pro Tools, it just seems to sound better out of the converters a little softer. When you max out the converter that it's squashing the bits coming out so when you back down it has a little breathing room. I don't talk technical that often...it's just listen to what's best for the track and let's record it." ■

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Does your DAW know the correct time?

Clocking the DAW

By Tal Herzberg

When watching a movie, the experience of motion is artificial – projecting a series of 25 still photos (snapshots) per seconds creates the effect of continuous motion. Our eyes' persistence of vision, somewhat like a compressor's release time, tricks our brain into experiencing a non-stop linear visual sensation. The same concept applies to digital audio: each audio sample is essentially an "audible snapshot" that stores a waveform's instantaneous value at a particular moment. This snapshot is so short it can't be heard as a discrete sound, but becomes audible only as part of a series of continuous samples. Playing these back consecutively tricks our brain into experiencing a non-stop, linear sensation of audio.

BIT DEPTH VERSUS SAMPLE RATE

It is crucial to understand the difference between sampling frequency (also called sample rate or clock speed) and bit depth. *Sample rate* is the number of samples recorded or played back every second (at 44.1 kHz sample rate, we're recording or playing back 44,100 samples per second). *Bit depth* determines a sample's resolution by defining how accurately its level can be measured, but whether the sample is 44.1 kHz with 16-bit resolution or 44.1 kHz with 24-bit resolution, there are still the same number of samples per second. The most common clock speeds in pro audio range from 32,000 to 192,000 samples per second (CDs are recorded at 44,100 samples per second).

REGULATING THE FLOW

The key to systematically analyzing and manipulating data streams of any kind (audio, video, etc.), is to create a predictable environment where predefined units (samples, pixels) can be individually acquired, stored, addressed, routed, and manipulated. These environments are created by designing electronic circuits where data can flow among various elements (microprocessor, memory, input/output devices, etc.). An extremely accurate electronic clock, based on the oscillation created by applying a voltage to a crystalline structure, determines the rate of this flow.

The clock is essentially the equivalent of an orchestra's conductor – a sort of a metronome. It's the device that dictates the pace at which audio samples move throughout the DAW.

JITTER

Imagine if the snapshots making the movie were randomly spaced: The visual experience would be non-linear, because at times too many snapshots will be squeezed into too short of a time, while large gaps at other times would create dark moments without visual information. The same applies in digital audio: all audio samples should play at a predictable, regular rate to create a linear audible experience, without "holes." Failure to do so will result in poor sound, caused by a phenomenon called *jitter*.

CLOCK SOURCE

The sound difference between well- and poorly-clocked DAWs can be quite dramatic, so it's important to use the most stable clock source available. The most common source is the one onboard every DAW's audio interface. Alternatives to those are external clocking devices, which are dedicated stand-alone hardware boxes offered by various companies, many of which are more precise than the clocks in typical audio interfaces. These boxes may also provide synchronization facilities, allowing the DAW to generate or lock to time code. Another option is to use the clock in a quality external AD/DA converter.

CLOCK TYPES, PROTOCOLS, CONNECTORS

The two most common types of clocks are *word* and *video*. Although they use different protocols, both attempt to achieve the same goal: tightly regulate data flow in the DAW. Other common clock protocols are AES, S/PDIF, and x256 (Super Clock).

When using an external clock source with the DAW, every audio interface needs to reference this clock as its master timing source (clock signals may be distributed individually, or daisy-chained). The most common connection is a coaxial cable with BNC connectors on both ends. The AES protocol commonly uses 110-ohm cable with XLR connectors on both ends, while S/PDIF clock usually uses the same cable with RCA connectors.

THE CLOCK IS ESSENTIALLY THE EQUIVALENT OF AN ORCHESTRA'S CONDUCTOR – A SORT OF A METRONOME.

Note that AES and S/PDIF connections can also transmit two channels of digital audio while carrying the clock, making it a very convenient

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solution for basic digital connectivity. If this is the method you choose for DAW interfacing and clocking (such as when using an external A/D converter), connect the external A/D box's digital output into the digital input of the DAW's audio interface. The DAW software should be set to accept an external digital audio signal, and the clock reference should also be set to external digital. Thus, the single cable connected between the A/D box and the audio interface carries both audio and clock into the DAW.

VARYING THE CLOCK SPEED

At times, we will need to change the DAW's clock speed for certain purposes. The most common application is VSO (variable speed oscillator) recording and playback. The amount of change is measured in percent (e.g., ±2%) or pitch/cents (0.35 semitones). One use for this is when a song's key is too high for a singer's range; reducing the DAW's clock speed (e.g., from 44,100 to 43,950 samples per second) slows down the playback speed and lowers the pitch, making it easier for the singer to reach the highest notes.

A cool trick is to speed up the clock when tracking drums (a lot if possible), so that the drummer plays to a faster tempo. After the recording is done, playing back at normal speed will make the drum sounds lower, thicker, and longer (this is especially effective on cymbals). However, any timing errors will also be exaggerated, so use this technique with care. Another cool trick is changing the speed up or down by only a few cents when doubling guitars, creating a gentle and natural chorusing effect (detune) without using effects processors.

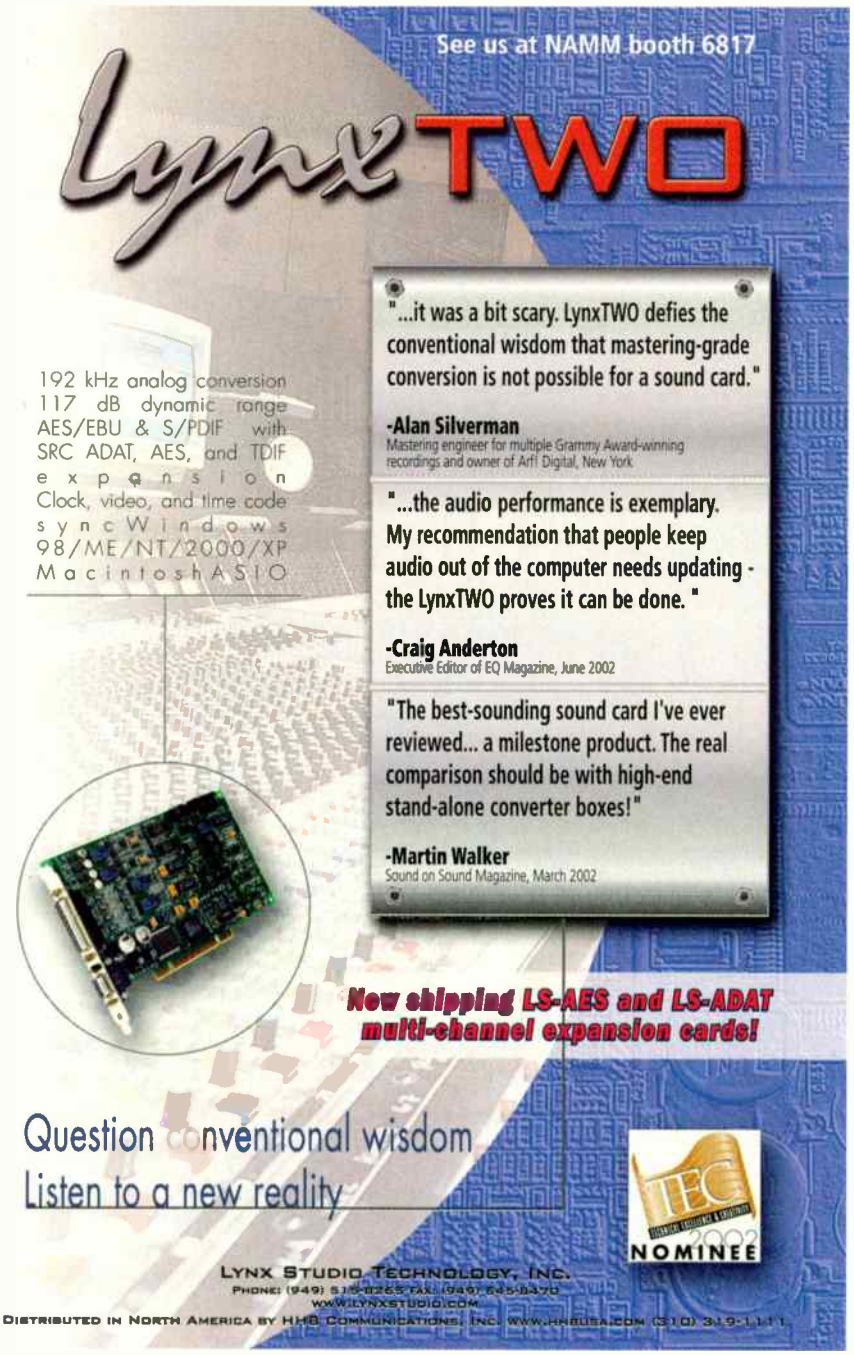
Another VSO application is to lock the DAW to certain video formats that use pull-up or pull-down frame rates, which causes a slight change in playback speed.

A final use is when locking the DAW to a time code source that emanates from a non-resolved source (such as an analog tape machine running without sync). In this case we set the DAW's clock reference to LTC (Longitudinal Time Code), which will then analyze the incoming time code (SMPTE track), and will constantly keep reclocking the DAW to match the slight changes in speed inherent in more unstable mechanism of an analog tape machine.

HOUSE SYNC

Finally, it is important to point out the advantages of what is called "house sync." In the modern day studio, where multiple digital devices need to interface smoothly with each other (DAWs, digital consoles, digital tape machines, samplers and sound modules, and even digital microphones and speakers), it is recommended to use a master clock source that independently feeds every digital device in the studio. Doing so will unify the data flow among all those devices, and will help make any type of connection and interfacing between them noise- and glitch-free, thus improving your music's overall sound quality.

Tal Herzberg is a Los Angeles-based programmer and engineer. His credits include the Counting Crows, Vanessa Carlton, Christina Aguilera, and the Grammy-awarded "Lady Marmalade" remake.



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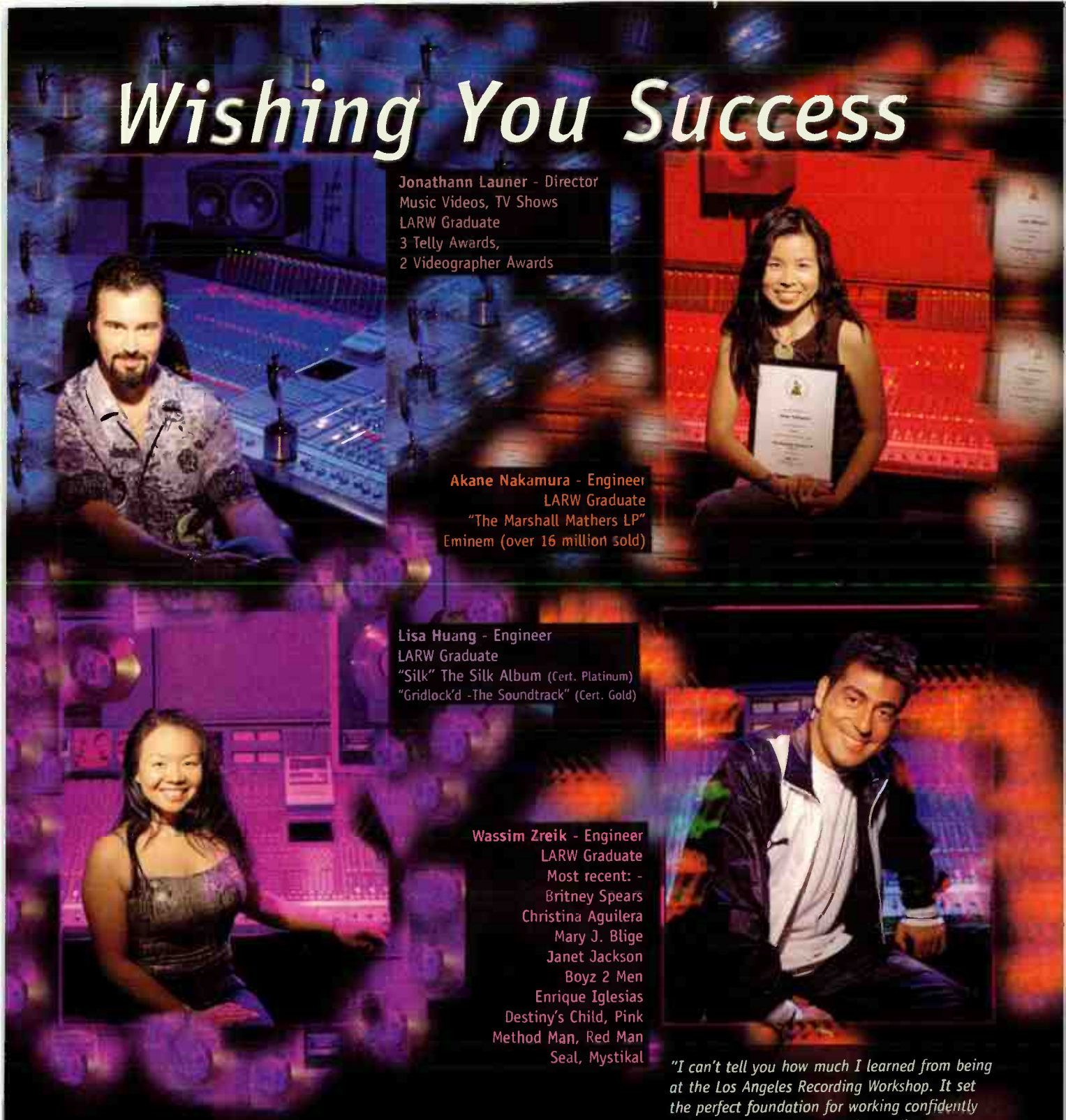

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More than just a guitar processor

AdrenaLinn Hot Tips

By Jerry McPherson, Roger Linn, and Craig Anderton

The AdrenaLinn, from Roger Linn Design, remains the first commercially available effects box to mate the world of guitar amp modeling and conventional effects with synchronized filter, envelope, LFO, and amplitude processing. Furthermore, there's a built-in drum machine, making the AdrenaLinn a great tool for coming up with grooves — it's always more inspiring to practice with a beat. Finally, AdrenaLinn is the ticket to integrating guitar with dance music, because it can create effects that fit in perfectly with rhythmically oriented music.

Want some tips? Here we go.

• Because of all the novel synched effects, it's easy to overlook using the amp modeling section — which offers some great sounds. I typically use the AdrenaLinn along with my regular setup; the amp rig gets panned (in mono) to one side, while the AdrenaLinn (taken direct, in mono) pans to the other side. For power sounds, I'll use my '66 plexi Marshall 50 watt amp, and set the AdrenaLinn to a distorted preset running direct to the console. Incidentally, I've noticed that the AdrenaLinn flips the guitar signal's phase; that, combined with the slight latency due to going through the AdrenaLinn's A/D/A conversion, makes for a *really* wide spread when patched in this manner. It trips engineers out because when they hear it, they put it in mono to check phasing — but because of the small delay between the two signals, cancellation isn't an issue. (JM)

• Swing Timing, which can turn any sixteenth-note drumbeat to swing timing or vice-versa, can improve the rhythmic "feel" of drumbeats and filter sequences. To do this, edit the Timebase parameter in the Edit/Drumbeat section: *16n* is a straight sixteenth-note feel, *16h* is halfway between straight and swing sixteenths, and *16S* is full swing timing. I find 16h particularly interesting because it tends to sound more "human" or "relaxed" than either straight or full swing sixteenths. (RL)

• Although AdrenaLinn is considered primarily a guitar effect, it's also wonderful with bass if you split the bass into two paths — a direct path that carries the unmodified sound, and a second split to the AdrenaLinn. This "superimposes" the filtering and other effects on top of the bass's solid bottom. Even better, with stereo, pan the straight feed to center, and use the AdrenaLinn's stereo outs panned full left and right. This creates stereo imaging for the bass without diluting the centered, full bass sound. (CA)

• The AdrenaLinn has several "arpeggiator" sequences, such as (depending on your software version) preset F14 or F34, which creates a sequence of notes based on an E harmonic minor scale. To transpose these arpeggiator presets in real time, connect a MIDI keyboard to the AdrenaLinn MIDI In, then change the Mod Source on the arpeggiator preset from *SEQ* to *S-n* (Sequencer + MIDI Note). This adds the incoming MIDI note number to the sequencer value, effectively transposing the sequence. (RL)

• Sometimes I let the AdrenaLinn "free sync" without using MIDI as a master tempo clock. I set AdrenaLinn to the correct tempo, and use the Bypass button (set to "restart" mode) to start the AdrenaLinn on whatever beat I want — sometimes a filter pattern that starts on a different beat in the measure gives a totally different feel. Remember, though, the LFO doesn't restart until you release the switch, rather than when you first press it. Because this switch does double-duty, don't hold the button down longer than a measure or the tempo will reset. (JM)

• Although you can internally send the drums to either the delay or the input by using the To Delay/Filter parameter, here's a more twisted option: patch the right output into the input, and set the Balance/Separate parameter to SEP. You can then experiment with a blend of straight and drum sounds, but unlike the "official" drum processing option, this allows you to get feedback with some patches when blending

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because the audio output feeds back into the audio input. (CA)

• I keep a post-it note on my AdrenaLinn and log the presets used on record dates so I don't use the same sound over and over on everyone's records. (JM)

• The AdrenaLinn has two updatable chips (Microcontroller and DSP). To check the Microcontroller rev (1.5 is current as of this writing), hold down the Up button and plug in the AdrenaLinn's AC adapter. To check the DSP rev (1.6 is current), hold the Down button and plug in the AC adapter. If the Microcontroller is 1.3 or higher but the DSP isn't, you can update the DSP chip via MIDI; instructions are on the web site (**www.roger-linndesign.com**). If both need updating or you'd prefer to simply replace chips rather than update via MIDI and a PC, a $20 update kit is available. Note that the latest DSP version includes new amp models. (RL)

• Under MIDI settings, usually the EG trigger parameter is set to AUD (audio), so that envelopes are re-triggered when you play new notes or chords on your guitar. But changing this to MnP allows triggering from an external MIDI note generator, while blocking program change messages. This allows for rhythmic re-triggering, even if what you're playing is sustaining. (CA)

• Emagic is no longer selling SoundDiver for PC, but don't worry. A free PC application for editing AdrenaLinn over MIDI will be available shortly from the web site. (RL)

• It takes a little level-juggling, but AdrenaLinn makes a useful send effect, particularly with multi-tracked drums — running some drum sounds through AdrenaLinn adds a rhythmic emphasis you won't get in any other way. I usually leave the kick, toms, and snare alone, and apply AdrenaLinn to a submix of percussion tracks and cymbals. (CA)

• The User preset side is useful for re-mapping the Factory presets into groups. I store similar presets (filter patterns, tremolos, amp models, auto-wahs, etc.) next to each other so I can quickly audition presets for the producer, rather than hunting around for them. (JM)

Jerry McPherson is a top Nashville session guitarist who has played on projects by the Neville Brothers, Jewel, Faith Hill, Amy Grant, Kenny Loggins, Toby Keith, Reba McEntire, Charlie Peacock, SheDaisy, and many others. Guitarist *Roger Linn*, in addition to designing the AdrenaLinn, invented the modern-day drum machine and also the "groove box." *Craig Anderton* listens to records that Jerry McPherson played on and uses equipment that Roger Linn invented.

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Each row of clips is a scene—much like a song section. Copy and drag clips to create and modify scenes while playback continues. Trigger all clips in a scene simultaneously or independently for break-down passages.

Control up to four effect send channels for each track.

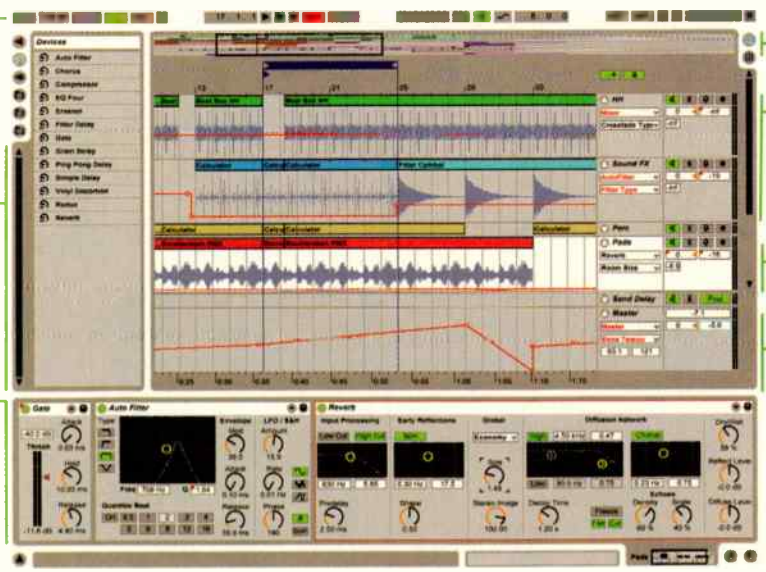
Access multiple inputs and outputs on your ASIO or CoreAudio interface. Connect Live to ReWire master or slave programs to exchange audio and sync.

Change the playback region, length and downbeat of looping clips or one-shots—all while the music continues.

Change tempo during or even after recording, including tapping to sync Live to musicians or the DJ. Elastic audio means that all audio stretches to change tempo and pitch independently anytime you desire.

Live comes with a range of high-impact effects such as reverb, filter delay, ping pong delay, erosion, gate, grain delay, EQ and many more. Add your favorite VST effects as well.

Drag-and-drop internal and VST effects into chains for tracks, sends and master in real time. All effect and mixer parameters are fully automated.



Your entire arrangement is displayed in an overview for quick navigation.

Live captures every action during your jams so you can improvise with total freedom, then edit to perfection later. Edit clips and breakpoint envelopes, add and remove material. Render your work after it's finished.

Record unlimited takes on unlimited tracks. Linear tracks can span looping sections.

Scale tempo over time to conform scores to film and TV.

Live 2 will forever change the way you make music: Easy demos for songwriters. Unprecedented flexibility for composers. New inspiration for performing musicians and DJs. Audio recording for Reason.

"...the Holy Grail of software. Now I do cues in 7 minutes. I had to have it at any price."
—Charlie Clouser, former keyboardist, Nine Inch Nails; composer, Fox TV's "Fastlane"

Download a demo from www.m-audio.com.

ableton

World Radio History

Loops move from the groove to the tube — and beyond

Let's Get Looped, Then Make Some Bucks

By Craig Anderton

Are you ignoring a possible income stream? Many people think of loop-based music as a DJ or groove thing that's not relevant to "real" recording. But a lot of savvy recordists are discovering that loops are the new "needledrop" music; for TV shows, movie soundtracks, commercials, industrial videos, kiosk presentations, and much more, loop-based music can be the key element that makes taking on a particular project cost-effective.

When I asked in my online forum at www.musicplayer.com whether people use sample loop CDs in their work, I was surprised at the number of people who have embraced this technique. As one forum member from Hollywood stated:

"Short deadlines plus no loops = no sleep. Short deadlines plus loops = getting sleep. Why reinvent the wheel to create something generic? [The clients] want something that's not canned needledrop, but they won't give me time to create something entirely original. No problem; slap a few loops to build basic structure, overdub a few original parts, sprinkle a few more loops for flavor, and presto — semi-original music that sounds fine."

It's not hard to get into loop-based music; the minimal time/money investment means it doesn't take much for it to become another tool in your repertoire of services.

