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Focusrite Saffire
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Then & Now

The well-known physicist Albert Einstein is credited with saying, "Everything should be made as simple as possible, but not a bit simpler". In this age when almost everything seems to be dumbed down to below the point of usefulness, that seems very useful advice. While undue complexity is unarguably a bad thing, there is a point beyond which things can't be simplified further without throwing away something useful, and that is just as true of digital recording systems as it is of higher physics.

Sound On Sound is fast approaching its 20th birthday, and in some ways, things have changed almost beyond recognition since we set out, but in other ways they haven't changed much at all. Take audio sequencing software for example — pretty much everything that we get bundled with today's software was part of the hardware studio two decades ago. Even MIDI has changed little since 1985, except that now we get it in colour instead of on a 12-inch Atari monochrome monitor! OK, so there are a few welcome new additions, such as *Auto-Tune*, but by and large, what we have now, we had then. The real difference as I see it is that back in 1985, only professionals working in seriously high-end studios had access to all these things, but today anyone buying even a 'lite' version of a mainstream sequencer gets the whole lot in a box — a multitrack recorder, mixer with full automation, state-of-the-art MIDI sequencing and more effects and processors than you can shake a digitally rendered stick at. Oh yes, and all those synths and samplers that you used to stare at longingly through the shop window.

What clearly isn't obvious to many users is that although a couple of hundred pounds will turn your computer into a very serious recording studio, it's not any easier to use than the multi-million-pound major studios of the '80s. I say this because we still get letters, emails and phone calls from people who say 'why can't they make all this stuff easier to use? It's far too complicated!'. Certainly it is possible to make simpler software, but then you don't have access to all the professional tools and features, so at some point you have to commit yourself to learning about all aspects of all types of studio equipment if you want to make the most of your home studio. After all, the engineers who used the original hardware did it as a career, not as a hobby, and most of them started out when there was a much smaller choice of equipment available, so they assimilated knowledge as they worked, rather than having to learn it all before they started out.

I guess what I'm saying is that learning how to use all of today's recording tools *is* complicated — not because the manufacturers are trying to make your life difficult, but because that's the nature of the beast. Music recording is a serious academic subject, and if you thought having to learn a sequencer was unreasonably difficult, that's only half the story, as there's mic technique, mixing and the principles of synthesis to learn about too.

If you find that prospect daunting, then perhaps the most sensible way forward is to follow the paths of the original studio engineers by restricting the options you use to handle the basics and only exploring further when you have become completely familiar with what you already use. It's amazing what you learn when you're restricted to eight audio tracks, a couple of compressors and a reverb unit! Learning about recording can be immense fun, but it's probably less so if you make the mistake of trying to use everything at once before you've found out what it's for. The best records of our time were made using far fewer facilities than you have access to, so take your time, explore, and learn as you go. Like most learning experiences, sound recording is a journey and the destination continues to recede as you make progress, because only then do you realise how much more there is to know. Anyone who's embarked on a music technology course because they thought it was an easy option knows exactly what I mean!

Paul White *Editor In Chief*

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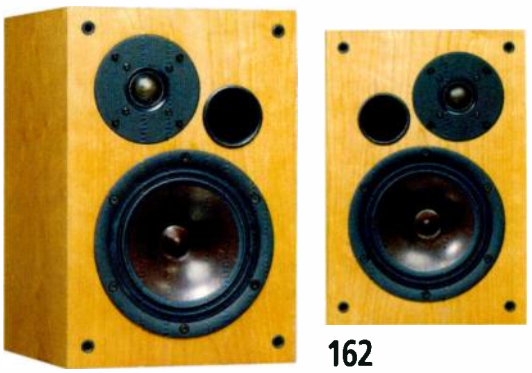

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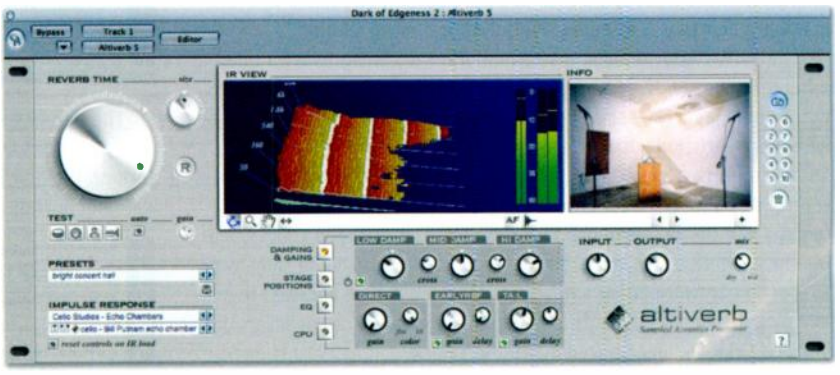

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I, DJ

Numark produce bespoke iPod DJ mixer

The unexpected hit of the Summer NAMM show was to be found on the Numark/Alesis booth — an all-white DJ mixer designed specifically to accept two iPods directly via slots on the top panel. The Numark iDJ works with all standard or mini iPods and includes big versions of the iPod buttons and wheels, a crossfader that pauses the iPod that's just been faded out, line inputs for bringing in two external sources and a mic input. A USB port means the iDJ also functions as an iPod docking station. The unit features EQ and volume controls, making it useful for impromptu DJ/party work, live gigs that use iPod backing tracks and so on. Even if you're not a DJ, it's one of those 'got to have' products. Two iPods, a sound system plus a mic and you have a basic DJ/disco setup. Brilliant.

The iDJ will be available in the Autumn, pricing to be confirmed. *Paul White*

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Open fire

Alesis undercut the competition with new Firewire-equipped mixers

The Summer NAMM show also saw Alesis unveil their new Multimix Firewire range of low-cost Firewire-equipped analogue mixers. Like their Multimix USB predecessors, the new mixers are available in 8-, 12- and 16-channel formats, but these feature a built-in Firewire audio computer interface. The Multimix Firewire 8 and 12 have four mic/line inputs with phantom power, balanced stereo line inputs, three-band EQ on each channel, an aux send and stereo return and built-in digital effects. The Multimix Firewire 16 has identical features but with eight mic inputs. The direct outputs are available over Firewire, post- the channel EQ, and the interface supports 24-bit, 44.1/48 kHz operation. All this is made possible at a surprisingly low cost by utilising the new Dice II Firewire chip developed by TC Applied Technologies.

All Multimix models are compatible with Mac OS X and Windows XP and are bundled with a copy of Steinberg *Cubase LE*. The range will be available before the end of the year, and though no UK prices have yet been set, the US list prices of $599, $699 and $799 suggest that the Alesis Firewire mixers will cost a lot less than competing products. *Paul White*

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Surf guitar

Waves team up with PRS Guitars to create amp-modelling plug-in

While Waves have taken their time getting into the guitar modelling plug-in market, they've made quite a substantial first impression with their *GTR* system, designed with the help of Paul Reed Smith Guitars. *GTR*, which stands for *Guitar Tool Rack*, will run on both TDM and native platforms, on both Mac OS and Windows, and comprises amp/speaker modelling software, a virtual stompbox effects section and a hardware guitar impedance and level matching unit that is effectively a guitar-optimised DI box.

The *Waves Amp* modelling software offers seven amplifier models at different drive levels, numerous speaker cabinets — you can drive any two simultaneously — and of course a choice of mic types and positions with more variations than offered by most of the competitors. *Waves Stomp* comprises 23 pedal effects, controllable in real time via a MIDI controller, as well as a tuner that can be set for custom or standard tunings. But the key component of this system is the Waves/PRS Guitar Interface, which is designed to load the guitar in exactly the same way as a good hardware guitar amp input stage and can be adjusted to suit any pickup type and strength. The outputs are at mic or line levels on balanced XLR and unbalanced quarter-inch jack.

The demonstration of *GTR* at Summer NAMM was particularly impressive, especially the way the models responded realistically to turning the guitar's volume control right down. Neither a firm release date nor a UK price had been set when we went to press. *Paul White*

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4 to the 04

Roland launch SP404 sampler

Following on from the SP303, Roland's new SP404 sampler is a compact unit which uses standard Compact Flash memory and can run off battery power, and it could prove an ideal portable sampler for DJs and musicians on the move. It features 29 on-board effects, hi-fi and lo-fi sampling modes and an integrated pattern sequencer. There are stereo line inputs and outputs, a headphone output, a MIDI input, a mic input and a built-in microphone. The SP404 costs £279.

The new Boss RT20 dual pedal is a COSM-based rotary speaker emulator with an eye-catching rotating LED display that shows the speed of both the high and low rotors simultaneously via blue and pink LEDs. The fast/slow rise times are adjustable and the pedal also includes an overdrive effect. The bass/treble rotor balance is adjustable and the user can switch between guitar and keyboard modes with a choice of four different modulation effects, including a Univibe simulation. You only have to see the display in operation to know that you want one. Hearing it just clinches the deal! It costs £169. *Paul White*

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World in motion

Edirol produce creative video-performance software

Another product at Summer NAMM which falls squarely into the 'I want it, even though I'm not sure what I'm going to do with it' category was the Edirol *Motion Dive Tokyo* performance package, a DJ-style video effects and clip player that combines an updated version of Japanese software company Digitalstage's *Motion Dive Tokyo* visual performance software with a hardware USB controller to enable anyone to produce eye-catching moving images that can easily be manipulated and mixed in real time.

The existing *Motion Dive* software has been updated to work with MIDI while Roland's V-Link system is also supported, enabling the visuals to be controlled from any Roland V-Link equipped instrument. Essentially, video clips (including Quicktime and digital camera stills) can be dragged into two areas and users can crossfade between them. Digital processing can be applied to the images in real time, enabling anyone to relive the '60s, but this time without the drugs! The software can also play back AIFF, WAV or MP3 audio files from the computer's hard disk and comes with a video library to get you started. The system runs on both Mac and Windows machines and the vaguely retro controller has dedicated hardware buttons and controls for BPM sync, video scratching, clip selection, crossfading and other assignable functions. The package will be available towards the end of the year, pricing TBC. *Paul White*

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Kicking cans

Super-affordable headphones from Audio-Technica

Priced at £19.95 and £29.95 respectively, Audio-Technica's new ATHT22 and ATHT44 dynamic headphones represent exceptional value for money from an established manufacturer. Both models have a circumaural, closed-back design and feature 40mm drivers and a 3-metre lead with gold-plated connectors. The T22 headphones offer a frequency response of 20Hz-22kHz, while the T44s' frequency response is further extended to 18Hz-23kHz. Both models are available from September.

T Audio Technica UK +44 (0)113 277 1441.
F +44 (0)113 270 4836.
E sales@audio-technica.co.uk
W www.audio-technica.co.uk

Psychoacoustics lecture for musicians and engineers

At the beginning of October, London School of Sound are staging a special one-off lecture on the principles of psychoacoustics, the neuroscience of hearing and the underlying processes involved in music perception, aimed at musicians, composers, producers and engineers. The one-day lecture will be led by Dr Thomas Stainsby of Cambridge University's Department of Experimental Psychology and Dr Christopher Long of the Medical Research Council's Cognition and Brain Sciences Unit. It costs £164.50 per person including VAT. To book, or for more information, contact London School of Sound.

T London School of Sound +44 (0)20 7354 7337.
W www.londonschoolofsound.co.uk

Top tubes

Electro-Harmonix branch out with a new mic preamp

The latest creation from Electro-Harmonix might look like one of their valve-powered effects boxes, but it's actually a mic preamp, designed as a compact valve front end for digital recording systems. The American-made 12AY7 Mic Pre features one 12AU7 and one 12AY7 vacuum tube built into transformerless FET circuitry providing up to 50dB of gain. Like the rest of EH's valve-powered range, and *un*like many other products which feature a 'vanity tube', the 12AY7 Mic Pre places a full 200V across the valves to get them really working. It has an XLR input and balanced TRS jack and XLR outputs. On the top of the unit there's an input gain control, phantom power, high-pass filter and phase-reverse switches and the 'quarter-inch output level' control which adds up to 18dB of additional gain to the balanced jack output. In addition to mains power and phantom power indicator LEDs, there's an overload LED which lights as the tubes are being pushed into clipping, and the 12AY7 is designed to overload in a warm and musical way. It costs £115 and is available now.

Electro-Harmonix are also now marketing the Oktava ML52 ribbon mic, reviewed in *SOS* December 2001 (www.soundonsound.com/sos/Dec01/articles/oktavaml52.asp), re-badged as the EHR1. This mic is a bit of a cult favourite, offering a smooth, dark tone, strong bass response and excellent side-rejection from its figure-of-eight pickup pattern, but it has at times been difficult to get hold of. So its return under the EH guise is a welcome one, especially at the price of £195. Company president Mike Matthews says that, on first trying out the mic, "I liked it so much that I decided to put the EH brand on it and get it out there to our customers". So there!

T Hot Rox UK
+44 (0)115 987 3163.
E hotroxuk@ntlworld.com
W www.hotroxuk.com
W www.ehx.com

Drive time

Tascam add CD drive to affordable multitracker

Based on the DP01FX digital multitrackers, reviewed in *SOS* April 2005 (www.soundonsound.com/sos/apr05/articles/tascamdp.htm), Tascam's new DP01FX/CD adds a CD-RW to the machine's existing features, which include eight tracks, two phantom-powered mic inputs, a pair of digital effects processors, a USB 2.0 interface and a 40GB built-in hard drive. The DP01FX/CD will be available soon, with pricing yet to be confirmed.

T Tascam
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Bear necessities

The Mama Bear acoustic guitar preamp

Now arriving on these shores courtesy of Aria UK, the Dtar Mama Bear is a digital modelling preamp designed to tackle the common problems encountered by anyone who has ever tried to get the signal from an acoustic guitar pickup to actually sound like a real acoustic guitar — under the headline 'Bear Kills Duck', Dtar promise to make pickup 'quack' a thing of the past! As Dtar stands for Duncan-Turner Acoustic Research — the company was founded by guitar pickup expert Seymour Duncan and guitar and amp builder Rick Turner — it's a safe bet that they know what they're taking about.

Similar in approach to the Fishman Aura preamp, reviewed in *SOS* November 2004 (www.soundonsound.com/sos/nov04/articles/fishmanaura.htm), the Mama Bear is even simpler to operate. Two 16-position rotary knobs are at the heart of its operation. The Input Source knob is set according to what kind of pickup your guitar is fitted with (piezo film, piezo ceramic, magnetic and so on) and tells the Mama Bear what it's dealing with. The second knob, labelled Target Instrument, is used to select the type of guitar you want to emulate, and the 16 options provided cover just about any conceivable option, including parlour, dreadnought and jumbo acoustics, gypsy jazz guitars and even resonators. The user can choose the option which most closely matches their actual guitar, or go for something completely different.

The Mama Bear uses 32-bit floating point processing and features 24-but A-D/D-A converters. Besides those all-important Source and Target knobs, there are input- and output-gain controls, an analogue low-cut filter and bypass, mute and phase-reverse switches. At the rear, there are balanced XLR and unbalanced jack outputs, a ground-lift switch and the input for the external mains adaptor. Hopefully, we'll be taking a closer look at the Mama Bear soon, but from the brief strum we had at the British Music Fair, in admittedly less-than-ideal conditions, the results sound very promising. The anticipated price of £289 sounds even better!

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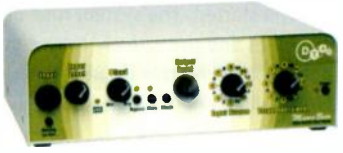

Instrument and equipment insurance from Music Insure

Music Insure are a new company providing specialist insurance to musicians. Backed by the Music Industries Association, Music Insure cover risks often not included in household insurance policies, including unrestricted professional use, accidental damage and theft from an unlocked room or unattended vehicle. Music Insure also have a working partnership with Musi-trac, suppliers of minute microchips which can be used to tag valuable instruments. Premiums start from £2.25 per month and there's no excess on acoustic/classical instruments, with a £25 excess on all electronic instruments.

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True tape

Rupert Neve takes tape emulation to its logical conclusion

The new Portico 5042 from Rupert Neve Designs is a two-channel 'true tape' emulator and line amp which joins the ever-expanding Portico range of modular units (the range already features a mic preamp, a line preamp and EQ, a compressor/limiter and an M&S stereo mixer). The 5042 is designed to recreate the rounded compression effect imparted by analogue tape and the half-rack unit incorporates an actual tape drive circuit that feeds

a tiny magnetic 'head' which is coupled to a correctly-equalised replay amplifier. According to the company, the only thing missing is the tape itself! As you would expect, the unit is built to extremely high specifications throughout and while the controls allow the user to drive the unit to produce tape-style saturation, the dynamic range of the Portico 5042 is far greater than that of any analogue tape recorder. The 5042 is available now exclusively from Rupert Neve Designs in the USA, at an introductory price of $1435 (currently about £810 excluding import duty and shipping) .

T Rupert Neve Designs +1 512 847 3013.
W www.rupertneve.com

Tiger feat

High-speed Edirol USB interface gets OS X 10.4 support

Edirol have produced a Mac OS 10.4 'Tiger' driver for their UA101 USB 2.0 audio and MIDI interface, reviewed in *SOS* May 2005 (www.soundonsound.com/sos/may05/articles/edirolua101.htm). Originally only compatible with Windows XP, the UA101 is now an option for Mac-based musicians. The development of USB 2.0 audio support for Tiger is another first for Edirol, whose UA1000, released in 2003, was the first-ever recording interface to use the USB 2.0 protocol. The beta version of the new driver is available to download from www.edirol.com/support/drivers.html, with the official release scheduled for sometime later this year.

T Edirol Europe +44 (0)20 8747 5949.
F +44 (0)20 8747 5948.
E info@edirol.co.uk
W www.edirol.co.uk

REQ-ing crew

EQ the Buzz Audio way

The latest product from New Zealand's Buzz Audio is the REQ 2.2 Resonance Equaliser. As you expect from a Buzz product, the REQ sets a very high standard in terms of both design and construction, with passive filter networks and Class 'A' discrete transistor amplifiers throughout. Each of the two channels has four sweepable bands which can be individually switched in and out of the signal path, as well as a switchable high-pass filter and a saturation control which adds vintage-style transformer coloration. It's available in two versions: a mastering version with detented boost/cut controls which range from -10 to +8dB and a lower-cost recording and mixing version with continuously variable boost/cut controls with a range of ±16dB. The REQ2.2 will be available by October, though UK pricing had not been confirmed when we went to press.

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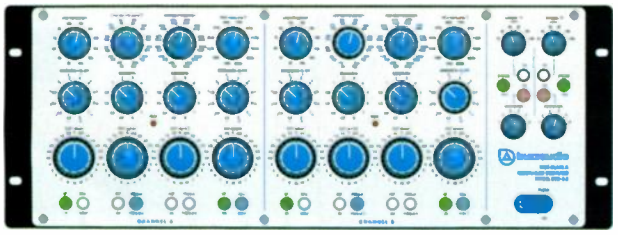

Special K

NI release virtual piano

Native Instrument's *Akoustik Piano* is a new sample-based virtual instrument featuring three grand pianos, namely the Steinway D, Bechstein D280 and Boesendorfer 290 Imperial, and one vintage upright, the Steingraeber 130. Multiple velocities, as well as entire sustain and release phases, have been carefully captured using a special mic setup and the clean and clear user interface allows the amounts of pedal noise, key noise and pedal-down resonance to be individually adjusted. The instrument also features a three-band EQ, pan controls and a built-in convolution reverb to simulate a range of acoustic spaces. *Akoustik Piano* is available now, priced £219.99. It's compatible with Windows XP and Mac OS 10.3 and above and can operate as a stand-alone application or as a VST, AU, RTAS or Direct X plug-in.

T Arbiter Music Technology +44 (0)20 8207 7880.
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Time capsule

New Korby Convertible mic head recreates the Sony C800G

Korby Audio have released a C800G capsule for their KAT 4 microphone system. Otherwise known as the Korby Convertible, the KAT 4 system consists of a high-quality hand-wired studio mic with hot-swappable heads which feature precise recreations of classic capsule designs. The latest addition is modelled after the Sony C800G microphone which (we're reliably informed) is currently very popular with US hip-hop artists. The new head joins the existing range of four classic vintage capsules, namely the Telefunken 251, the AKG C12 and the Neumann U67 and U47. It costs £934 including VAT and should be available by the time you read this.

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E sales@asapeurope.com
W www.asapeurope.com
W www.korbyaudio.com

Uno for the road

IK release free virtual guitar amp

Hoping to demonstrate the capabilities of their *Amplitube* amp modelling software to new users, IK Multimedia have produced *Amplitube Uno*, a stand-alone guitar amp simulator for Windows 2000 and XP and Mac OS X. *Amplitube Uno* features the Crunch amp model and a distortion stomp box taken from the full version and it's available now as a free download from www.amplitube.com.

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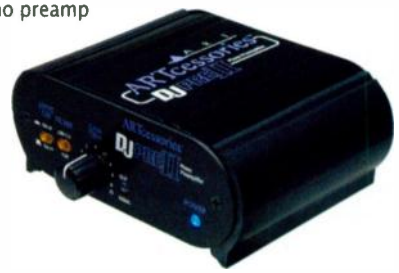
E uk.sales@ikmultimedia.com
W www.ikmultimedia.com

This year's model

ART update mini studio boxes

Applied Research and Technology (ART), who are currently celebrating their 20th year in the pro audio business, have produced new versions of three of their most popular devices. The latest incarnation of the much-imitated Tube MP, christened the Tube MP Project Series, features a significant shift in design, with the controls moving from the top to the front of the desktop unit, which has a sturdy stackable casing. It also does away with the 'Variable Valve Voicing' feature of the Tube MP V3, reviewed in *SOS* February 2005 (www.soundonsound.com/sos/feb05/articles/arttubemp.htm), and replaces the V3's VU meter with a four-segment LED meter. The valve-equipped single-channel preamp offers 70dB of gain, phantom-powered mic, line and high-impedance instrument inputs, high-pass filter and phase reverse switch and input and output gain controls. It costs £69.99.

The new USB Phono Plus (formerly the USB Micro Pre) is a Mac and PC USB interface for line-level and phono (turntable) signals. It also features optical and coaxial S/PDIF inputs, a low-cut filter and a gain control and can be powered via USB or a mains adaptor. It has stereo line outputs and a headphone out and costs £79.99. The DJ Pre II (formerly, and rather confusingly, the Phono Micro Pre) is designed to sit between a turntable and the rest of your audio recording or playback system and provides a phono preamp gain control and switchable input capacitance (100pF/200pF) to optimise phono cartridge response. It costs £44.99.



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Metropolis launch on-line mastering service

Renowned recording and mastering facility Metropolis are launching their on-line mastering service, www.imastering.co.uk, on the 1st of September. Basic CD mastering costs £75 per track, equating to around £900 for a 12-track CD including a finished CD-R and a CD Master. Vinyl mastering starts at £100 per side. iMastering uses a secure FTP server and all payments are made on-line.

E imaster@metropolis-group.co.uk
W www.imastering.co.uk
W www.metropolis-group.co.uk

Live drum tracks made to measure

Professional drummer Joe Crabtree is offering a custom drum track recording service via his web site, www.drumsolo.co.uk. Post or upload a version of your song without drums and he'll record a drum track and send back the multi-tracked recording so you can mix them yourself, or supply a full stereo mix. The price is a fraction of what a session drummer and studio time would cost, according to Joe, and satisfaction is guaranteed or your money back! Contact him for more information.

E info@drumsolo.co.uk
W www.drumsolo.co.uk

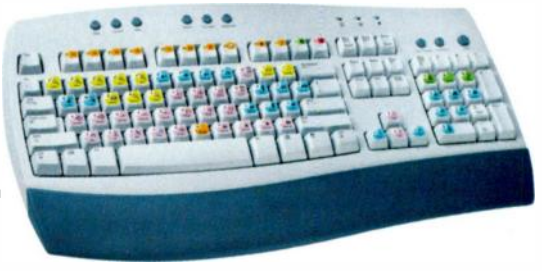
Shortcut Shangri-la

25-percent discount on keyboard shortcut stickers for all *SOS* readers

Editor's Keys, whose range of low-priced keyboard shortcut sticker sets for audio and video software was featured in last month's *Pro Tools* Notes column, have announced that they're offering a 25 percent discount to all *Sound On Sound* readers. Sticker sets tailored to *Pro Tools*, *Cubase*, *Sonar* and *Reason* are all available now from www.editorskeys.com, with a *Logic Pro* set apparently soon to be released. Sets for *Avid*, *Final Cut*, *Premiere* and *Photoshop* are also available.

The coloured stickers are made from splash- and fade-resistant PVC and feature clear icons illustrating each shortcut's function, as well as the original QWERTY symbol. The company claim using shortcuts can speed up production time by up to 40 percent, and at £10.99 per set the Editor's Keys stickers are a great deal cheaper than buying a whole new editing keyboard.

Best of all, with the current 25 percent discount offer, each set will only cost you £8.25. Head to www.editorskeys.com/saver to take advantage of the deal.



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E info@editorskeys.com
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Perfect pitch

Latest *DP* update adds powerful pitch automation capabilities

Version 4.6 of *Digital Performer*, a free update from v4.5 for Mac OS X 10.3 and 10.4, is now available to download from www.motu.com. New features introduced in the update include pitch automation, which allows users to adjust the pitch of monophonic audio using track automation tools. Anything from subtle pitch-correction to radical pitch-shifting effects can be drawn on using the pencil tool, in the same way as level, panning and effects automation. It's also now possible to quantise and scale pitch and to convert audio to MIDI.

The *Pattern Gate* plug-in (pictured right), essentially a gate controlled by a 16-step sequencer, can be used to create rhythmic patterns from pads, drones and loops, while the new V-Racks feature is a convenient way of managing plug-ins and virtual instruments that also reduces the CPU load. This is because a V-Rack behaves like a normal *DP* sequence but it holds virtual instrument tracks, aux tracks and master fader tracks but no disk tracks.

Elsewhere there are a number of new features for creating music for film and video. You can open multiple Quicktime movies within one project, the Find Tempo feature, used to find a suitable tempo to match video cues, has been enhanced and projects can be bounced directly to a Quicktime movie.

DP 4.6 also supports multiple outputs from Audio Units virtual instruments and Audio Units and Rewire outputs are now managed from a single window. The AAF file standard for exchanging multitrack files with *Pro Tools* is also now supported. And, last but not least... well, actually last *and* least, there are a wider range of metronome click sounds!

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W www.motu.com

Practice makes perfect

Rehearse, record and play back with the PSD340

The Superscope PSD340 features two CD drives which can play MP3 CDs as well as standard audio CDs and allows real-time independent key and tempo manipulation, allowing the user to change the speed or key of the music for practice purposes. The lower of the two drives also records to CD-R or CD-RW, whether from the other drive or from the PSD340's stereo mic, line and aux inputs, coaxial S/PDIF input or built-in mic. The machine can provide phantom power to condenser mics and also features built-in reverb and delay effects and a chromatic tuner. It's available now, priced £763.75.

T Studio Music Company +44 (0)20 8830 0110.
E info@studio-music.co.uk
W www.studio-music.co.uk
W www.superscopetechnologies.com

The Guide To MIDI Orchestration price correction

The price given in last month's review of *The Guide To MIDI Orchestration* by Paul Gilreath (see page 242 of *SOS* August 2005) was incorrect. The correct price is £39.95 including VAT.

T Time + Space
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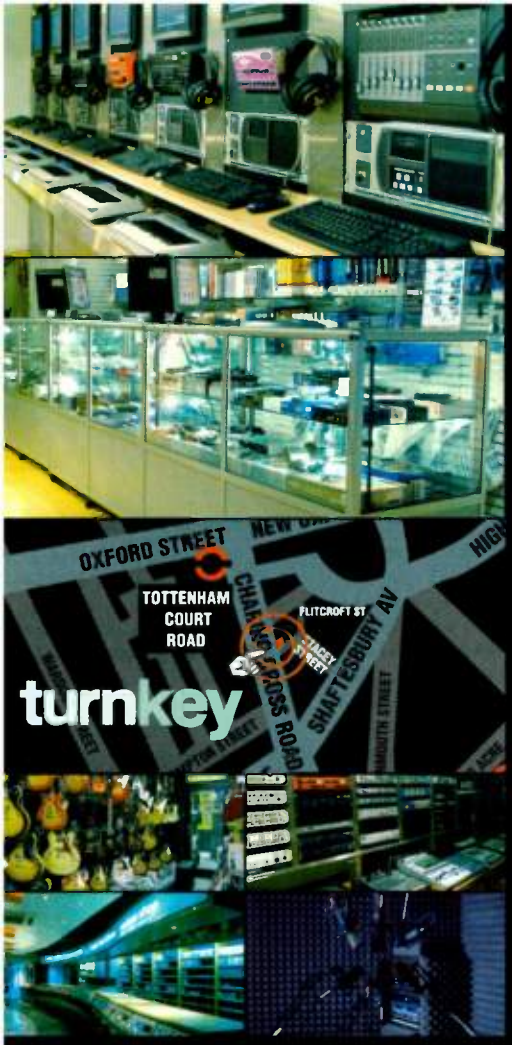

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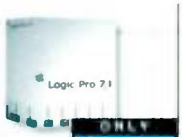

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S03SL
MIDI SYNTHESIZER — YAMAHA

Compact 5 octave keyboard synth with 64 note polyphony and 25MB wave ROM using Yamaha's rich 4 layer AWM2 tone generation to provide hundreds of great stereo sounds. There are 480 XG / GM presets, plus 128 Yamaha factory synth presets, 20 factory drumkits together with user preset space for 128 programs, 2 drumkits and 32 multis. The synth has 64 resonant LPF filters, huge Yamaha effects DSP including wah, overdrive as well as pitch / mod wheels, LCD and computer interface.

RRP £499 **£299.99** YAMA-S03SL

REVOLUTION X
NEARFIELD MONITOR — TANNOY

A sensational offer on this amazing centre speaker! Tannoy's Revolution X is ideal for 5.1 surround monitoring, home cinema, or use in pairs as normal monitors. It houses two composite 5 inch woofers and a 1 inch soft dome tweeter in a rear ported d'Appolito configuration. The cabinet has magnetic sheilding and heavy 17kg build quality. Output is 90dBspl per watt with max 90 watt RMS continuous rating (approx 150W program peaks) and 6 ohm nominal impedance. Very flat, linear 50Hz - 20kHz +/-3dB response and detachable black grille.

RRP £150 **£49.99** TANN-REVOLX

REVEAL SUB 15
ACTIVE SUBWOOFER — TANNOY

Probably the best "bang for the buck" active subwoofer on the market. A sensible sized 95 litre bass cabinet loaded with a 15 inch woofer, front ported, and driven by a dedicated 100W RMS power amplifier built-in. Delivers a kickin' output to -3dB at 25Hz, but that's not all..! The Reveal Sub 15 is the nerve centre of an active 5.1 surround system with onboard HPF / LPF crossover and 6 channels of amplification to drive all other (passive) speakers. ie. 100W for itself (sub) plus 100W centre amp output and 4x 70W (from L/R, rear L/R amp outputs.) Wow!

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VMK 88
MIDI CONTROLLER — FATAR

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Solution packages only available at these prices when you purchase a Carillon PC. All prices include VAT.

TOTAL SATISFACTION
NO EXTRA CHARGE

When you buy a music computer, all bases should be covered. To that end, we include everything below as standard in the price - all you need to get started plus all you need to keep working, and then some! This stuff could easily set you back nearly £2,000 if bought separately, but then you'd still have the familiar issue of one supplier blaming another for your problems if things went wrong. Go on - how many other reasons do you need?

FIX

Carillon Fix is quite possibly the most useful piece of software we've ever encountered. It allows us to 'dial-in' to a computer and control it as if we were sitting in front of it. One of the hardest things in tech support is extracting from the caller exactly what they mean by 'it doesn't work'. Using Fix we can instantly see what the caller is talking about. They can sit and watch while we show them how to do what they want to do. Unlike some other remote solutions, Fix provides realtime chat windows, on screen drawing, file transfer and the ability to reboot the computer and dial back in - vital tools for troubleshooting.

Carillon Fix allows us to solve nearly all problems quickly and without fuss, and without having to have the system returned to us.

PRICE ELSEWHERE ~~£24.99~~ **£FREE**

RESTORE

Having a backup of your system is vitally important, especially in these days of sneaky viruses. Carillon provide each system with a complete factory backup of the original configuration which will return your system to how it was when you first received it - clean and working (but with your audio files still intact). With the internet and cover disk demos, computers can get clogged up with rubbish over time and there are many things out there that may interfere with your music software.

Even more useful is that you can create your own system backups! So, once you have the system how you want it then you can create your own 'Recovery', and if the worst happens you're back up and running in no time.

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SOFTWARE

We've got together with Intel and leading software house Native Instruments to bring you a superb collection of synths and mixing software that takes full advantage of Intel technology. The unparalleled performance Xpress Keyboards recreates the sounds of three legendary classics, which to this day have not lost an ounce of their popularity. B4 Xpress delivers the powerful sound of the B3 drawbar organ including rotary speaker, FM7 Xpress delivers the sounds of the famous FM synths of the 1980's, and Pro-53 Xpress recreates the sounds of the beloved Prophet-5 analog synth. On top of that you also get Traktor DJ Studio - simply the best DJ-ing software around for mixing up your MP3s, CDs or other recorded sound files. It goes beyond the possibilities of conventional DJ equipment by implementing a vast range of mixing features that only software can provide.

PRICE ELSEWHERE ~~£189.99~~ **£FREE**

HELP

Software generally comes with a manual of some sort to show you how to uncover the mystery of how it works. Soundcards similarly have documents telling you which bits do what. However, there's always been one bit missing that tends to create a yawning gap between making music and not being able to do anything - how the soundcard and software relate to each other. The sofware company don't know what soundcard you are using and vice-versa.

All of the 'Solutions' we offer come with comprehensive specially written tutorials that bridge the gap between the soundcard and the software and show you how to use the system as a whole. It's an invaluable resource for new users or anyone who needs a point in the right direction.

PRICE ELSEWHERE ~~£24.99~~ **£FREE**

SOUNDS

SampleLab was formed to produce the most sonically accurate recordings possible by using only audiophile quality equipment and a fully 24 bit recording, editing and mastering process from start to finish. The resulting collection of sample CDs has received rave reviews in the music press. All 6 titles are provided, free of charge, in .Wav format with Halion and EXS24 instrument definitions.

The titles are: Drum Fundamentals, Discography, Luscious Grooves, Spatial Awareness, Analog Archive, and new Broken Beats - check out www.samplelab.com for full details and audio demos.

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QUIET

In an ideal world with little pressure on finances and floor space, noisy stuff like tape machines and computers are exiled to a 'machine room' which is acoustically isolated from the studio mixing area. The reality is that most studios operate from one room. In this situation, comfortable, accurate monitoring is seriously compromised by a noisy computer (how can you hear your gate thresholds properly, or long fade-outs against a background of fan and drive noise?). Worse still, the need to record clean acoustic instruments and vocals can rule out the use of a standard PC altogether. The Carillon AC-1 is no standard PC. We've invested hundreds of hours in the testing and sourcing of quiet components and designed the system from the ground up to be as silent as possible - you'll find our four AC-1 Core systems to quieter than anything else in their class.

PRICE ELSEWHERE ~~£180.95~~ **£FREE**

KEYBOARD

This is an absolute stroke of genius. Keyboard shortcuts in software enable you to navigate about and perform actions so much quicker than messing around with a mouse. Our hard wearing keycap sets for the included keyboard (the mouse is free too!) are subtle and unobtrusive and don't render your keyboard useless for any other applications - they simply encourage you to use the shortcuts and in no time at all your speeding around your software without even thinking about it.

Available for Cubase, Nuendo, Sonar and Pro Tools and provided free of charge when you buy any Carillon system - just tell us what software you want to use.

PRICE ELSEWHERE ~~£99.99~~ **£FREE**

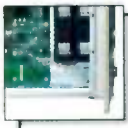
SUPPORT

We know our computers and we know the software and hardware. We're not a computer company with a passing interest in music, we're a music company that has a passion for getting the best out of computers. We're musicians and we all use computers in our music making. When you contact us you're talking to the most concentrated bank of computer music knowledge that you'll find anywhere, plus you get access to the restricted support area of our website.

We've used pretty much every soundcard and piece of music software there's ever been, so if you can't get sound in, or MIDI out, or sync synchronising, then come to us for the highest quality support around.

PRICE ELSEWHERE ~~£699.00~~ **£FREE**

SYSTEM



Carillon's audio PC systems integrate hardware and software as never before. Painstaking attention to detail means we worry about stuff like low-level Windows settings, and leave you with the creative dilemmas. Carillon has direct access to thousands of audio software and hardware products. Critically, our selection of components for each system is totally independent of any supplier our selections are based on rigorous testing, active participation in user forums, up to the minute market information, and literally thousands of man years experience with hundreds of brands - our engineers' experience is our number one benefit. Each Carillon Audio System is carefully designed like a dedicated hardware product to be produced in large numbers, so you don't have to be the guinea pig.

PRICE ELSEWHERE ~~£300.00~~ **£FREE**

Unsolicited *Sound On Sound* web forum quotes!

"I just got a Cubase SX Pro Studio from Carillon, and it is the best quality PC I've ever seen. It's built like a tank, and all the hardware is first-rate - all I had to do was hook it up, turn it on and go."

"I must say that I have found the general after-sales and customer services provided by Carillon to be extremely impressive. They are the only company that I have dealt with in the last few years who have pro-actively made sure that I was satisfied."

"The Carillon is a remarkable beast - very powerful and almost totally silent!"

"You're deciding between a G5 and a Carillon system. These are BOTH extremely high-end machines, the only difference that springs to mind is that Carillon have an excellent reputation for support."

"Carillon PC's are as professional as you can get."

"My Carillon is an AC1-LE which I bought about two years ago. It's built like a tank and I love it to death"

"Reliability has been excellent - no problems at all."

"I bought an AC-1 15 months ago and will repeat what others have said - great build quality, very quiet, cool case, configured BRILLIANTLY and full of freebies."

"The price is incredibly reasonable considering the expertise and support that you're getting access to."

"I have just bought a Carillon music PC. Top notch kit, very quiet and rack mountable as well. 10/10."

"The machine I bought from them is brilliant."

Sound On Sound PC Music Forums at www.soundonsound.com

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NI Traktor DJ Studio	£129.99
ASK Software Tutorial	£24.99
6x SampleLab Sample CDs	£359.70
PC Silencing Kit	£180.95
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VIRUSControl™ VST/AU Plug-in
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2048 flashable ROM and 512 user Singles, plus 16 all new self-contained multi-programs, each with 16 'embedded' singles, for layers, splits, and poly-arpeggiators you can tweak and transform without affecting your other banks, and much more! Beside this great synth, Total Integration is also a pro-quality audio/MIDI control centre, the included VIRUSControl™ VST/AU plug-in lets the VIRUS hardware appear as a softsynth in your host application – with sample accurate timing! The VIRUS can process audio from directly within your computer with no CPU overhead, and you can even seamlessly chain plug-in FX onto its sounds. With +4dB balanced analog and digital I/O backed by 24bit 192kHz converters, it is also perfect as the main I/O for your whole rig. To top it off, the synth hardware also doubles as a totally programmable MIDI control surface complete with 32 user memories. VIRUS TI represents a revolutionary new way to work and play, and with product evolution ensured with free upgrades from Access. This is just the beginning! Order yours today, and discover how ***one synth really can be all things to all musicians!***

The Specifications:

- Dual DSP for 80 note polyphony*
- Wavetable, HyperSaw™ and original VIRUS oscillator models. 3 main oscillators per voice (+sub)
- Parallel Reverb, Delay, Chorus, Phaser, Ring Mod, Distortion and Analog Boost FX per part
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- VIRUSControl™ VST/AU Plug-in links your synth to a Mac or PC to enable it to appear as a dual-stereo mix sample accurate soft synth with additional editor/librarian functionality
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* 80 note polyphony based on average patch load. Oscillator/filter model selection can result in slightly less or even more.

For detailed specification, brochures and demos go to www.virus-ti.com or contact info@access-music.de

VIRUS | TI KEYBOARD

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Q&A

Your technical questions and queries answered

Q Do I need to register with royalty collection agencies abroad as well as in the UK?

Is the German GEMA essentially the same as the MCPS? Does a band putting out its own CDs need to register with different people in different countries, or do these organisations cover all situations?

Via Email

Releasing a record commercially requires a fair amount of paperwork.

***SOS* contributor Tom Flint replies:** GEMA performs pretty much the same function in Germany as the MCPS (Mechanical Copyright Protection Society) does in the UK. GEMA's full name (Gesellschaft für musikalische Aufführungs- und mechanische Vervielfältigungsrechte) translates as the Society for Musical Performing and Mechanical Reproduction rights. In other words, GEMA help songwriters, lyricists and music publishers obtain their royalties and, just like the MCPS, GEMA acquires these funds by taking a cut of record sales revenue in exchange for granting manufacturing licences to record labels.

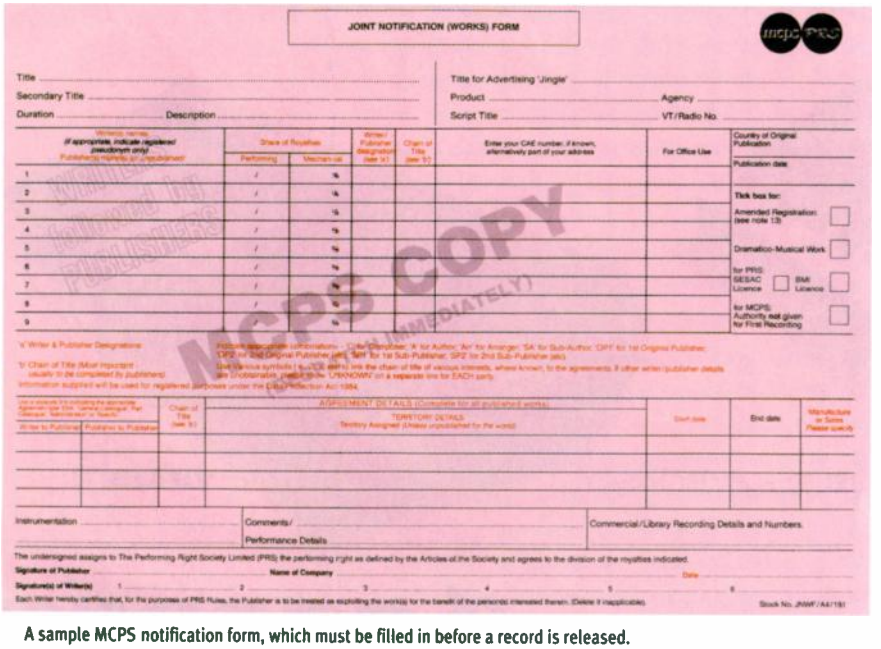
In the UK, the MCPS licences usually have to be paid by the record label up front and are set at 8.5 percent of the price the label charges the distributor for each record (known as the PPD or Published Price to Dealer). The 8.5 percent is the writer's cut of the record's sale price, although writers who are signed to a publisher have to split their fee according to their publishing deal. If no dealer or distributor is involved, the figure paid by the record label is rated at 6.5 percent of the retail price, excluding VAT. GEMA operate in a similar way, although they take just over nine percent of the PPD.