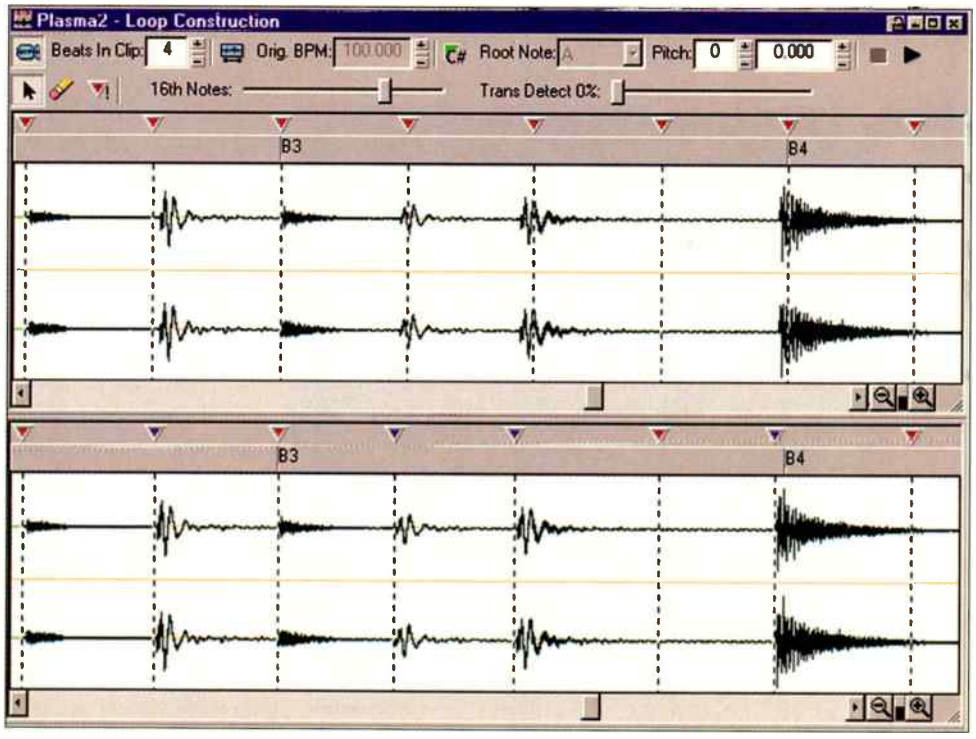


FIGURE 1: Proper marker placement is key for wide-range tempo stretching.

HOSTING YOUR LOOPS

The program that put looping on the map, Sonic Foundry's Acid, has since grown into a sophisticated program with a list price to match (see my review in the November 2002 issue). Along the way, it spawned a new WAV file variant, the "acidized" WAV, which embeds information that allows loops cut at different tempos or pitches to be "stretched" so they're compatible with each other.

Cakewalk's Sonar is another "pro" program that can use acidized files, as is Ableton's Live; both have given further legitimacy to making music with loops. But these are fairly deep programs, so if you're already using other DAW software, you might be reluctant to invest the effort into learning something that you may use only rarely.

However, there is an alternative: Cakewalk's Plasma, which lists for $49, extracts Sonar's looping functions. While a consumer-oriented program, Plasma has enough horsepower for a pro environment. It not only reads acidized files, but supports soft synths, plug-ins, and recording/editing for both MIDI and audio. This is crucial for when you need to add an overdub, narration, specialized sound effect, or whatever to avoid a totally "canned" sound. (Also note that Sonic Foundry offers a "lite" version of Acid Pro called Acid Music, which lists for under $100.)

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PLUG THIS IN

If I could only take one DSP effects box with me to the moon, it would have to be the Kurzweil KSP8."
Alan Howarth, Engineer, Composer

"I really like the KSP8 and from the minute I hooked it up it has become a vital part of my mixing session."
Michael Wagener, Double Trouble Productions, Inc.

"The KSP8s routing flexibility and parallel processing capabilities were ideal for the situation. We also used one to process Mike Garson's main piano sound. Using the same sound source through a combination of subtle distortion, EQ, and ambience effects we were able to get piano sounds that had quite radically different character. For many songs, instead of changing patches on his keyboard, Mike's just changing to a different KSP8 chain program."
Tony Widoff, Programmer: David Bowie *Heathen* Tour

"This is the one to beat."
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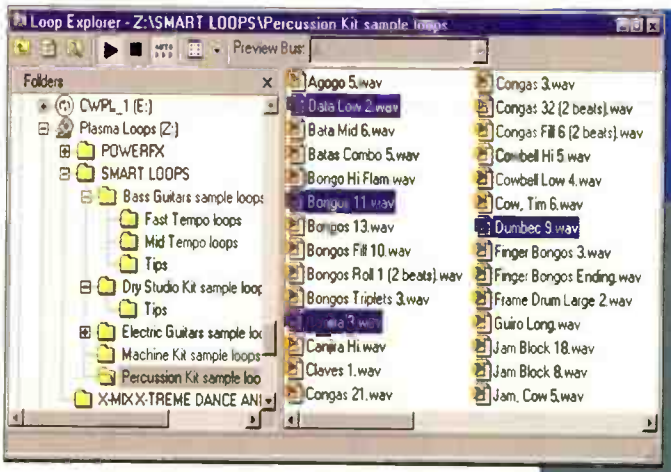
Although Plasma is Windows-only, BitHeadz's Mac-compatible "Phrazer" loop-based software has a slimmed-down version, Phraser LE, that lists for $99 and can read acidized WAV files.

THE SOUNDS

Loop CDs with "acidized" WAV files are plentiful. The most prolific producer of such CDs is, perhaps not surprisingly, Sonic Foundry. Sample CDs typically cost around $30-$100, so getting a big collection together can be pricey.

However, some sample CDs are "construction sets" for particular forms of music. These CDs "deconstruct" multiple tunes into component parts (bass, drums, pads, fills, etc.) that you can mix and match to create



USING "CONSTRUCTION KITS" WITH PLASMA

Few people know that Plasma's Loop Explorer window (Fig. 2) can audition multiple loops *simultaneously*. This is particularly useful with "construction kit" sample CDs, as you can hear how well various elements work together. Plasma's main tempo control sets the tempo at which the loops play.

Simultaneous auditioning works best with acidized loops. Otherwise, the loops need to be at the same tempo to play together coherently. (Also, all the loops have to reside in the same folder). Here's the procedure:

1. **In the Loop Explorer, click on the first loop you want to hear.**
2. **Click on the Loop Explorer's Play button.**
3. **To add a loop, Ctrl-click on another loop in the Loop Explorer's list of files.**
3. **To de-select an already-selected loop, Ctrl-click on it again.**

Enable the Loop Explorer's Auto-Preview button (the icon to the right of the stop button) so that selecting a loop automatically plays it with the others. If Auto-Preview is off, then you'll need to hit the Play button to hear a new selection

After selecting the loops you want to use, you can drag them over as a group to the Clips pane.

FIGURE 2: Multiple files can play simultaneously, so you can hear how they sound together.

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  —Fletcher, Mercenary Audio

- "The **Mini-Me** is the way to go for high end sound... we now have a world class ADC to use in the field!"
  —Doug Oade

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  —TJP

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variations within a particular genre. Investing $200 or so in sounds can be enough to do a project that will bring in far more than that. Incidentally, Plasma includes a library of loops to get you started; you can get a fair amount of mileage out of them.

There are other methods of time-stretching, such as the REX file format pioneered by Propellerhead Software, and Ilio's Groove Control technique, used in their sample CDs. This article, though, will keep things simple and concentrate on acidized file formats.

BEWARE THE BAD ACID!

With Plasma, you aren't restricted to using acidized files; a standard file can be used, and like Acid, Plasma will make an educated guess as to how to embed stretching information. It does this by inserting markers at prominent transients, and the digital audio between markers is sped up or slowed down to maintain rhythmic integrity.

However, acidization is an art, not a science. Some sample CDs with "acidized" files merely bring the files into Acid, let Acid make its guesses, then save the file — and these guesses aren't always right. Files created on drum machines tend to acidize well, but if a file has some hits that are a little bit off (*e.g.*, played by a human), the markers usually need to be hand-adjusted for best results. This is also the key to creating your own acidized files out of parts you've recorded, or from other sources.

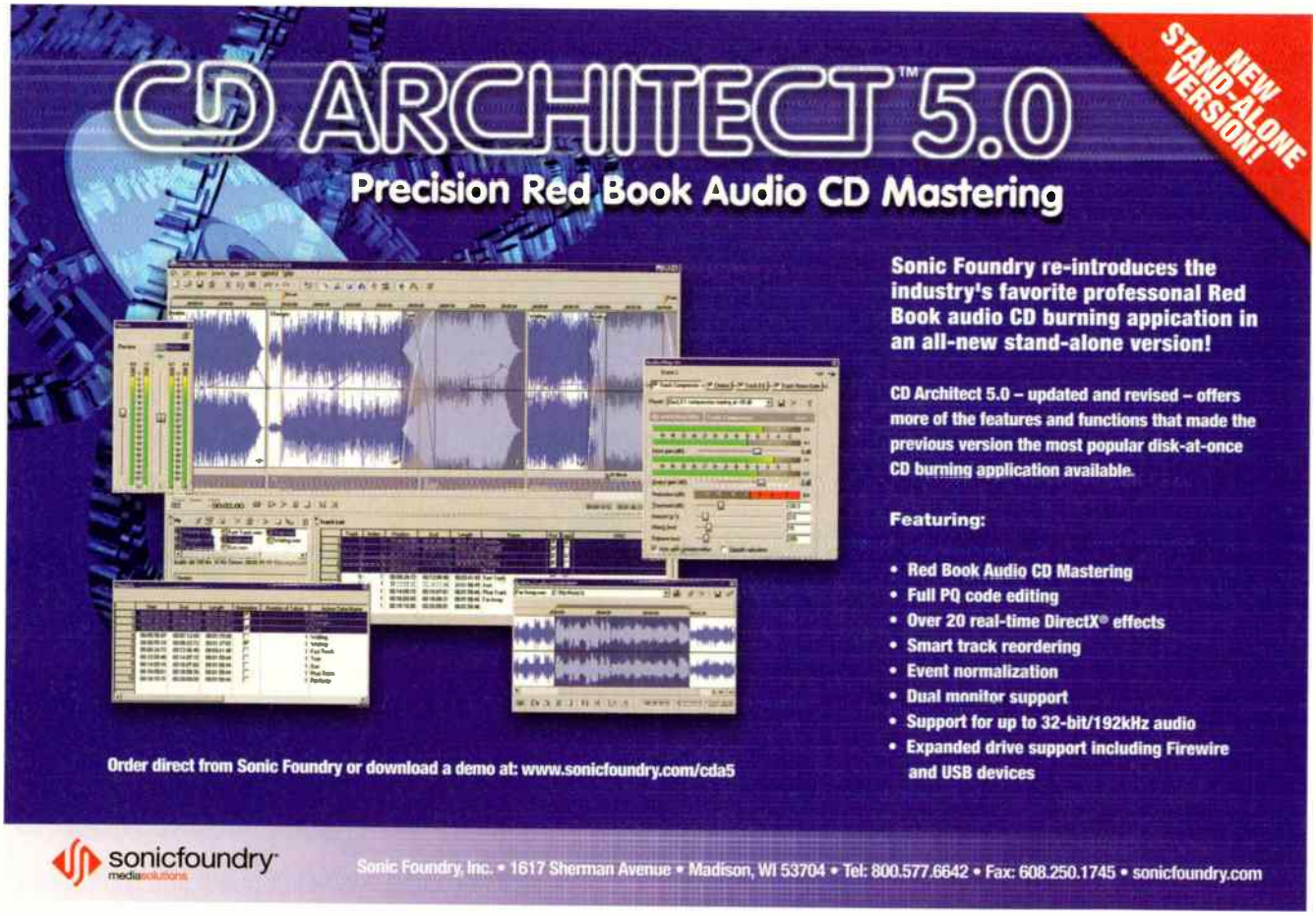
To test a file, slow it down by 15-20%. If you hear obvious flamming (doubled hits), you'll likely need to move some markers in the Loop Construction window so that they land *exactly* on the beat instead of just near it.

Fig. 1 shows a before-and-after example of fixing a loop in Plasma's Loop Construction window. Note how some of the markers in the upper view land just before or after a drum hit; these have been moved by hand in the lower view so that they fall exactly at the beginning of the drum hit attack (markers that have been moved turn blue).

ARE WE LOOPED YET?

Okay, you have the program and some loops. But you need to create an *artful* combination of loops, not just throw a bunch of loops together and hope they sound good. Experienced loop music makers cut pieces of loops and paste them elsewhere, create fills out of different loops, add modulation and tempo changes where appropriate, and apply other techniques to add expressiveness and variations.

If you haven't worked with loops, give it a shot. The bottom line is that it might help out *your* bottom line...and it's fun, too. ■



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Put your PDA to work making music on the road

In The Palm Of Your Hand

By Steve La Cerra

I remember my Mac Classic. It was small enough to take to sessions and when I bumped the memory up to 8 MB, I was living large. It's hard to believe that I carry more power than that in my Palm VIIx and it's small enough to stick in a coat pocket. With the increased portability and power of "palmtops," a small industry has cropped up developing music and audio 'ware specifically for PDA application.

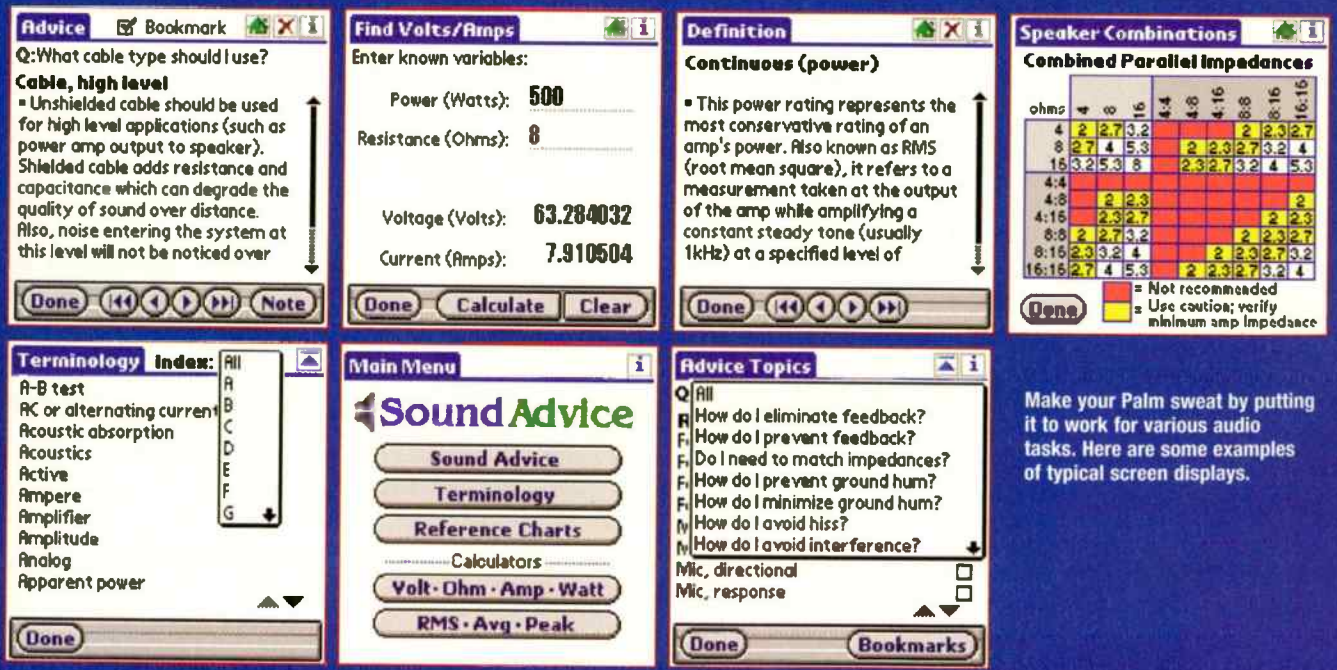
One of the earliest supporters of audio 'ware for the Palm OS was Handi-Systems Inc. a company that designs and manufactures accessories for 3Com's Palm III, IIIx and VII (www.modularsound.com/handiq.htm). Their HandiClip and HC-3 Duplex HandiClip interface Palm organizers with any MIDI- or RS232-compatible device, opening up a world of control possibilities. Handi Systems' HandiQ EQ software enables MIDI control of Ashley Protéa, TC Electronic TC1128, or Behringer UltraCurve equalizers. A version is available for the Klark Teknik DN3600, but as of this writing it hasn't been tested by KT. HandiQ features vary somewhat depending upon the audio hardware, but general controls include on-screen sliders for adjustment of EQ bands, mute, and all-flat. Multichannel control is supported for the Protéa and TC1128. A version called HandiQ.DFR11 is under development for the Shure DFR11. HandiFX is a universal effects controller providing MIDI control over any MIDI-compatible effect device. Facilitating MIDI I/O is the HMY HotSync-to-MIDI converter cable.

Sound Advice from Palmetto Logic (www.palmettologic.com) is an audio reference tool that can help troubleshoot audio problems. Built into Sound Advice are more than 100 "advice records" with suggestions for solving common audio problems. In addition, Sound Advice contains some useful features such as the ability to calculate voltage and current from known power and resistance, or convert among RMS, average, and peak values. There's also a chart that cross-references AWG and CSA wire gauges. Sound Advice can be run on Clie, Palm, and Handspring units.

From Swivel Systems (www.swivelsystems.com) comes the SG20, a clip-on module for use with Palm III and VII series handhelds (Palm V/Vx using the Palmdock V from Solvepoint), IBM Workpads, and HandEra 330 and TRGpro. The SG20 interfaces with a detachable MIDI/audio expander cable, providing MIDI I/O as well as stereo RCA outs. There's a built-in, 1/8-inch stereo headphone jack with a volume control and bass boost switch. The SG20 provides 128 instrument sounds, supports up to 24 simultaneous 16-bit/44.1 kHz voices, and can import and play back standard MIDI files.

Swivel Systems has been working in conjunction with miniMusic (www.minimusic.com), manufacturers of NotePad and BeatPad MIDI software. NotePad is a music composition sketchpad providing three different ways to enter notes, user-definable key and time

▶ continued on page 118



Make your Palm sweat by putting it to work for various audio tasks. Here are some examples of typical screen displays.

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Audio Technica's large-diaphragm condenser mics have proven to be very popular here at Sweetwater, and now the AT4040 adds its name to that illustrious line. An excellent mic for all kinds of studio applications, the low-priced AT4040 offers a hotter output and lower self-noise than similar mics in its class. You can record directly to your computer-based digital audio workstation via the FireStation's analog inputs without losing the AT4040's smooth, natural sonic characteristics.

Korg Triton Studio

Korg's flagship synthesizer is simply one of the most powerful instruments available. A comprehensive synthesizer workstation, the TRITON offers everything you need to create, mix, and master your music: powerful recording and editing, professional effects and fantastic sounds, mixing... it's all here. The TRITON's mLAN option means you can easily hook it up to your computer-based production studio for a whole new level of power!

PreSonus Audio Electronics

Presonus FIREstation

Presonus' 8-channel FIREstation interface is designed to be the heart of your digital recording studio. Any mLAN compatible keyboard such as the Yamaha Motif or Korg Triton Studio can be seamlessly patched into the FireWire ports of the FIREstation to send audio and MIDI information to your computer. You can plug microphones, instruments and external preamps into the analog inputs while monitoring them in realtime without latency. Need more inputs? Just daisy-chain multiple FIREstations for up to 40 channels of I/O. There's even a built-in 1x1 MIDI port for interfacing with MIDI devices.

Yamaha Motif

Yamaha's MOTIF master synthesizer sets a new standard for sonic performance and creative freedom. It offers a whopping 85MB of Yamaha's finest sounds and the revolutionary Integrated Sampling Sequencer, a 16-track sequencer that lets you easily add vocals, guitars and drum loops to MIDI sequences.

While these workstation powerhouses can stand alone as complete music production systems, imagine the creative potential when combined with other devices in an integrated intelligent FIREstation/mLAN studio.

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Presonus' FIREstation interface, with state-of-the-art mLAN technology, is destined to become the most essential piece of gear in your digital studio. Just as AES/EBU and MIDI have set the standard for the way music technology communicates, so mLAN or FireWire technology promises to bring that level of integration to the recording and audio set-ups of the future. But unlike USB, an mLAN FireWire solution uses separate data streams for different types of data in a single wire. There's no need for a card or large cable. Video and other FireWire devices can be run on the same FireWire cable without affecting the timing of the mLAN musical data. And because mLAN is non-proprietary, any mLAN-equipped product will work with any other mLAN-equipped product.

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Apple iMac

You can drive your whole mLAN system with a top-of-the-line iMac. Thanks to mLAN, the latest iMacs are as adept at providing pro-level audio/MIDI communication as the expensive PCI-based desktops of the past. The new iMacs feature an 800 Mhz PowerPC G4 with Velocity Engine, the ferociously fast NVIDIA GeForce4 MX graphics processing unit, and the Super Drive — a combination DVD-R/CD-RW — that lets you burn your own CDs and DVDs. The striking 17-inch flat panel widescreen LCD display gives you more space for viewing all your windows and toolbars.

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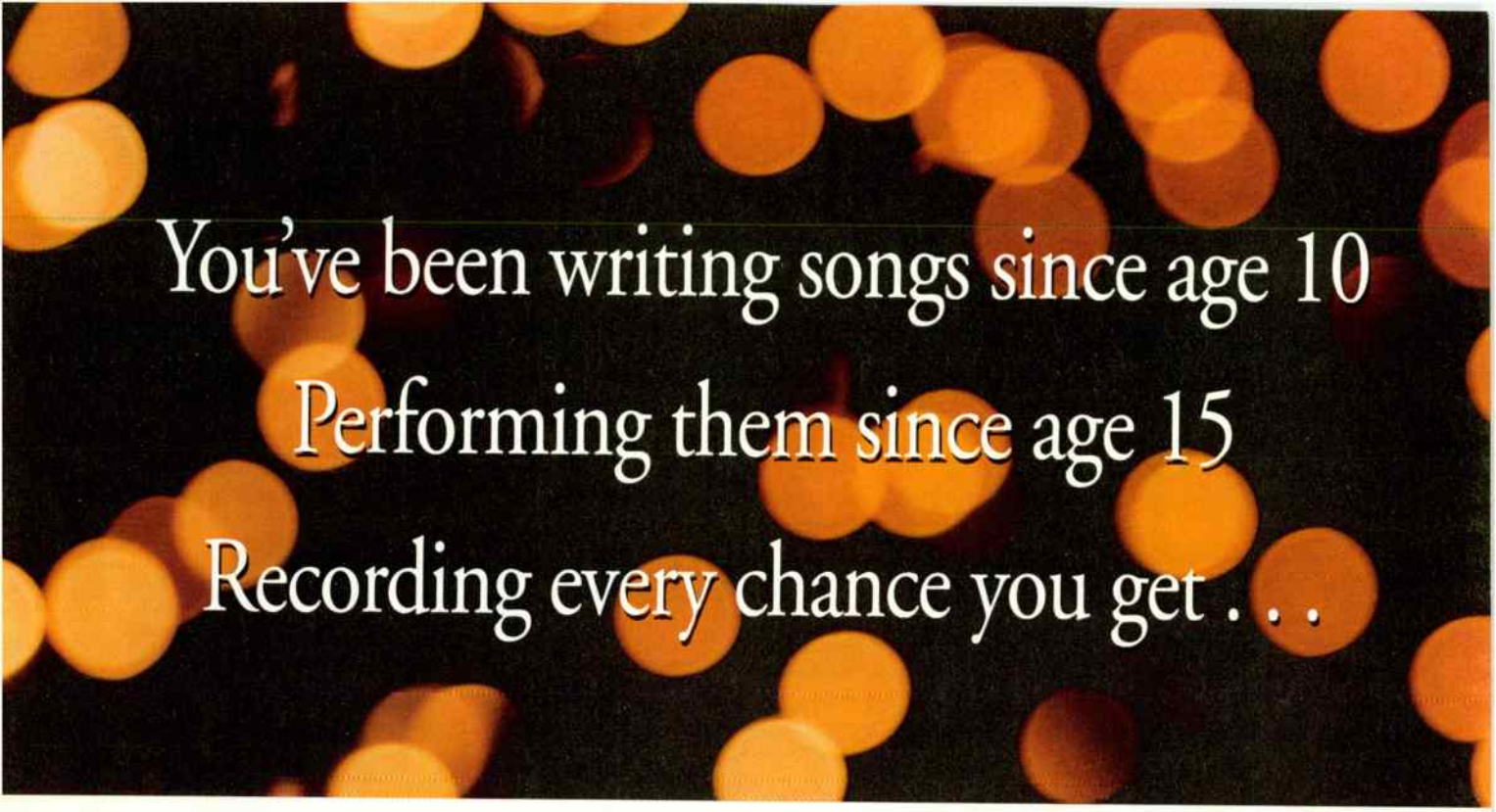

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HOW TO BUY GEAR

The Number One topic of the emails and letters we get here at *EQ* is: "Should I buy product X or Y?" Everyone wants help deciding which pieces of gear are most deserving of their hard-earned cash. And for good reason; with the massive range of choices out there, we're all suffering from Option Anxiety.