Other countries besides Germany also have their own versions of GEMA. In France, for example, there is SACEM, in Japan JASRAC, and in the US they have the Harry Fox Agency.

Quite whether you will actually need to deal with GEMA, or any other foreign agency depends on your location. According to the MCPS, licensing is not determined by the country of manufacture, but by the country in which the label is based. This means that if you are a UK-registered company it won't be necessary for you to get a licence from GEMA, even if you are using a German manufacturing company to make your CDs. The same is true if you are manufacturing CDs in the UK and exporting them to Germany. Obviously you could strike some sort of deal with a German label and have them release the record on your behalf, but it would then be up to them to obtain the relevant licence from GEMA.

It's worth noting that the MCPS are not the only collection society you need to consider contacting when releasing a record. There is also Phonographic Performance Limited (PPL), which collects licence fees for records played on the radio and TV and in pubs, clubs and other public places, and the Performing Right Society (PRS), which collects royalties from the public performance and broadcast of musical works (both recordings and live performances). Fortunately, both the PPL and PRS gather musical performance royalties from foreign countries on your behalf, so you don't necessarily have to sign up to the equivalent organisation in each and every country.

The PPL have both a Performers Services department, which deals just with performer rights, and a Members department dedicated to serving the rights of labels and the owners of record releases. In each case there are a variety of different PPL forms to sign, which determine exactly which rights the PPL will manage. The Members' Overseas ▶


JOINT NOTIFICATION (WORKS) FORM

mcps prs

Title
Secondary Title
Duration Description
Title for Advertising 'Jingle'
Product Agency
Script Title VT/Radio No.

Writers' names (if appropriate, indicate registered pseudonym only) Publishing name(s) (if applicable)
Share of Royalties: Performing / Mechan-ical %
Writer / Publisher Designation (see 'a')
Chain of Title (see 'b')
Enter your CAE number, if known, alternatively part of your address
For Office Use
Country of Original Publication
Publication date
Tick box for:
Amended Registration (see note 13)
Dramatico-Musical Work
for PRS: SESAC Licence / BMI Licence
for MCPS: Authority not given for First Recording

'a' Writer & Publisher Designations
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TERRITORY DETAILS: Territory Assigned (Please underline for the world)
Start date
End date
Manufacture or Sales (Please specify)

Instrumentation
Comments/ Performance Details
Commercial/Library Recording Details and Numbers

The undersigned assigns to The Performing Right Society Limited (PRS) the performing right as defined by the Articles of the Society and agrees to the division of the royalties indicated.
Signature of Publisher
Name of Company
Date
Signature(s) of Writer(s) 1 2 3 4 5 6
Each Writer hereby certifies that, for the purposes of PRS Rules, the Publisher is to be treated as exploiting the work(s) for the benefit of the person(s) interested therein. (Delete if inapplicable)
Stock No. JNWF/A4/1SI

MCPS COPY
NOT FOR PUBLICATION

A sample MCPS notification form, which must be filled in before a record is released.

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"The most exciting new product in years."

This is the typical reaction we've heard from people seeing the revolutionary Smart AV Console for the first time. Designed for use with today's most popular DAWs including Apple Logic, Digidesign Pro Tools, Steinberg Nuendo and Merging Technologies Pyramix, the Smart Console represents a quantum leap forward in ergonomics and is radically different from any other control surface or mixer on the market today - operation is so intuitive and well thought out that you can be up and running in minutes rather than days, and project completion times are slashed. Highlights of the design include:

- Patented touch-sensitive ARC technology allows instant *one touch* selection of any channel or group of channels from those currently in use on the DAW.
- ARC also allows instant muting, soloing (or custom function) of any channel, even if it not currently active on the console.
- Channels named in your own handwriting on the ARC appear in the electro-fluorescent display.
- Dual concentric touch-sensitive EQ pots show current gain and frequency information on LED fan displays.
- Central LCD touch-screen with dual concentric touch-sensitive pots offers detailed control of EQ, dynamics and 3rd party plug-ins for any channel with one touch selection from the ARC.
- Motorised touch sensitive aux send knobs and touch-sensitive pan knobs with LED surround pan displays.
- Motorised touch sensitive surround panner available to all channels.
- Ultra-fast 100mm Penny & Giles touch-sensitive motorised faders.
- Optional Edit Panel with high quality jog wheel, 40 custom function buttons and built-in 12" LCD.
- Available in 48, 72 and 96 channel ARC versions.
- Small footprint allows installation even in project rooms.
- Built-in support for third party surround monitoring controllers, remote mic pre-amps, etc.

smartav

Most of all though, this console really does have to be seen in action to be believed.
Call us today to arrange a free demonstration - it *won't* take much of your time.

...did we mention we are also the UK's No.1 Pro Tools dealer?

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Q&A

Mandate is the form which allows a label to specifically identify the overseas territories from where they'd like the PPL to collect royalties. The form still makes it possible for members to 'opt out' and register with foreign collection agencies representing particular countries, but PPL already have a reciprocal arrangement with 19 major territories including France, Germany, Japan and the US, so there's not really much point in creating more administration work for yourself by signing individual deals. The only complication is the relationship with France, where it is necessary for labels to specify whether the PPL speak to either the SCPP (Société Civile des Producteurs Phonographiques) or SPPF (Société Civile des Producteurs de Phonogrammes en France)! Quite whether one organisation is more forthcoming with royalties than the other is unclear. Performers have a separate set of PPL forms to complete, which also include an Overseas Mandate form.

The PRS do the same job of collecting royalties for songwriters and music publishers, and have a similar kind of reciprocal relationship with overseas collection agencies, so if you have written any material on the album you will need to speak to them to claim these rights separately. As you can see, by signing with all the British organisations, you should have everything covered.

Incidentally, just recently the MCPS and PRS joined forces to form the MCPS-PRS Alliance (www.mcps-prs-alliance.co.uk), which is actually even more closely related to the setup of Germany's GEMA, which deals with both mechanical and performance rights.

For more information on this and other aspects of the music business, check out Tom Flint's seven-part series on running your own record label, beginning in SOS *September 2002 (www.soundonsound.com/sos/Sep02/articles/diylabel.asp).*

Q Can I leave my mic powered up?

I've just bought my first mic, a Rode NT1A, which requires phantom power, and I'm wondering if there's anything wrong with leaving it plugged in with phantom power switched on for long periods of time? It's a bit of a hassle to have to take it off the stand, unplug it and put it away every time I use it.
***SOS* Forum Post**

Technical Editor Hugh Robjohns replies: There's no problem with leaving your mic powered up — many professional studios prefer to keep their mics powered all the time, and there are some good arguments in favour of this approach.

The most likely cause of damage to a mic is accidentally dropping it on the floor, and that is most likely to happen when putting it on or taking it off a stand! So avoiding that risk is probably a good thing. Also, if the mic is supported in a shockmount, continually taking the mic in and out of the mount will tend to stretch the suspension elastics and weaken the clamps, again making it less reliable over time.

So, assuming that you have space to leave your mic on its stand, it's not a bad idea. However, you should take steps to make sure that the capsule is protected from dust when not in use, so placing a clean

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WRH

Leaving a condenser mic such as the Rode NT1A on it's stand and powered up when not in use does no damage, though you might want to keep the dust off with a polythene bag.

polythene bag (a freezer bag, for example) over the mic when you have finished with it is a sensible precaution.

Leaving the mic powered will also help to keep moisture at bay in most locations (as long as we are talking about a room in a house rather than a shed in the garden). As well as keeping dust away, a polythene bag over the mic will also help keep warm air around the capsule.

Most electronic components are quite happy if powered permanently, and generally fail when power is applied after being turned off. So leaving a mic powered is unlikely to shorten its life significantly, and may well prolong it!

As I said, a lot of high-end studios leave their mics on stands, powered and protected with bags — it's not an unusual practice at all. Of course, in those situations the mics are in use pretty much every day, but if having the mic on a stand, powered and ready to go, helps make it easier to record something when the mood takes you, why not? It would be a shame not to record something just because you can't be bothered to get out a mic stand, unpack a mic and plug it all up!

Q How do I hook up my reel-to-reel tape machine?

I recently purchased a second-hand Tandberg reel-to-reel tape machine and I'm having difficulties connecting it to my external hi-fi. I was provided with a lead that has a five-pin socket at one end and phono leads at the other, which I plug into the 'analogue in' socket on my hi-fi. However, when I'm playing tapes the music only comes out of one channel. The back of the Tandberg has two of these five-pin sockets and also three other holes, marked 'p up' 'amp' and 'radio'. Can you tell me how I can get the sound coming from both speakers and not just one? Any help would be most appreciated by this novice reel-to-reel owner!
***SOS* Forum Post**

Technical Editor Hugh Robjohns replies:
There are several possibilities here. The most obvious one is that the DIN-phono lead you have is broken. DIN is the Deutsches Insitut ▶

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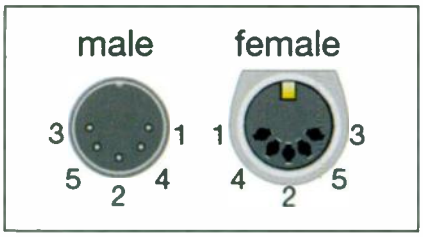
Q&A

▶ für Normung, a German standards-setting organisation, and it specified a range of connectors using a similar body with between three and 14 pins. The three- and five-pin versions were used a lot on hi-fi equipment in the '60s and '70s, before the RCA 'phono' socket became the standard interface, and now the five-pin DIN is most commonly found on MIDI leads. If you have a test meter, check the connections between the phono plugs and DIN pins to see if the cable is faulty.

For some bizarre reason, some manufacturers' implementation of the DIN wiring is exactly the opposite of others, so although I am giving the most common way of wiring them up, bear in mind that this is not always the case. The 5-pin DIN sockets were used to convey stereo unbalanced signals. The DIN pins on a male jack are numbered in the order 1, 4, 2, 5, 3, clockwise from right to left (see diagram). Normally, pins 1 and 4 were used for the left and right inputs, respectively, and 3 and 5 for left and right outputs, with the middle pin of the five (pin 2) serving as the common screen or earth connection for all four signals. If your DIN-phono lead only has two phono connectors on it, the centre pins of the two phonos will either go to 1 and 4, or 3 and 5 — a test meter will help you find out which.



The 'standard' numbering scheme for DIN plugs.

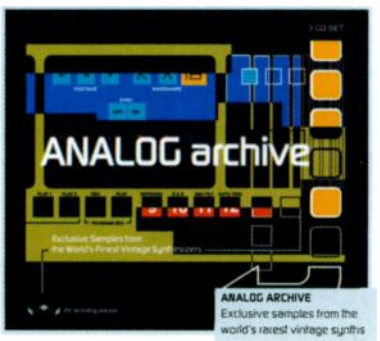
The other possible explanations for why you're only getting output on one channel are broken electronics within the machine itself, or that you are trying to play a quarter-track tape on a half-track machine (or vice versa)...

You can check the latter by looking at the heads or making a test recording to a blank tape. A half-track head uses almost half the tape width for each channel, so you'll see the two head gaps occupying just under half the tape width, with only a small gap (guard band) between them. A quarter-track head uses slightly less than a quarter of the tape width for each track, and the two channels are separated by a quarter-track width, so the two head gaps are separated by the width of another head gap.

As for the 'p up', 'amp' and 'radio' sockets, this suggests that the machine has a built-in record selector and preamp. 'P Up' will be an RIAA phono pickup input, for example. 'Radio' is pretty self-explanatory, and 'amp' is probably another line-level input — but it could possibly be an output intended to go to a preamp. It would be worth checking anyway!

Q How can I use side-chains in Steinberg *Cubase SX*?

I've been using Steinberg *Cubase SX* for a couple of years now, but although the bundled VST dynamics plug-ins in *SX* 2 are perfectly reasonable, after reading up on various production methods. I've realised that professional studios make a lot of use of 'ducking' and side-chaining compressors in order to keep the vocals or lead instruments



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in balance with the main body of the mix, for example. I know this sort of thing is possible in *Reason* or *Live*, but from what I understand of *Cubase*, signals cannot be 'routed' in this way to a compressor's side-chain to modulate another signal. Or could it be done with something like the Xlutop *Chainer* or some such virtual router? The Waves plug-ins feature side-chain options, but I wouldn't know how to route a signal into them (and, as far as I know, *Chainer* doesn't support them). I'd greatly appreciate your advice.
Dale Kunzler

Features Editor Sam Inglis replies:
You're quite correct that the *SX* mixer is not very good for side-chaining using external key inputs. In fact this is true of many other DAW programs, too; the only one I know that offers the necessary flexible bussing structure is *Pro Tools*. For instance, I'm pretty sure that the side-chain features on Waves plug-ins only support external key inputs when used in *Pro Tools* — in *SX* and other applications, the side-chain is always the same as the audio input itself.

Recently, however, a few plug-ins have appeared that allow you to compress a stereo track in *SX* with the side-chain keyed from a separate source track. The way this works is a bit clumsy: you need to create a surround channel on the mixer, then route both the audio source and the side-chain signal to it. That way, a 'surround' plug-in inserted on that channel can 'see' both the audio source and the side-chain signal. Plug-ins I'm aware of that allow you to do this include Otium FX's *Compadre*, DB Audioware's *dB-D* dynamic processor and Kjaerhus Audio's *Golden Unipressor*. I should point out that I haven't tested any of them, though! SOS

Kjaerhus Audio's *Golden Unipressor* allows the use of side-chain inputs in *Cubase SX*.

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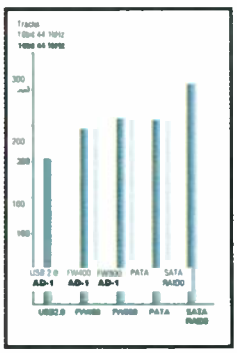
FireWire 800 – 800Mb/s



However, "real world" figures can be very different when you actually get down to it. In order to get a better idea of what our drives are capable of, we performed tests using audio track count, and also compared the results to that of a normal *internal* IDE drive (PATA) and SATA RAID-0 (2 serial ATA drives running as a single drive). As the graph *(right)* shows, the **AD-1** performs very favourably by comparison. The results are for a sustained rate of transfer playing back audio tracks in Cubase SX2.

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SOS: Save Our SW1000!

I know the pages of *SOS* are not really the place to air one's wish list, but could you find a few column inches to try and persuade the bods at Yamaha to develop a newer version of the SW1000XG card? I was hoping to squeeze more life out of the old soldier when I migrated to a Mac, only to find that, although Yamaha intended to develop OS X drivers, they could not make it so.

For musicians on a budget there has never been such a powerful and compact tool. Yes, the 01X is capable of everything the SW1000XG and DSP Factory (DS2416) could do, and more, in the mixing department. Yet it was the combination of the synth, soundcard and mixer on one PCI card that was the heart of the SW1000XG's versatility and hence popularity... oh, and of course the price! Not everyone has room for an 01X, but most have a spare PCI slot.

Perhaps other readers might like the chance to offer their thoughts and see if we can persuade Yamaha that it's a format worth keeping and developing.

Ian Harker

The SW1000XG PCI card has been consigned to history, while, for Yamaha, the mLAN protocol and products like the 01X represent the future.

Peter Peck, Marketing Manager for Music Production at Yamaha-Kemble, replies:

You raise some interesting points and I hope I can help with some of them. Firstly, we are sorry that there will not be an OS X driver for SW1000XG. The decision to stop support on this OS was not taken lightly. However, after much internal debate and consumer research, we had to regrettably take that step. We kept the SW1000XG fully supported for its record six years of sales, but could not justify the additional investment for OS X development.

As you know, the SW1000XG was, and remains, a unique concept. Unfortunately, all good things come to an end and we have discontinued its production. There are always many reasons for changes made to products and the direction of development — often too many to list! As a result, I am not in a position to give you all the detailed reasons, but I can share with you some of our computer-related thinking to help you understand our decision.

SW1000XG and DS2416 were designed a long time ago, in the days when the majority of customers had multiple PCI slots available, before plug-and-play and before software synthesizers became so commonplace. Naturally, when designing a product, we have to consider both how long it will take to develop and the length of time it will stay in the market. This means we have to be thinking a long way into the future. We have seen some incredible changes in the music-production process over the past few years, like the massive explosion of affordable software synthesizers and the ever-decreasing price of the laptop computer. As processing power has increased, VST instruments have really offered the musician a great value-for-money alternative to some PCI-based hardware alternatives. With many of our customers having migrated to physically smaller computers and laptops, as a manufacturer we have to find commercial solutions to suit those customers' needs — hence mLAN.

Yamaha (and all the other mLAN Alliance companies) now clearly see the future of computer-related music production as a scaleable, networkable system. By using the Firewire buss for mLAN we can now offer musicians and producers new tools and features that could not be achieved if we had remained on the PCI buss. For example, an mLAN-equipped Motif synth now can act as a bi-directional software controller, tone module, audio interface, multi-effects processor and controller keyboard. Admittedly, it has a higher price than the SW1000XG, but the increase in audio quality and feature set can justify that.

Our recent purchase of Steinberg allows us to offer even tighter integration with software — we can ensure that hardware appears as VST instruments and that the entire 'studio' is recalled within a sequencer project file (hence our Studio Connections initatives). All of these advantages are now available to any computer with basic Firewire connectivity. The mLAN protocol even allows for products to be networked without the computer — a very attractive benefit for live applications in particular.

So, although we recognise that there is still a PCI market, we do have to consider the rise of software synths and take notice of the overall direction of the computer as a musical platform. This means that Yamaha is now highly focused on mLAN.

Interestingly enough, our research shows that the vast majority of UK 01X owners previously owned the SW1000XG and DS2416. They made the transition as they found they were using the SW's onboard soundset less and less but needed more effects processing, balanced inputs and software control. These customer surveys also cite laptop owners as the highest percentage of users.

I hope that this background information and insight helps you to understand some of our motivations with regard to the SW1000.

You Aren't Surrounded

I enjoyed Derek Johnson's review of Wizoo's *Latigo* and *Darbuka* in *SOS* June 2005. I recently reviewed *Latigo* for Audiomidi.com in the US, and found your review to be very

concise and on target — nicely done. One Mac-related piece of information that I didn't see in your review which is of interest to users of AU and RTAS plug-ins is the lack of multiple outputs and surround capabilities. By default, *Darbuka* and *Latigo* only supply one stereo out for both AU and RTAS platforms, while the VST version includes support for multiple outputs and surround.

I am more concerned, however, that Wizoo have not clarified this information in their marketing, or on the product's packaging (I urged them to provide a disclaimer on the web site, until updates were made available). In fact, AU and RTAS users would only find this information after either downloading the manual, or after having bought the product. Even then, a disclaimer is only made obvious several pages into the manual.

These limitations were confirmed to me by their tech support (back in February), though they were ambiguous about when this might be resolved. I think these are both stellar products worthy of a fine review, but I think Wizoo need to be more forthright in advising what features are actually available to potential buyers.

Greg Paxton

News Editor David Greeves replies: *We got in touch with Wizoo via M Audio UK, UK distributors of* Latigo *and* Darbuka, *and they confirmed the problem. Wizoo explained that "host limitations in* Pro Tools *and* Logic *made it impossible to come up with multi-out versions of the plug-ins" but said that forthcoming updates would include multi-out versions for* Logic *(Audio Units) users. Those updates to* Latigo *and* Darbuka *have since been posted on the Support section of* www.wizoo.com and updates for RTAS users may well be available by the time you read this. As to Wizoo's reticence in disclosing this limitation, it's disappointing, but understandable at the same time!

SOS DVD001 Feedback

Finally, last month saw the launch of the new quarterly SOS *DVD, and we have since received a large number of overwhelmingly positive responses to it. Here's a small sample of the correspondence we've received.*

This new disc is absolutely fantastic. The videos, Studio SOS in particular, are so much more informative than just reading the articles, which I have found extremely helpful in the past. This is a quantum leap forward. The Product Zone videos are just what is needed to demonstrate what the products can do. The contents of the disc are all good and well thought-out. Well done *SOS*, this is brilliant and so helpful. PS: I still like the magazine as well!

John Buchanan

I received *SOS* by post yesterday with accompanying cover DVD. I could not wait to boot up and see what was on offer, and I was thoroughly impressed by the quality of the topics and their delivery. Having read other magazines which also offer tutorials on DVD, I feel that the *SOS* quality blows the competition away, and sets a completely new standard.

Robert Willson

I would just like to congratulate you on the introduction of the *SOS* DVD that came through the post along with my subscribed mag — excellent! This is a great added bonus that I found very usable, and the video tutorials are great — more of them please! I do on occasion buy other music-tech magazines from the high street with cover discs which can be OK, but your disc was a joy to receive, with straight-to-the-point content, and a nice easy-to-read cover ! I'm off to the studio now to erect a shelf above my '*SOS*-only' bookcase to hold my new DVD collection!

Del Strange

Fantastic. What a nice surprise — educational, instructive, entertaining and with excellent sound and video quality. Looking forward to DVD002 in November.

George West

Universal Audio LA610

Recording Channel

Two classic designs — the 610 preamp and LA2A compressor — are combined for the first time in this attractive new reissue.

Hugh Robjohns

The interest in, and demand for, 'vintage' audio preamps and compressors remains constantly high, although whether that is because vintage analogue units do what they do better than more modern designs is a debate best saved for the pub! The American manufacturer Universal Audio is a name associated with some of the most highly regarded valve audio products — the classic Teletronix LA2A compressor and Putnam 610 preamp, for example, are both known and valued the world over. The subject of this review is a modern conjugation of those two classic vintage units into one box, called the LA610.

The LA610 combines a three-input preamp with an optical compressor, all mounted in a large 2U rackmounting case with vintage-style control knobs and switches, kept nicely warm by a trio of valves, and weighted down by some high-quality audio transformers. In concept, it is very similar to the company's own 6176 recording channel, which combines the same 610 valve preamp with the classic 1176LN solid-state compressor. However, the new LA610 is roughly two thirds of the price of the 6176, which makes it even more attractive!