But the fact is, we can't tell you what to buy. We can provide you with First Looks, Product Views, and trade show reports to keep you up on new gear releases and trends. We can write articles about how various types of equipment are used in the studio. We can tell you how top-notch engineers and producers are applying different pieces of gear in the real world. We can dissect products in reviews, and give you our impressions. But as much as we'd like to, we can't tell you exactly what to buy. The reason is simple: your needs and applications are unique, and only you can make the final decision as to what's best for you and your studio.

What we *can* do is help you make better decisions for yourself — and hopefully help you avoid making mistakes that cost you money, valuable time, and effort. On the following pages you'll find tips on how to get the most from your gear-buying dollars, and how to avoid buyer's remorse. So get out your credit cards and do your part to boost the economy — but don't forget, as much as we all love new gear, it's talent, ears, and heart that make the music... —*Mitch Gallagher*

World Radio History

HOW TO BUY GEAR

Live by these seven rules if you want your budget to survive technological change

TECH GEAR ROULETTE

By Craig Anderton

I met Billy Bumluck at a video store in the early '80s. We were both proud owners of new VCRs; he was browsing in the Beta section, I was looking at VHS. "You use VHS?" he asked. When I nodded, he said "Too bad, man. Beta is the only way to go — better picture, more reliable, and it has Sony behind it. Your VHS machine will be a doorstop next year, so enjoy it while you can!"

We talked a bit more, and I found out he was a guitarist and technology fan, so we kept in touch. A couple years later, I got a call. "Hey, you gotta check out this new Amiga computer! It has separate chips for graphics and audio, does sampling better than a Fairlight, and has some great games." So I went over to his house, and sure enough, it ran circles around the Macs, Ataris, and PCs of its day. "No more Beta mistakes for me," said Billy. "This baby's made by Commodore, and considering they've sold six million Commodore-64s, I don't think they'll be going out of business any time soon."

Well, after the Amiga died, Billy had enough. "Okay," he said, "I'm getting a Mac. There's a fantastic program called Vision, it'll wipe the floor with your Master Tracks Pro. It will be the perfect complement to my Sequential Circuits and Oberheim synthesizers." And for a while, it looked like Billy made the right choice, especially when Opcode added hard disk recording to MIDI sequencing. "Craig, nothing's going to stop those Opcode guys. No one else is doing hard disk recording and MIDI, I'd buy stock in them if I could."

Then Opcode was sucked into the BHDC (Black Hole of Dead Companies). Billy was pretty shaken this time, and had heard stories of Apple going through problems. So about a year ago, he decided to switch to a PC. "There's a billion of 'em out there. This is one standard that won't die on me." I told him Apple wasn't going anywhere, but he was adamant. "Nope, no more obsolete stuff for me, and no more little companies. I'm going out right now and getting Logic Windows!"

Billy never was the same after Emagic dropped Windows support. Last I heard, after his savings evaporated with the collapse of Enron and Worldcom, he went to a back-to-nature commune in Montana, with no electricity or television. Oh yes, and with an acoustic guitar to replace his Yamaha G10 MIDI guitar.

There's a little of Billy Bumluck in all of us. My Commodore CDTV sits alongside some other ill-chosen relics of technology past, each one representing a costly mistake. But they seemed like such good ideas at the time....

With technology changing on a seemingly daily basis, you don't just buy gear any more — you have to be a soothsayer. (I wondered if TV psychic Miss Cleo was of questionable abilities long before anyone else; it just seemed too suspicious that *no one* ever called up asking if it was a good idea to switch to OS X or Windows XP.) How can you protect yourself? How can you stay ahead of technology *and* bankruptcy court? Here's the scoop.

RULE #1: YOU *WILL MAKE MISTAKES*

Resign yourself to it. If huge companies can make mistakes after spending zillions of dollars on focus groups

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and product research, so can you. Maybe you got sucked in by the ads, maybe you just got taken by something that didn't pan out. The object is to minimize these mistakes so they don't devastate your checking account.

Some people end up with Purchasing Paralysis, where they won't buy anything out of fear that something better is coming around the corner. Well, something is, so get used to it. *The secret to avoid getting burned is not to lose money on an investment.*

For example, suppose you bought an original, 16-bit Alesis ADAT for $4,000. As you sit mousing around with your shiny new DAW, that might seem like it was a mistake. Bu if you did projects on it that earned you $10,000, it was a wise investment indeed — you more than doubled your money (better than what you'd get from a bank, for sure).

Always consider *return on investment*. I was debating whether or not to buy a Minidisc when it first came out, because they were pretty expensive back then, and the survival of the format was in question. But I did, and wrote enough articles about MD and how to use it that I made money on the deal. MD could disappear tomorrow, and my buying it would not have been a mistake.

So the question is not, "Am I buying something that will become obsolete?" because you *know* you are. The correct question is "Can I amortize the value of this investment *before* it becomes obsolete?" If buying something will make you more money than not buying it, get out the checkbook. Simple as that.

RULE #2: RUN, DON'T WALK, FROM FUNNY FORMATS

Remember the Elcaset? DCC (Digital Compact Cassette)? The QuickDisk? The multitrack tape recorder (no, not ADAT) based on video cassettes that were used for black-and-white Japanese television production? Quad hi-fi systems? Ouch.

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I haven't bought a DVD burner not because I don't need one — I do — but because there are several competing formats. And a player that plays all of them isn't good enough, because if I'm going to save my valuable data on something, I want the format itself to survive. Until the DVD recordable world settles down, I'm sticking with removable hard drives, which work fine and are a standard for the foreseeable future.

Will 5.1 be a funny format several years from now? Probably not. Of the various memory card formats — SD, SmartMedia, Compact Flash, Memory Stick, etc. — which will survive? Will DVD-A? SACD? I don't know, and I'm not buying an SACD player until I do. Of course, this creates a chicken-and-egg situation — a format can't become established until people buy it — but I think I'll let Billy Bumluck be the guinea pig, not me.

Bottom line: if at all possible, wait until a format is established before committing to it. If necessary, stick with an older format until you're sure the new one has legs.

RULE #3: FOR WINDOWS, BUY CUSTOM-INTEGRATED COMPUTERS

Here's the absolute wrong way to buy a computer: Go to your local office supply store or electronics superstore and ask for their best price. When I tell this to people, they always say "But for $600 I can get a 1.8 GHz processor, a CD-RW drive, 512 MB of memory, and even a monitor!" Okay. But does it have the option to put in a graphics card that handles two monitors? Are there enough slots in the motherboard for a couple DSP cards like the TC PowerCore or Universal Audio UAD-1, along with a real sound card to replace the built-in sound functions? Can the USB be upgraded to 2.0? Are there FireWire ports, or will you need to add a card for that? And when components fail, are they expensive proprietary parts available only from the manufacturer, or off-the-shelf stuff you can pick up at Fry's or CompUSA?

IT MAY BE HEARTBREAKING, BUT ALL THAT EFFORT WE PUT INTO MAKING THE BEST POSSIBLE SOUND IS APPRECIATED BY A MINUSCULE PERCENTAGE OF THE LISTENING AUDIENCE.

That's not all. I can call my system integrator and get actual technical support; if you go for one of the systems specifically designed for use by musicians (see the August 2002 issue of *EQ*), you'll be way ahead of the pack. Sure, it will cost you more in terms of the initial price. But after five years, a couple of upgrades, and minimal downtime, you will be ahead by thousands of dollars in terms of value received.

RULE #4: THERE'S NOT THAT MUCH DIFFERENCE AMONG SOFTWARE, SO DON'T AGONIZE OVER IT.

This is not to minimize the fact that software can have very different vibes. But every DAW can cut, paste, and copy, accept plug-ins, go to the beginning and end of the file, etc. Remember that *music software is a few major features, and thousands of little ones*. Our article on choosing DAW software

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(pg. 66) covers this topic in more detail, but the main point is that you want to look at deal-breakers and deal-makers, not which keyboard equivalent you use for the MIDI transposition function. Zoom out and get the big picture of what software does, because ultimately, that's what you'll be depending on every day.

RULE #5: BE WARY OF BUYING THINGS BEFORE YOU ACTUALLY NEED THEM.

One friend recently asked if he should upgrade to a 96 kHz system (he already does 24 bits). I asked if his delivery medium was CDs; yes. I asked if any clients had requested 96 kHz recording; no. Was he happy with the current sound of his studio? Yes.

So why did he want to go to 96 kHz? Because "Everyone's doing it, and I don't want to fall behind. Maybe I can attract more clients if I go for 96 kHz."

The key word there is *maybe*. I told him to stay with what he had until a client said they *needed* 96 kHz for their sessions, or he got gigs where the delivery medium *required* 96 kHz. That's when to take the plunge: when you can amortize the gear with actual income.

The advantages of waiting are that the technology improves, prices become lower, and existing companies have a track record, so there's a better knowledge base of what to buy and what not to buy. It's almost never a good idea to buy a piece of technology "just in case." Wait until there's a demonstrable need.

RULE #6: NO LISTENER GIVES A DAMN WHAT MIC PREAMP YOU USED.

Or which software, computer, monitors, mic, etc. The only people who care are gear heads, and I assure you, gear heads do not make up the bulk of the music-buying public. I've used a lot of different DAWs, and you know what? *My music sounds*

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pretty much the same on all of them.

All that matters about music is its emotional impact. No one listens to mics; they listen to singers. No one listens to amps; they listen to guitarists. Remember this when you are tempted by hype to think that there is "magic" gear that will make your music better. Gear can make your *sound* better, but it rarely makes your *music* better. (I treasure gear that is so wonderful to play that it indeed inspires me to play better.)

And before you get too worked up about sound, also remember this: most people wouldn't know good sound if it ran up behind them and said, "Boo." People think MP3s sound just fine. They didn't care if the Dolby switch was on or off on their cassette decks. They listen to car stereos that have almost nothing but low end. Get the picture? It may be heartbreaking, but all that effort we put into making the best possible sound is appreciated by a minuscule percentage of the listening audience.

Now, I'm not saying don't make great-sounding music. Always do the very best you can in anything you do. But in the context of buying gear, if it takes **you** 30 hours of work to earn the **money** to buy a brand-new whiz-bang **microphone**, your music might actually be better if you spent that money on books about harmony theory, took a course on screenplay writing to improve your lyrics, or just went on a vacation and collected some real-life experiences to fuel your muse. Then, maybe you'll have a real reason to pick up that whiz-bang mic.

RULE #7: THE BEST WAY TO COPE WITH TECHNOLOGY IS TO PUT IT IN ITS PLACE.

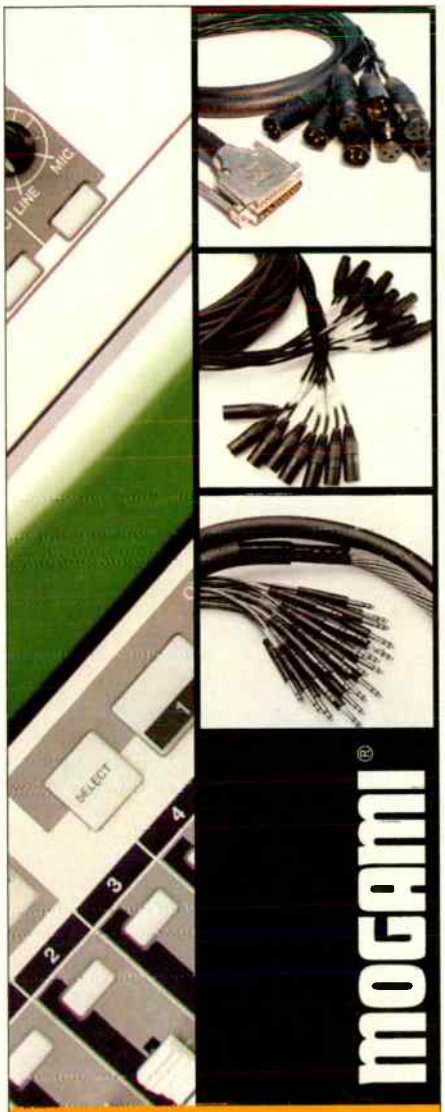
I have a hammer that's 20 years old. I'm sure that since then, the metals used in them have been improved, the handles have become easier to grip, and the weight is now distributed more ergonomically. But you know what? It drives nails just fine.

My main hardware synthesizer is 13 years old. My DAT deck is a TASCAM DA-30 (the original one). I burn my CDs at 4X. Then again, I have a totally expandable, dual processor Athlon computer, some fantastic soft synths, and two monitors. The point is, I don't let technology rule me. ("You have to buy a better DAT, you must be able to burn CDs at 16X, you must go surround.") I rule technology: I pick and choose those things that are going to help my music.

IF BUYING SOMETHING WILL MAKE YOU MORE MONEY THAN NOT BUYING IT, GET OUT THE CHECKBOOK. SIMPLE AS THAT

I also either jump in as an early adopter, pay the premium price, and milk something for all it's worth, or get in on the tail end of a technology when it's proven, reliable, and inexpensive. I bought one of the first Panasonic DA7 digital mixers, and now you can buy them on blowout at a fraction of what I paid. Do I mind? Not at all: I've gotten so much use out of it, and made so much off of projects done with it, that not buying it would have been a major mistake.

I'll leave you with this: when it comes to technology, *you're the boss.* Fulfilling *your* needs is all that should matter. Good luck making the right choices! ■



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HOW TO BUY GEAR

Get sound in and out of your computer

HOW TO CHOOSE AN AUDIO INTERFACE

By Craig Anderton

Computers can be pretty smart, but when it comes to sound, they need a translator that can convert sound waves into the digital language of ones and zeroes. *Audio interfaces* provide this translation.

If you're moving from a tape-based setup (analog or digital) or "all-in-one" workstation setup to a computer-based system, you'll need an audio interface. But if you bought an interface several years ago, it might be time to upgrade. Like everything else, interfaces continue to evolve, and they can make definitely affect overall sound quality.

Most stock Windows and Mac computers include sound capabilities, but these are consumer-grade. Also, built-in I/O is usually limited to 16-bit operation at sample rates of 48 kHz or less. *EQ*'s recommendation: forget built-in sound capabilities, and go for a pro-level solution.

However, the growing sophistication of audio interfaces has led to option overload. Choices are nice, but it becomes hard to separate what manufacturers want to sell you as opposed to what you really need. So, we'll explain the concepts involved in audio interfaces so that you can become educated enough to make an informed choice.

PCI CARD, USB, OR FIREWIRE?

There are three main types of audio interface formats:

PCI card. This plugs into a PCI slot on your computer's motherboard. It may place all its connectors on the backplate, a second backplate that installs next to the board but doesn't take up a slot, or have a cable that goes to a separate (usually rackmountable) breakout box that's festooned with connectors.

Advantages: Cards usually offer the tightest integration with the computer; MIDI ports associated with cards typically exhibit better timing than USB models. Also, if there's a breakout box, the connectors can be placed where it's most convenient for your studio setup.

Disadvantages: You need to open up your computer, and with Windows machines, have to deal with IRQ issues and possible conflicts with other cards. Although any conflicts can almost always be resolved, those who aren't into computers may find the experience frustrating.

USB. This type of interface is a separate box that plugs into a computer's USB port. Early USB interfaces got a bad rap because of problems in computer operating systems; however, starting with Windows 98SE and MacOS 9.1, USB has been quite reliable on both platforms.

Advantages: You don't have to open up your computer, and the experience is pretty much "plug and play." It's also easy to move among different computers, even if they're different platforms — use a USB interface with your desktop, then if you go on the road, plug it into your laptop.

Disadvantages: USB 1.0 is a relatively slow protocol, so there's a bandwidth limit — you're not going to get 16 channels of 24/96 audio. Note that although there may be timing issues with MIDI, the latest generation of USB MIDI interfaces with time-stamping can overcome these inaccuracies. USB 2.0 promises considerably better performance, but isn't in wide use yet.

FireWire. This is similar conceptually to a USB interface

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The Quattro from M-Audio is a USB interface with 4 analog ins, 4 analog outs, and a built-in 1-in, 1-out MIDI interface.

as it plugs into a built-in computer port, but has the potential to run at a faster speed.

Advantages: Similar to USB, although FireWire interfaces need their own drivers, whereas USB interfaces can often use existing system USB drivers. Also, FireWire is faster than USB.

Disadvantages: With the Mac, FireWire ports have been built in for some time, so using a FireWire interface is pretty much plug-and-play. However, most Windows machines will need a FireWire (IEEE-1396) card. Although installing one is a pretty straightforward process, it negates the advantage of not having to open up your computer and install a card.

HUMAN INTERFACE VERSUS JACKS ONLY

A new type of interface, typified by products like the TASCAM US-428, adds more functionality (*e.g.,* mic preamps, a mixer with faders, signal routing, etc.) to a basic interface. These connect via USB or FireWire, and are generally intended for smaller studios and portable applications. However, as these units become more sophisticated, they will blur the line between audio interface, digital mixer, and human interface. Digidesign's FireWire-compatible 002, which incorporates audio/MIDI I/O and is optimized for use with Pro Tools LE software, is an excellent example of this trend.

The big issue here is dedicated versus general-purpose interfaces. Dedicated types fit specific software like a glove. General-purpose systems need templates for the software you want to use, but should you switch programs or platforms, your investment *may* still be protected.

The other issue is modularity versus a self-contained solution. If a unit contains I/O and control, will it accommodate an upgrade to higher sample rates or bit resolution? Will the human interface section also control other programs, such as soft synths? A modular system is more flexible, but requires more savvy to put together, and there's no guarantee that the various elements will work together seamlessly. Self-contained solutions are more foolproof, but usually less expandable and compatible with fewer products.

WHAT I/O DO YOU NEED?

Perhaps more than any other feature, this will drive your selection. The first question is whether you need analog, digital, or both types of I/O, and if digital, which flavors of digital.

If your studio setup uses a digital mixer or has outboard A/D converters, then you don't need analog I/O: you can feed analog signals into these outboard units, whose digital outs go into a digital-only card. This has two advantages:

- A digital-only card is less expensive than one with analog I/O, all else being equal.
- The setup is more modular — you can change A/D converters to upgrade your sound, or add a digital mixer and interface it with the card. There are even special-purpose analog-based units (*e.g.,* the Presonus DigiMax LT reviewed in this issue) that interface multiple mics with digital-only interfaces.

Analog I/O choices. I used to avoid

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sound cards with onboard analog I/O, but reviewing the Lynx Studio series of cards changed my mind — it *is* possible to get good audio performance from a card sitting inside a computer, although this requires rigorous board layout and shielding. Most pro-level cards with analog I/O use external breakout boxes that keep the audio circuitry well away from the computer's EMI (electromagnetic interference).

Analog I/O can be either *balanced* or *unbalanced*. Balanced inputs can minimize electrical interference induced into a cable, which is important with "noisy" digital studios that are prone to interference from monitors and computers. Balanced ins are popular in pro installations that use long cables, which are more prone to picking up interference than short cables. Unbalanced inputs are usually fine if cables connected to the card are under six feet or so.

Balanced line systems use either XLR or TRS (tip-ring-sleeve) 1/4-inch stereo connectors. (Even though TRS types use stereo connectors, they still carry only a mono signal. The tip carries the signal's "hot" line, and the ring carries the out-of-phase version required for balanced line operation.) However, plugging into a TRS jack with a mono plug will convert it to unbalanced operation. Unbalanced lines use either RCA phono jacks or standard 1/4-inch mono phone jacks.

Also check if the analog system includes mic preamps, and whether there's phantom power available should you need this. For convenience, having built-in mic preamps is useful, but for ultimate performance, you will likely want to handpick the mic pres you like best, and feed them into line-level analog ins (or if they have digital outs, into the digital inputs).

Digital I/O. There are four popular types of digital I/O protocols:

- *S/PDIF*. This carries a stereo digital audio signal and uses either RCA (phono) or TOSLINK fiber-optic connectors for in and out connections (some cards include both optical and electrical I/O). Many CD and DAT players, as well as some signal processors and digital mixers, include S/PDIF outs you can send to a sound card's inputs.
- *AES/EBU*. This is another two-channel interface that is very similar to S/PDIF, but uses balanced, XLR-style connectors and is more pro-oriented. Some interfaces offer AES/EBU as an option.
- *ADAT optical interface*. This 8-channel interface uses TOSLINK connectors, and sends/receives signals over a fiber-optical cable. While originally used with Alesis ADAT recorders, it has become a de facto multichannel standard — mixers, synthesizers, hard disk recorders, and other devices often include an ADAT interface.
- *TDIF electrical interface*. This protocol, originated by TASCAM, uses a DB-25 connector to send and receive eight channels of audio over multi-conductor cable. Although it hasn't achieved the same level of acceptance as the ADAT interface, it nonetheless has a significant industry presence.

Of course, what you'll need depends on the other gear in your system. In general, I like ADAT I/O because so much gear is compatible with this standard, and putting eight channels on a thin, fiber-optic cable is a plus. But you'll probably also need SPDIF and AES/EBU to handle the occasional piece of outboard gear.

EQ RECOMMENDS

For field applications, a simple USB interface is small, light, and functional. If you need more than just I/O, check into the somewhat larger units that include mic pres, faders, etc. Mac fans who are into more of a "road studio" should look into FireWire interfaces; the paucity of Windows notebooks with FireWire ports (although they are becoming more common) currently makes this a less attractive choice for Windows users.

For desktop applications, a PCI card offers performance advantages over USB 1.0 devices, especially if you use MIDI and your software does not support a time-stamping interface (or your budget doesn't allow buying one). However, in the future USB 2.0 will likely level the playing field. FireWire for desktops is another story: it delivers the type of performance associated with cards, but without having to open up the box and deal with installation issues. Windows users may need to add a FireWire card, though.

When convenience is paramount, an interface that includes quality analog I/O is the easiest to set up. When upgradeability is crucial, go for all-digital I/O, and populate the rest of the setup with appropriate mic pres and converters.

The driver selection will depend on the software you use, but *EQ* recommends Mac owners make sure that OS X drivers are available or in the pipeline, as that's the wave of the future. For similar reasons, Windows users will want WDM drivers; GSIF drivers are a necessity if you plan to use GigaSampler.

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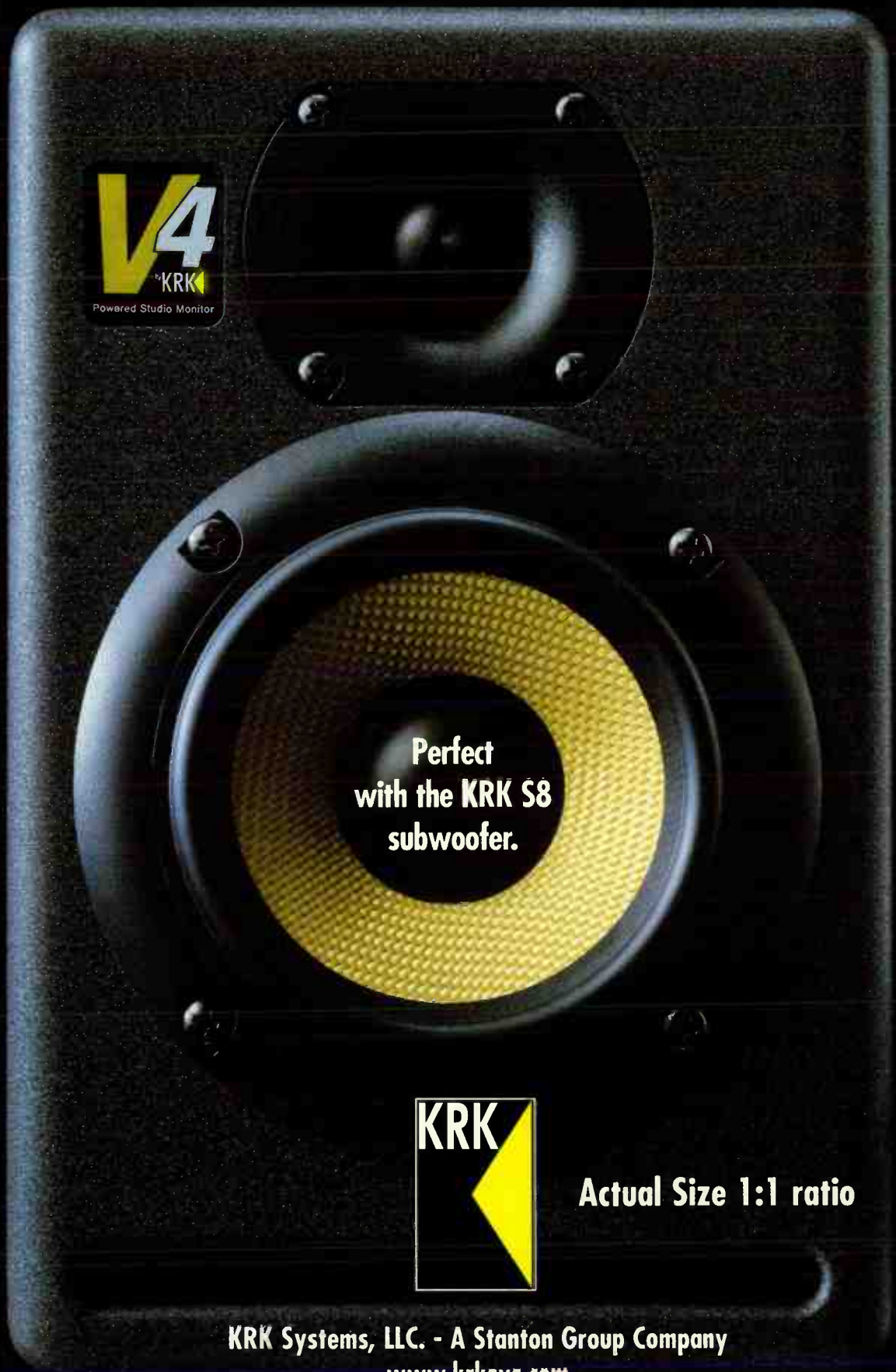
Who Says Size Matters?



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DRIVERS

Your software determines which drivers are essential; for example, Cubase is optimized for use with ASIO drivers, GigaSampler requires GSIF drivers, and Sonar is happiest with kernel-streaming WDM drivers. Both Mac and Windows systems have "old school" drivers (SoundManager and MME respectively) which are compatible with just about anything, but offer lower performance than newer options.

Mac fans will want to make sure their card's drivers offer OS X compatibility, or will soon. Despite any naysayers, OS X is here to stay. Similarly, Windows users will want WDM compatibility. This low-latency protocol is being adopted by more and more programs.

ASIO, developed by Steinberg but embraced by dozens of manufacturers, provided a pro audio driver solution before Apple and Microsoft realized that low-latency audio drivers might be a good idea. Although some feel that ASIO will be eclipsed by Apple's and Microsoft's new protocols, ASIO is well-entrenched and is also a true cross-platform solution. It's not going anywhere for quite a while.

Note that drivers are often updated. Check the sound card manufacturer's web site for details. Also note that some companies do clever variations on a theme, such as developing high-performance MME-compatible drivers that retain the compatibilty of MME, but offer far lower latency (*e.g.*, Aardvark interfaces). Finally, not all drivers are created equal: a well-written driver with a well-designed sound card can outperform combinations that aren't as meticulously designed.

Also note that web sites for software manufacturers often include lists of which cards are known to work with their software, so this is a good place to start your research.

RESOLUTION AND SAMPLING RATE

The ability to handle high bit resolutions and sampling rates is a function of both hardware and software, but even if the software can handle it, that means nothing unless the hardware can too. Do you need 96 kHz or 192 kHz sampling? Higher sample rates will cost you more, but you may need them to remain commercially competitive, or if the rest of your signal chain is of sufficient quality that using lower sample rates will degrade the overall fidelity.

As to bit resolution, the general consensus is that it's well worth running at 24-bit resolution, even if your final delivery medium is a standard 16-bit Red Book CD. As a result, most modern analog interfaces use 24-bit converters, and digital interfaces can pass audio with 24-bit resolution.

The Quattro from M-Audio is a USB interface with 4 analog ins, 4 analog outs, and a built-in 1-in, 1-out MIDI interface.

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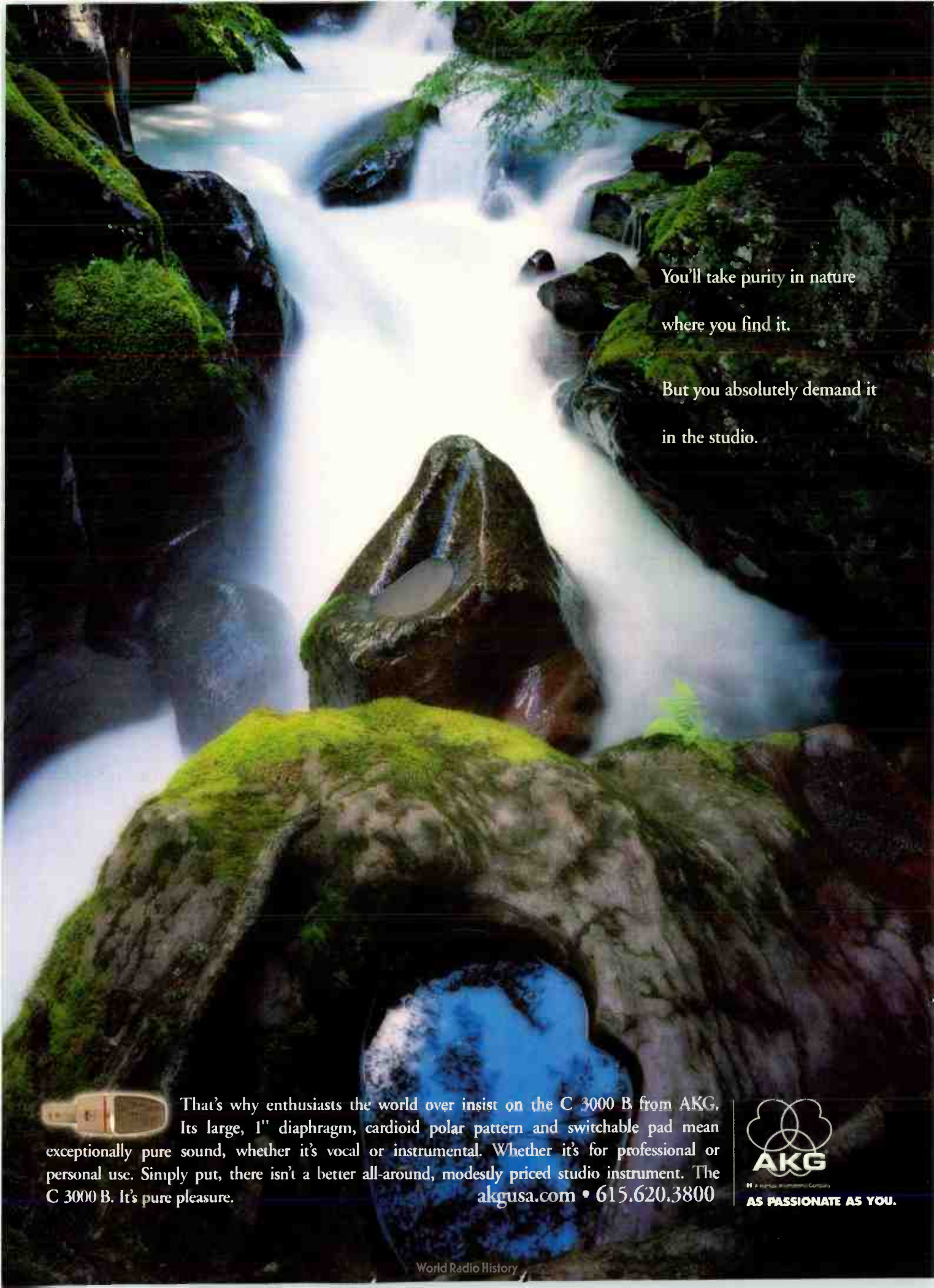

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ABOVE AND BEYOND

There are other features to consider in professional contexts. SMPTE sync is built in to some interfaces, which is important if you need to sync with other SMPTE-compatible devices (not a given in audio-only studios, but a necessity for those involved in post-production).

Another option that may be important is word clock input and output. Word clock is a sync signal, identical to the sample rate, which ensures digital audio signals are all clocked at the same rate. When connecting two pieces of gear together, one device's input simply follows the clock signal generated by the other piece of gear. However, with multiple pieces of equipment, you want all digital audio to sync to a common clock signal. A word clock out can provide this common signal, while a word clock in allows synching to a word clock source.

Systems that are based exclusively on the ADAT optical interface don't require word clock, as clocking is part of the ADAT interface. Still, it's good to be prepared.

Also check out any "special sauce" features. For example, some manufacturers include onboard DSP that raises the price, but can pay for itself in convenience. For example, CreamWare's Pulsar boards pioneered using DSP to run virtual instruments and processors, independent of the host processor; MOTU's 2408 mk 3 uses DSP to provide the functionality of a digital mixer, thus allowing for zero-latency monitoring (otherwise, monitoring through the sound card/computer chain results in some amount of delay).

In any event, audio interfaces have made dramatic progress over the years, from purveyors of sounds for games to full-blown, high-fidelity devices. The bottom line is this: an audio interface is as crucial a component as a microphone, as it links the outside world to your computer — choose it with care.

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World Radio History

HOW TO BUY GEAR

Asking the right questions is sometimes more important than just looking for answers

Decision, Decisions: HOW TO CHOOSE A DAW

By Craig Anderton

Reviews — whether by industry experts in magazines like *EQ*, informed salespeople, or users who present their opinions in internet forums — can be very helpful in deciding what type of gear to buy. However, you have to be realistic. Many people wish they could just pick up a magazine, see a comparison of several DAWs, and read a conclusion that says "Clearly, DAW (X) is the best one."

But the real world doesn't work that way. With very rare exceptions (like when a product totally commands a particular niche), reviews can't tell you whether a piece of gear is the best one for your needs, because no one program has it all.

As a result, you have to do your homework. This doesn't involve just comparing features; the most crucial element is analyzing *how you work and what tasks you need to do.*

Of course, some decisions will be made for you. If you've just been subcontracted to do a ton of music for a studio that does movie soundtracks and uses Pro Tools, you'd be crazy not to get Pro Tools. If you're a Mac fan, you can ignore Sonar, Acid, Wavelab, and other Windows-only software; if your axe is a PC, then you don't need to investigate Digital Performer, Deck, Peak, and the like.

Cubase SX's mixer is highly customizable and easy on the eyes. Channel strips can be wide or narrow, and show knobs with smaller numbers or linear controls with larger numbers. Entire sections can be shown or hidden as well.

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But some choices are much harder to make. For example, suppose you use Windows and are trying to decide between Sonar and Cubase SX. I've tested and used both, and can say without hesitation that they are both extremely capable, brilliantly engineered programs. Yet they're quite different; what might be perfect for one user could be less so for another. So, let's look at the thought processes that go on behind comparing programs, and hopefully you'll be able to apply these insights to your own situation.

LOOK FOR DEAL BREAKERS

The first step is to narrow down your list of candidates by eliminating those programs that simply won't serve your needs.

For example, if surround is an important part of your work, or you expect it to be, you can eliminate all programs that don't offer surround capabilities. Or, suppose you used Acid for years and have a huge library of acidized WAV files, but want to move on to something with more sophisticated MIDI options. As you probably don't want to negate your investment in sample CDs, you'll want a program that can read acidized files.

Maybe you've used Propellerhead's Reason for years but wish you could do digital audio recording with it, or used Ableton's Live and want MIDI editing. If the program you choose implements the ReWire protocol, you can continue to use these programs (and the files you developed for them) with your DAW.

Other deal-breakers include hardware incompatibilities; for example, if you have a dual-processor system, you'll want a program that offers dual processor support. One deal-breaker for me is if a program's controls can't respond to external MIDI control, as I like to mix using multiple hardware faders rather than doing everything with a mouse.

Another deal-breaker relates to your hardware. For example, Sonar works most efficiently with WDM drivers. If your sound card doesn't offer high-quality WDM drivers, or MME drivers optimized for lowest latency, you'll find using Sonar a frustrating experience. Similarly, trying to run Cubase without ASIO drivers will — *ahem* — "drive" you up the wall.

LOOK FOR DEAL MAKERS

Some people buy a program for one particular, essential feature. The classic example is Acid 1.0: although it lacked MIDI, had limited digital audio capabilities, and didn't support plug-ins, for those working with loop-based music it was the only game in town. I've known people who bought Sonar because of the included Cyclone virtual instrument (there's no plug-in equivalent), and some who went for Logic because of how well it integrates with their EXS24 sampler. And when the VST plug-in format first appeared in Cubase VST, many flocked to that program because it could run everything inside the computer.

HOW WILL YOUR BUSINESS EXPAND?

Where is your studio/business headed? If you think audio-for-video might be part of the picture, make sure your DAW supports a video window. But be aware that video implementations vary greatly from one program to another. You want to be able to import as many video formats as possible, and hopefully, have it scrub along when you scrub audio. This is a situation where trial versions can be very helpful: load some video, and see how smoothly it operates. Do screen redraws slow to a crawl? Does the program tend to crash more? Can you easily resize the window?

Music magazine reviews tend to give short shrift to video capabilities, so this is something you'll need to research on your own.

LOOK AND FEEL

Beauty is indeed in the eye of the beholder. You'll be spending a lot of time with your DAW; if you feel a program is downright ugly, all the features in the world won't make it prettier.

There are two main components to evaluating look and feel:

Aesthetics and functionality. You

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want the program to inspire you, but functionality also matters. If there's intelligent use of color, you'll be able to stay in a more "right brain" creative mode. For example, consider a program where the pan function is a numeric value, compared to one where a pan fader changes color based on position. With the latter, you can glance at the screen and get a quick read on the general panning situation. With the numeric version, you need to look much more closely at the numbers, and mentally compare which channels are panned more to the left or right.

Customization. Can you adapt the screen to your liking? For example, some engineers are most comfortable with a DAW mixer that looks like the hardware equivalent, with virtual faders and knobs. Others prefer a more compact setup that has nothing to do with hardware emulation. A good program will not force you into a particular way of working, but give you choices (see figs. 1 and 2).

BUDGETARY ISSUES

Of course, budget always enters into any purchasing decision. But something that may greatly influence your

▶ continued on page 118

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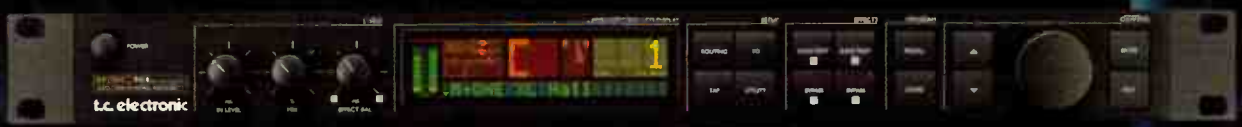

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10 COMMON GEAR-BUYING MISTAKES

By Fletcher

Over the years I've seen more than a few people make mistakes when buying gear. They think they've done their "homework," only to find that the tool they thought was going to change their life for the better has become a useless piece of rack filler, and a daily reminder of a costly mistake. Here are ten tips to help you avoid some of the traps that lie in wait of the prospective gear purchaser.

1. Don't buy gear because of specs. Specs can be made to say damn near anything the person making the specifications wants them to say. Twenty-bit converters can outperform 24-bit types, and 12-bit samplers can have lower noise than 16-bit models. The bottom line is that few of us record specifications, we record music. The only thing that matters is how the tool sounds, on the music to which you're applying the tool.

2. Don't buy solely on the basis of reviews, web site postings, etc. Every one of us has different requirements for our tools. What works well for one reviewer's application, or for some hotshot dude on a web forum, may be remarkably wrong for the music you do or the application where you want to apply the tool. Reviews can help narrow down your search, but not much more.

3. Don't buy endorsements. Seeing some Famous Engineer Dude holding up a piece of equipment with a quote doesn't mean that the brother actually uses it. It often means he got one for free, and wants the publicity of having his picture in a nice full-page glossy advertisement. This sort of thing has helped out a few careers, but doesn't guarantee that your work will sound anything like the Famous Engineer Dude's" work because you invested in a particular device.

4. You can't really tell jack about a product in a store. The only worthwhile place to check out gear is in your environment, where you're comfortable. So, make absolutely sure that you know a store's return policy before you make a purchase — check whether the store has a 3-day or 30-day return policy, and whether that return policy is for a full refund, or store credit. Also, before you take that microphone out of the store to try at home, make sure that the store won't quote some nonsense "health code regulation" that supposedly prohibits returning the microphone for any reason.

5. Don't buy on the basis of religion. You know what I mean...the people who use a particular DAW because "everyone uses it"; there are plenty of products that can sound and work better than the various "industry standards." Look around at how you work, how you would like to work in the future (very important), what features you think you'll require, then evaluate a variety of systems on the basis of how they sound with your music. Also, avoid religion when it comes to converters, Mac versus PC, plug-ins, microphones, and "vintage" gear.

6. Watch out for the sheep factor. The "sheep factor" comes from having read in a bunch of articles, or heard from your

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HOW TO BUY GEAR

friends that "X" piece of gear is the "be all-end all" of any recording. Some companies are living on momentum. There may have been so many revisions and models of products from a given company — and it may have changed hands so many times — that unless you do some serious homework, you could very well end up with a pig that has a cool logo.

This also applies to a lot of "reproduction" products. Some are absolutely killer sounding, perhaps even better than the originals; others are just crap that trade on a fading reputation. You won't know for sure which is which until you evaluate the unit in your studio, on your music.

7. Don't always wait for the next "revision." Especially in the madcap world of digital audio products, some revision will probably come out within hours of your buying an item. The bottom line: these are tools. Yes, there may be an improvement or two as time marches on, but if you get equipment made by a customer service-oriented manufacturer, they will often make software updates available to users of previous versions for a significant discount. Meanwhile, you were able to use the tool to put bread on the table.

8. The latest and greatest ain't necessarily best. Sometimes a previous revision did something that's missing in the latest software. Going back to the dark ages, I once had a Lexicon PCM-70 with a great program in software revision 2.2 called "tile room." It wasn't in software revision 3.0, and I was seriously bummed. This has happened to me a few times (though that one really got me, so I remember it best). There have been other improvements to hardware units that really weren't, and several pieces that were great before serial #54321 but flat-out sucked after serial #54322.

Be somewhat skeptical of "improvements." Manufacturers will sometimes make "improvements" so they can resubmit an old product for a new magazine review. Other times manufacturers will make "improvements" so they can cut costs during the manufacturing process. It's your job (and the job of the sales weasel with whom you've struck up a meaningful relationship) to make

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sure that an "improvement" is really going to be an "improvement" to your studio, music, and way of working.

9. Be careful about buying solely on the basis of price rather than service/support. There are full service stores, there are "box houses," and there are some that kinda function as both. If you buy solely on price, you'll be jumping from place to place and won't develop a relationship with any particular sales person. Developing a long-term relationship with a vendor can save you money in the long run — when sales people get to know you and have a handle on your needs, they'll often be able to make intelligent recommendations.

When you purchase from a "box house" on price alone, it's vital that you've done your own homework, and know *exactly* what you need to serve your purposes. (Editor's note: But don't do the research on a retailer's time, then turn around and buy from someone else based on price. That's not just rude and inconsiderate, it contributes to putting the people who helped you out of business.)

10. Avoid buying from unsecured web sites where you supply credit card numbers. If you're shopping over the Internet, make sure that the information you supply is transmitted over a "secure" line. It's very easy for your credit card information to be lifted in transit by someone with even medium hacking skills. If this happens, you may find that in addition to buying a "Heranix Defribuluxer," you also purchased half of the macadamia nut production for the island of Maui for the next six months.

Something like this happened to me recently: My wife bought some bathroom fixtures on line, somebody grabbed her credit card number, and it turned out she had a small shopping spree through many other online shops. We were only responsible for $50, but someone else got a hell of a nice pair of boots, a sleeping bag, and a sub-zero rated parka on her credit card number, then she had to take the time to clean up the mess.

With that said, also understand that when you make an online purchase, you may be called by the vendor to supply additional details that only the actual cardholder would possess.

There you have it, ten tips. Best of luck with your studio's capital improvements. The key is to spend your money wisely on equipment that will last you 20+ years. Try to avoid "disposable" purchases that let you get by for now, but you will outgrow in a year or two. Think about it — if you spend $500 on a unit that will serve you for only two years, that unit cost you $250 per year to own. If you buy a $2,000 unit and are able to use it for 20 years, it only cost you a $100 year, and you will have made a significant income during that time by having a better quality unit that helped you make better sounding product. That's called "value," as opposed to "bang for the buck."

Fletcher is the buyer for Mercenary Audio, so he purchases a lot of gear every year. He started as a sound reinforcement engineer in 1973. Entering the studio in 1979, and leaving the road for good in 1986, he's been an engineer and producer straight through to present, despite his "day gig."

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Tommy), MIDI Time Code to allow MIDI data to be time-stamped with SMPTE timing information, MIDI Machine Control for integration with studio gear, microtonal tuning standards, and a lot more. And the activity continues, as issues arise such as how best to transfer MIDI over USB.

The guardian of the spec, the MIDI Manufacturers Association, has stayed a steady course over the past 20 years, holding together a coalition of mostly competing manufacturers with a degree of success that most organizations would find impossible to pull off. The early days of MIDI were a miracle: In an industry where trade secrets are jealously guarded, manufacturers who were intense rivals came together because they realized that if MIDI was successful, it would drive the industry to greater success. And they were right.

I had an assignment at the time from a computer magazine to write a story about MIDI. After turning it in, I received a call from the editor. He said the article was okay, but it seemed awfully partial to MIDI, and was unfair because it didn't give equal time to competing protocols. I tried to explain that *there were no competing protocols*; even companies that had other systems, such as Oberheim and Roland, dropped them in favor of MIDI. The poor editor had a really hard time wrapping his head around the concept of an entire industry willingly adopting a single specification. "But surely there must be alternatives." All I could do was keep replying, "No, MIDI is it." Even when we got off the phone, I'm convinced he was sure I was holding back information on MIDI's competition.

MIDI HERE, MIDI THERE, MIDI EVERYWHERE

Now MIDI is everywhere. It's on the least expensive home keyboards at Circuit City, and the most sophisticated studio gear. It's a part of signal processors, guitars, keyboards, lighting rigs, smoke machines, sound cards...you name it. It has gone way beyond its original idea of allowing a separation of controller and sound generator, so people didn't have to buy a keyboard every time they wanted a different sound.

In the last week, here's how I've used MIDI in the studio:

- Saved the setup of my Panasonic DA7 mixer in Sonar as Sys Ex, so I could recall the mixer settings I used when mixing a tune.
- Played several software synthesizers, which are all driven by MIDI tracks, with the M-Audio Oxygen8 keyboard.
- Used the same keyboard as a remote control for Sonar, so I could stop and start recording remotely while doing guitar overdubs.
- Sent my computer's MIDI out into the Adrenalinn signal processor so its tempo could sync to the sequencer.
- Updated the Adrenalinn firmware by downloading a MIDI file from the net, and transferring it over via MIDI.
- Programmed the Line 6 POD by setting up the DA7's MIDI layer to send controller information out to adjust various POD parameters.
- And finally, practice for an upcoming gig at NAMM by running MIDI control signals from a Peavey PC-1600x fader box into a USB interface connected to a Mac PowerBook, so I can do a "live remix" with Reason.

Yeah, I guess MIDI is still viable....

SO WHERE'S IT GOING?

"Always in motion, the future..." Well, Yoda does have a point. But the key point about MIDI is that it's a hardware/software protocol, not just one or the other. Already, the two occasionally take separate vacations. The MIDI data in your DAW that drives a soft synth doesn't go through opto-isolators or cables, but flies around inside your computer.

One reason why MIDI has lasted so long is because it's a language that expresses musical parameters, and these haven't changed much in several centuries. Notes are still notes, tempo is still tempo, and music continues to have dynamics. Songs start and end, and instruments use vibrato. As long as music is made the way it's being made, the MIDI "language" will remain relevant, regardless of the "container" used to carry that data.