My engineering genes always force me to take a peek at the back panel of a new product first, and in the case of the LA610 I discovered a lot of empty space. There are just three XLR connectors: a microphone input, a line input and a line output. There are no options to access the compressor side-chain — either to insert an equaliser or to link a second unit for stereo operations — and no pre-compressor outputs either. The only other facility is an IEC mains inlet to the internal linear power supply. The fuse holder can be inverted to allow operation on either 115V or 230V supplies.

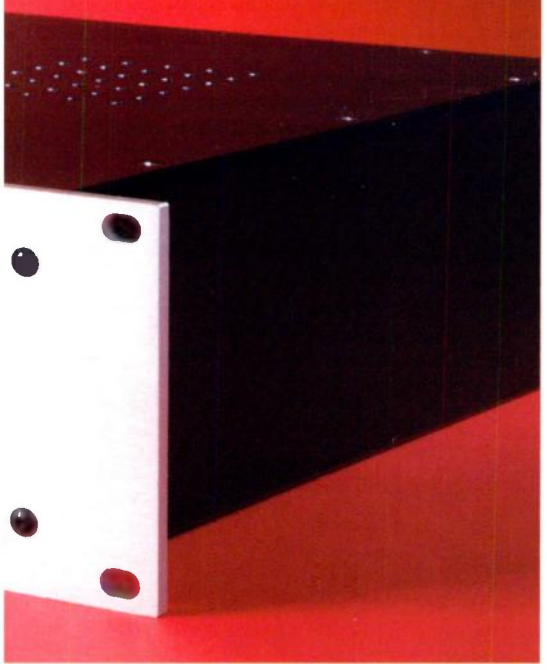
The front panel looks fantastic, and is divided into three separate areas. The preamp controls are to the left, enclosed in a raised black panel, while the compressor controls are to the right, gathered within another raised black panel. To the right of both is a small VU meter and the power switch and associated indicator. The black-panel sections make it look like the LA610 houses separate modules, which is a nice styling feature.

The controls comprise three large knobs and six smaller ones, plus five miniature toggle switches and a very chunky power switch. The only nod towards modern styling is the blue-ish lamp which comes on when the unit is powered — although rather than the ubiquitous blue LED, I was pleased to find this is actually an incandescent bulb behind a purple-blue jewelled cover.

Preamp & Equaliser

The preamp section is dominated by a large rotary level control. This has a very light

"The LA610 looks fabulous, sounds great, and is easy to use, allowing you to concentrate on the performance and sound character rather than the technicalities."



Photos: Mark Ewing

action indeed — which doesn't seem right somehow — but it works well enough. To the left are the input conditioning facilities. Two rotary switches select the input and coarse gain, while three toggle switches provide an input pad, phantom power, and polarity reverse. The coarse gain can be switched in 5dB steps over a range of ±10dB, which is translated to span -25dB to -5dB when the 15dB input pad is switched in.

The unit has three inputs altogether. I've mentioned the rear-panel mic and line inputs, but there is also an unbalanced high-impedance input via a quarter-inch socket on the front panel for guitars and the like. The rotary input selector switch has five positions, though. The central position selects the rear-panel line input, while the two on the right select the front-panel DI input with either 47kΩ or 2.2MΩ input impedances — designed to provide ideal loads to active outputs and pickups respectively. The two left-hand switch positions select the microphone input with either 500Ω or 2kΩ impedances. The first option is intended to match vintage dynamic mics while the latter conforms closely to the modern standard.

To the right of the large level-control knob are facilities for a two-band passive equaliser. Each band has a rotary switch to set the gain in 1.5dB steps to ±6dB, plus a further 3dB step out to ±9dB. Both bands also have selectable turnover points determined by toggle switches. The high band has options for 4.5kHz, 7kHz, and 10kHz, while the low band is provided with 70Hz, 100Hz, and 200Hz.

Optical Compressor

The T4 Optical Compressor section features two large control knobs. The first sets the amount of Peak Reduction, while the second sets the make-up Gain. Turning the Peak Reduction control clockwise increases the amount of compression, while the Gain knob provides up to 20dB of gain to restore peak levels. There are no controls for attack and release times — these are fixed — and the ratio is determined by a simple rotary switch which sets the operating mode between Bypass, Compress, or Limit. The compression ratio is somewhere between 2:1 and 3:1, and varies to a degree depending on the Peak Reduction setting. A second rotary switch determines what is shown on the VU meter: preamp output, compressor gain reduction, or output level.

As will be apparent, the controls are all very straightforward and intuitive, and easy to use. The only criticism I could make is that the positions of the preamp toggle switches are not always easy to see from a distance. Indicator LEDs would spoil the look of the unit, though, and (with the exception of the polarity switch) inappropriate settings would usually be obvious anyway.

Circuitry & Technology

The LA610 draws heavily on the original 610 and LA2A circuitry. The input and output transformers, for example, are the same as those used in the 610 preamp. However, there are some significant differences too. Whereas the 610 employed one 12AX7 dual-triode valve for the input gain stage and a 6072 valve to drive the output, the modern LA610 uses a pair of 12AX7s instead. This is because the preamp output stage only has to drive the compressor circuitry rather than the output transformer. A 6072 valve is still used in the unit, but it provides the compressor's make-up gain and drives the output transformer.

The preamp circuit design is configured so that increasing the coarse gain reduces the amount of negative feedback around the input 12AX7 valve. This has the inevitable side effect of increasing the amount of harmonic distortion — which is rather pleasing with the right sources. Hence the overall signal level and quality can be controlled by careful juggling of the coarse Gain and fine Level controls — the latter acting as an attenuator for the signal feeding the output 12AX7 valve. The maximum overall gain is a shade over 60dB, which should be enough for most studio applications, and the inclusion of the 15dB pad switch allows the preamp section to handle high-level signals far more easily than could the original 610 designs.

The handbook states that the LA610 is deliberately voiced to sound brighter than the original, and it certainly does sound very open at both frequency extremes. I didn't have access to a 610 to make a direct comparison, but to my ears the LA610 does sound a little brighter and more forward than I would have expected of the original design. The EQ is sufficiently controllable and subtle enough to allow gentle tailoring of the frequency response, though.

The compressor section is not exactly the same as that of the LA2A either, but the T4 compressor stage employs very similar optical attenuator circuitry — designed by the former Urei designer Dennis Fink — to ensure that the LA610 retains the rather individual compression characteristics of the original. This optical section is based on a special electro-luminescent panel which illuminates bespoke photo-resistors, the combination giving the unique programme-dependent dynamic and tonal characteristics — the 'signature sound', if you like — of the LA2A levelling amp. The active circuitry comprises another 12AX7 valve on the input side, with a 6AQ5 in the side-chain.

The attack and release time constants are well chosen, the attack being fast enough to do the job without drawing attention to itself, ▶

SOUND ON SOUND

Universal Audio LA610 £1209

pros

- Two great classics in one neat, stylish box.
- Flexible gain structure allows the valve character to be controlled and abused as required.
- The T4 compressor makes life so simple.
- Excellent value for money.
- A blue jewelled bulb cover is so much cooler than a blue LED!

cons

- Can be difficult to see the positions of the toggle switches.
- No side-chain linking facilities.

summary

A neat combination of two valve classics — the 610 preamp and the LA2A levelling amplifier — with a significant price saving thrown in for good measure. Although deliberately tailored to have a modern, bright sound, the essential features and character of its forebears shine through.

and the release being the usual two-stage affair, releasing loud transients quickly but imposing a slower release on more sustained loud material. Although the limiter mode provides an infinity:1 ratio, it has a very soft knee so that the effect is not the heavy clamp that so many limiters impose.

The 20dB make-up gain is provided by the 6072 valve mentioned above, which drives the output transformer. It is worth pointing out that the Bypass mode isn't a proper bypass — it simply disables the gain reduction — so all the compressor circuitry remains in circuit at all times. Good job it sounds so transparent, then! Actually, this is useful because it means that the gain make-up remains active, allowing further manipulation of the gain structure for interesting creative effects.

The LA610 In Use

Setting the LA610 up is very straightforward and the controls are easy and obvious to adjust. I would imagine the majority of users would employ this channel strip to handle vocals, so I started off plumbing in a Neumann TLM103 and set the gain control to suit a competent male vocalist. The immediate first impression was of a large and open sound quality, but with a very slight overemphasis on the sibilance region.

Depending on the mic in use this could be a blessing or a pain — and with the TLM103 I leaned towards the latter opinion! In the right circumstances, though, the LA610's slightly forward character would help to emphasise transient detail and presence, but when partnered with a bright mic the combination can sound a tad edgy on its own. Having said that, when the vocal was auditioned within a complete mix I found it did tend to retain a clarity and presence which helped it to cut through easily and without the need for further EQ tweaks on the console.

However, few people will ever use the preamp on its own, and it could be argued that the slightly brighter character of the preamp helps to compensate for the inherently darker tonality of the compressor. Since most people will make use of the compressor all the time, this swings and roundabouts approach works extremely well, and the overall sound character is more or less neutral when the compressor is active.

Swapping the Neumann for the ultra-flat Sennheiser MKH40 revealed the precise spectral balance of the LA610. While it obviously boasts a more 'modern' sound than its forebear, the extra brightness is relatively subtle and, I think, well judged to balance the compressor's slightly subdued character. The benign equaliser can be used to tailor the sound very easily if necessary, as can careful positioning of the mic, of course. As I suggested earlier, trading input gain against the output level allows the amount of valve coloration to be adjusted, a balancing act which provides a useful range of characteristics from ultra-clean to obviously distorted — although the latter always sounds musical and appealing. The distortion character is rich and rounded, adding extra weight and mid-range body in that characteristic way of overdriven triodes.

The compressor section sounded indistinguishable from the LA2A when heard on its own — certainly, all of the latter's character and attributes were present, and cranking the Peak Reduction control around delivered the expected results every time. This revised T4 optical compressor works beautifully, even when driven hard. However, I have to say that the small VU meter, while easy to read, isn't as attractive as the larger metering of the LA2A.

Using the DI input with an electric guitar, I found the ability to control the amount of front-end gain was very effective in adding character and bite to an otherwise lifeless pickup. This was also where the equaliser came into its own, allowing the highs to be tamed and the lows boosted to create a very full and attractive sound. I'm not a fan of DI'd guitars in general, but I found it was possible to create a surprisingly usable sound with the LA610, particularly when the compressor was set to Limit mode and driven fairly hard. It didn't have the scale of a decent amp miked up in a good space, but it produced a much bigger sound than I was expecting and it worked remarkably well within a mix. The same was broadly true of an active bass too — and the compressor worked superbly to control its transient excesses.

A Marriage Of Classic Designs

Original LA2A compressors and 610 preamps are rare and very expensive beasts, and even the modern remodelled units are expensive, so the new LA610 represents a very welcome addition to the modern studio equipment list. I think it is fair to say that the LA610 is not quite the sonic equal of those original classic devices — but it is not inferior either. The sonic differences are fairly subtle and based primarily on fashion, rather than being the result of cut corners or cheaper components, although the production costs have certainly benefited from the revised circuit designs. Indeed, the inherently flattering characteristics that defined both of the originals are still there in this new combined design — but it does sound more modern and detailed than the originals. To most, this will be a good thing, while owners of real LA2As and 610s can rest assured that their investment remains safe!

The best bit is that the LA610 is priced very attractively in the UK. A modern production LA2A costs over £2300, and the single channel M610 (which has a much simpler EQ section) retails for £938, so the LA610 represents a very significant saving over these two separate units. It looks fabulous, sounds great, and is easy to use, allowing you to concentrate on the performance and sound character rather than the technicalities. This is a very versatile unit that just does what it is supposed to do without fuss, and bestows a very musical and appealing character on whatever it is being asked to do. While clearly an expensive product in relation to the typical home studio budget, this is a very cost-effective unit in comparison with equivalent designs and gets my very firm recommendation as a characterful, flexible channel strip. SOS

information

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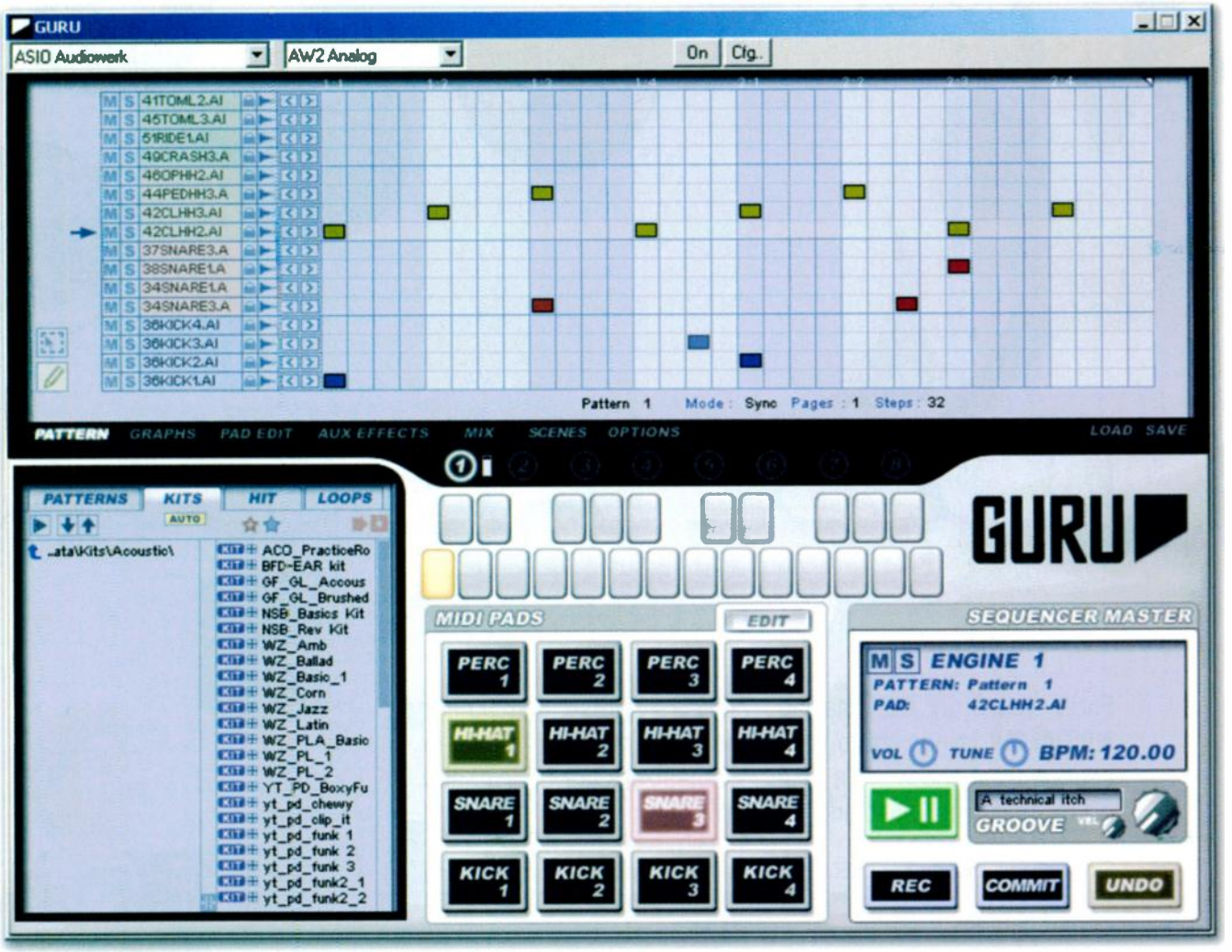


FXpansion Guru

Virtual Drum Sampler For Windows & Mac OS X

FXpansion's software drum machine takes the 'pad sampler' concept pioneered by Akai's MPC range to new levels.

Paul Sellars

"The beatbox of your dreams is here!" the brochure proclaims. Which is nice. I was wondering when that was going to turn up.

The beatbox in question is FXpansion's *Guru* sampling drum machine, which is constructed in software rather than hardware. As such, it has the advantage of offering near-seamless integration with your preferred sequencing applications, via the VST, RTAS, Rewire, Audio Units and DXi interfaces. It also has the associated disadvantage of not actually existing in any tangible, material form, and is consequently not quite as well suited to physically banging out a rhythm on as an Akai MPC or similar hardware beatbox.

Guru is available for both Windows 2000 and XP, provided you have an 800MHz or better CPU, and Mac OS 10.3 or above, running on a 733MHz G4 or better. A minimum of 384MB RAM is required, while 512 is recommended. A DVD-ROM drive is also required, as the software installs from a DVD, along with several Gigabytes of sample content from Yellow Tools, Wizoo, Groove Criminals, Gforce and others.

Installation is trouble-free. You have the option to install *Guru* as a stand-alone application, as well as in the above-mentioned plug-in formats. A couple of mouse clicks are all it takes, and the only

SOUND ON SOUND

FXpansion *Guru* £150

pros

- Ingenious Smart Slice function works well.
- Shift Graphs allow for flexible phrasing.
- Comprehensive built-in effects.
- User interface is logical and well laid-out.

cons

- No audio export in the stand-alone version.
- No built-in Song mode for chaining patterns.

summary

A very impressive sampling drum machine, with some powerful and innovative features. Not quite the perfect virtual beatbox, but not far off it.

minor inconvenience is the time spent waiting for the rather sizeable sample library to be copied to your hard disk. Copy-protection is in the form of a simple serial number, provided with the DVD. The first time *Guru* is opened you're prompted for said number, after which you won't be bothered again. No on-line activation, no USB dongles, no headaches at all — perhaps FXpansion feel that elaborate copy-protection mechanisms are more trouble than they're worth. Whatever their reasoning, it serves to make life just a little bit easier for the end user, and may earn them a little extra goodwill from customers as a consequence.

A nice, printed manual is provided, complete with full-colour screen-grab illustrations. I'm aware that I always go on about printed documentation in software reviews, but I really do think it makes a difference, especially when learning your way around a new application. *Guru*'s manual is reasonably well-written and quite comprehensive.

Mighty Engines

Guru's user interface is fairly intuitive, and it's not difficult to work with. That said, there are one or two design concepts that perhaps aren't immediately self-explanatory, and are worth explaining. *Guru* (or each instance of *Guru*, if multiple plug-in versions are open) has eight 'Engines', each of which can be thought of more or less as a drum machine in its own right. The eight Engines respond independently on MIDI channels 1 to 8.

Engines aren't completely independent of one another, however. While the first of the Engines can have its tempo set arbitrarily (if *Guru* is used as a plug-in it takes whatever tempo information is supplied by the host application), the remaining seven Engines must be set to a multiple of the first Engine's tempo. So, for example, Engine 1 might be set to 120bpm, while Engine 2 could be set to '1/2' (half Engine 1's tempo), or '2/1' (twice Engine 1's tempo). This 'tempo multiplier' can be anything from '1/8' (one-eighth the original tempo) to '8/1' (eight times the original tempo). Using multiple Engines and different combinations of tempo multiplier, it's possible to come up with a variety of complex, layered polyrhythmic arrangements.

Guru's Engines play Patterns. A Pattern can contain a maximum of 128 steps, spread over four pages, and each Engine can store and play 24 different Patterns. You can switch Patterns by clicking the on-screen Pattern buttons, by sending a MIDI note between C3 and B4, or by using *Guru*'s powerful Scenes function (see box). Patterns can be programmed in step time or recorded in real time, with or without quantising, in both the stand-alone and plug-in versions of *Guru*. *Guru*'s Pattern recording functions are relatively simple, and very easy to use. You can either record hits from a MIDI controller, or use the mouse to click the on-screen Pads. Buttons labelled Commit and Undo allow you to keep or discard recorded passes without leaving record mode.

There's also a neat Groove feature, which allows you to apply varying amounts of timing and velocity variation to a Pattern, based on one of several dozen Groove templates. It's also possible to create your own templates — see the 'Shift Graphs And Other Graphs' box. Each of the eight Engines has its own independent Groove controls.

Finally, there are those Pads. A Pad is essentially a playback sampler, with its own associated on-screen pad and assigned MIDI note. Each Engine has 16 Pads, which are divided into four categories: Kicks, Snares, Hi-Hats and Percussion. Pads are fairly sophisticated, allowing up to eight different samples to be either stacked or velocity-switched. Parameters including gain, pan, pitch and filter settings are all adjustable, along with sample start and end points. Each pad has two envelope generators, one controlling amplitude, the other patched to pitch and filter cutoff.

Demo

At the time of writing, no demo version of *Guru* was available to download (although some good, informative tutorial videos were). A demo version is planned, and will hopefully be available by the time you read this, or shortly thereafter. Personally, I always like to try a demo version before buying any software and I'd generally advise readers to do the same. In an ideal world a review like this would provide you with all the information you needed to make a decision, but in reality it's still always better to see things for yourself before handing over your money!

Effects

Guru provides an impressive array of built-in effects, which on the whole sound excellent. These are accessible in several different ways. 'Pad effects' are basically insert effects, applied one per Pad. Pad effects include compression, several flavours of distortion, ring modulation, some nice gritty sample-rate and bit-depth reduction effects, and six different one-band parametric EQs.

Each *Guru* engine boasts 16 Pads, on which up to eight samples per Pad can be layered.

The Mix view is where you combine the outputs from *Guru*'s eight Engines and apply effects to them, if you wish.

There are also half a dozen oscillator Pad 'effects' which don't process sound at all, but instead synthesise different waveforms (sine, triangle, saw, square, pulse, noise) and can be used to generate various pitched and percussive noises.

The remaining 'Engine effects' can be used as inserts on a one-per-Engine basis in the 'Mix view' panel, added to Aux effect busses (each Engine has three Aux busses), or inserted in the Master buss via which all eight Engines are routed. Engine effects include a stereo tempo-sync'ed delay, flanging, chorus, compression, reverb, distortion, LFO and envelope-controlled resonant filters, a phaser, a comb filter, 'bit-crusher' distortion effects, ring modulation and EQ. There's also a 'Trancegate' rhythmic gate, and an unusual 'Freezer' effect, which grabs part of the incoming audio stream and loops it in surprising ways.

Smart Idea

One of *Guru*'s more interesting features is its 'intelligent' sample-slicing function, referred to by FXpansion as Smart Slice. This is similar to the kind of transient-detecting loop-slicing algorithm pioneered by *Recycle* (*Guru* can import *Recycle*-sliced files), but with a clever twist. Put simply, Smart Slice not only attempts to work out where the individual hits in a loop are, it also attempts to guess what they are. Based on the material it finds within an audio file, *Guru* will divide the loop up into individual hits, and automatically assign bass drums to the four Kick Pads, snares to the four Snare Pads, hi-hats to the four Hi-Hat Pads and any remaining hits to the remaining Perc(ussion) Pads.

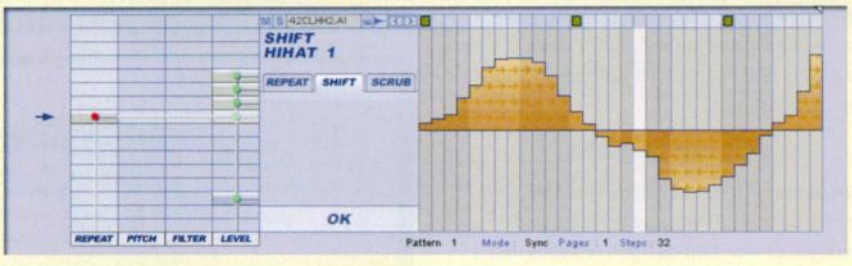
I have to admit I was sceptical as to how well this would work, but the results are really quite impressive. Switch to the Loops tab in *Guru*'s built-in file browser, navigate to a folder full of suitable files, and a list of file names appears with a small plus ('+') symbol beside each one. Click the plus symbol and the 'tree' expands, directory-fashion, allowing you to see a list of detected slices within the file. *Guru* analyses these slices and automatically picks what it considers to be the best four candidates for each Pad category. Click on each of the Pads in turn (or play their assigned notes on your MIDI controller) and

Shift Graphs And Other Graphs

It's possible to use *Guru* simply as a MIDI-controlled drum sample plug-in, and allow your host application to take care of all the sequencing duties. That would be a shame, though, as *Guru*'s onboard sequencer is deceptively powerful, and very well designed. At first glance, it may appear primitive: a straightforward step sequencer, with everything hard quantised. While this would have the advantage of simplicity, it would be rather inflexible — and wouldn't allow Smart Slice to accurately extract phrasing information from sampled drum patterns.

Guru solves the problem with what FXpansion call Shift Graphs. Graphs in *Guru* are, in essence, control data sequences associated with patterns, rather the like the controller strip in the edit page of a conventional MIDI sequencer. There are Graphs for velocity, pan, tuning and filter cutoff, among others. Shift Graphs are implemented in a very similar way, except they don't contain control data in the usual sense. Instead, they allow you to shift each step backward or forward in time slightly. Values above the centre line make events 'late'; values below the line make them 'early'.

When Smart Slice extracts the phrasing from a sampled pattern, it automatically creates Shift Graphs for the detected slices, to ensure that all the idiosyncrasies of the original phrasing are preserved as closely as possible. Likewise, when patterns are recorded live, without quantising, Shift Graphs are generated to preserve the feel of the original performance.



You can also create your own Shift Graphs, to liven up patterns you've programmed from single hits. To introduce a bit of natural variation into a hi-hat pattern, for example, simply switch to the Shift Graph for one of your Hi-Hat Pads and quickly draw in a gentle, wavering curve. This immediately loosens up the pattern, and makes things feel a bit less metronomic. You can be as precise or as random as you like when creating Shift Graphs, and trying out different variations is quick and easy. If you come up with anything you particularly like, it can be saved as a Groove template for use in other projects.

In addition to Shift Graphs, there are two other types of Graph that can be used to interesting effect. Repeat Graphs allow you to repeatedly trigger a Pad a variable number of times within a single step of a Pattern. The Pad can be retriggered two or three times, producing fairly natural-sounding 'drags' or rolls, or many more times to create anything from short 'machine gun' fills to strange, glitching mechanical whines.

Scrub Graphs are different again, and allow you to dynamically shift the start point of the sample assigned to a Pad. The centre line represents the normal start point, as defined in the Pad edit view. Values above the centre line move the start point for playback forward (ie. to a point later in the sample), while values below the line do the opposite. Some peculiar effects can be created in this way.

HANDS-ON PRODUCTION

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▶ you can immediately hear which slices have been assigned where.

What's striking is how quickly the analysis and assignment of slices is carried out. With shorter samples, it's all but instantaneous. You simply select the file name in the browser, and straight away the Pads begin to flash, indicating that new slices have been assigned. Longer files take longer, but rarely more than a couple of seconds.

There are three options governing exactly how Smart Slice works. When Both is selected, *Guru* will load the detected slices from the audio file and automatically create a Pattern to trigger them in their original sequence. When Score is selected, the sequence Pattern is created, but the slices aren't loaded. When Audio is selected, the sample slices are loaded, but no sequence pattern is created. This presents some interesting possibilities. You can, for example, pick a drum loop you like the sound of, and have *Guru* automatically load its slices and create a Pattern to trigger them. You can then activate the Audio option and select a different drum loop in the browser. *Guru* will analyse the new loop, and a moment later you'll be able to hear the first loop's sequence triggering the second loop's slices. If you don't like the results, just select a different file in the browser and hear how some different slices sound. Or activate Score and try loading a different Pattern (see the 'Shift Graphs And Other Graphs' box for more details about extracting Patterns). All this can be done on the fly, while *Guru* plays. Juxtaposing one loop's Pattern with another loop's slices can produce some surprising results, even with the most familiar and over-used samples, and *Guru* makes the process close to effortless.

Of course, Smart Slice is not absolutely foolproof. To work well it needs to be fed audio files of a sensible length, which have been trimmed to loop cleanly when repeated. Even then the odd confusion can arise: a handclap may be incorrectly identified as a snare, or a low tom might end up on one of the Kick Pads. Overall, though, it works remarkably well.

If some loops seem to be particularly problematic, you can switch from Smart Slice's default Fast mode to either Enhanced or Hi-Sens mode. Both of these can provide better results with difficult files, at the cost of a slightly slower analysis phase. Another option available is Equal-16ths mode, which simply slices a loop into 16 equal segments and assigns these to the Pads sequentially. Needless to say, you're under no obligation to keep *Guru*'s automatically generated slices and Pad assignments. You can easily move the beginning and end points of a slice, and you can manually assign different slices to different Pads, as you like.

Creating A Scene

***Guru*'s Scenes function is simple, but extremely useful. A Scene in *Guru* is like a snapshot — a complete record of the state of all eight Engines, their current Patterns, and all associated parameters. You can store *Guru*'s state to a Scene by simply Shift-clicking one of the 48 Scene containers visible in the Scene view. Each Scene container has a MIDI note assigned to it, and you can recall a stored Scene either by clicking the relevant Scene container with the mouse, or by sending its assigned MIDI note.**

Scenes could be extremely useful for improvising arrangements in a live performance, and triggering Scene changes with MIDI notes from your host sequencer is a good way of creating complex arrangements from your *Guru* Patterns.

A Few Small Points

As a reviewer, I feel that one of my principal responsibilities is finding things to complain about. Sometimes this is easy, but in the case of *Guru*, I've struggled to come up with any really substantial objections. That said, there are couple of features currently absent which could be very useful, especially for users working with the stand-alone application.

The first of these is audio file export. While it's easy to create a WAV or AIFF file mixdown of your patterns when using one of the plug-in versions of *Guru* within an appropriate host application, at present there isn't any way of doing this with the stand-alone application.

Secondly, even if audio export were available, its usefulness would be limited by the fact that *Guru* does not include any kind of in-built 'song' sequencer for chaining patterns together to create larger arrangements. Of course, this is no problem when running *Guru* as a plug-in, since Scene or Pattern changes can be triggered by your host's MIDI sequencer. Even so, it would be a nice addition. FXpansion tell me they have plans for future updates of *Guru* which will include a proper song sequencer and audio file export functions for both the plug-in and stand-alone versions. For the time being their absence is unfortunate, but not disastrous.

One final whinge is that there's no straightforward way to switch the pattern resolution to triplets. I raised this with FXpansion, who pointed out that triplet phrasing can be created in any of the Engines other than the first one, by setting the tempo multiplier to '3/2' and the Pattern length to '12' or '24'. In my opinion this is stretching the definition of 'straightforward' a bit, but it is a solution.

These quibbles aside, I have to say that I have been impressed by *Guru*. It's a well designed and well organised virtual drum machine with some genuinely innovative features. Smart Slice works better than I expected it to, and could be a valuable labour-saving feature for anyone regularly working with sampled loops. The combination of straightforward, point-and-click Pattern editing and the flexible phrasing options provided by Shift Graphs is a clever compromise, which makes programming effective patterns quick and easy.

Provided you're happy for your drum machine to be virtual rather than actual, and assuming your computer is already equipped with a suitable audio interface and MIDI controller, you can't go far wrong with *Guru*. At £150, it's competitively priced for a product of this type, and the supplied sample library full of patterns, kits, hits and loops makes a very worthwhile addition to the bundle. SOS

Test Spec

- PC with 1.8GHz Athlon CPU and 512MB RAM, 2x 7200rpm Maxtor hard drives, Emagic Audiowerk 2 soundcard and VIA AC97 onboard sound, running Windows XP Service Pack 2.
- Tested with *Audiomulch*.

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Classic Tracks

Artist: The Pretenders
Track: 'Back On The Chain Gang'
Label: Sire
Released: 1984
Producer: Chris Thomas
Engineer: Steve Churchyard
Studio: AIR London

In 1982, the Pretenders responded to desperate circumstances with some of the strongest material they would ever produce. Engineer Steve Churchyard was there to record it.

Richard Buskin

When the Pretenders regrouped, for want of a better word, at AIR Studios in central London on July 20, 1982, it was amid traumatic circumstances. Only singer/songwriter Chrissie Hynde and drummer Martin Chambers remained from the depleted band. The previous month, on June 14, bass player Pete Farndon had been kicked out due to his chronic drug habit, and two days later fate had then dealt the ultimate ironic blow to one of those who'd been party to Farndon's sacking: lead guitarist James Honeyman-Scott, whose musical versatility had played a large part in the band's success, was found dead from an overdose of heroin and cocaine.

Farndon would succumb in similar fashion the following year, yet in the meantime Hynde, pregnant with the child of Kinks frontman Ray Davies, penned a moving tribute to Honeyman-Scott entitled 'Back On The Chain Gang'. She and Chambers recruited some replacements at very short notice in order to record the song: former Manfred Mann's Earth Band guitarist Robbie McIntosh, whom Honeyman-Scott had already enlisted to play alongside him in the Pretenders, plus Rockpile guitarist Billy Bremner and Big Country bassist Tony Butler. As on the band's first two albums, *Pretenders* and *Pretenders II*, Chris Thomas was in the producer's chair, yet this time around the engineering would be taken care of by Steve Churchyard instead of Bill Price.

After Nick Lowe had produced the band's first single, a cover of Ray Davies' 'Stop Your Sobbing' which made the UK top 40 in early 1979, the Pretenders had enjoyed chart success on both sides of the Atlantic with the aforementioned albums, as well as the singles 'Kid', 'Brass In Pocket' and 'Talk Of The Town'. And according to Churchyard it was the "creative genius" of Chris Thomas that accounted in large part for the group's distinctive sound, as well as their ability to bridge the gap between punk, new wave and melodic pop.

"Without a doubt, if George Martin was the fifth Beatle, then Chris Thomas was the fifth Pretender," Churchyard says. "He was hands-on in all aspects of the recording, whereas a lot of producers produce from their phone in the car. He was there for every moment of whatever was going on, directing either me or the musicians, and in many respects he was my mentor. I probably learned more from him than anybody else."

Fresh Air

The producer and/or engineer for an incredible array of artists, including the Stranglers, Rod Stewart, INXS, Madness, Paul McCartney, Big Country, Joni Mitchell, Counting Crows, Cliff Richard, Ricky Martin, Celine Dion, Sinéad O'Connor, Tim McGraw, LeAnn Rimes and, most recently, the Eagles, Herbie Hancock, Dishwalla, Beck, Ben Folds and Sheryl Crow, Steve Churchyard grew up in Surbiton, Surrey, and entered the business in 1974 as an assistant at the tiny Orange Music 16-track studio in London's Soho. This was located in the basement of a guitar shop on New Compton Street, where it wasn't unusual to see the likes of Jimmy Page or Paul Kossoff trying out new instruments, and Churchyard remained there three years before continuing his engineering career at AIR.

"That's where I'd always wanted to work," he says. "I'd initially failed to get an interview there and went to Orange instead, but after three years I called AIR's manager Dave Harries and he offered me a job as an assistant. This was kind of a step back, because I'd gone from a tape-op at Orange to being an engineer, chief tech and studio manager — it was like a one-man operation. However, I jumped at the chance. A lot of the records that I listened to back then were made at AIR, as well as at Olympic and Morgan — Rod Stewart and the Stones and Zeppelin — so I really wanted to work at AIR, and my first job there was assisting Geoff Emerick on Wings' *London Town* album, at which point I realised I really knew nothing at all about recording.

"At Orange I'd been working with a home-made, two-inch tape recorder, built by one of the guys who worked there, and it sort of worked here and there. There was no remote control for it — I was the remote control — whereas AIR was a 24-track facility with four studios, about eight technical engineers and probably eight full-time sound engineers, including Pete Henderson, Steve Nye, Jon Kelly, Colin Fairley and, of course, Geoff, who was chief engineer. Not only did I get to assist the greatest, but George Martin was my boss and I just made myself available for whatever was going on, so I got to work with George on a lot of different things, including a number of Paul McCartney sessions."

A Difficult Time

It was after spending five years at AIR that Steve Churchyard began working with Chris Thomas. Bill Price normally engineered for Thomas, but Churchyard filled in on a Big Country assignment when Price was occupied with the management of AIR's sister studio, Wessex, and it was in the middle of the Big Country project that Churchyard was then

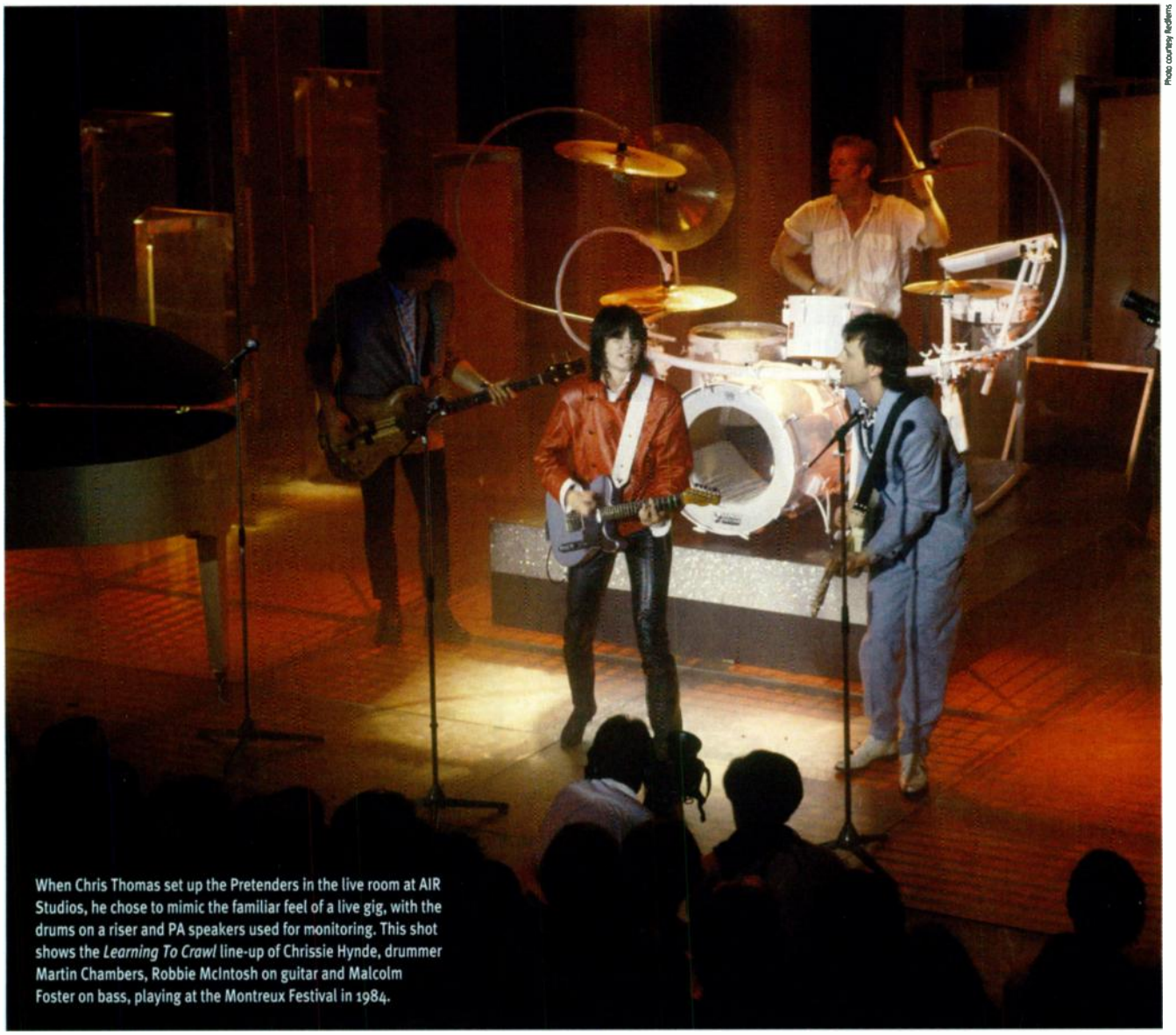


Photo courtesy Redferns

When Chris Thomas set up the Pretenders in the live room at AIR Studios, he chose to mimic the familiar feel of a live gig, with the drums on a riser and PA speakers used for monitoring. This shot shows the *Learning To Crawl* line-up of Chrissie Hynde, drummer Martin Chambers, Robbie McIntosh on guitar and Malcolm Foster on bass, playing at the Montreux Festival in 1984.

asked by Thomas to record 'Back On The Chain Gang'.

"Since they had previously recorded at AIR and Wessex, I'd already met the Pretenders," Churchyard remarks. "I'd be down the pub chatting to them, so I knew them all socially before I ever worked with them. Now Jimmy [*Honeyman-Scott*] and Pete were gone, and it was a really difficult time for Chrissie and Martin. They were still in shock, basically, and the rest of us were all very sympathetic to what was going on. I don't think anybody really knew what state the Pretenders were in at that point. Chris got hold of a number of different people and the session was just kind of pasted together."

While Tony Butler played bass on 'Chain Gang', with Robbie McIntosh playing rhythm guitar and Billy Bremner playing the memorable lead part, McIntosh would take over on lead for the subsequent, appropriately titled *Learning To Crawl* album, which would mostly feature Malcolm Foster on bass. All of the recordings took place in AIR's Studio One, which housed a 56-input, 24-track Neve 8078, one of three built for AIR, designed in conjunction with George Martin, and now considered vintage although it was then state-of-the-art, boasting a frequency response from 40Hz to 100kHz, ±1dB.

"Its EQ was designed by Geoff Emerick and it had 34427 remote mic pres that are on the new Neve 88R," Churchyard states. "That console, which had no automation, is now at AIR Lyndhurst and has got GML. Everything we did was manual mixing."

A Studer A800 Mk III tape machine and JBL 4350 monitors were housed inside AIR's spaceous fourth-floor Studio One control room, where windows afforded real daylight from London's Oxford Circus, and the adjacent live room was large enough to accomodate a 60-piece orchestra. "That fourth-floor space was originally a banqueting hall," says Churchyard. "The main room was pretty live, with very high ceilings and linoleum on the floor, and there were also three isolation rooms; one on the left as you looked through the control-room glass, one to the right, and one at the back that was always full of gear."

According to the engineer's recollection, he never heard a demo of 'Back On The Chain Gang'. Instead, he assumes it was rehearsed before the band entered the studio. "The 'B' side of that single was 'My City Was Gone', and the bass riff was something that Tony Butler used to play just as a warm-up," Churchyard recalls. "He was playing it in rehearsals and the song grew out of that. I wasn't at the rehearsals, but I do remember the tracking session, and because it was the 'B' side, we knocked it out real quick."

First, however, there was the 'A' side...

"The structure for 'Chain Gang' had already been figured out when they came into the studio. I mean, Chris [*Thomas*] was always well into the song and the arrangement, even though some stuff was invariably changed on ▶

the fly. We would do a number of takes, and because everything was 24-track analogue we'd do takes and then we'd do edits. Chris would say 'OK, take three,' and we'd take a chunk out of that and splice it together with various other takes before getting ready to do overdubs.

"The Pretenders were set up as if they were going to play live — for 'Chain Gang' we had Martin's kit on a foot-high riser in the centre of the room. I'm not sure what the riser did for the sound, but it looked great. We used a PA behind him — some small Yamaha self-powered speakers — and once we got the drum sound we'd send stuff back from the control room out through that PA just to pump up the sound in the room. It would either be snare drum or toms, and if he was playing along to a Linn 2 drum machine, which we used a lot as a click, that might also go back out through the PA and become part of the drum sound. The delays that you can hear on the drum sound of 'My City Was Gone' were AMS delays sent through the console and back through the PA, giving a kind of tinny quality — tinny in a good way.