Happy birthday, MIDI. You have served us well, and we wish you many happy returns. ■

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THE TWO TOWERS

The making of the towering second soundtrack for *The Lord of the Rings.*

BY WILL ROMANO

World Radio History

Critics and rabid fantasy fans alike thought it couldn't be done. It was folly, they said, to attempt to bring J.R.R. Tolkien's epic trilogy, *The Lord of the Rings*, to the big screen in a three-part series — and to film it all at once. Hindsight is, of course, 20/20, and New Line Cinema, behind the visionary direction of Peter Jackson, has thumbed their noses at the naysayers by earning over $860 million (and a few Academy Award nominations) and presenting to audiences some of the most fantastic film imagery in recent memory.

Still, the makers of LOTR aren't out of the woods just yet. The second film in the cinematic trilogy — *The Two Towers* — has a difficult mission: to intelligently and creatively move the plot along while holding the audience's attention for a three-hour flick with a guaranteed unresolved ending.

While it's safe to hedge that *The Two Towers* will undoubtedly take its place next to *The Fellowship of the Ring* in film history, the producers approached this project as though they had to prove themselves all over again. Every aspect of the finished movie is the direct result of the unflinching commitment to excellence and extraordinary passion of the filmmakers. The music is no exception. Throughout the summer and the fall of 2002 the LOTR music production crew had worked intently on getting the tracks ready for dubbing in New Zealand. Composer Howard Shore even wrote, for the most part, to the final cut of the film so that the music and images are innately synchronous. That may have prolonged the filmmaking process (and it is certainly different from other film projects), but the proof, as they say, is in the pudding.

"Nuances change from cut to cut, beat to beat within the scene," said Paul Broucek, executive album producer, music executive, and supervisor at New Line Cinema. "Howard is a master composer and the way he works makes the music seem so in tune with the picture."

Nothing was left to chance. The music crew used two recording devices (one for backup), three venues, one full orchestra, two choirs, and recorded a dizzying number of takes. The project was, quite simply, a monster. This many-tentacled creature could have spun the production out of control, but it didn't, in part because the producers and engineers were using two different network systems for storing their tracks. Thanks to the A/V SAN PRO network (installed at legendary Abbey Road Studios in London), the mixing/editing process was made easier and quicker.

"In the old days mixing editors would have to exchange tapes," said Broucek. "Now it is all on a network, so, if more than one editor wants to access a cue — a piece of music — they can tweak it simultaneously from their own separate stations."

"Unlike last year when I was mixing the first film and we ended up with a control room full of tapes, the SAN was a complete dream," said head mixing engineer Peter Cobbin. "My assistant engineer got far too much exercise walking between his seat and the tape machine — what with spooling and finding certain spots."

RECORDING THE SOUND OF EVIL RISING

The Fellowship of the Ring soundtrack was awe-inspiring, but *The Two Towers* — while equal in sonic complexity — is quite a bit darker. It's no accident that as the characters surge straight to the heart of evil, the mirth within the musical score decreases.

"There is more at stake in the second film," said Broucek. "The ring is affecting Frodo [Elijah Wood] and he is getting weird. Saruman [Christopher Lee] and his evil army are gathering force. The fellowship has been splintered."

The music is composed of three basic elements: orchestral, choral, and solo vocal. They all meld beautifully into one another — a byproduct of the quasi-operatic format on which Shore based his composition.

"In an opera, everything stems from the music," said Shore, who not only composed but orchestrated, conducted, and produced

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the music. "While this is the reverse of that, I am trying to achieve the same effect: get all of your senses working together so the film lives and breathes like one complete work."

Most of the orchestral recordings were done at the CTS Colosseum at the Watford Town Hall during the summer of 2002 and the choral sessions were recorded, for the most part, at Abbey Road Studios' Studio 1. (A minimal amount of recording was also done at AIR Studios at Lyndhurst Hall in London.) The Colosseum is a shoebox-shaped acoustic dream with a huge 135 x 75 ft auditorium and a stage area that accommodates a 150-piece orchestra. (It also included a 25 x 14 ft video screen.) The sessions would begin at Watford at 2 PM and continued to 5 PM. The sessions would pick up again at 6 PM and continue to 9 PM.

Recording engineer John Kurlander — a Los Angeles resident and transplanted Brit who has engineered for The Beatles, Elton John, Boyz II Men, and Celine Dion (among others) as well as numerous classical projects — would arrive at Watford at 7 AM and begin hanging mikes and positioning chairs. While Kurlander isn't forthcoming on just where the mikes were placed in relation to the musicians, he takes pains to say that he carefully mapped his recording set up to ensure that it remained the same whether the venue was Watford or Abbey Road.

"Just like a digital desk will recall a set up with total accuracy and all the mic pres are brought back within fractions of a dB, so the same way the musicians and the chairs on the risers are set up to that degree of recall," explained Kurlander. "In that way we could do sessions that are spread out over time. I would say that every chair and every musician and the relationship of that musician to the mic was set up to within one inch — or less."

"[John] puts the mic stands at the same depth, gets the measuring tape out and makes sure the distance is the same no matter what venue we were at," explained Broucek. "He also has a level to make sure that the angle is exactly the same. In this way, there were no changes to the sound and we were able to go back and grab any piece of the cue we want."

To capture the near-100 piece orchestra Kurlander set up a Decca Tree with three large diaphragm tube condenser Neumann M-150s — left, center, right — high above the action, and four Neumann TLM-50s: two for surround sound (higher than the tree) and two for wide range on the outside of the strings.

"The M-150s and the TLM-50s are probably my favorite orchestral mics," said Kurlander. "The M150 is a reincarnation of the famous tube M50. When [Neumann] came out with the TLM-50 people were disappointed because they didn't sound like the old M50. What some people failed to realize is that they were never supposed to. They had uses for me as wide mics, for the strings and the surround mikes that were set up high above the orchestra."

To complement the Neumanns, Kurlander used a number of other mics including AEA R44C ribbon mikes — a recreation of original RCA 44 ribbon mics (which is a figure 8 pattern) — for close miking (or "closer miking" compared to the TLM-50s) for the strings. (All the others mics are omnidirectional — the M150s more so at low frequencies.)

For far-range spot mikes, Kurlander employed DPA 4006's (an omnidirectional condenser mike) for woodwinds and percussion. On other instruments such as the harp, Kurlander used a Coles 4038, and Electro-Voice RE20's for the two pianos (one was used for effects).

"The second piano was banged with chains and that ruckus would rear its ugly head any time you'd see the Uruk-hai,"

Clockwise from top: Howard Shore and John Kurlander at Abbey Road; Peter Cobbin in the Penthouse at Abbey Road; John Kurlander alone.

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said Kurlander.

The microphones, including the tree and individual mics that make up the various surround configurations, were all bussed to separate tracks in Pro Tools. "I'd record probably a maximum of 32 mics," said Kurlander. "The average input for the basic orchestra was about 26 mics and extra for the soloists such as solo violin or solo flute or ethnic instruments like a sarenghi."

Fourteen of the main mics went through Avalon 2022 mike preamps. The other 12 mikes went through Neve Capricorn mike preamps.

"I tend not to use different makes of mic pres for different instruments," explained Kurlander. "I don't put brass through an Avalon and strings through something else. I find that the sounds that the Avalon give are incredibly transparent and clean. In my experience, when you are dealing with orchestral miking you don't want too much colorization."

From the mic pres, the signal went into six Prism Sound Dream ADA-8's (analog to digital converters), which were racked up for a 48-track rig. After the Prisms, the signals went into the desk — a Neve Capricorn — which fed out MADI.

"The MADI went into the Euphonix MADI router and the router split the signal, which went to the [Sony] 3348 for safety copy and to Pro Tools," explained Kurlander. "Then the Pro Tools went back through the MADI router and returned to the Capricorn for monitoring while it was recording."

Though Pro Tools was the main recording device, the 3348HR was used as backup. "The 3348 was just running in case something happened with Pro Tools," said Kurlander. "Maybe once every four or five sessions you'd have a crash on Pro Tools during the take and rather than have to tell Howard [Shore], 'Well, we didn't get that take,' we went through the trouble of running the 3348 so nothing was ever lost. The 3348 was used to recover over a dozen takes over a three month period. If we thought we had lost a track from Pro Tools, we just switched it back through the MADI router. So instead of the desk signal going into Pro Tools, the 3348 was getting routed back to Pro Tools for instantaneous recovery."

The Pro Tools tracks were then stored on a mini storage network. Ultimately, the cues were transferred to a large area network, the A/V SAN Pro, which was based at Abbey Road Studios in London.

The LOTR score also required the recording of a 60-voice mixed adult choir (the Voices of London led by conductor Terry Edwards) and a 30-voice boy's choral group, the London Oratory School Schola. Most of the vocalists were recorded at Abbey Road's Studio 1. For the first film, Broucek and Kurlander and the music team tried to record the choirs and the orchestra in the same sessions. But for *The Two Towers*, director Peter Jackson wanted separation for the mix so the voices were overdubbed and done separately. "It is a little unwieldy to have 96 musicians and a 60-piece choir in the same room at the same time," admits Broucek.

The Studio 1's solid wooden parquet flooring, and similar size to Watford — typical of the English architecture of the 1920s — made for impeccable acoustics. Kurlander had the pleasure of recording Ben Del Maestro with the London Oratory School Schola. He used spot Neumann 87s and two TLM-50s for left and right ambience.

"The acoustics at Abbey Road are such that we had Ben singing in the middle of the studio and it sounded just as impressive as a one-hundred piece orchestra," commented Peter Cobbin.

Assisted by Irish linguist Roisin Carty, the solo vocalists for both film projects sang in the languages of Tolkien such as *Sindarin* and *Quenya* (elfish speech). Other forms of speech such as *Andunaic* (dwarfish), Black Speech, and a form of Olde English (for the world of Rohan) crop up in the film as well. Because the score is at its root opera, the languages become the voices of the score.

"Tolkien was a professor of language,

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so we take great care in translating the Tolklen languages correctly and also pronouncing them correctly in the recordings," said Howard Shore.

The music producers had a great pool of singing talent to choose from. Former Cocteau Twins singer Elizabeth Fraser sings "Isengard Unleashed," which includes a kind of reprise of her *Fellowship* performance, "Lament For Gandalf." The young Del Maestro is the lead voice on "Forth Eorlingas." Opera soprano Isabel Bayrakdarian takes the forefront for "Evenstar," a piece concerning the love between Strider and Arwen. Sheila Chandra fuses elements of her traditional Indian and pop music experience for "Breath of Life." Hilary Summers sings on the bonus track to the CD soundtrack ("Farewell To Lorien"), and Virgin Records' budding 22-year-old star, Italian/Icelandic Emiliana Torrini breathes life into "Gollum's Song" (an ode to that misshapen, misunderstood, and misguided creature she sings in English) with her succulent Nordic accent.

"Torrini is Icelandic and we thought her voice would be perfect for the film because a Nordic type of culture is so predominate in the film," explained Shore.

ENTER SAN-MAN

Over 160 minutes of music is featured in the film, with an average cue clocking in at anywhere from 8 to 10 minutes. (Shore had written a massive near-10 hour score for the 11-hour film trilogy.) Kurlander, in order to avoid confusion in the mixing stage, sent the track count skyrocketing by using the full 48 tracks of Pro Tools even when there wasn't a

SIMULTANEOUSLY BUILDING A CD SOUNDTRACK

Four weeks into the mixing process for *The Two Towers* score, the CD soundtrack (an abbreviated version of the movie music) was being pieced together. Peter Cobbin's stereo mixes were vital to its formation.

"After I finished a film mix, I would do an independent stereo mix at Abbey Road which was on the SAN in a separate file," said Cobbin. "Then, on a Pyramix digital audio workstation, a PC editing system, another editor who was working purely on the soundtrack, had the ability to peel off the tracks on the A/V SAN PRO network. He could pick up my surround mixes and my stereo mixes and then at Howard Shore's request — who obviously knew the score backwards — we could manage to start cutting down the cues. It would start off by Howard saying, 'I really like these bars of these cues — it would be good to keep these.' We were setting up the CD soundtrack song list almost like chapters of the book."

The final *The Two Towers* CD, the standard jewel box edition, has 19 tracks (20 tracks, if you own the limited edition version). Like the motion picture soundtrack for film one, the song listing on *The Two Towers* unfolds in chronological order to coincide with the movie plot. It was Shore's and the production team's idea to let the listener relive the movie, or visualize it if they haven't seen it.

"Howard had plenty of opportunity to hear how some of the process of whittling down and cutting down to shape of the score for the soundtrack and he was hearing this constantly. And that is a process that was constantly revised. Howard had very clear and specific ideas for how he would like the soundtrack to be shaped," explained Cobbin. "By the time that the film finished we almost had a soundtrack that really only take another two or three days additional work to finish because we managed to keep up with the soundtrack independently of the film."

World Radio History

signal on a track.

"I've worked on other movies where they always tell you to keep the disk space down — keep only the number of files you need — but if those tracks get in the hands of someone else, it could be confusing and frustrating," explained Kurlander. "They could be looking for tracks that are not there. So, I like using all 48 tracks and essentially making the Pro Tools a 48-track recording machine even if there were only 40 tracks with signals on them. You can imagine how many thousands of files we had.

"During the recording sessions I would do, in addition to the tracks, a live monitor mix and a 5.1 stereo mix," continued Kurlander. "That would all get edited together when it went to Peter Cobbin for mixing at Abbey Road. He'd have all my microphone and live mixes and start by listening to my live mix and refining it."

Before final mixing, the tracks went through an extensive edit process. Edit review sessions involved Shore, Kurlander, and other editors (including edit mappers who helped to decide what take to use — though they never actually did the edit themselves) and were aimed at deciding how well the tracks worked.

"We'd do this maybe two or three times a week," remembered Kurlander. "Sometimes I'd get a call that there would be a review session at 11:30 PM — after we had been working all day."

If something had to be redone, usually that decision was made after the initial remix of the tracks. (A whole other round of mix review sessions occurred later.)

"Sometimes things would get re-recorded for different reasons," said Kurlander. "If Howard felt that he wanted to touch up something he would slightly re-write it or ask if we had a better take. If I felt that something should be re-recorded, then it would be brought up. Either way, if it was agreed to record something again, we'd slate it in for re-record."

Thanks to the A/V SAN Pro network, music files were changed very easily. The crew sifted through cues, cut and tinkered with them, to bring out the best in the track. The SAN works like a network server; different editors and mixers can use the same files, at the same time, and make changes simultaneously. The SAN had nearly sixty drives with a total storage capability of over two terabytes. A fiber optic cable running around the Abbey Road facility linked six different editing and mixing rooms. Pulling the information off the network made the process of instituting changes to the score much easier and faster.

"We would do a mix and then it would go through review," said Cobbin. "Once on the network, there were three specific editing rooms capable of editing 48-track. The editors would peel off whatever sessions were needed and edit based on requested changes. All you would do is look at the drives on the SAN and pick up what you needed. You generally have a cue per drive so it was easy to locate material."

▶ continued on page 116

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Equipment Spotlights!

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Fostex DV 40

PG.2

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PG.1

Dale Pro Audio Launches New Web Site

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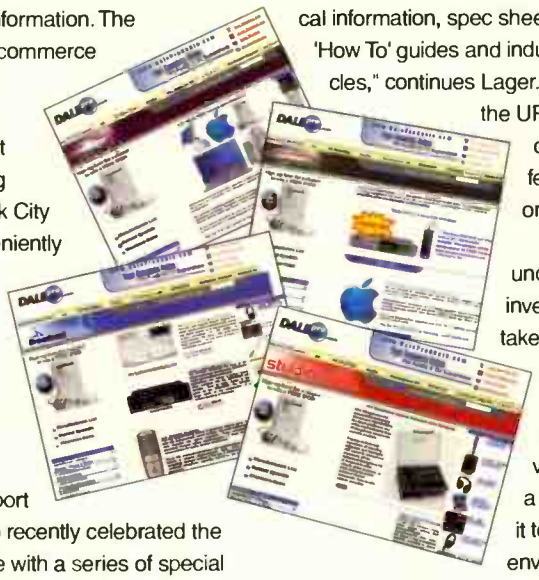
Responding to the needs of its customers, Dale Pro Audio has redesigned and rebranded its Web site, www.DaleProAudio.com to offer many advanced e-features such as secure online ordering, real time order tracking and enhanced product information. The foundation for the e-commerce platform is Dale Pro Audio — a family owned company that has been conducting business in New York City since 1957 — conveniently located at 7 East 20th Street, between 5th Ave & Broadway. The company is built on the strength of its sales people and knowledgeable support staff. Dale Pro Audio recently celebrated the launch of its new site with a series of special offers and give-aways.



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Transducers Are Forever

What can you do to make your studio stand out? Recording formats come and recording formats go, but transducers are forever. Regardless of the recording format, live recording will typically require mics, mic preamps, and speakers. Synths are great, but until we have chips installed on our vocal cords, we'll still be singing into microphones.

While there have been incredible advances in recording devices, the mic manufacturers haven't stood still. There have been a flood of large-diaphragm condenser mics from both Europe and Asia. You can buy a mic with excellent performance for under $500. At least one manufacturer makes a mic with usable frequency response to over 40 kHz that would be ideal to use with 24/96 recorders. At the other end of the spectrum, we're seeing a trickle of mics with on-board AD converters. It's only a matter of time before we'll be using optical mics with laser elements to convert sound into digital signals.

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Mic preamps have also come a long way. At least 20 manufacturers produce 1- or 2-channel preamps with either dynamics, EQ or both. Preamps look to the past with re-creations of famous designs from the 50s and 60s. Others embrace the future with digital outputs.

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continued from page 1

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continued from page 1

audio, computer-based recording, microphone technology, contractor installations, broadcast engineering and much more.

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World Radio History

Ellipse Offers Dual Concentric Technology

Tannoy's latest studio monitor — the Ellipse 8 — is a three-way, active speaker in a unique elliptical cabinet. The Ellipse 8 employs dual concentric high- and low-frequency drivers, plus a SuperTweeter, which extends high-frequency response out to 50 kHz. The Ellipse 8 is designed for nearfield reproduction in music, post-production, and broadcast applications.

Ninety-degree horizontal dispersion provides a wide sweet spot for practical working across the console, while analog signal processing achieves an exceptionally flat frequency response in use. Discrete MOSFET power amplifiers, with generous power supplies, provide more than ample power with extremely low noise and distortion. The unique cabinet shape not only has a striking appearance but is inherently stiff. Constructed of laminated birch with a massive MDF baffle and rear panel, the enclosure is non-resonant acoustically and mechanically.

Constructed from an alloy and carbon-fiber dome, the SuperTweeter is driven by a dedicated 30-watt amplifier (with 80 kHz bandwidth) and is time-aligned to the Dual Concentric driver. Crossover between the HF driver and the SuperTweeter is at 14 kHz — a point high enough not to interfere with critical mid-band stereo information.

Available at DALE pro audio
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Field Recording Life After DAT

If the days of the DAT recorder — which revolutionized the art of field recording in late '80s — are numbered, as many believe, what will take its place?

Popular alternatives include flash cards, hard-disk recorders and laptops. Marantz, a company with an excellent track record in portable recorders, introduced the PMD690 — a stereo recorder with a Type III PC Card slot, compatible with both compact flash and ATA-size PC Cards and IBM MicroDrives. The Denon DN-F20R compact flash card field recorder is another exciting new product on the market. First-generation PC card recorders such as these serve as excellent options for the radio, TV broadcast and film markets, where the majority of individual recordings are relatively short in length.

Recently, new laptop computer-based products have been developed to satisfy the growing needs of field recording engineers. Two-channel solutions like the Sound Devices USBPre1.5 and the Grace Design Lunatec V3 are both proven, high-quality audio interfaces. For more advanced applications, there is the Metric Halo Mobile I/O 2882+DSP — an 8-channel, FireWire®-based multi-format audio I/O which is fully modular and interoperable, and when chained together, the overall system will run up to 128 total channels of 96k audio. Designed to provide on-board low-latency signal processing for seamless foldback mixing in tracking, the Mobile I/O provides engineers with unsurpassed flexibility and real time control in the field.

Another viable alternative is the Zaxcom Deva II — a beefier version of the world's first portable 4-channel 24-bit uncompressed hard disk recorder. The Deva II is loaded with upgraded software, a triple redundant directory structure and an improved mic preamp. Clearly, removable hard-drive recorders and laptop computers represent the future for audio engineers interested in utilizing high-resolution formats for extended recording sessions in the field. Look for more articles on laptop recording in upcoming Issues of Dale eNews.

Console Comeback?

Over the past few years, small to medium format consoles have been overshadowed by the all-encompassing DAWs available today. Recently, however, we have seen a resurgence of interest in consoles. This is due in part to advances in technology and users discovering the limitations of a DAW as a standalone solution. Consider a desk like Yamaha's DM2000, Sony's DMX R100 or perhaps the Tascam DM24. With digital dynamics and EQ on every channel, a user can save a ton of DSP power in their DAW for other processes, virtual instruments, or sheer track count. In addition, these desks provide a tactile work surface, whether for use as a console or controller. And thanks to their inserts and flexible routing matrix, you can now easily insert all of your old (or new) outboard gear on your mixes again. Analog consoles need not be left out in the cold. Although they may lack the processing power of digital desks, they are free of latency constraints and can offer signal routing flexibility that may offset the price of larger I/O for your DAW. Nothing says, "This is a legit studio" like a console. Just about everyone has a computer, but many feel a console differentiates the pros from the enthusiasts (or something like that). If you have been missing that large, impressive piece of gear in your room, the interaction of signals as they sum in an analog or high-quality digital board, or just the look of lots of buttons, knobs, and faders, start thinking about a console. Of course, this very brief overview just scratches the surface regarding your choices and trade-offs. Give us a call, and we'll be happy to help you sort things out.

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World Radio History

By Mitch Gallagher • mgallagher@musicplayer.com

Disc Makers Elite-Pro1 DVD-R/CD-R Duplicator/Printer

CD production, not just duplication

Many studios have found that being able to offer short-run duplications of CDs can be a nice little profit center. And many independent musicians have found that it makes sense to have a duplicator around for doing short runs of their own projects. One of the first DVD-capable duplicators was recently released by Disc Makers, the Elite-Pro1. (Other models in the line offer various configurations of drive types and numbers.) In addition to duplicating CDs and DVDs, the Elite-Pro1 has an integral printer for adding text and graphics to your discs.

The Elite-Pro1 is a turnkey system, comprising a built-in PC and all necessary software. Set up is easy; you have to install the "pick arm," which is the piece that actually moves the discs around from drive to drive. The only other set up is placing the printer on its stand and hooking it up, and hooking up the CPU monitor, mouse, and keyboard. The system arrives with the required software installed, although the review unit I received couldn't find drivers for its printer. It was no problem to install them from the included software CDs.

As a duplicator, the system is easy to use. Just boot the Disc Juggler software, tell it how many copies you want, and go. The Elite-Pro1 isn't the fastest duplicator on the block, a function of its 2x/8x DVD-R/CD-R writer (the CD-only version is a 48x writer). However if you want to go faster, you can upgrade to multiple write drives. A second drive was included with my review unit. Installing the additional drive wasn't difficult, requiring only basic screwdriver skills.

While the Elite-Pro1 works fine as a straight duplicator — I tried a variety of disc types and formats, and all were copied perfectly — it can do much more. As mentioned you can also print on the duplicated discs. A software package is included that lets you design basic layouts, add text, drop in graphics and photos, etc., so you can start making good-looking product right off the bat.

The software included with the Elite-Pro1 can also get much deeper into the details of CD/DVD creation. It comes with a 154-page manual that covers all the possibilities and includes a nice glossary of related terms. The software is powerful enough that you can use it to create discs from scratch based on your raw data or audio files — you don't have to work by copying an existing disc. You can create all formats, CD-ROM, CD-Text, Bootable CDs, data DVDs. multi-session DVDs, bootable DVDs, and more. You can really get tweaky, right down to sub-codes. All of this detail is hidden if all you want is basic duplication, but there's tons of easy-to-use power there if you want it.