"As a drummer, Martin was great. Invariably, we'd go for performance over any timing factor, and we'd cut it together old-school style. The Linn 2 sat beside his drum kit, we'd figure out the tempo for the song, and he'd either play to a click track or some kind of loop that he would make. Then, depending on the loop, with some songs we would actually feed that back through the PA. There's Linn drum running throughout the song 'I Hurt You' — it was going out through the PA, into the room, and Martin was playing along to it, so it became part of the song.

Steve Churchyard today.

"This whole PA thing was kind of new to me. Chris Thomas and Bill Price had designed it to fill the room with more sound, and Martin also liked it because it was like being on stage, hearing everything through his monitors. He'd feel the kick drum coming back at him, and it was just more live than the usual studio dryness. His kit was miked with [*an AKG*] D12 on the kick, Sennheiser 421s on the toms, a [*Shure*] SM57 on top of the snare, a [*Neumann*] KM84 on the bottom of the snare and a KM84 on the hi-hat. This was kind of a standard setup. The overheads were AKG 451s, although to this day I normally use Coles 4038s.

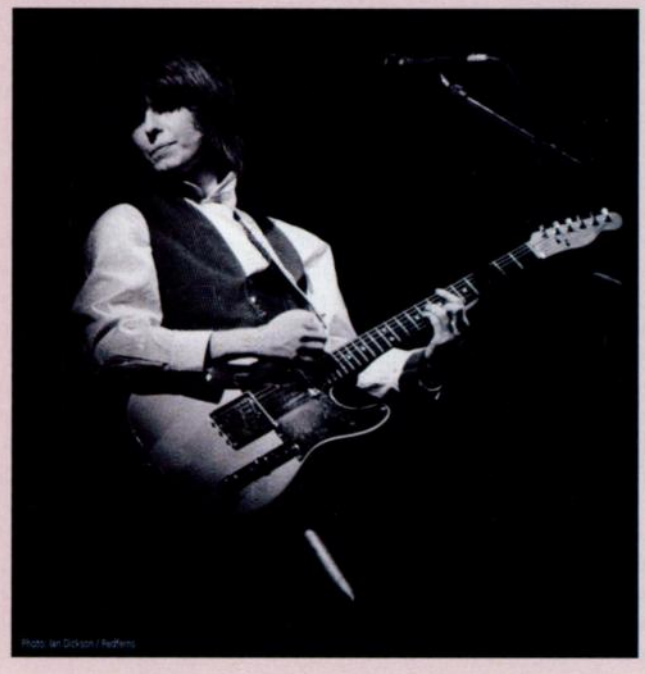
"Aside from Martin's playing, it was also thanks to Chris Thomas that the drums sounded so great. The live tracking, playing with the Linn drum, putting it out through the PA — Chris ensured that it sounded very organic while at the same time employing some trickery that the listener wouldn't really be aware of in order to make it sound exciting. You know, we might just set up a mic in the middle that would have some kind of ridiculous compression on it, or something like that, and mix that back in there. This was the result of Chris having been George Martin's assistant on the Beatles' *White Album*,

A Solo Performance

"When it came to her vocals, Chrissie was great so long as nobody else was in the room," Churchyard says. "The band, everybody was kicked out. They all went upstairs and played pool, and nobody was allowed to come back down until we'd got them. Only Chris Thomas and myself were in the control room while Chrissie sang, and he'd have to coax a performance out of her. Chris was all about that. On a vocal day we might sit around for hours and drink tea and have lunch and chat about everything other than what we were about to do, and then at a certain point — which was part of Chris's gift as a producer — he would say 'OK, how about now?' Sometimes he'd also wait for her to decide when to sing it.

"The 'Chain Gang' vocal was comped from three or four takes, and then Chris sang her own harmonies before Martin and Tony did the backgrounds. That lead vocal was all Chrissie. I put a [*Neumann*] FET 47 in front of her and had [*a Urei*] 1176 compressing her through the custom Neve board, and that was basically it. Still, having just listened to the song again to remind myself what it sounds like, I've noticed a giant pop on the first line — 'I found a picture of you...' Hearing it 20-odd years later I'm thinking 'Oh, I wish I fixed that.' That's what happens when you don't use a pop shield.

"On the surface, Chris [*Hynde*] was all business when it came to this song — let's get this done, and don't let anybody in the control room or else you'll suffer the wrath of Chrissie. If she was at all acerbic, then rightly so. The studio is never a very natural environment in which to sing, and so we'd do anything we could to make her comfortable. If you catch her on the wrong day, things can be heavy, but she can also be very funny, and she was very easy to work with when we did 'Chain Gang'. Only later did I realise how emotional it must have been for her."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through the Badfinger days and working with Roxy Music and Brian Eno. He's been around a lot of creative people."

Heavy Weight

While bass player Tony Butler, standing to Martin Chambers' left, was DI'd, Robbie McIntosh played his Strats on the other side of the kit, his amp in one of the isolation booths, miked with a combination of Shure SM57 and Neumann U87. "A lot of the time the guitar sounds were so layered with multiple guitars, it's hard to now figure out where one starts and another ends," says Churchyard. "We'd use Rickenbacker six-strings and 12-strings, Strats, Les Pauls, everything."

Billy Bremner, standing next to the bassist, played a Telecaster, as did Chrissie Hynde, standing in front of Martin Chambers. Both guitars were miked with the same SM57/U87 combination employed for Robbie McIntosh, while Hynde's scratch vocals were recorded with a Shure SM58.

"The band members could almost touch each other," Churchyard says, and given the circumstances surrounding the sessions, the mood was not as bleak as you might imagine. "As I've said, there was a slightly strange atmosphere, with no one really sure if the Pretenders would continue as a band, but we also had some fun. For instance, that hammer sound in the choruses involved us all going around banging stuff together to try to get the right effect. In the end, the best sound came from these 25-pound weights that were normally used to hold the orchestral boom mics in place and stop them falling over. My assistant, Jeremy Allom, was therefore commissioned to bang them together — if you meet him today, his arms are probably a little bit longer than they should be. It took more than one take. I mean, you can imagine trying to smash two weights together in time. In those days there was no digital technology to sample a take and paste it in. It all had to be played.

"Then there were the background vocals, the 'oohs' and 'aahs'. Martin Chambers and Tony Butler did these, but at first Chrissie didn't think their efforts were good enough, so she bent over in front of them and wiggled her bum while they were singing. We all fell about laughing, but I have to say it achieved the right results."

No such encouragement was required for Billy Bremner's ringing, countrified solo which, along with Hynde's vocal, served as the backbone and focal point of the song. "That was probably done in one take," Churchyard surmises. "I think he just played it. I don't remember any struggle. It was one of those inspired things. Everyone flipped at how he played it and then we all went down the pub."

Effects were sparse. "They were pretty much spurned," says Churchyard. "And besides, we didn't have many. There was an EMT 140 echo with tape delay, maybe an MXR flanger here and there on the drums, some compression on bass and overall compression in the mix, but back in 1982 things were still pretty basic."

A mid-'80s brochure from AIR Studios on Oxford Street shows the Studio One and Two control rooms, both of which were used during the recording of the *Learning To Crawl* album. AIR Studios moved to Lyndhurst Hall in Hampstead in the early '90s.

'Chain Gang' was tracked and cut together in a day, and then a couple of days were spent on the overdubs: lead vocal, backgrounds and some additional guitar parts, as well as Jeremy Allom's bashing together of the 25lb weights.

Layer Upon Layer

The remainder of the *Learning To Crawl* album was recorded and mixed through the end of 1983, with plenty of breaks interspersing the sessions while Hynde came up with new material, the last of which was that ethereally beautiful Christmas number '2000 Miles'. "For the intro guitars on '2000 Miles' we used an Eventide 949 Harmonizer, with the guitars pitched up two octaves and some feedback," Churchyard recalls. "If you check the song out, there's this really high guitar part that runs throughout, played by Robbie McIntosh. By that point he was playing all the lead guitar. He was a great guitarist and a lot of his solos were done in just one take. In 1983, the Pretenders went out on the road a little and got to know each other and learned to be a band again.

"One of the most challenging songs on the album for me was one that sounded kind of simple but had layer upon layer of guitars — 'Middle Of The Road'. It sounds like one guitar playing the riff, but there were at least six guitars. The riff itself was chopped up into pieces — there were the high and the low parts, both doubled, and each part was played individually and left to ring, sustained through the next part. It was Chris Thomas's idea to do it that way, and although it took a long time and was quite a laborious process, the end result was fantastic.

"Invariably, when we'd get to guitars everything would be layered. That's the classic Pretenders sound. It's a sound that Jimmy [*Honeyman-Scott*] had created, along with the great live feel of Martin's drums and having Chrissie's vocal really loud in the mix, leaving no doubt that she's in control of the song. Over the years people have asked me 'How did you get that sound on her vocals?' Well, I put a 47 in front of her, she sang it and we made sure you could hear it. It was all Chrissie Hynde. And it was very much in the tradition of all that early British pop where the vocals were so far out front. That would never fly today.

"Unlike some vocalists, Chrissie wasn't all that shy about people hearing her, and she also didn't hold back when it came to her opinion on a song. Chris Thomas once told me that Chrissie had said '"Brass In Pocket" goes out as a single over my dead body.' Of course, it did, and it did OK. She was quite happy, meanwhile, to track her guitar parts and have all the other guitars layered on top. We were very conscious about retaining that Pretenders sound, and if anything got too challenging we just went down the pub. I don't remember any violent mood swings. Everybody was very mellow."

The New Pretenders

The mix, which took place in the same studio, on the same console, in August 1983, basically amounted to balancing the tracks and trying to present them in their best light. As Steve Churchyard remarks, "there were no real surprises. I'd generally spend a few hours setting things up, and then once I'd got the

track in what I considered to be a reasonable shape, Chris [*Thomas*] would come in and we'd work on the mix together. We'd just put it down on half-inch analogue at 30ips, and, because there was no automation, if we had to punch in we'd just stop the tape, wind it back a little bit and make an edit.

"The only song that wasn't mixed in Studio One was 'My City Was Gone', which was mixed in Studio Two. I remember saying to Chris 'Why don't we try mixing this at 15ips on half-inch? That might be cool.' And that was an interesting moment, because we had the mix and then it was 10 o'clock and time to go down the pub before it closed. When we came back to check the mix, Chris said 'Yeah, it sounds good, but I've got an idea for an edit.' I said 'Chris, I'm a bit drunk right now. This is not the time for razor blades.' He said 'No, no, don't worry about it. I'll tell you where to cut.' The job's difficult enough when you're sober, so that wasn't a great moment... I got through it, but I don't recommend it."

After recording a couple of the Pretenders' 1984 Stateside concerts for MTV broadcast, Churchyard didn't work with the band again. That same year he departed AIR to go independent, and following numerous US assignments he relocated there in the early '90s, where he now resides in San Diego while doing much of his work in LA. Among his most recent engineering projects was the mix of an album by Juliette & The Licks, the outfit of actress Juliette Lewis. "She tracked me down because of my work with the Pretenders," says Churchyard. "The *Learning To Crawl* album has generated a lot of work for me, and while that's great, it's sometimes difficult when people want me to reproduce that Pretenders guitar sound. 'OK, well, can you play like Robbie McIntosh?' Still, I'm flattered by how I'm associated with that album, I think it's awesome. Unlike a lot of '80s recordings, especially the synth-based stuff, the Pretenders' material hasn't dated, and the reason for that is it's a rock band.

"When we finished 'Chain Gang', it was the first song by the new Pretenders, and I've always thought it sounded a bit thin, lacking in bottom end. That's my own personal issue with it, whereas I think the subsequent tracks were tonally better. However, it never seemed to bother anybody else, and if it was a bit thin then it actually might have helped the sound on the radio. Now, listening to it for this interview, it sounded pretty good.

"I mean, everything was analogue — it was tracked on analogue, cut together, and then everything was comped and worked within that medium. It was also mixed to analogue, and then once we did all the mixes we'd do what Chris [*Thomas*] would call a production master, where, rather than let the mastering engineer EQ it, we would do our own EQ, balance it all out, level from track to track, cut and sequence it, and comp it to another two-track. So, I don't know how many analogue generations that is, but in this day and age it's pretty astounding that there's anything left of it." SOS

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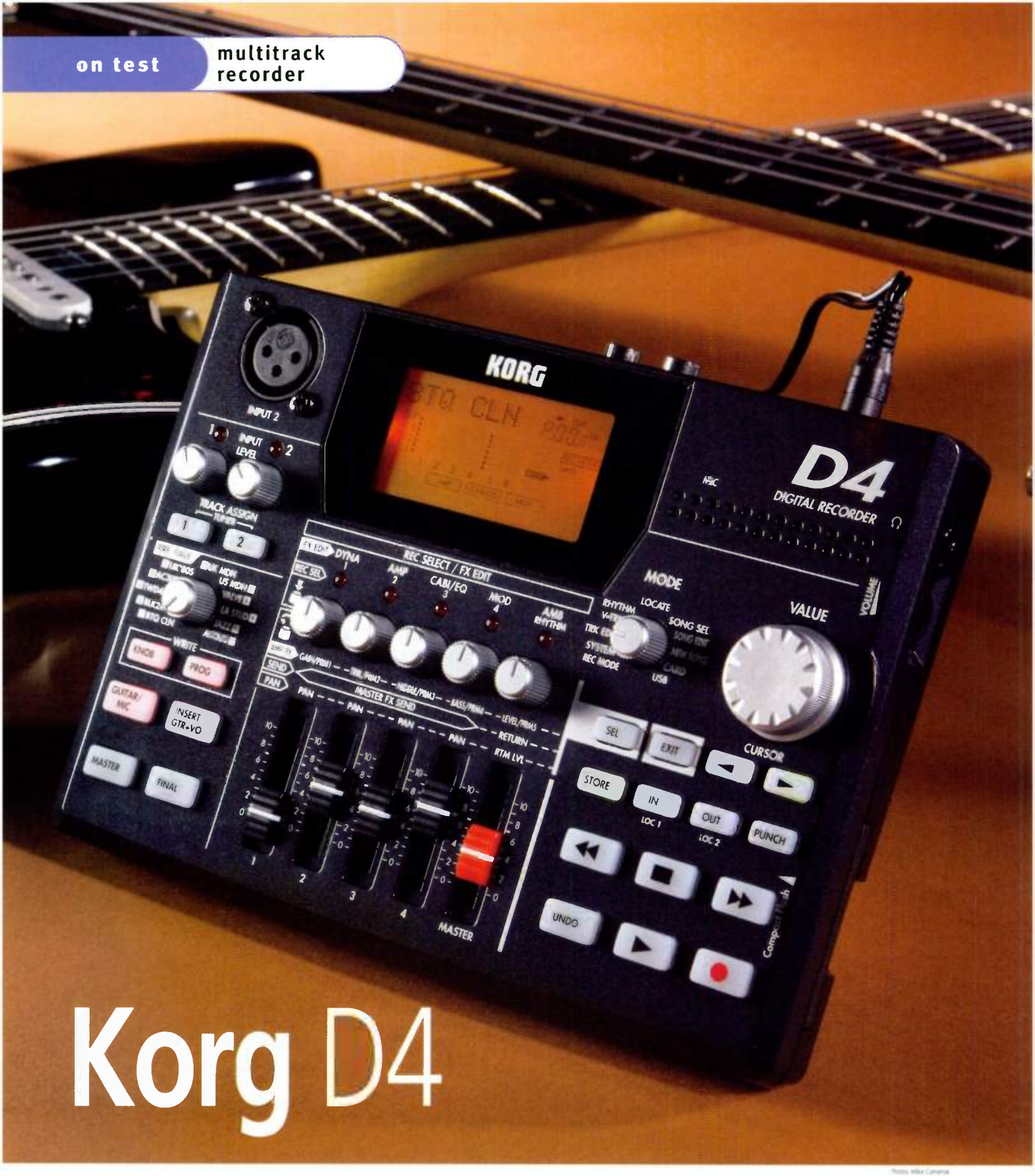

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Digital Multitracker

Tom Flint

The D4 is a four-track digital recorder with built-in effects, a simple rhythm generator, and some basic audio editing tools. It's a touch smaller than a sheet of A5 paper, no deeper than a cheese sandwich, and about as heavy as a copy of *Sound On Sound*. As you can imagine, it's pretty compact, although too large to be a pocket device, especially when its external 9V power supply is taken into consideration. In fact the D4 is more of a 'recording notepad', capable of recording basic compositions two tracks at a time, and requiring the minimum of outboard. For example, a guitarist can start by plugging their lead directly into the back, use the in-built tuner to get set up, select a suitable amplifier and speaker simulation, lay on

some reverb, delay or distortion, and play along to one of the internal rhythms at a tempo and time signature of choice. The D4's editing tools make it possible to hone a performance somewhat, alternative takes may be stored on the 28 virtual tracks, and there are additional send effects available for use on the mix and across the stereo buss during mixdown. Complete mixes can be saved as stereo MP2 files and imported into a USB-connected PC or Mac, or simply output to a stereo recorder of choice.

Memory Flash

There's no hard drive in the D4 so all recording work is stored on Compact Flash cards. Compact Flash is nowhere near as fragile as a hard-drive assembly, and that makes it an ideal memory format for portable recorders like the D4. To date, the limited capacity of RAM cards has meant that recorders using them have been limited in terms of track count and/or recording resolution. Things are sure to change, however, now that some cards can store up to 2GB of data. To put it into perspective, Roland's VS1680 16-track originally shipped with a 2GB hard drive as standard, and that seemed pretty good at the time!

Having just four tracks, the D4 should be well served by the new large-capacity cards, yet it still uses data compression, and its sample rate is fixed at 32kHz, instead of the CD standard of 44.1kHz. Although these RAM-saving measures make it possible to use cheaper cards, they also compromise recording quality. Nevertheless, the D4 still has 20-bit A-D and D-A converters and records at 16 bits per sample. MPEG1 Layer 2 compression is applied at all times, although there is a per-project choice of three different levels of data compression. Recording time varies according to the severity of the data compression and the capacity of the card, which can be anything from 16MB up to 2GB.

Taking Control

The D4 has hardly any hidden menus and almost all its controls are on the top surface, so what you see in the pictures is pretty much what you get. The no-nonsense Mode knob makes it possible to select the majority of functions pretty quickly, but when editing a track or effect, or changing the rhythm settings, it is necessary to delve into a sub-layer or two using the Value knob, the two Cursor keys and the Select and Exit buttons.

The most frequently used controls are the five pan knobs in the centre of the recorder. I call them pan knobs, but they actually perform a number of functions depending on context. Sometimes they adjust effects parameters, while at other times they control the send level of an effect. They even double up as buttons when pressed, and are used for selecting on-screen options or track record assignment. Various screen icons flash on and off telling the user what the knobs are ready to do at that moment, so it's necessary to read the manual carefully to find out what everything means.

The D4 is capable of recording two tracks simultaneously via the two rear-panel quarter-inch jack sockets. Routed to the second input channel is an XLR socket, actually situated on the top of the D4. The input allows a balanced mic lead to be connected, but no phantom power is available. There is also a built-in mic that can be used either for recording or so that the on-board chromatic tuner can monitor acoustic instruments. Also round the back are two RCA phono sockets proving the stereo output, and a USB port which allows song files and MP2 mixes to be backed up to a Mac or PC. One further rear-panel jack socket enables a footswitch to be connected and used to trigger drop-ins. The only other I/O left unmentioned is the headphone socket, placed on the right-hand edge together with its Walkman-style volume wheel, and the Card slot which is found underneath the transport buttons.

SOUND ON SOUND

Korg D4 £249

pros

- Small and portable.
- Fairly easy to use once familiar.
- Takes 2GB Compact Flash cards.
- Has a speedy USB facility.

cons

- Uses data compression and only records at 32kHz.
- No phantom power.
- No marker points.
- No dedicated channel EQ.

summary

A neat little multitracker which offers good digital editing options and onboard effects for a fair price.

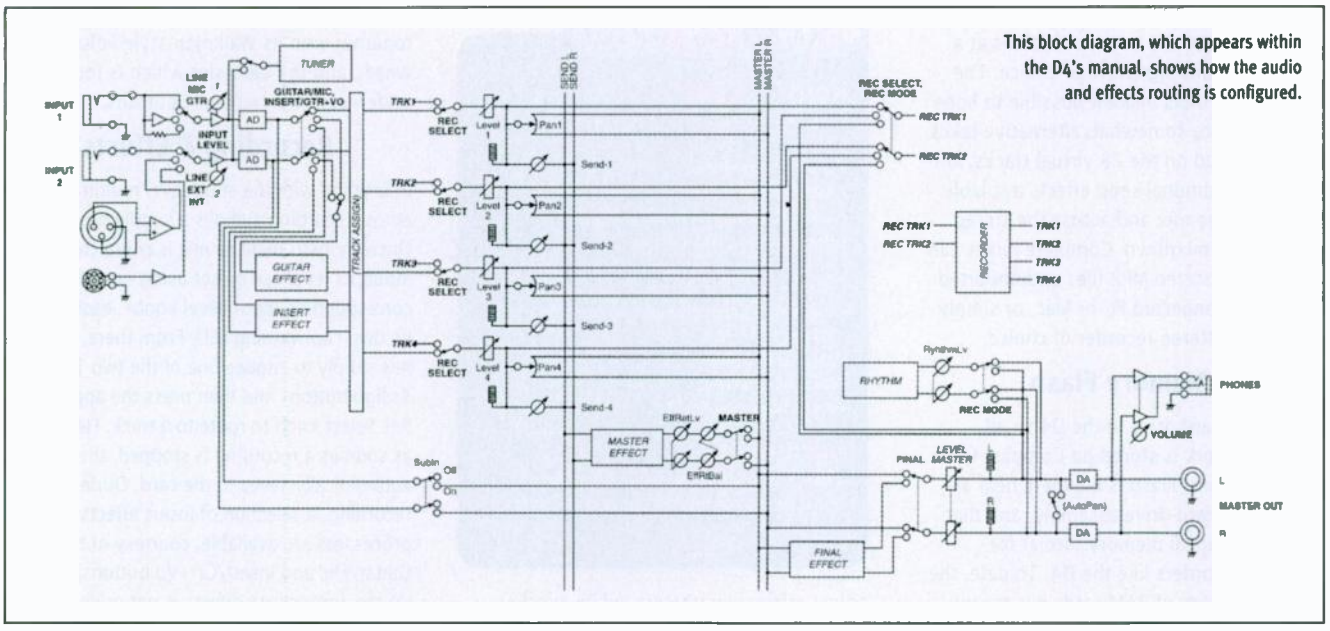
Recording & Effects

In keeping with the entry-level multitracker ethos, recording audio is a simple process. Once an instrument or mic is connected to an input, its level can be set using one of the two corresponding Input Level knobs, each with its own clip-warning LED. From there, the user has simply to engage one of the two Track Assign buttons and then press the appropriate Rec Select knob to route to a track. Helpfully, as soon as a recording is stopped, the D4 automatically saves to the card. During recording, a selection of insert effects and processors are available, courtesy of the Guitar/Mic and Insert/Gtr+Vo buttons. Setting up the appropriate effects is not quite so elementary, though, due to the way the D4's 93 effect algorithms have been organised.

The first thing to understand is that effects cannot be picked individually; they have to be chosen as part of a pre-arranged Chain. There are 11 Chains in all, which are inexplicably named from 'A' to 'E', and then from one to six. By consulting the table at the back of the manual it is possible to identify the Chain best suited to a particular purpose, and then select a Program preset which is created using that Chain type. Again, it's necessary to consult the manual to find out which Chain each of the 99 Programs belongs to. Individual Chain effects can be turned on/off and swapped like for like, so, for example, one cabinet simulation can be exchanged for another. It's not possible to rearrange effects into any order, though; if the sequence is not suitable then a more appropriate Chain has to be picked as a starting point. Certain key effect parameters are editable using the aforementioned pan knobs, and newly adjusted programs can be saved into one of 99 user slots.

Family Resemblance

The D4 is a direct descendant of Korg's PXR4 four-track, reviewed in *SOS* December 2001 (www.soundonsound.com/sos/dec01/articles/korgpxr4.asp). The specifications of the two products are very similar, but there are important differences. Firstly, the PXR4 used Smart Media cards, which Korg have abandoned in favour of Compact Flash. The PXR4 was designed to be pocket sized, but I suspect few owners ever carried their one around with the mobile and wallet. Korg have taken a different approach this time and made the D4 larger and less fiddly to operate. One other difference is the origin of the effects. The PXR4 derived its effects from Korg's Pandora processor, whereas the D4 uses the slightly more contemporary REMS (Resonant structure and Electronic circuit Modelling System) effects.



This block diagram, which appears within the D4's manual, shows how the audio and effects routing is configured.

The effects on offer clearly show that the D4 is primarily aimed at the guitarist. The first three Chains are designed for guitar, all providing 28 amp models designed to emulate the best-known products of the last few decades. Amps can be mixed and matched with cabinet models too, so that, for example, you can have the emulation of a Vox AC30 amp driving a cabinet belonging to a completely different model.

Given that there is so much for guitarists, the D4 is strangely lacking in Chains arranged to allow two independent sound sources to be recorded with different types of processing. For example, only Chain 5 and Chain 6 offer two independent parallel processors, and both Chains have fairly limited menu options. Chain 6, for example, inserts a cabinet simulation on track 1 or track 3 and a limiter on track 2 or track 4, but it only gives 10 cabinet choices and just the one limiter! Some of the other Chains do provide stereo in/out options for applying suitable effects to things like keyboards or drum machines, but, by and large, mono recording is favoured.

The actual mixer part of the D4 is basic. It is possible to pan each track, set its level, and bounce selected tracks together, but there's no channel EQ, and no direct way to route tracks to an external effects processor. The internal effects do offer a range of four-band EQ options, as well as a number of dynamics processors, but they have to be used as part of a viable effects Chain.

The Record Mode position of the Mode dial provides a couple of ways to submix tracks and their effects so that more overdubs are possible. When Bounce is selected, tracks are mixed to a spare track (or tracks), together with effect treatments and any additional input signal. Alternatively they can be 'Mastered' to a track pair via a stereo compressor, limiter or reverb. The MP2 mode actually creates and stores a new song file on the card, so mixes can be bounced down at any time without affecting the original track data.

The D4's editing options include Copy, Insert, Erase, Delete, and Time-expansion/compression. Edits can be made by simply positioning the two locate points in the desired start and end locations. Although the locate points can also be used to jump to points within a song, there are no song markers. I should also briefly mention the rhythm generator which is basically a glorified metronome offering 87 patterns. The tempo, time signature, and level can be changed, but it's not possible to build a drum arrangement from different patterns.

In Use

Although the D4 is designed to be fairly straightforward to use, it's not as user-friendly as it could be. It certainly does take time to get to grips with the multi-function pan knobs and the effects Chain arrangements. Usability would be improved if it were possible to set song markers — even just a few would help the user to get around. Navigating is best achieved by turning the Mode dial to Locate and then adjusting the time value directly to move through the track.

The effects are of a fairly high standard relative to the low-cost nature of the D4 itself, and I can't imagine any guitarist feeling that there aren't sufficient amplifier, cabinet, and guitar-pedal emulations. I particularly enjoyed playing with the included guitar-synth effect, which offers a range of sine and sawtooth waveforms, octave shifts, and portamento options. Some rather creative results are to be had once a suitable threshold setting is found, and I'm sure a few guitarists will find creative uses for it. It's also worth mentioning that all the standard delays and reverbs were effective and nicely programmed.

As regards sound quality, I have no gripes. The D4 records cleanly, having no

hard drive to generate machine noise. The very short faders and stumpy on-screen metering create the feeling that the D4 has a limited dynamic range. Nevertheless, the sound quality is good enough for demo work, and even the Economy mode sounds OK.

Some multitrackers I've tested recently have been rather sluggish in USB mode, but the D4 works smoothly and quickly. Backing up the demo track, 'Boa Blues', to my PC took just 40 seconds, for example. If a stereo MP2 song file has been created from a mix and stored on the card, it too is easily copied across from folder to folder, just like any audio file.

The D4 records directly to an internal Compact Flash card, and capacities of up to 2GB can be used.

Conclusions

The sorts of moans one would normally have were this a larger multitracker, such as the lack of mute or solo buttons, are not really relevant here. However, phantom power would have been nice, some more song navigation tools are needed, and there should be some degree of channel EQ available, particularly as the effect Chain structure limits how and when EQ can be used.

There's no denying that Korg have been clever in the way they've made the pan knobs perform a number of jobs, but I'm sure some users will find the design confusing. Korg could have included a few more controls by making the D4 larger, and it would still have been portable: the widespread adoption of laptop computers has shown that people are willing to carry something larger than the D4 as hand luggage. A laptop-sized D4 could also have a larger screen, more dedicated buttons, and possibly an internal power supply, giving it enough weight to prevent a tugged guitar lead pulling it off the table top!

Now that 2GB Compact Flash cards are available, Korg may want to think about introducing an uncompressed recording facility which operates at 44.1kHz sampling rate, particularly as the D4 already has 20-bit A-D and D-A converters. I'm not sure why the option is not available already, unless the Compact Flash medium can't exchange data fast enough.

At this UK price, the D4 is one of the most affordable products of its type on the market, but its feature set is limited. All in all it offers a cheap way to record simple demos, and seems like the modern-day equivalent of the cassette four-tracks many of us grew up with. SOS

information

£	£249 Including VAT.
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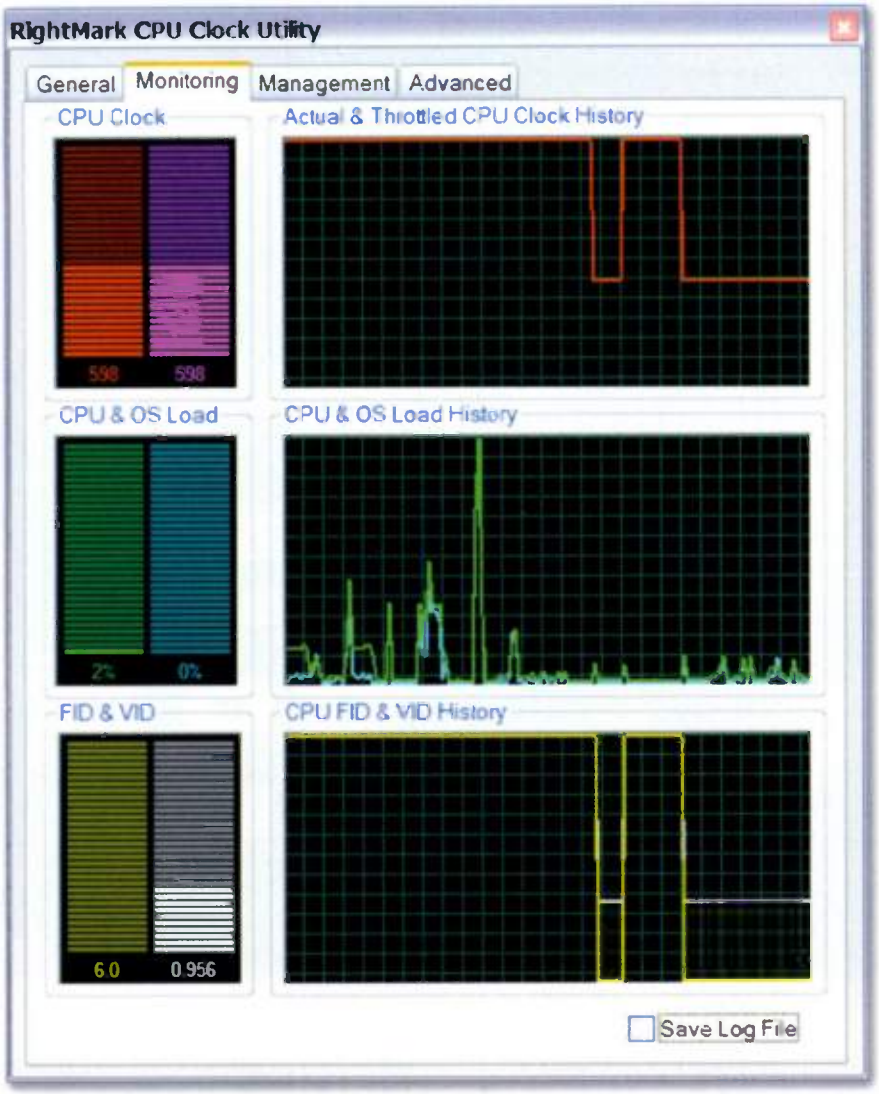


Little Helpers

Useful Utilities For The PC Musician

Whether you're running a single PC in your bedroom or a bank of them in a professional studio, sometimes a tiny freeware or shareware utility can make the difference between frustration and elation. We round up some of the best and point you to places where you can find more.

Martin Walker

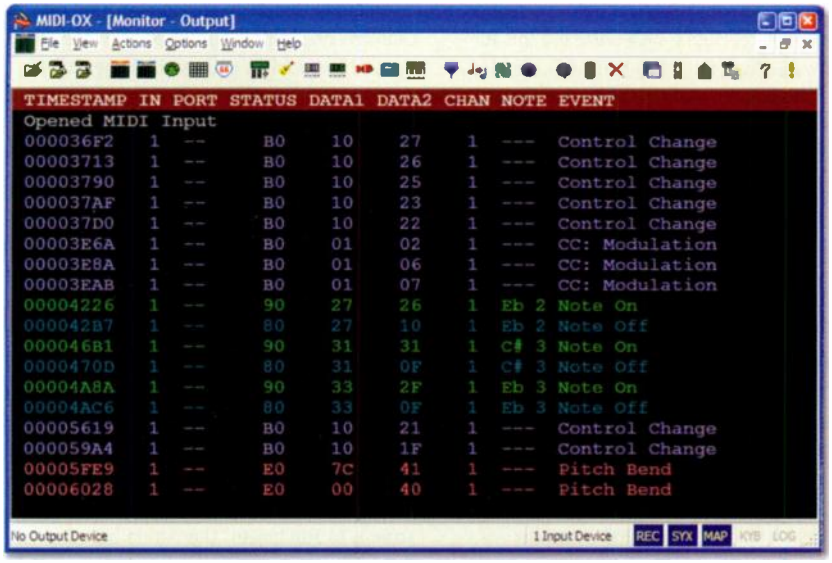
The right freeware or shareware utility can be a godsend for the PC musician. It might help you track down an annoying problem, cure it or bypass it altogether; it might provide you with a new means of generating or modifying sounds; it might simply save you money you'd otherwise have had to spend on a commercial equivalent. Ironically, although such utilities are often quick and easy to download via the Internet, their relatively small size often results in them being overlooked among the morass of available files. Some of the best ones aren't hosted on the mainstream web sites either, but on the developer's own pages.

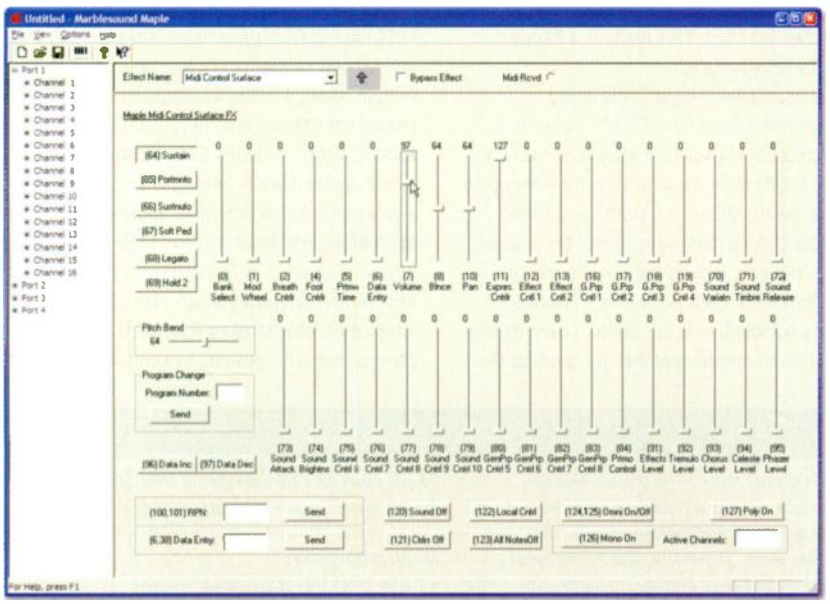
So this month I've rounded up some of the most useful utilities that should specifically interest the PC Musician, organised into various categories with suggested uses. Many new musicians seem to be moving across to making music on their PCs after working for years on hardware multitrackers or elderly Atari ST computers, so I make no apologies for including some old favourites in the list. However, whether you're a newcomer or an expert, there should be something for you. The majority of the utilities I include are freeware, and the few shareware ones have very reasonable registration fees considering how useful they are.

MIDI Monitors, Routers & Plug-Ins

There are those who consider MIDI an outmoded technology — sales of new MIDI hardware synths are falling, and some musicians are busy selling their existing ones second-hand because they now use totally software-based sources. However, other musicians are eagerly snapping up these bargains, and anyone who uses a VST or DX Instrument is probably still using MIDI data to trigger it from an external keyboard. Moreover, MIDI controllers are an incredibly popular way to add real-time expression to MIDI performances, to automate both MIDI and audio sources, or simply to control sequencer functions from a distance. So, given that MIDI still plays a big part in many musicians' lives, what can utilities do to enhance this experience?

For many, a big frustration comes when they're trying to make a certain controller change a particular synth parameter and nothing is happening. If you know what data you're trying to generate from your controller, the answer is to monitor what's actually coming out to see what's amiss — it may be something as simple as incoming data being sent on the wrong MIDI channel. For many years, the standalone 800KB *MIDIOX* has performed this function for me and many other musicians with finesse, and it's still a free download from www.midiox.com. All you need to do is open its MIDI Devices window, select the MIDI input that your controller is connected to, and then you can view every MIDI message the controller generates. For those who want to see which MIDI data is arriving inside their VST-compatible sequencer application, Wally Cescato's *MIDI Data Monitor* (www.freewebs.com/wallyaudio) loads as ▶





MIDI is still an important part of most musician's performances, and utilities such as *MIDIOX*, *Maple Tools* and Markleford Friedman's MFX plug-ins, shown here, can help you get the right MIDI data to the desired destination.

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USEFUL UTILITIES

a VST Instrument and displays incoming MIDI note, aftertouch, pitch-bend and controller data on four 'LEDs', as well as providing a scrolling data display in text form.

Those with hardware MIDI synths will easily find loads of soundbanks for their particular make and model on the Internet, but after you've downloaded these SysEx (.SYX) files to your PC you'll need a way to send them on to your synth. *Sonar* users can do this directly (as can users of Cakewalk's older *Pro Audio* sequencer range) but if, like *Cubase*, your sequencer doesn't recognise such files, you'll need a suitable utility. Once again, *MIDIOX* comes to the rescue. However, if you want something even simpler that's devoted to SysEx transfers, *SendSX* (www.bome.com/midi/sendsx) also works with all versions of Windows.

There are still times when MIDI routing utilities are useful. Some can add multi-client support to MIDI hardware that doesn't have it, so that you can route a sequencer and synth-editing software simultaneously to the same MIDI output for changing sounds while playing back a song. Hubi's *Loopback* and Herman Seib's *MultiMID* were the ones that started it all for Windows 3.x and 9x, and they're still available (http://members.nextra.at/hubwin/midi.html and www.hermannseib.com/english/multimid.htm). Others can act as MIDI patch cables, so that you can port data from one application to another in real time, or modify incoming MIDI data before sending it on elsewhere. Hubi's *MIDI Cable* did this for Windows 3.x and 9x, while Jamie O' Connell's *MIDI Yoke* (www.midiox.com/myoke.htm) worked for many on Windows NT and subsequently Windows 2000 and XP, but caused problems with Tascam's *Gigastudio*.

Fortunately, a modern patch-cable alternative is now available that seems to work with everything: Marble Sounds' *Maple Virtual MIDI Cable* (www.marblesound.com/Maple_driver.html) is freeware and runs on Windows 95, 98/ME, 2000 and XP. Once you've installed it and rebooted, it appears in all your MIDI applications as four extra MIDI Ins and Outs, so if, for instance, you want to send the MIDI output from your main sequencer to a stand-alone soft-synth, you can select Maple MIDI Out: Port 1 in your sequencer and Maple MIDI In: Port 1 on the synth and the two applications will be connected via MIDI. This really is a handy utility to have installed.

The associated *Maple Tools* utility (www.marblesound.com/Maple_tools.html) either accepts MIDI data from your sequencer via the Maple MIDI Outs, or directly from up to four hardware MIDI input ports, and then modifies it in various ways in real time, using various plug-ins individually configured for each channel of each port. There are two plug-ins bundled with the utility: *Layering* lets you achieve complex patches by sending the incoming MIDI data to any combination of channels on multiple output ports, while *MIDI Control Surface* lets you send a huge variety of controller-data messages using software sliders and buttons.

Various third-party developers have added special performance features to their sample libraries by writing plug-ins for *Maple Tools*. For instance, PMI supply their *Grandiose FX* plug-in to enable users of their *Gigastudio* piano libraries to re-pedal (switch between sustaining and no-sustaining samples in real time), and add pedal-noise samples and extra release samples. This is a free download for those who would like to try using it for other applications (www.postpiano.com/Maple/Ind/GrandiosoFX.zip). Gary Garritan also includes the *Maestro Tools* plug-in for his *Orchestral Strings*, to add legato, alternating bow strokes and mono mode to its repertoire.

For those who would prefer to record their MIDI data in its original form, then modify it inside their sequencer in real time via a MIDI plug-in, there are lots available to suit any sequencer that accepts plug-ins in MFX format, which includes *Cubase*, *Nuendo*, *Sonar* and *Project 5*, amongst others. There's a wonderful collection of 19 plug-ins by Markleford Friedman at Ten Crazy (www.tencrazy.com/gadgets/mfx), including *MFX Auto Alternator*, which provides the alternating bow strokes feature of *Orchestral Strings*, but with options to send the alternate

Where Can I Find Utilities?

The vast majority of offerings in the Multimedia sections of utility libraries tend to be for general-purpose use — audio players, plug-ins for use with them, various codecs and encoders to work with compressed audio formats, CD rippers and simple audio editors. For those who already have a full-featured MIDI + Audio sequencer and a clutch of plug-ins, and are more interested in creating their own music than copying other people's, there's probably little of interest. However, there are some gems to be found if you search hard enough. Here are some web sites that I've found rewarding in my travels:

GENERAL PURPOSE:

- Cnet's Download.Com (www.download.com) provides many categories, but has a handy search function, so you can narrow down the options when you're looking for something in particular.
- Download FreeTrial (www.downloadfreetrial.com) is, as its name suggests, a web site where you can download free or trial versions of software. I mention it because I found quite a few utilities here that I hadn't spotted elsewhere.
- Nonags (www.nonags.com) is unusual in having mirror sites around the world hosting its contents to make them quicker to download, and in hosting freeware only. It's been around since 1995 and is now absolutely vast, yet very clearly laid out, with descriptions, ratings and links to authors' home pages.
- Simtel (www.simtel.com) is slick and very professional and has a filtering system so that you can specify the operating system, type of license (freeware, demo, shareware, and so on), price, user ratings and even file size, to narrow down your search.
- Snapfiles (www.snapfiles.com) is vast. The two innocuous buttons, labelled Shareware and Freeware, near the top of the main page take you to one of the biggest selections of downloadable files on the Internet, each with several hundred categories. The Multimedia sections aren't all that useful to musicians, but there are loads of general-purpose utilities and a very good synopsis and rating system.
- Softpedia (www.softpedia.com) is a vast repository of shareware and freeware for both Mac and PC. The Windows section offers 19 categories, but many of these are further divided into sub-categories to make searching a more productive experience.
- SourceForge (http://sourceforge.net) has over 100,000 registered products across 19 categories and caters for the academic as well as the more casual user. This is a site at which you could profitably spend quite a few rainy afternoons.
- Tucows (www.tucows.com) is always a little slow to appear for my liking, partly because of the number of ads, but it has 660 titles in its Audio section so it's well worth a visit.
- UtilityGeek (www.utilitygeek.com) provides a huge range of diagnostic tools and utilities for the PC owner, neatly split into 22 categories.