The Disc Makers Elite-Pro1 isn't the least expensive duplicator on the market, but it certainly is among the most powerful and flexible — it's a CD/DVD production station in addition to a straight duplicator. ■

DISC MAKERS ELITE-PRO1

MANUFACTURER: Disc Makers, 7905 N. Route 130, Pennsauken, NJ 08110. Tel: 800-468-9353. Web: www.discmakers.com.

SUMMARY: Upgradeable turnkey duplicator can handle both CD and DVD duplication, as well as print right on the discs.

STRENGTHS: Turnkey system is easy to set up and use. Field upgradeable to multiple drives. All required duplicating/printing software included.

LIMITATIONS: Too noisy to sit in your control room.

PRICE: Elite Pro1 for CD, $4,690; Elite Pro1 for CD/DVD, $5,290. (Elite-Pro1 for CD, without built-in CPU, is $3,790; $4,290 for DVD.) Other configurations also available.

World Radio History

By Mitch Gallagher • mgallagher@musicplayer.com

Summit Audio TLA-50 Mono Tube Leveling Amplifier

Take your studio to the compression summit

SUMMIT AUDIO TLA-50

MANUFACTURER: Summit Audio Inc., P.O. Box 223306, Carmel, CA 93922. Tel: 831-728-1302. Web: www.summitaudio.com.

SUMMARY: The TLA-50 provides classic Summit tube compression in a compact, affordable package.

STRENGTHS: Fat warm sound. Easy to use. Sidechain input. Stereo-linkable. Cool output/gain reduction meter.

LIMITATIONS: None to speak of.

PRICE: $695

We're all looking for the best front end for our systems; the best mics, preamps, and converters. Also included in that list are compressors; great-sounding gain control is essential for tracking many styles of music. Summit has been well known in the compressor game for years, beginning with their high-end DCL-200. The latest compressor from the company, the TLA-50, features hybrid circuitry, combining both vacuum tube and solid-state technologies.

The TLA-50 is a single-channel, half-rack unit. Its rear panel features a combination 1/4-inch/XLR input connector and separate 1/4-inch and XLR outputs. Quarter-inch sidechain and stereo link jacks and a three-prong IEC power connector round out the I/O complement. Up front, the first thing that catches your eye is the cool horizontal mechanical meter — no LEDs here. The meter has a yellow backlight; this flashes red when the unit clips. On the left, there's small three-position switches for setting attack and release times, a switch for setting the meter to show output level or gain reduction, and the output gain knob. (There's no input level control but for most applications you'll never miss it.) On the right are the gain reduction knob, the power switch, and a three-position switch that toggles among bypass, compress, and stereo link. To use the TLA-50 in stereo, two units must be connected with 1/4-inch cables by their rear-panel Link jacks.

Setting up the TLA-50 is easy, and is clearly described in the excellent manual: Adjust the gain control for 0 VU on the meter. Set the desired attack and release times (start with slow attack and fast release), adjust the gain reduction to a suitable amount, then re-adjust the output level for 0 VU. At this point, you can experiment with the attack and release times until you are satisfied with the results. Simple!

I only had one TLA-50, so I couldn't check stereo operation. However, I put it through its paces while tracking and mixing a variety of sources. As a straight compressor, the unit functions well. I had no problem dialing in the results I wanted. Compressor novices will find the TLA-50 easy to use, while veterans will find it fast to set up. Inveterate tweakers may wish for more detailed control over ratio, etc., but for most applications the TLA-50 has everything you need to get the job done.

I also used the TLA-50 for de-essing vocals, by routing an equalized signal into the sidechain input, and I used it for ducking overly present keyboard pads that were interfering with a rhythm guitar track — in both applications, the TLA-50 performed very well.

All the audio quality you'd expect from Summit is in the TLA-50. The box is clean and quiet, and delivers a punchy output signal that's slightly fatter and rounder than what was originally sent to the inputs.

The TLA-50 is more flexible than it would appear on the surface, with all the control you need to get the sounds you want, and nice extras such as sidechain insert and stereo linking. It's easy to use, and adds a desirable to the signals it processes. And it's compact and affordable. What more could you ask for? ■

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World Radio History

By Mitch Gallagher • mgallagher@musicplayer.com

Benchmark DAC1 Two-Channel D/A Converter

Getting audio out of your digital system is just as important as getting it in

As we've moved our studios into the digital world, most of us have focused on the front end of the equation — getting the best possible converters we can for translating audio from the analog to the digital world. In many cases the other end of the chain seems to have been ignored or to have taken second place in importance.

But recently several companies have introduced high-quality digital-to-analog converters (DACs) intended to bring the analog output of our digital systems up to the level of the input. Among these new offerings is the Benchmark DAC1, a half-rack unit that comes in at an affordable price. More than just a straight-ahead converter, the Benchmark offers an array of useful features inside its compact enclosure.

The back panel contains three sets of stereo digital inputs: AES/EBU (XLR), coaxial (BNC, but an RCA-to-BNC adapter is included), and TOSlink (optical). A front-panel switch lets you select among the input options. Also on the back panel are balanced XLR and unbalanced RCA outputs; both are active simultaneously. Rounding out the back panel is a standard IEC power cable connector (no wallwart), and a three-position switch for setting output level. In the top position, the output level is fixed and calibrated using 10-turn rear-panel trim controls. In the middle, the line outs are turned off. In the bottom, variable position, output level is governed by the front-panel volume knob. Rounding out the front panel are the three-position input selector and three LEDs indicating power, clock error (or no signal), and the presence of a non-PCM signal such as Dolby AC3. In addition, the front panel has two 1/4-inch headphone jacks whose level is controlled with the variable gain knob. Note that there is no power switch; you'll need to plug the DAC1 into a power switch if you want to turn it off.

BENCHMARK DAC1

MANUFACTURER: Benchmark Media Systems, 5925 Court Street Rd, Syracuse, NY 13206. Tel: 315-437-6300. Web: www.benchmarkmedia.com.

SUMMARY: Excellent-sounding, flexible D/A converter that will Provide noticeable sonic improvement for many digital systems.

STRENGTHS: Clear, open sound quality. Multiple switchable inputs. Output level control. Headphone outs. UltraLock jitter-reduction technology.

LIMITATIONS: No power switch. I want a six-channel unit for 5.1!

PRICE: $795

The presence of the output level control knob and headphone jacks takes the DAC1 from being a straight-ahead converter, and turns it into a useful "back-end," especially for a DAW-based studio. Simply connect the outs of the DAC1 to your speakers, without need for a volume control box or for the small mixer many studios use for monitor control. Plus, having multiple switchable inputs lets you easily A/B and reference sources, and you can monitor with headphones right off the same box. I hooked up the DAC1 to the AES out of my Pro Tools rig, as well as the optical out of my CD player and the S/PDIF out of my MasterLink. Being able to jump between the digital sources, listening to all of them through the same converters, and minimize circuitry by also controlling volume from within the converter was beyond convenient, it was a joy!

The DAC1 also has other features, such as jitter reduction and automatic de-emphasis for consumer digital signals — I found it worked very well on my home stereo rig. It can accept and automatically lock to sample rates ranging from 28 Hz to 195 kHz, and has 24 bits of resolution.

But none of that would matter if the DAC1 didn't deliver sonically. And it does, in spades. It has an open, present sound, with smooth, even, highly detailed top end, and full bass. Its dynamic response is exemplary. In other words, the DAC1 sounds great. I highly recommend this box. ■

World Radio History

SPIRIT

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Got loads of stereo sources to record? The Spirit E Series is the answer.

Just because you only need a small mixer, it doesn't mean you don't need a great mixer. The new Spirit E Series packs legendary Soundcraft know-how into a compact format to deliver pristine sound quality and all the features you need for a wide variety of recording applications. A choice of 6, 8 and 12 channel models is complemented by the unique ES, with 10 dedicated stereo channels for mixing sources from samplers, sound modules, keyboards etc.

- 6, 8 and 12 mono channels with 2 stereo inputs
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- ES – a massive 40 inputs can be fed to the mix outputs
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- Multi point signal channel status monitoring on all channels
- Built in extensive metering for mix and control room/solo system
- Precision 3-band EQ with swept mid
- Easy conversion to rack mounting (option)

SPIRIT E SERIES

Pictured: Spirit ES with 10 stereo and 4 mono input channels

NEW

JUST A FEW EXAMPLES OF THE MANY DEVICES YOU CAN PLUG INTO THE ES

Pictured left: The ES stereo input channel

SPIRIT Notepad

4 MONO/2 stereo inputs, high quality mic preamps, 2-band EQ on all mono channels, post fade aux sends, switchable phantom power, turntable inputs, 2 track tape return, mix and monitor outputs, and headphone socket.

SPIRIT M SERIES

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SPIRIT FX16

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E 12

12 mono input channels, ultra quiet mic preamps, 3-band EQ with swept mid, +48v phantom power, 100mm faders, easy conversion to rack mounting.

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World Radio History

By Mitch Gallagher • mgallagher@musicplayer.com

Studio Network Solutions Fibredrive Fibre-Channel Hard Drive

High-speed storage for a high-resolution world

STUDIO NETWORK SOLUTIONS FIBREDRIVE

MANUFACTURER: Studio Network Solutions, 1986 Innerbelt Business Center DrSt. Louis, MO 63114. Tel: 877-537-2094.
Web: www.studionetworksolutions.com.

SUMMARY: High-performance hard drives are essential in today's recording world; the FibreDrive keeps up with the best of them.

STRENGTHS: Supports loads of simultaneous tracks. Easy to install.

LIMITATIONS: No documentation.

PRICE: 72-gig drive, $2,200

In today's recording studio you simply must have reliable, fast hard drives. While E-IDE and various flavors of SCSI drives continue to get better and better — as well as cheaper and cheaper — the demands placed on DAW drives also continue to get tougher and tougher. This is especially true with high resolution multitrack projects, where tons of data must be rapidly shuttled on and off disk in support of 24-bit/96 kHz or 192 kHz audio. In recent years, we've seen the emergence of fibre channel, an optical hard drive connection protocol, especially in large networked installations where multiple users are simultaneously accessing the same drives. Studio Network Solutions has been one of the leaders in the fibre-channel charge for commercial studios; now the company is offering the Fibredrive, a single-disk fibre channel storage device aimed at single user applications.

The Fibredrive package consists of a PCI interface card, an external hard drive (the review unit I received was 36 gigs in size, but the Fibredrive is currently available in 72 GB and 146 GB capacities), a CD containing driver software, and an interconnect cable. The cable is long enough that you can place the drive well away from the computer if necessary.

Installation was painless. I dropped the PCI card into my dual-GHz Mac, replacing my usual ultra-2 wide SCSI card. After plugging AC into the drive and hooking the drive up to the card, all that was left was to boot the computer and install the drivers. The entire process took 10 minutes, including the card installation.

Once you've got everything installed and booted, the Fibredrive shows up like any other drive connected to your computer. I tested it primarily with Pro ToolsIHD, but also with other programs such as Nuendo, Logic, and Digital Performer. In every case, the Fibredrive performed to an outstanding level. I've found that Pro Tools typically places the highest demands on hard drives; my normal E-IDE and U2W SCSI drives can support around 12-16 high-res tracks in PT, but beyond that things get difficult. With the Fibredrive, high-resolution audio was no problem at all. I started out testing the disk with a 32-channel 24-bit/96k session, which barely made the Fibredrive work hard. Next I played back 32 tracks at 24-bit/96 kHz, while simultaneously bouncing those same 32 tracks to 32 new tracks. I ended up by playing all 64 tracks simultaneously.

Even under that kind of strain, the Fibredrive never broke a sweat. Under normal circumstances, you'd need to distribute that many high-res tracks across multiple drives to get adequate performance. But the Fibredrive handled the load by itself and without problem. Very impressive.

For those who need the best in hard drive performance, the Fibredrive is well worth checking out, especially if you're working on large high-res projects. But even for day-to-day low-demand work, having a speedy drive that consistently delivers is a beautiful thing. ■

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World Radio History

By Craig Anderton • canderton@musicplayer.com

PreSonus DigiMAX LT 8-Channel Mic Pre with ADAT Optical Output

Here's the missing link between analog mics and a lightpipe input

Eight-channel mic preamps are common, but those that terminate in an ADAT lightpipe and pass 24-bit data are a bit more unusual. There are several possible applications for the DigiMAX LT:

- If you do live recording with a stand-alone hard disk recorder or digital tape machine and it has an ADAT optical in, take along one or more DigiMAX LTs and you can interface mics directly — no mixer required.
- If your computer's audio interface has an ADAT in, mics can feed right into your computer.
- Most digital mixers have a limited number of analog inputs, along with card slots for digital ins. For example, I have a Panasonic DA7 with eight mic inputs, eight line inputs, and two 8-channel ADAT cards. The DigiMAX LT is an easy way to get more mic ins — just blast 'em into the ADAT card.

Okay, let's get into details.

CONTROLS

Superficially, the single rack space DigiMAX LT looks like any other 8-channel mic pre. Each channel has a gain control (10 dB inherent gain for each stage, 54 dB max), –20 dB pad, +48V phantom power switch, and three indicator LEDs for active, –10 dB, and clip. There's also the World's Largest Power Switch.

Other front panel switches include sample rate select (32, 44.1, or 48 kHz) and another to select an external clock. This would come from the rear-panel word clock in (not the lightpipe, of course — signals go to it, not come from it). DigiMAX LT can also be the master timing source, via word clock or lightpipe out.

INS, OUTS, AND ANALOG

Inputs, located on the rear panel, are Neutrik 1/4-inch TRS or XLR combo jacks. The line ins have a 10k input impedance, so don't expect to plug in guitar, bass, or other non-active instruments. It would have been convenient if two of the inputs had high enough impedance for guitar; as things stand, you'll need an external preamp.

There are also eight 1/4-inch TRS insert jacks (one per channel). The obvious application would be to insert dynamics processors, equalizers, de-essers, etc. But you can also feed the sends to a separate cue mixer for zero-latency monitoring if you don't want to monitor through a recording system that has objectionable latency, or feed signals in via the returns to digitize inputs, while bypassing the LT's internal preamps.

Doing a send requires the semi-reliable "insert partway into the jack" technique. However, PreSonus has thoughtfully provided an applications note on their web site that tells how to wire insert cables so they'll function reliably as direct outputs — just surf to **www.presonus.com/html/products/digimax_lt.html**.

ABOUT THE SOUND....

I was pleasantly surprised by the sound quality, especially given the cost per channel. The noise and hum seemed way down (PreSonus quotes better than –98 dB signal-to-noise), and the sound is smooth — there's no buzzy or spiky quality. The high end isn't quite as present as the FMR Audio RNP (which, to be fair, costs the same as four DigiMAX LT channels and also lacks digital outs), but compared to anything in its price range, the LT was either equal or better. The bottom line is that I wouldn't hesitate to use the DigiMAX LT for just about any recording application.

And that pretty much sums up the DigiMAX LT: it does its intended job, does it well, and can push eight 24-bit channels into a lightpipe for under $125 a channel. 'Nuff said! ■

PRESONUS DIGIMAX LT

MANUFACTURER: PreSonus, 7257 Florida Blvd., Baton Rouge, LA 70806. Tel: 800-750-0323. Web: **www.presonus.com**.

SUMMARY: Interface eight mic or line inputs to an ADAT optical input.

STRENGTHS: Solid, smooth-sounding mic pres. Word clock in and out. Phantom power available for each channel. Insert jacks for zero-latency monitoring, inserting processors, or converting analog signals to digital without going through the mic pres.

LIMITATIONS: No high-impedance instrument inputs.

PRICE: $999.95

World Radio History

Attention Computer Geeks:

We're introducing a new mixer with features you'll appreciate.

Don't take it the wrong way–we have more than our share of computer nerds here at Samson. That's why the new MDR 8 is more than just a great sounding 8-channel mixer. For one, it features our exclusive Hard Disk Mode. HDM is an independent monitoring bus that eliminates latency when tracking to a PC. You will find it nowhere else. You'll also find transparent sound, high quality mic preamps and 24-Bit DSP effects that sound so real, you'll actually want to use them. At just $229*, the MDR 8 mixer costs less than most peripherals. And the geek thing? Take it from us. You'll get used to it.

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*Estimated Street Price

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World Radio History

By Craig Anderton • canderton@musicplayer.com

Line 6 PODxt Guitar Amp/Speaker Modeler

The next-generation POD is far more than a software rev

The Line 6 POD was one of those right features, right time, right price products that captured the imagination of guitarists. Although some felt digital modeling couldn't replace a good guitar amp, POD easily passed the acid test: when you played back a POD track, listeners usually weren't sure whether it was POD or an amp.

The PODxt takes the POD concept much further. It's slightly larger and somewhat more expensive than the original, borrows significantly from the Line 6 Vetta amp, and takes advantage of refinements in digital technology (as well as major redesigns) to deliver a more detailed, nuanced sound. But that's not all....

LINE 6 PODXT

MANUFACTURER: Line 6, 29901 Agoura Rd., Agoura Hills, CA 91301. Tel: 818-575-3600. Web: www.line6.com.

SUMMARY: Costs more than the original, but delivers a whole lot more.

STRENGTHS: High-definition sound quality. Excellent stomp box models. All parameters programmable from front panel. Far more informative display. More flexible save and recall functions. Updatable via Flash memory rather than EPROM replacement.

LIMITATIONS: USB port functions not yet implemented. Audible zippering on a few parameters. Acoustic guitar model sounds decent only with very specific pickup types and settings.

PRICE: $569.99

FIRST IMPRESSIONS

The basic control set remains similar to the original: Nine knobs for real-time control over crucial parameters (bass, treble, middle, presence, channel volume, reverb, drive, effects tweak, and output), along with selectors for amp models (32) and effects setups (64). However, the 4-line, backlit LCD is a wonderful addition, and there are more buttons for instant programming access.

I/O is also as expected (stereo balanced/unbalanced audio out, audio in, headphone out, MIDI in, MIDI out, and footswitch) except now there's a USB port. Unfortunately, it doesn't do anything yet; however, digital audio over USB will be provided shortly with drivers for Mac (ASIO, Sound Manager) and Windows (DirectSound, WDM, ASIO). This will be followed by MIDI over USB.

The manual, which is excellent aside from including *nothing* on USB, gives useful info (including photos) on the amps and stomp boxes that were modeled. Good stuff.

THE SOUND

When I first flipped through the original POD's various models, certain ones became fast favorites, while others fell by the wayside. My PODxt experience was quite different: the percentage of "useable-every-day" amp and cabinet models seemed greater, and more often than not, mixing and matching disparate amps and cabs produced useful effects.

Compared to the raunchy POD sound (which still has a certain charm), PODxt sounds more refined. Oddly, this doesn't neuter the more aggressive models — it's like POD is a hot kid guitarist, whereas PODxt is that same hot kid guitarist with more maturity and control. Overall, the tone is downright inspiring.

Also, the A.I.R. (Acoustically Integrated Recording) concept has been enhanced. In addition to the 22 cabinets, there are three mic

World Radio History

models (actually four, because the SM57 model offers on- or off-axis response), and a control for dialing in the desired amount of room sound.

THE EFFECTS

With POD, the amp modeling required so much processing power there wasn't a lot left over for effects. PODxt offers much more: there are four effects slots (modeled LA-2A compressor, stomp box, modulation, and delay), each with a dedicated button for bypass (or if "double-clicked," for editing). Stomp box options include models of the Arbiter Fuzz Face, E-H Big Muff Pi, Ibanez Tube Screamer, ProCo Rat, Tycobrahe Octavia, Boss CS-1 compressor, MXR Dynacomp, Mu-Tron III envelope filter, Vetta Compressor, and attack/delay.

The modulation effect options are rich as well: Uni-Vibe, MXR Phase 90, Boss CE-1 chorus, A/DA Flanger, Boss DM-2 delay, a couple of rotating speakers, a couple of tremolos, E-H Memory Man (now I don't feel so bad my original one broke), Maestro tape echo (with authentic "warble" control), Roland RE-101 Space Echo, and some delays. The reverbs are a major step up compared to the original POD, with solid springs, plates, rooms, and halls.

QUITE A BOX....

With all these programming options, it's not surprising PODxt has more sophisticated save options: an entire channel, just the amp+cab+mic model, or just a custom effects setup. And to call them up, the optional FBV Shortboard brings footswitch control to gigs.

Does PODxt obsolete the POD? In a way, yes; it's a more capable device. But the POD has its own brash character, and costs considerably less, so it's not surprising that Line 6 will continue to produce both.

Yet if you're a POD fan, spend an hour with the PODxt and you'll be hooked. The sound is gorgeous, and the added functionality is welcome. The bottom line is simple: lots of gear makes me *sound* better; PODxt is one of those rare birds that makes me *play* better. ■

THE FBV SHORTBOARD

Although the original POD concept first found favor as a recording interface, it is equally at home on stage, especially when feeding flat-response amplification systems instead of guitar amps.

If you use a PODxt live as well as in the studio, check into the FBV Shortboard, a scaled-down version of the footswitch unit designed for the Vetta amp. It's solidly built and requires no power (it gets juice via the same standard Ethernet cable that carries signal).

There are 12 footswitches: bank up, bank down, four for channel selection within a bank, tap tempo/tuner, and five for individual effects (compressor, stomp box, reverb, modulation, and delay). A footpedal, which feels like it could actually survive real gigs, can serve as either a volume or wah pedal. A jack accommodates an expression pedal, which can be dedicated to volume or effects tweak.

At $369.99, this probably isn't something you'll need in the studio (hey, just punch when you want to change sounds, or use MIDI automation). But if you're taking your PODxt out on a date, the FBV Shortboard makes it a lot more convenient to use.

World Radio History

By Pete Leoni

Wavemachine Labs Drumagog 3.0 Drum Replacement Plug-In (Windows)

Don't like your recorded drum sounds? Try this....

No matter how carefully you record acoustic drums, sometimes bleedthrough, phasing, and other problems can be a project killer. Fortunately, Drumagog — a DirectX plug-in — can quickly replace less-than-stellar drum sounds. Replacement drums can be either Drumagog's own multi-velocity sample sets, or you can roll your own; replaced and original samples can also be blended. Furthermore, Drumagog operates in real time, and often performs its magic without any significant tweaking.

Installation is simple and obvious. You can try a full-function demo for 14 days; to buy it, you send payment and your machine ID to Drumagog, which sends back an unlock code.

GETTING GUI

Drumagog's interface has four screens: Main, Samples, Ghost Notes, and Advanced. The Main screen's Input control adjusts the gain of the track that triggers the samples, while Sensitivity sets the triggering threshold. Resolution determines a "timeout" period before Drumagog can play another trigger, which helps prevent false triggering in tracks with high average levels.

WAVEMACHINE LABS DRUMAGOG 3.0

MANUFACTURER: Wavemachine Labs, 2250 Green Bay Rd., Highland Park, IL 60035. Tel: 877-318-9283. Web: www.drumagog.com.

SUMMARY: DirectX plug-in simplifies drum replacement.

STRENGTHS: Really works. Creative "extra" features such as ghost notes enhance functionality. Requires very little tweaking. Good sample management. Can save a session when everything sounds great except the drum recording.

LIMITATIONS: Samples essentially limited to kick, snare, and toms. Best performance occurs when drums to be replaced are on individual tracks. GUI hogs screen space.

SYSTEM REQUIREMENTS: DirectX-compatible host application.

PRICE: Basic, $99; Pro, $269

A "visual triggering" graphic provides a real-time, scrolling waveform display that shows which hits exceed the threshold and initiate a trigger. Although the Input, Sensitivity, and Resolution "knobs" are no longer visible when you choose visual triggering, Sensitivity and Resolution are still editable by dragging lines on the visual triggering display.

Furthermore, a multi-mode filter (high/low/bandpass) can help extract a specific triggering signal from a track containing multiple sounds. Although Drumagog is definitely intended to replace drums recorded on individual tracks, it is possible to separate some drums, particularly kick, from program material. To test this out, I tried extracting hi-hat from an overhead room mic signal — it took some tweaking, but it worked. If the included filter isn't drastic enough, aggressive pre-filtering (e.g., parametric EQ) can sometimes provide a clean enough trigger for Drumagog. (And if you don't like the pitch/timbre, a tuning knob can change any triggered sample's pitch by up to ±100%.)

SAMPLE SETS

Depending on the samples in a set, Drumagog can trigger them dynamically (louder hits trigger louder samples), randomly (the program chooses among two or more sample sets so all hits don't have to sound the same), and positionally. The positional multisample feature lets you select samples in real time that correspond to different stick hits — for example, sometimes you might want to replace a ride cymbal with a bell hit, and sometimes with a straight one.

Sample management is easy, as you can just drag-and-drop samples into the Samples screen

World Radio History

when creating complex sample sets; it's even possible to "grab" a sample from the track being processed and add it to the sample set. Furthermore, Drumagog supports AIF, SND, WAV, and Drumagog's own GOG format (the Pro version supports GigaSampler format, too). The GOG format stuffs up to 48 multi-samples and associated settings in a single file, thus allowing easy transfer among projects, and simplified backup.

ADVANCED FEATURES

"Stealth Mode" lets the track's audio pass though unchanged except when the sound to be replaced generates a trigger. For example, the hi-hats in a snare/hi-hats track can pass through, while snare hits get replaced. "Auto Ducking" ducks one track's audio based on a trigger from another track, which is useful when you want to nuke something like the snare sound from the overhead mics because you're using Drumagog to replace the existing snare track.

When an instance of Drumagog receives a ducking signal, a Ducking Response control adjusts the "look ahead" time. Ducking Time works much like a gate to allow fine adjustment of open time, and a Level control selects how much, if any, of the original audio should pass through. These controls are intuitive and function well.

An "eye candy" — but helpful — feature shows an actual AVI movie of a drum being hit in addition to the trigger indictor. This may seem like fluff, but it makes it easier to catch, for example, missed triggers.

Also, note that the Pro version offers a MIDI out that can trigger drum machines or virtual instruments, and provides on-the-fly re-sampling of drum samples to the project sample rate.

GHOST NOTES

Drumagog can detect a performance's tempo and generate extra notes, fills and patterns. After detecting the tempo, preset fills and patterns are selectable from a drop-down list. These "ghost notes" can run constantly, or appear only at specific times. An Ignore Fills checkbox cleverly allows pre-existing fills and rolls to pass through unmolested, until a steady beat kicks back in and the "ghost notes" resume. This is an ingenious feature that can add some "personality" to lackluster parts.

PERQS AND QUIRKS

Although Drumagog chooses and replaces its samples in real time, latency is surprisingly low. Unless you've selected the highest-accuracy level detection (which is very rarely needed), Drumagog detects velocity and triggers a corresponding sample in 3.6 ms.

One of the best features is that over several sessions with Drumagog, I found tweaking unnecessary. In fact, during one session the drummer asked if I would be using Drumagog. She was unaware that she had been monitoring the playback with Drumagog engaged! Of course, whether you'll need to tweak depends on the performance, amount of bleed, and song tempo, but I was pleasantly

▶ continued on page 117

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works with your system; and updates appear regularly, so I suspect it won't be too long before they nail down the loose ends. www.sonicreef.com

ELECTRO-HARMONIX HOLIER GRAIL ($298)

by Mitch Gallagher

Electro-Harmonix has come on strong in recent years with re-issues of "vintage" stomp boxes and with new processors, such as the Holier Grail digital reverb + gate on review here. Like all E-H boxes, the Holier Grail has a steel enclosure and is primarily aimed at guitarists. But stomp boxes are also being used by studio engineers these days, and this box works well on a variety of sources.

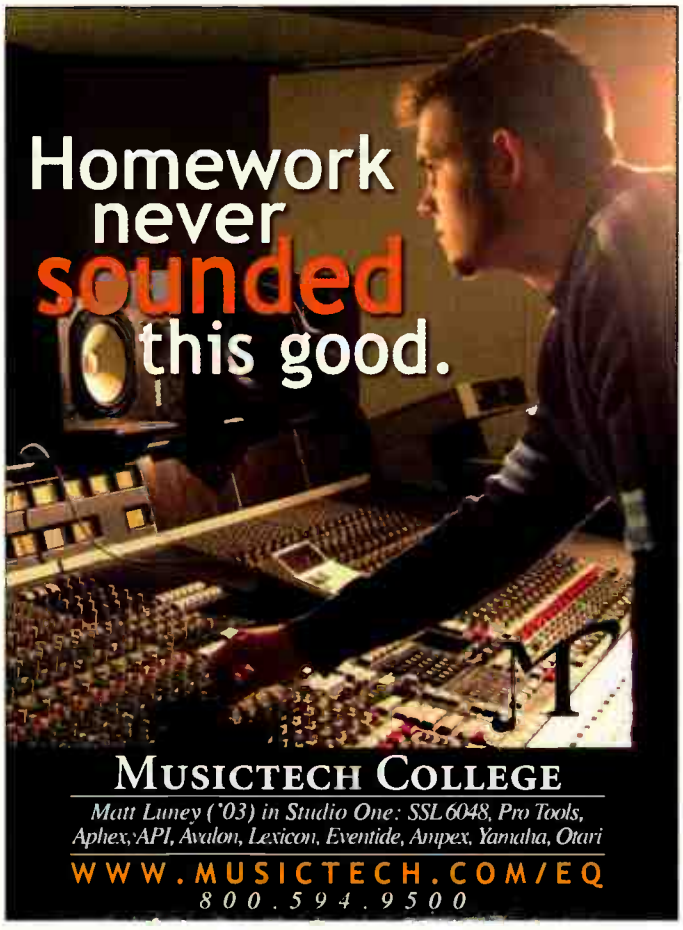
THE VIBE: We're talking a stomp box here, so you'll have to get your levels right if you want to feed it from a pro piece of gear. But that also means that it's easy to use and provides immediate gratification. There's not a ton of tweaky control, but knobs are provided for the main parameters.

What you get are four reverb flavors (spring, hall, room, and Flerb - a flanger/reverb combo) with two length settings each (long and short). However, the sonic options increase with the addition of the gate, which also has a "reverse gate" setting.

WHAT'S HOT: No menus! Plug it in, twist the knobs, and go. I was especially enamored of the spring reverb algorithm - it's useful for a lot more than just surf guitar tracks. All the reverbs have a metallic quality to them, which works well for drums, guitars, and other sounds. The gate works smoothly once the threshold is set properly.

WHAT'S NOT: The reverse gate wasn't that effective; it provides a different envelope, but it wasn't the "backward" sound I was expecting. Also, the reverb is mono — which is okay for the spring setting, but less so for a hall or room.

THE VERDICT: If you're looking to add a different flavor of 'verb to your arsenal, the Electro-Harmonix Holier Grail can provide it. It's designed mainly for guitar applications, but will also serve you well as a studio processor. www.electro-harmonix.com



World Radio History

ADINDEX

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AKG USA	615-620-3800	www.akgusa.com	63
Alesis	310-821-5000	www.alesis.com	47
ALTO/Applied Research & Technology (ART)	585-436-2720	www.artproaudio.com	95
Apogee Electronics Corp.	310-915-1000	www.apogeedigital.com/mini-me	43
Audio One	615-341-0056	www.protoolstraining.com	86
Audio-Technica	330-686-2600	www.audio-technica.com	C2
Auralex Acoustics	800-959-3343	www.auralex.com	30
Aviom	610-738-9005	www.aviom.com	45
Backbeat Books	408-848-8294	www.backbeatbooks.com	116
Broadcast Supply Worldwide (BSW)	877-564-0560	www.bswusa.com	99
Clarion Associates	800-VIVALOI	www.clarionins.com	56
Conservatory Of Recording Arts & Sciences	800-562-6383	www.audiorecordingschool.com	64
Dale Pro Audio	800-345-DALE	www.DaleProAudio.com	Supplement
DBX	801-568-7660	www.dbxpro.com	79
Digidesign	800-333-2137	www.digidesign.com/HDdealer	25
Disc Makers	888-800-4046	www.discmakers.com/eq4	109
Discrete Drums	800-387-5720	www.discretedrums.com	117
Dupco	866-333-8300	www.dupco.com	68
Electro-Harmonix	718-937-8300	www.ehx.com	76
Focusrite	866-FOCUSRITE	www.focusrite.com	16
Full Compass	800-356-5844	www.fullcompass.com	13, 62
Full Sail	800-226-7625	www.fullsail.com	42
Furman Sound	707-763-1010	www.furmansound.com	54
Genelec	508-652-0900	www.genelec.com	C3
Grace Design	303-443-7454	www.gracedesign.com	38
Griffin Technology	615-399-7000	www.griffintechnology.com	71
Hear Technologies	256-922-1200	www.HearTechnologies.com	5
ILIO	800-747-4546	www.ilio.com	9
Just For The Record	866-989-9818	www.justfortherecord.net	112
KRK Systems	954-689-8833	www.krksys.com	61
Kurzweil	253-589-3200	www.ksp8.com	41
LA Recording Workshop	818-763-7400	www.recordingcareer.com	35
Lynx Studio Technology	949-515-8265	www.lynxstudio.com	34
Mackie Designs	800-258-6883	www.mackie.com	3, 33
Mark Of The Unicorn	617-576-2760	www.motu.com	C4
Martinsound	800-582-3555	www.martinsound.com	103
M-Audio	626-445-2842	www.m-audio.com/ozone09	15
M-Audio	626-445-2842	www.m-audio.com	39
Mesa/Boogie	707-778-6565	www.mesaboogie.com	6-7
Microtech Gefell	604-942-1001	www.gefell-mics.com	101
Millennia Media	530-647-0750	www.mil-media.com	53
Mogami Cable	800-800-6608	www.mogamicable.com	55, 57, 59
Musician's Friend	800-436-6981	www.musiciansfriend.com	22-23
Musictech College	800-594-9500	www.musictech.com/eq	112
Neumann USA	860-434-5220	www.neumannusa.com/105dmb	74
Oasis	888-296-2747	www.oasiscd.com	50
Omnirax	800-332-3393	www.omniraxdirect.com	64
Professional Audio Design	781-982-2600	www.proaudiodesign.com	111
RealTraps	866-RealTraps	www.realtraps.com	68
Recording Workshop	800-848-9900	www.recordingworkshop.com	78
Roland	323-890-3700	www.rolandus.com	21
Royer Labs	818-760-8472	www.royerlabs.com	67
Samson	516-364-2244	www.samsontech.com	29, 73, 105
Shure	800-25-SHURE	www.shure.com	17
Sonic Circus	617-696-9360	www.soniccircus.com	87
Sonic Foundry	800-577-6642	www.sonicfoundry.com	44
Soundcraft	888-251-8352	www.soundcraft.com	97
Steinberg	818-678-5100	www.steinberg.net	37
Summit Audio Inc.	831-728-1302	www.summitaudio.com	107
Superdups	800-617-3877	www.superdups.com	56
Sweetwater Sound	800-222-4700	www.sweetwater.com	19, 48-49
Sweetwater Sound	800-222-4700	www.sweetwater.com	124-127
Tannoy North America Inc.	519-745-1158	www.tannoy.com	65
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World Radio History

Craig Anderton • canderton@musicplayer.com

Sample CD Reviews

PROFESSIONAL MUSIC PRODUCTION SET

The Groove-Doctors

(www.groove-doctors.com)

Talk about an ambitious effort — when I opened the box for the 16-bit Hard Rock set, 37 CDs came tumbling out (21 data CDs, 1 QuickTime video tutorial CD, and 15 audio rehearsal CDs), along with a 41-page manual and additional "charts" documentation. (Although recorded at 16/44.1 with Sony Super Bit Mapping, the files are also available in 24-bit format on 41 CDs; either set is available in WAV, AIFF, or SDII formats. Smaller, "themed" packages are also available.)

The concept is to provide a rhythm section of guitar, bass, and drums, spread over 35,000 one-bar loops, with flexibility emphasized over "plug-and-play." There are pre-mixed drum loops, fills, and auxiliary parts, as well as single-shot crashes. But patterns are also broken down into individual tracks (kick, hi-hat, etc.), so you can remix the individual elements. Tracks (except for breakout fills) are leakage-free, which simplifies drum sound replacement if desired.

Despite the massive number of CDs, be aware that the only style is rock, and the same material is repeated for all instruments in multiple tempos (108, 120, 130, 140, and 150) and for bass and guitar, for each note of one octave, with legato and staccato versions of each. As a result, there aren't as many stylistic variations as you might want — you need to create these through cutting and pasting the existing loops. (I'm surprised there's no "acidized" WAV version of the set, which would require a fraction of the CDs.)

The instrument sounds are clean and "neutral" with no room or overhead miking and only a touch of reverb, so they lend themselves to processing (especially the multitracked drums). All instrument parts were meant to work together, so there is a cohesive feel even when you're cutting apart bass or guitar parts to create melodic fills. Note that unlike drums, the bass and guitar sounds are mono.

The 15 audio CDs play related one-bar patterns consecutively, in groups of four measures. This provides enough time to get a feel for a groove. A printed chart correlates CD running time to patterns; while this is helpful, it would have made sense to sub-index the tracks to identify the different grooves.

How the Groove-Doctors' set fits into the world of sample CDs is interesting. They take more work to put together a track than "load 'n go" loops, but are better suited to customization, and aren't locked to a particular key. The main competition here isn't so much other sample CDs, but soft synths like Wizoo's Virtual Guitarist and Spectrasonic's Vinyl, which also aim for flexibility. However, the main point of differentiation for the Groove-Doctor approach is that the three instruments are designed to work together. (CD-ROM WAV, AIFF, or SDII format; 16-bit, 37-CD set or 24-bit, 41-CD set; $499)

MORE THAN STYX

Todd Sucherman

(www.morethanstyx.com)

Check out the pedigree for this two-CD set of audio loops: Todd Sucherman from Styx does the drumming, with engineering and production by Kevin Elson (Journey, Aerosmith, Don Henley), Rich Chycki (Mick Jagger, Pink), and two people who need no introduction to regular *EQ* readers — David Frangioni and Roger Nichols.

CD1 has 46 "groups" of loops while CD2 has 32 groups, along with individual samples from Roger Nichols' legendary WendelJR drum library (kicks, snares, toms, percussion, hats, and cymbals). Each group has multiple variations (from three to 37 loops); tempos for the groups range from 70 to 160 BPM.

Not surprisingly, the drums are superbly recorded (you feel like you're in the room). Some of the variations also incorporate excellent dynamics processing and EQ. Usually I prefer to add my own, but when you have this level of talent twirling the knobs, you can use the loops "as is" — a real time-saver. The playing has a great feel, with more stylistic variety than you might expect from a "rock drums" sample CD.

While the audio CD format is universal, it's puzzling that these loops aren't also available in "acidized" WAV or at least AIFF format, especially with so many sample CD sets now including data CDs for DAWs along with audio CDs for auditioning. Also, no one-shots are provided for the drum hits in the various loops; while it's great having the WendelJR drum sounds available — some are truly amazing — they aren't the ones used in the loops. Finally, the tempos are close, but not always exact (*e.g.*, 149.4 instead of the stated 150 BPM).

But any nit-picking relates to presentation, not content. These loops are indeed plug-and-play (once you've converted them to your file format of choice), and the production is both meticulous *and* grand. (Two CDs, Red Book audio format, $129.95)

▶ continued on page 118

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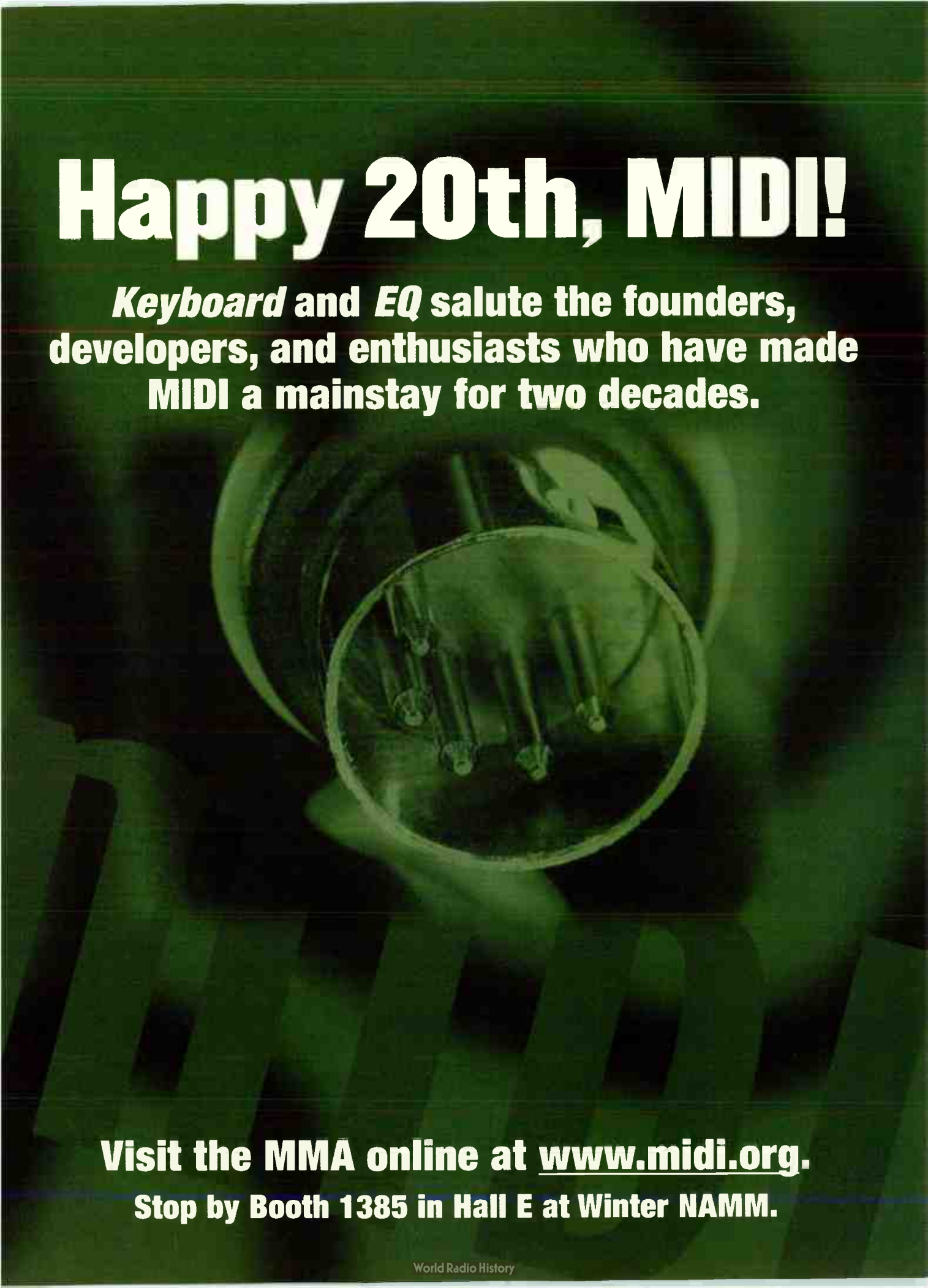

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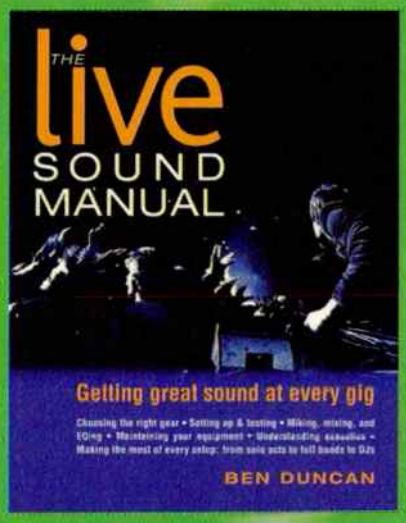

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THE TWO TOWERS

▶ continued from page 88

Cobbin worked from high atop Abbey Road, in the studio/lounge space called "The Penthouse," which housed a 48-track Pro Tools system, a digital AMS/Neve Capricorn mixing console, a Euphonix 727 interface/converter, and B&W 801 Nautilus speakers for 5.1 surround sound mixes. A large 42-inch plasma flat screen used for viewing the picture was run off Pro Tools using an Aurora Fuse video card for instantaneous lock between the picture and audio. Incorporating the picture with the music was helped immensely by the SAN network, which was accessible from a number of different editing rooms.

"When we would get picture cuts, which were sometimes for a period there everyday, it was a matter of uploading the revised picture cuts and putting them on the SAN network," said Cobbin. "Sometimes Peter [Jackson] would ask for some specific changes that he would like to see to picture. All of the rooms — which included three editors and myself — could download and incorporate the new picture cuts into their own systems. With it all being edited together you sometimes get a different impression of how something sounds and that can alter the music balance."

To move the operation along, a monitoring system (a pair of B&W Nautilus 802's fed via ISDN running stereo mixes from Cobbin's mix room) was installed in Howard Shore's hotel room in London.

"I went down to his hotel room and set up some monitoring down there so we could play him mixes live off the board and he could hear it in his room," said Cobbin. "That really sped up the review process considerably. He'd turn up his speakers and we'd play it and we'd get notes straight away and make the changes in real time. Howard wouldn't have to come down to the studio and wait for a number of things to load up so he could hear it."

THE NEW ZEALAND CONNECTION

"After we got a cue signed off, the mixes on the SAN network were picked up in one of our other editing rooms and then consolidated — packaged if you will — in such a way that it was bulletproof when they sent it to New Zealand electronically," explained Cobbin. "The mixes were sent from MPC [Motion Picture Company] in Soho to a broadband network connection in New Zealand where the film unit awaited. In New Zealand, they dropped the audio files into their session to sync up to exactly."

Was Cobbin worried about the files being damaged or corrupted in the transfer?

"No," he maintained. "There was no compression and we did a number of tests to ensure there was no degradation of the quality. It's reasonably impressive to get something to the other side of the world, a 24-track mix — 24-bit, 48k — from the scoring stage in London, completely multitrack edited, mixed, conformed to picture, and have that ready to play on a dubbing stage in Wellington, New Zealand, all within a matter of hours."

The last stage? Some final changes to the dubbing mix were made as per Peter Jackson's request from New Zealand.

"Occasionally Peter and the gang in New Zealand would send us a message saying, 'Can we have an alternate mix of this?' We were able to give a tight turnaround to something if it was urgent," explained Cobbin. "We were able to edit the change into our multitrack session and mix it so it was compatible with all of the previous mixes, and check that with Howard."

Given all of the time, energy, and know-how poured into the making of the soundtrack (and not to mention the films themselves), it's no wonder that the creators feel a sense of accomplishment and responsibility toward preserving the Tolkien legacy.

"Peter Jackson, and producer/screenwriters Fran Walsh and Philipa Boyens spent years working on this movie," said Shore who is currently working on the score for *The Return of the King,* the final film. "Tolkien spent 14 years writing *Lord of the Rings,* so we can spend a few years creating it for film."

"We felt responsible as guardians of making these films, that the music was appropriate and superlative," explained Broucek. "We wanted to make sure that what we were making was timeless. ■

World Radio History

DRUMAGOG 3.0

▶ continued from page 109

surprised at how little coddling the program required.

I'd prefer a more compact GUI, and more cymbal choices (there's only one cymbal sample — a hi-hat). Also, the basic/pro dichotomy can be a little confusing, especially as you can do *à la carte* upgrades to the basic version for specific features (*e.g.*, add GigaSampler import for $69, or auto re-sampling for $49).

But that's it for complaints. Being able to swap drum samples quickly in audio tracks opens up creative re-mixing possibilities; but perhaps more importantly, it's the ability to salvage problem tracks that makes Drumagog such an indispensable tool.

Special thanks to James Gillies, "Segway," and Craig Anderton.

Pete Leoni is an independent producer-engineer and along with his partner Morgan Pettinato, is the founder of Q-Performance PC Audio Systems (a division of East Coast Music Mall).

AES LIVE SOUND

▶ continued from page 8

runs real-time spectrum analysis, and also measures RT60. Signal processing introductions came from **BSS (ProSys PS-8810** 8x10 digital processor), **dbx (2-Series Graphic Equalizers,** as well as the **DriveRack 260** with auto gain control, auto EQ, and JBL speaker/Crown power amp tunings with setup wizard), **Rane (AC 24** four-way crossover with automatic phase compensation for crossover filters), **Inter-M (GEQ-1231D** stereo 31-band graphic EQ and **GEQ-2231D,** a dual version), and **XTA (Series 2** processors — **C2 Dual/Stereo Compressor, D2 Stereo Dynamic EQ, E2 Stereo Parametric EQ,** and **G2 Dual/Stereo Gate**). **Garwood** showed off their **APM Series** of hardwired personal monitors, while **Crown** added the **IQ-PIP-Lite,** the **IQ-PIP-USP3** and the **IQ-PIP-USP3/CN** to their line of PIP modules. ■

THE PRICE VS. THE EQUATION

▶ continued from page 71

ented toward immediate gratification. The ability to purchase almost anything over the Internet is perhaps the best example of this. Over 20 years ago, I watched the hi-fi industry go through tremendous turmoil as the plethora of specialty and high-end shops dissolved, and my tweaky audiophile friends were left with superstores carrying mid-level gear and salespeople who didn't have any depth of knowledge. Is this a good thing for the general public? Perhaps. Is it a good thing for the people who really need help or access to better products, support or service? Probably not. Remember, you're voting with your dollars — vote for the stores that are more concerned with *keeping* a customer than just *selling* to one.

Jeff Radke is VP of Sales with Sweetwater, one of the industry's leading music technology suppliers. Sweetwater faces its own decisions daily about whether the gear it buys will be what people really want and need.

World Radio History

ROOM WITH A VU

▶ continued from page 24

on which really makes a huge difference in the clarity of the vocals.

"From the ViPRE I'll go into the 'Bentley' of all compressors, the Fairchild 670. On vocals I try keeping the time constant on 1 through 3 and just hit the threshold with the input gain a little under the middle setting. The reason I use the Fairchild is the sound! I'm not really a technical man but other compressors just don't move me like the Fairchild." ■

TECHNIQUES LIVE

▶ continued from page 46

signatures, and cut/copy/paste editing. BeatPad is a pattern-based sequencer allowing you to save multiple patterns, swap the patterns during playback, or change MIDI instruments and channels. miniMusic applications are currently available for Palm OS 2.0 and higher, though some features require Palm OS 3.0 and higher. miniMusic manufactures a Palm-to-MIDI interface that converts any serial HotSync Cradle or cable into a MIDI interface, and they support the Tsunamidi sound module. Tsunamidi contains the full General MIDI sound set, and fits the Palm V, Palm Vx, and IBM WorkPad C3.

miniMusic software is compatible with Beat Plus from Hagiwara Sys-Com (**www.hscjpn.co.jp/english/eproduct/e-beatplus.html**), a tone generator Springboard module for use with any of the Handspring Visor handhelds. Beat Plus employs a Yamaha LSI for FM and ADPCM sounds, includes both a headphone jack and speaker, and conveniently runs on the Visor's batteries (yet reportedly drains little power).

If your tastes run toward the PocketPC, Planet Griff (**www.planetgriff.com**) offers Griff, a sequencer app with plug-in architecture. Griff can import WAV files or — using The Sampler plug-in — can record samples directly into a PocketPC. Built-in effects include reverb, delay, distortion, chorus, and flanger. Available plug-ins include PocketVoid DX (FM synthesizer), PocketPluck (plucked string generator), PocketKick (kick drum emulator), and mdaFilter (12dB/octave filter). Audio output from Griff is via PocketPC headphone jack, or Griff can render mixes to 16-bit, 44.1 kHz .WAV files.

Also for the PocketPC is Jaytraxx from Klaar (**www.klaar.com**), a music composition tool featuring a sequencer, real-time synthesis, and sample editing. In addition to bi-directional looping, Jaytraxx supports up to six simultaneous stereo audio channels, real-time effects, and dynamic playback options such as song speed, and muting. Audio resolution may be user-adjusted to compensate for slower PocketPC's.

Widget Australia (**www.widget.com.au**) has an entire range of palmtop products including the MIDI/USB HotSync Cradle. Intended for use with Visor Platinum (and compatibles), it integrates MIDI out circuitry into a standard USB HotSync cradle. Widget's MIDI3c provides a MIDI out for palmtops that can't internally support MIDI baud rates, including Psion and WindowsCE devices. For a down and dirty MIDI connection, their Visor MIDI Interface Cable connects directly to a Visor HotSync connector, offering a smaller alternative to the MIDI/USB Cradle. ■

SAMPLE CDS

▶ continued from page 114

NUMINA — EMOTIONAL PEAK SOUNDS FOR CINEMA

Jesse Sola

(www.sonicfoundry.com)

The title tells it like it is: I could score a chase scene for any futuristic sci-fi/action flick in 10 minutes with this CD and a couple of synths. Then again, I could also score the scene where the druids discover the Crystal of Doom, or for that matter, the one where Tommy Lee Jones is chasing The Fugitive. This doesn't mean the sounds are clichéd — sonically, they're quite original. But they produce highly evocative effects that seem biologically destined to mate with visuals.

The 514 MB of samples include beats (abstract sounds with discernible tempos), drones and pads, one shots, "quirps" (mostly arpeggiated types of sounds), sound FX, and themes. The FX aren't realistic ones, but more like short phrases as opposed to beats or drones. Themes can be fairly long; one of my favorites, "Long Vocal Theme," clocks in at 38 seconds — others are even longer.

Except for the one-shots the sounds all loop, but of necessity the acidization is non-standard: some loops are long, some short, and not all follow the usual "power of two" beat length. Some work much better when crossfaded repeatedly rather than looped. No matter; stack them together, and you can get some intense, polyrhythmic patterns that are instant soundtrack material.

You're not going to base your next dance hit on these samples, although some would definitely be fun to slide into the occasional ambient background or inserted into breaks. But if you do soundtrack work that tends toward action, sci-fi/horror, or mystical journeys, I predict you'll get a lot of mileage out of this CD. (CD-ROM, acidized WAV format, $59.95). ■

HOW TO CHOOSE A DAW

▶ continued from page 68

decision is the roster of included signal processor and virtual instrument plug-ins. Which is a better deal — a program that costs $800 but includes all the plug-ins you need, or a program that costs $300 but requires spending $700 on plug-ins to get crucial processors and instruments?

Remember that included plug-ins may not represent value if you don't like their sound. Reverb in particular is hard to get right, so make sure any plug-ins are indeed assets.

THE FINAL CUT

After narrowing down your search, download trial programs of the contenders. Check which one makes the best initial impression, because often, that's the one that will work best for you. But be fair: work with a program for a week. Sometimes features that are initially confusing fall into place, or ones that didn't seem all that important grow on you.

When you do make your final choice, take solace in the fact that these days, it's hard to go too wrong. DAW programs are sophisticated and constantly being updated; furthermore, compatibility with different plug-in protocols allows just about any DAW to be accessorized to your liking. Truthfully, you can make music with any DAW — but some will suit you better than others, and only you can decide which one fills that role. ■

World Radio History

ROGER NICHOLS

▶ continued from page 128

birthday parties, weddings, stag parties, and any video that families find important. He also edits the video and produces DVDs.

Radio: Somebody has to do the audio for Howard Stern. Wait a second: All there is on radio is sound. Without sound, there wouldn't be any radio.

TV: There are tons of places for audio engineering for TV. There's the live audio during the show, there's the mixing of the band for shows like *The Letterman Show,* but there's also all of the promos that get aired during the week leading up to the show. "Next week, on Fox. See the real truth behind *Miami Vice*."

Concert/Live Sound: Mixing front-of-house for a monster act would be good, but there's also monitor mixing, and setting up the entire touring sound system. Don't forget the all-night tour bus rides to get to the next gig.

Audio Equipment Design: What about designing a new power amp, limiter, headphone box, direct box, mixing console, analog EQ, or a surround system speaker switch?

Speaker Design: There will never be enough speaker designs. Buy a copy of MacSpeakerz and get to work.

Microphone Design: Think of a cool name for the mic, and come up with a microphone that sounds the way you want it to sound. You can start by going to work for an existing mic company.**Studio Design and Construction:** Now that everyone has a studio at home, don't they need it to sound better acoustically?

Workplace Acoustics: What about making offices full of cubicles quieter? Could factory floors be quieter?

Automotive Acoustics: It is not just the sound of the speakers and the trunk-rattling power of the amplifier. The shape and volume of the automotive interior has an effect on the final outcome. Now that 5.1 has found its way into automobiles, the design becomes even more critical.

Acoustic Noise Cancellation: You've probably tried noise-canceling headphones. The same technique can be used to quiet air conditioner noise in studios, rumble from subways, and other unwanted noises.

Seismic Activity: Seismic waves are sound waves that travel through the earth. Timing differences at various receiver points determine the location. Many other things can be learned from this data.

Hearing Research: This is a biggie. Aural transplants are allowing the deaf to hear, sometimes for the first time. There's talk that the hearing mechanism may in fact be digital and not analog. The inner ear does real-time FFT analysis of the sounds and sends digital signals to the brain. I knew it all along.

There are, of course, many other fields for the audio professional. I mention these to get you thinking about more than just cranking out a hit record. There are many more potential audio engineers than there will be hit records, so the fact is that if you love audio, you may have to look into some other related field.

My father always told me to, "Keep your ear to the ground and your nose to the grindstone." I replied, "But it's hard for me to mix in that position…."

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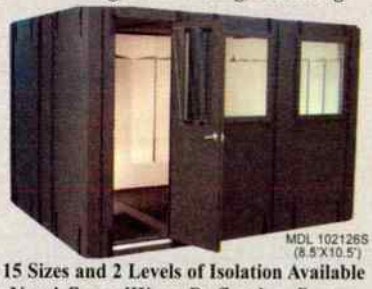

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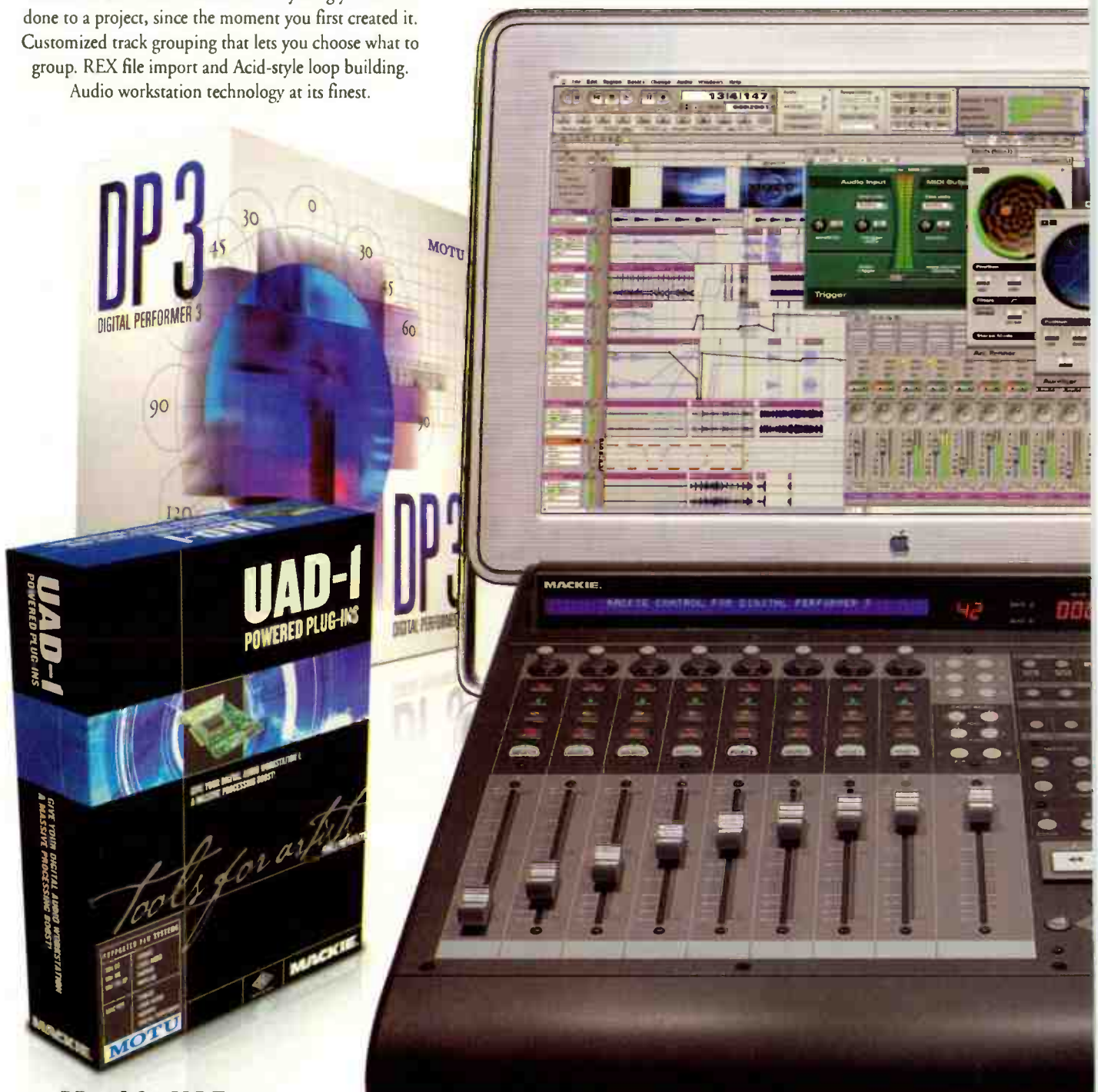
Digital Performer on the Power Mac G4, MOTU audio interfaces, Mackie Control, cutting-edge plug-ins and breakthrough virtual instruments deliver the complete MOTU studio experience.

MOTU Digital Performer 3.1

Unlimited undo that remembers everything you've ever done to a project, since the moment you first created it. Customized track grouping that lets you choose what to group. REX file import and Acid-style loop building. Audio workstation technology at its finest.



Mackie UAD-1

UAD-1 is a PCI card that allows you to run dozens of sophisticated effects plug-ins inside Digital Performer without bringing your Mac to its knees. What's the secret? A custom-built, monster DSP. It's like adding an extra $20,000 worth of effects gear to the dozens of native plug-ins included with DP.

Mackie Control for DP3

Designed in direct collaboration between Mackie and MOTU, the new Mackie Control automated control surface puts 9 touch-sensitive Penny & Giles automated faders under your fingers (8 plus a master), 8 motion-sensitive rotary encoders, and dozens of custom-programmed switches. Want more faders? Add 8-channel Control XT expanders. You'll feel like you are putting your hands on Digital Performer itself.

THE MOTU STUDIO CALL SWEETWATER

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THE MOTU STUDIO

The New Power Mac G4

Dual-processor heaven for Digital Performer.
Don't make Digital Performer sing.
Make it scream.

Spectrasonics Atmosphere™

Introducing Atmosphere: a breakthrough native virtual plug-in instrument for Digital Performer from renowned developer Spectrasonics that integrates a massive 3.7GB arsenal of lush pads, ambient textures and powerhouse synths with a "powerfully simple" user interface for shaping and creating your own sounds with up to one million layer combinations. Features over 1,000 NEW cutting-edge sounds by acclaimed producer Eric Persing.

MOTU 2408mk3 and 24I/O

MOTU's new powerhouse interfaces give you 96kHz analog and digital recording in a system that's expandable to 96 inputs and outputs. Connect all your synths, sound modules, drum machines and effects processors and mix it all from your computer desktop with absolutely zero host buffer latency. Looking for the latest breakthrough in native audio recording? Look no further.

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MORE GEAR FOR THE MOTU STUDIO

Applied Acoustics Lounge Lizard

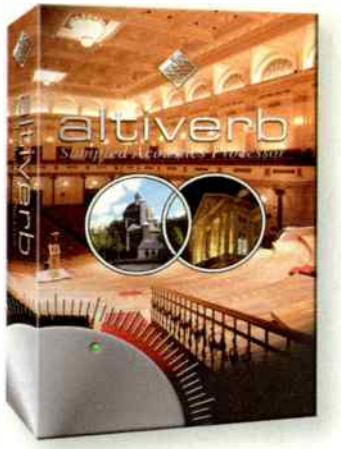
Lounge Lizard is the very first physical modeling virtual instrument for Digital Performer. What does that mean? Incredible realism and warmth. Physical modeling reproduces the sound and feel of a real instrument in ways that synthesizers and samplers can't. Choose from many classic electric piano presets, or shape your own with powerful, yet intuitive controls. Lounge Lizard delivers the complete, authentic electric piano experience to your Digital Performer studio.

TC Works D-Coder

Produced by Waldorf, the legendary German synth company that brought you PPG Wave and Attack, D-Coder is a Vocoding synthesizer plug-in for TC PowerCore and Digital Performer. D-Coder goes way beyond classic vocoder concepts by providing 100 bands (instead of the usual 30 or so) and an integrated tone-generating synthesizer, allowing you to create vocoding effects with no external carrier signal. It's like having a Waldorf Q synth inside DP, but with no processor drain on your Mac, thanks to Powercore.

AudioEase Altiverb

The first and last word in sampled reverb plug-ins, Altiverb brings acoustic spaces to your Digital Performer mixes with unparalleled realism. Based on an astonishing technological breakthrough that takes advantage of the Apple G4 Altivec™ processor, Altiverb fully reproduces the acoustic qualities of real spaces, from shimmering cathedrals to world-class recording studios. AudioEase provides dozens of venues from around the world — or capture your own and apply them to any recording.



BIAS Peak 3

Burn Redbook CD's. Read and write MP3, Dolby AAC™, 24 bit WAVE and more. Batch process hundreds or even thousands of files. Ultra-fast waveform editing. Run standalone or launch directly from DP3. Unlimited undo/redo with graphic edit histories. View multiple audio documents simultaneously. Unique DSP and looping tools like Convolve, Repair Clicks, Loop Tuner™, Loop Surfer™, Guess Tempo™, Duplicate, and more. Hot swap real-time effects in series, parallel, or hybrid using Peak's Vbox™ SE VST matrix. Native for Mac OS 8.6 thru Mac OS X - including version 10.2 Jaguar. Optimized for Apple's G4 Velocity Engine. The ultimate editing, processing and mastering companion for Digital Performer.

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Summit Audio 2BA-221

The better your audio sounds going into your MOTU workstation, the better it sounds period. Introducing the extraordinary new 2BA-221 continuously variable impedance microphone preamp. Mix mic, line, and Hi-Z instrument inputs through the 2BA-221's hybrid vacuum tube output and/or its solid state output. Modular, expandable input design, swept high pass filter, insert jack, and internal power supply make the 2BA-221 a powerful tracking and mixing tool.

Glyph Trip2

Glyph Technologies, the industry leader in high-performance audio storage, brings you the ultimate in FireWire disk storage: Trip2. Early-warning SMART technology alerts you to potential drive problems before they happen. Slide a Glyph-engineered, vibration-resistant (and therefore ultra-quiet) drive cartridge into one of six expansion bays and feel the bullet-proof reliability through your fingertips. Glyph FireWire is the perfect compliment to MOTU PCI on today's latest Power Macs because FireWire disk access and PCI audio streaming are handled on different busses, so you maximize the performance of your system.

Raxxess IsoRaxx

The only sound you should be hearing in your MOTU studio is the sound of your speakers. Simply install your computer, external hard drive or any other acoustically challenged equipment in your studio into the IsoRaxx. IsoRaxx has all of the features you need to keep your equipment safe and quiet, reducing fan and hard drive noise by an average of 21 dB. IsoRaxx's electrostatic filter intake helps keep dust bunnies out of your hard drives, and the lock-and-key front door keeps your gear from growing legs. With IsoRaxx, you won't miss what you've been hearing.

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Career day

There's Nothing To Do

I hear this complaint at least once a week. It sounds like my kids when they sit around over the weekend, "There's nothing to do!" All you have to do is look around — there's plenty to do. And there's plenty of work in the world of audio, too. Here are just a few fields that deal with audio:

Recording Engineer: This is what everyone thinks about first. Working in a recording studio, recording bands, and wondering where you're going to hang all of your gold and platinum records.

Mixer: A subset of the engineering category, but there are engineers who specialize in only mixing other engineer's recordings. You gotta be good to get into this slot.

Surround Mixing: Surround mixes may be the vehicle that pulls the record companies out of the slump. Much of the new material recorded is mixed for surround at the same time the stereo mixes are done to keep the budgets down.

Spatial Perception: A field that investigates how the human mind interprets audio information into perceived 3-dimensional positioning.

Remixing: Take existing recorded material and turn it into a completely new genre of music, usually geared toward dance clubs.

Mastering: The last stage of the artistic process before the CDs and DVDs are pressed and sent to market. The mastering engineer hears hundreds of finished CDs besides yours. He has the perfect perspective to add the finishing touches.

Archiving and Restoration: Old recorded material in storage is deteriorating as we speak. Saving old tapes and resurrecting music from the past is becoming more and more in demand.

Forensic Audio: What was really erased on the Nixon Watergate tapes? You can recover information that was thought to be lost. It could be fun and profitable.

Video Games: Have you ever played a good video game without sound effects? I didn't think so.

Multimedia: Educational DVDs and CD-ROMs are becoming a big business. Any subject from *How To Build A Nuclear Trigger* to *Raising Aardvarks For Pets.*

Video: Video isn't much good without audio. Industrial video with well-done audio. School choirs recorded for parents, church choirs, weddings, live music performances, and many other projects that are usually recorded only with the in-camera microphone. Offer your services, or offer classes to teach people how to do it right.

Sports: Audio for sports broadcasts is a big business. Everyone wants to hear the grunts of pain when the quarterback is sacked, or the crack of the bat as it sends the baseball over the outfield fence. Shotgun mics, wireless mics, and parabolic reflectors are all tools of the sports audio professional.**Loops For Sale:** There are guys who sit around all day listening to CDs and records to find the pieces that can be used to make the next killer groove. Layering piano licks from one record with rhythm pieces from another record. Artists call these guys up and have them come down to the studio. If the artist likes one of the loops, he pays the loop guy lots of money, and makes a hit record out of it.

Toys: Talking robots, talking dolls, and boxes filled with sampled insults that play back whenever someone walks into the room. I knew a guy who worked full time for Mattel recording phrases that went inside Chatty Kathy dolls. That is, until the X-rated ones accidentally showed up at Toys R Us....

Film Sound Design: Location recording, sound effects, Foley, and making the picture and sound work together is a big business. There are plenty of places to start a long and satisfying career.

Sound Effects Libraries: There are companies that hire people to go around and record everything. Babies crying, dogs barking, cars crashing, trains passing by, airplanes taking off, crowds cheering, and everything else that makes a sound. A lot of this has already been done, but the technology has improved and all of it can be done better.

DV Audio Post: Kind of like sound design for film, but on a smaller scale. I know a guy who started a business doing audio post for home videos. He adds sound effects and music to

▶ continued on page 119

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High Definition Audio Redefined

Mac or PC. Mixer or no mixer. Build your computer-based studio with a MOTU PCI core system.

Are you building a desktop studio with a Mac or PC? Then you'll need to stream a lot of audio in and out of your computer. And our new PCI audio interfaces give you loads of 96 kHz analog and digital I/O at a great price. Monitoring latency is a thing of the past, thanks to the PCI-424's new DSP-driven CueMix technology. Use the audio software of your choice, together with our CueMix Console™, to command your entire studio from your desktop. Whether you mix entirely inside the computer or externally with a digital mixer, our 2408mk3, 24I/O and HD192 interfaces deliver the quality, flexibility and price you need to make your dream studio a reality.

- **Flexibility** — choose the core system interface that's right for you.
- **Expansion** — connect up to four interfaces. Mix and match with legacy MOTU PCI interfaces (2408, 2408mkII, 1296, 1224, 308, etc.)
- **High Definition** — 96 kHz analog, optical and TDIF digital I/O. 192 kHz analog with the HD192.
- **No-latency Monitoring** — DSP-driven mixing and monitoring with zero host buffer latency.
- **Built-in sync** — resolves to SMPTE time code and video with sub-frame accuracy (no sync box needed).
- **Compatibility** — works with virtually all audio software for Mac and Windows 98SE/Me/2000/XP.

Together, a 2408mk3 and 24I/O give you 32 analog and 24 ADAT/TDIF digital inputs and outputs in a compact, affordable system.

Our cross-platform CueMix Console works side by side with your audio software to give you a no-latency mix bus for every stereo output in your PCI-424 system.

For 192 kHz analog sound, add an HD192 interface to your system.

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