AUDIO/MIDI ONLY:

- Audio Tools Direct (www.audiotoolsdirect.com) has about 600 downloads available, although most of their 29 categories contained little of interest when I looked.
- DA Sound (www.dasound.com) has a good search/browse function that helps you narrow down the options. Particularly useful is the browse-by-platform option (if, for instance, you're only interested in files that are compatible with Windows XP).
- Harmony Central (www.harmony-central.com/Software/Windows) has another large collection of audio-related shareware and freeware.
- Hitsquad's Shareware Music Machine (www.hitsquad.com/smm) has over 5000 software items to download, sorted into about 100 different categories, and I suspect that it's the most comprehensive site of its type around.
- Partners In Rhyme (www.partnersinrhyme.com/pir/PIRwindows.html) has a good selection of audio and MIDI files, but many of them are rather old, and with few details provided you can waste a lot of time downloading things that you subsequently find will only run on Windows 3.1.
- Synth Zone (www.synthzone.com/utilities.htm) has plenty of music-related links, although, once again, many of the utilities are quite elderly.

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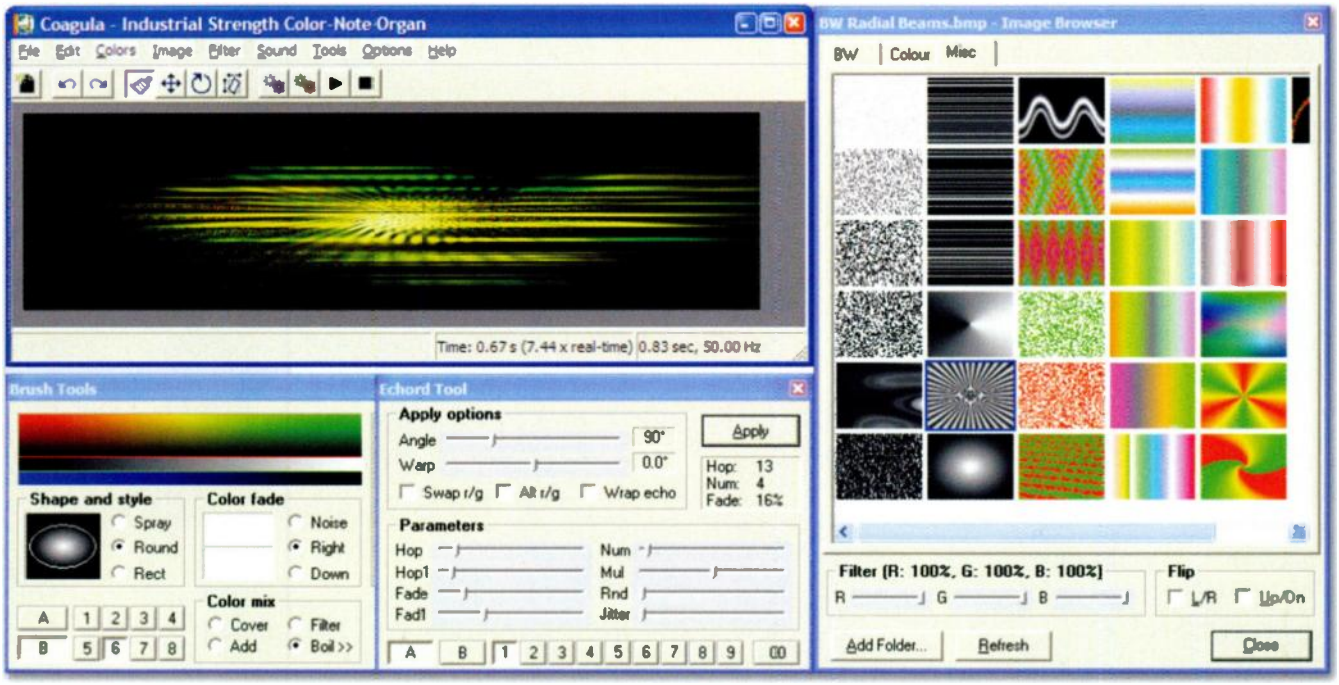

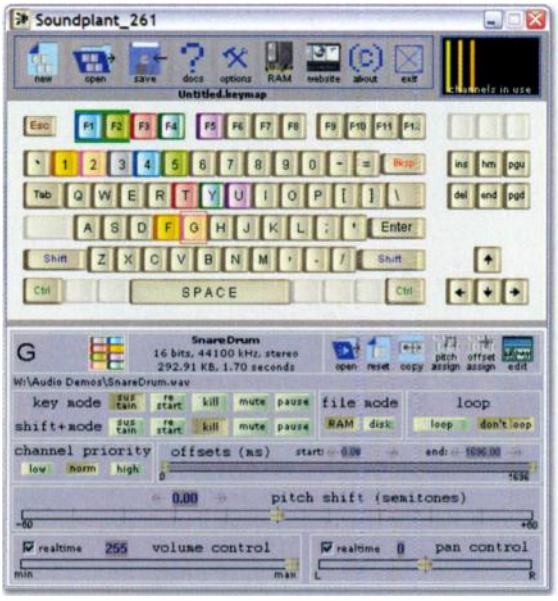

Creating sounds from images may generate some fresh inspiration, using utilities such as *Coagula*, while *Soundplant* is a handy sample-triggering tool that you could use during live performance.

messages to different MIDI channels so that you can create the same effect with your own sample sets. Others include *MFX Track Doorman*, which ensures that only notes from a specific key range reach your synth (ideal for making sure your string orchestrations are correct), *MFX Kick Peddler*, to convert sustain pedal or other switch movements into kick-drum data, and *MFX Key Tweaker*, to generate any controller data from a range of keys, for those who don't have modulation or pitch-bend wheels on their keyboards. Some users have found the install process confusing, but all you do is unzip the three files belonging to each plug-in into any folder of your choice. In the case of *Cubase SX*, I just created an MFX folder inside my existing VST plug-ins folder. Then you double-click on the file ending in 'BAT', to let the Windows Registry know of its existence. Further MFX plugins can be found at the Frank's MIDI Plug-ins web site (www.midi-plugins.de), and Nicolas Fournel's web site (www.nicolasfournel.com).

Audio Utilities

Most audio manipulations are now carried out within host applications that already contain many internal transformation tools, and most support VST or DX plug-ins that can add loads more, so stand-alone audio utilities are becoming of less interest nowadays. Nevertheless, I did find some intriguing tools in my travels.

Let's start with a couple of very handy stand-alone tools from AnalogX (www.analogx.com). *Delay Time Calculator* does just what it says on the virtual tin: you enter the tempo of your song in BPM and it provides a readout of seven note lengths in milliseconds that you can dial into your hardware or software delay unit. *Tap Tempo* is for when you don't know the tempo of a song — just press the space-bar on each beat and a tempo readout magically appears. At 209KB and 206KB respectively, you can't go wrong.

The freeware *Soundplant* (www.soundplant.org) could prove very useful to some musicians, as it turns the computer keyboard into a sample-triggering device capable of assigning WAV or AIFF files to up to 72 different key combinations. You can then use it as a rough-and-ready drum pad, or as a performance or installation tool. The software's graphic interface allows drag-and-drop configuration of each key, with controls for pitch, offset, volume, pan and looping, and you can batch-assign the same file at different pitches and offsets across multiple keys. Just make sure that your keyboard repeat delay is set to High and the repeat rate to Slow.

Coagula (http://hem.passagen.se/rasmuse/Coagula.htm) is described as an 'image synth' and provides a range of drawing tools for creating graphic images that you can then render into a WAV file. Each line in the image controls the amplitude of one sine-wave oscillator at a specific pitch, and different colours determine stereo placement and noise contributions. Included are a variety of unusual filters, overlays and tools, and the results range from drones through washes of sound to evolving sci-fi soundscapes. You can also import BMP files. *Audiopaint* (www.nicolasfournel.com) is rather simpler, providing no drawing tools but offering the facility to import GIF and JPEG as well as BMP images. You can also use a sample instead of sine-waves to generate your sounds, for very different results.

If you want to explore the outer fringes of audio, pay a visit to The Transparent Corporation (www.transparentcorp.com) and enter the mysterious world of brainwave manipulation. Here you can download a demo version of the *Brain Sound Studio* that embeds

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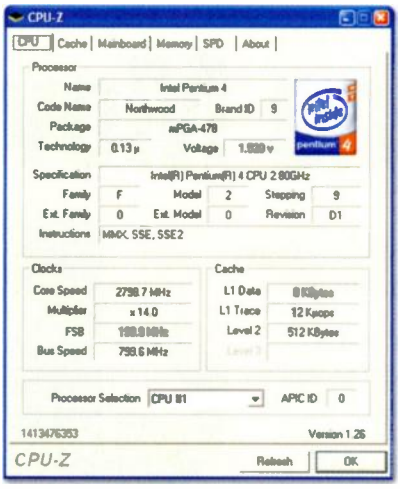
Testing Your Hardware

We regularly get new members on the *SOS* Forums asking how they can find out what motherboard make and model they have in their PC, or what processor, how much RAM and of what speed. Probably the most comprehensive utility that can tell you all this is SiSoftware's *Sandra* (www.sisoftware.co.uk/sandra), which provides a host of modules covering Information, Testing, Benchmarking, Listing and various Wizards. You can learn a vast amount about your PC from these, and use the information to test the performance of the PC's various sub-systems.

However, the beginner or casual enquirer could easily become overwhelmed with *Sandra*'s data read-outs, and for quick-and-easy display of all the parameters mentioned above the freeware *CPU-Z* (www.cpuid.com/cpuz.php) is hard to beat. It provides just the right amount of information in one tabbed interface covering your CPU, Cache, Mainboard, Memory and SPD (Serial Presence Detect) read-out from each RAM slot.

The other area that beginners often find they want to measure is hard drive performance, especially if their system can only manage the playback of a few dozen audio tracks before running out of steam. *DskBench* (www.sesa.es) is a perennial favourite for this, as it's tiny (just 36KB) and can be dropped into each partition on a drive and run from there to measure the drive's sustained read/write transfer performance, check that the drive is correctly using DMA (Direct Memory Access) for low CPU overhead (this is a common reason for poor audio playback performance) and give you an idea of how many audio tracks you should be able to run with different disk-block buffer sizes in your sequencer application. *Dskbench*'s read-out is text-only, but if you're not sure what results you should be getting this makes it easy to paste your results into the *SOS* PC Music Forum, where more



The quickest and easiest way to find out what hardware is inside your PC is to run *CPU-Z*, which will interrogate your CPU, motherboard and RAM.

experienced users will soon provide feedback.

If you'd prefer a graphic display of sustained drive performance, *HD Tach* (www.simplisoftware.com) is probably your best bet. Rather than providing individual transfer rates for each partition, it shows how this parameter varies from the outside (fastest) to the inside (slowest) of each of your drives, as well as providing a CPU utilisation figure. If this encourages you to think more carefully about how your various drives are partitioned, all the better.

Boot Management

Once you understand the ins and outs of partitioning (see PC Musician May 2005 for more details), it's well worth installing a music-only Windows partition alongside the one you use for more general activities such as Internet surfing, word processing and so on. You can separately install Windows into several partitions by using its 'install new copy' option, and use Window's own basic boot-manager utility to choose which one to run each time you boot up your PC. Quite a few musicians do this with no problems at all, but others aren't quite so lucky, running into problems and limitations.

If you're prepared to lay out a little money and want a considerably more versatile boot manager, Terabyte Unlimited's *Boot It NG* (Next Generation) is just $35 and provides a boot manager, a partition manager (not as versatile as *Partition Magic*, but good enough in many cases) and a partition-imaging utility so you can save compressed security copies of partitions, as well as cloning them. Since it doesn't run from Windows, you can also

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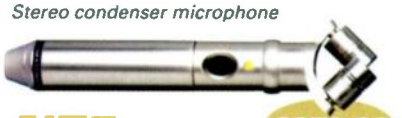
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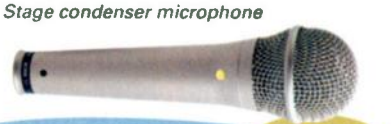
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use it to image Windows itself.

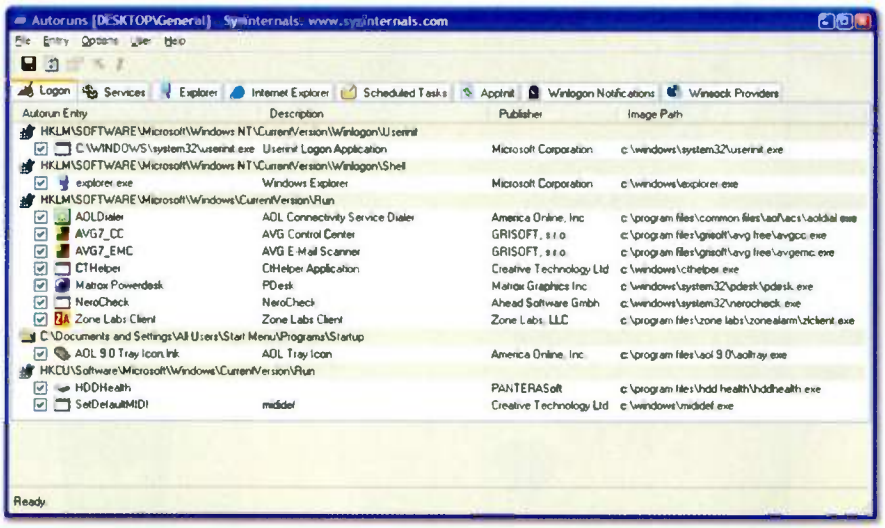
Boot It NG also provides various special features, such as removing the usual limit of four Primary partitions on a drive (each operating system must normally be installed on such a partition, so this allows you to install more than four instances of Windows in complex setups), and has a Multi-OS option that can boot multiple operating systems from one primary partition. *Boot It* was first released 10 years ago, has gained an enviable reputation for reliability (particularly important when you're using it to back up your data) and can be downloaded from www.terabyteunlimited. com/bootitng.html

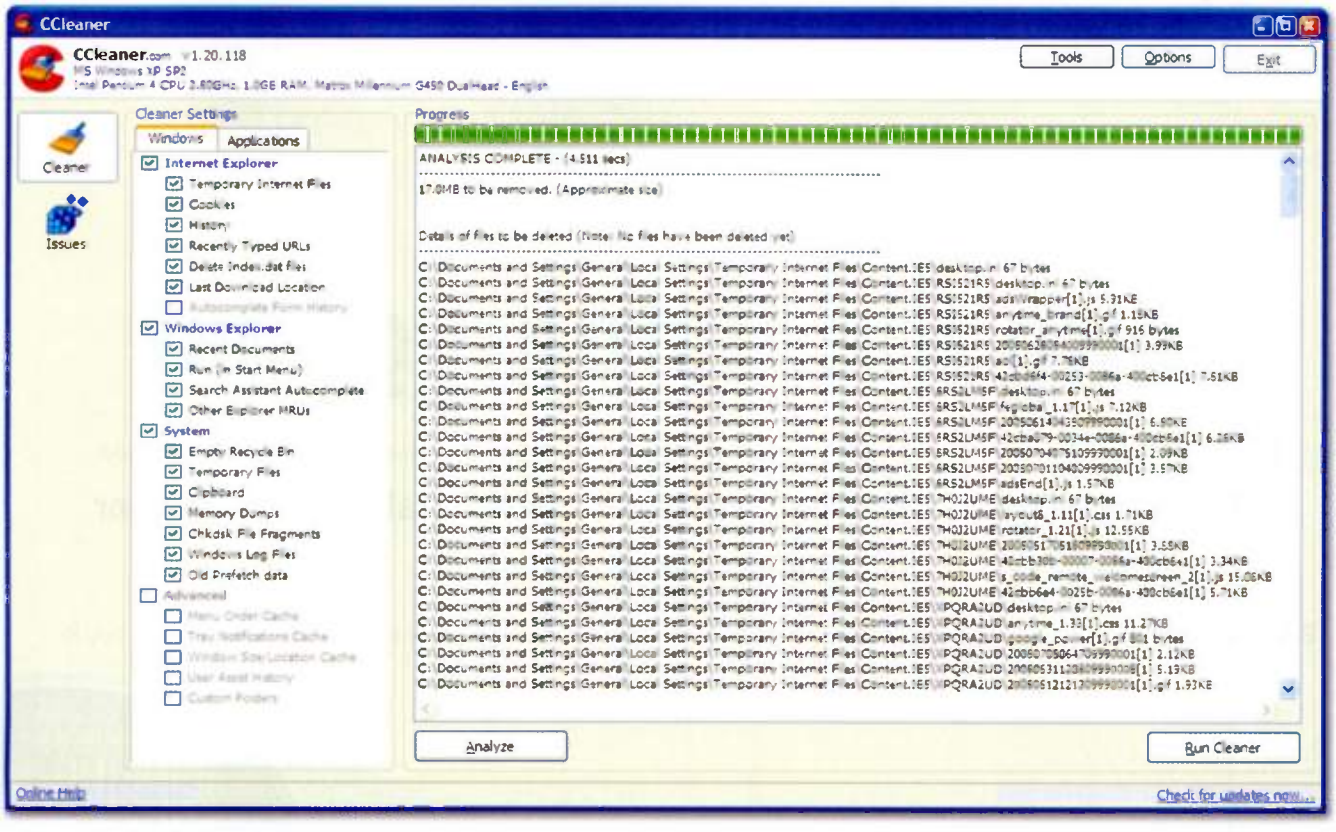
However, another product could well claim the prize of 'ultimate boot manager'. Star Tools' *Bootstar* (www.star-tools.com/bootstar/english) also increases the limit from four to 15 primary partitions per drive, but is the only boot manager, to my knowledge, that provides extra security features, by physically hiding each Windows partition so that when you boot into another one it's entirely unaware of the other's presence.

Bootstar lets you choose an entire profile consisting of up to four visible partitions out of the 15 possible, and in its Profi security mode doesn't simply restrict access to 'hidden' partitions, like most other boot managers, but instead deletes its MBR (Master Boot Record) information so that the partitions cannot even be seen from partitioning tools such as *Partition Magic* or Windows own *FDisk* (although you can temporarily deactivate it to carry out maintenance work). If you're concerned about the possibility of a music-only partition getting virus problems, I know of no way for any infection to pass from an Internet-enabled partition to one that's totally invisible until you reboot into it. Like *Boot It NG*, you can test *Bootstar* for 30 days without any restrictions, then it costs just $25 to register per computer. Unfortunately, I can't show you screenshots of either of these utilities, because they are installed and run long before your PC reaches the Windows environment.

Windows Tools

While the majority of musicians now have few problems achieving smooth audio recording and playback, there are still regular posts on the *SOS* Forum complaining of occasional clicks and pops. One of the commonest problems afflicting the PC musician still seems to be unwanted third-party tasks running in the background and interrupting audio recording and playback. The quickest way to see which processes are currently running is to use the Ctrl-Alt-Delete key combination to launch the Windows Task Manager, but although this provides a long list of





Tracking down unwanted Windows startup tasks and laptop power-management issues that cause audio clicks and pops is made easier using utilities such as *Autoruns*, while *CCleaner* will keep your PC optimised and remove traces of your Internet activities.

Searching Guidelines

There are so many utilities out there that it's difficult to sort the wheat from the chaff (which is the main reason for this round-up). However, if you're searching for something different, here are a few things to remember on your travels.

• Some MIDI utilities, in particular, date right back to Windows 3.1 and may or may not run under the Windows XP that most of us are now using. Unfortunately, not every download site provides details of release dates or supported operating systems, so if the utility appeals you may have to do some detective work. If the file is in zipped form, you'll be able to glean a lot from the date-stamps of the files within it, and if some of them are dated 1993 be wary: the utility may still run, but it may need some elderly DLL files that are no longer part of Windows. If you just get a Setup.exe file you won't have any idea of its release date, but if it suggests when you run it that it should be installed in the root C: directory, or doesn't cope with long folder names (abbreviating them with the tilde '~' symbol), it's probably very old.

• If you intend to try out a batch of utilities, the safest approach is to first make an image file of your Windows partition. Then you can install what you like, safe in the knowledge that if anything goes awry you can restore the image file to return your hard drive to the state it was in before you started (that's what I did while researching this feature).

• Occasionally you can download a file and find that it's in a compressed format Windows won't read automatically, such as RAR or UUE. One of the best utilities for dealing with such formats is *WinRAR* (www.rarlab.com). It's available in a huge number of different languages and can either be launched as a stand-alone application onto which you drag and drop supported file types or can be integrated into Windows Explorer for right-click Extraction options. *WinRAR* is shareware. You can use it free for a 40-day trial period and a single license costs about £19.

The only compressed format I've ever had to deal with that wasn't covered either by Windows or *WinRAR* is MIME, which can occur with encoded email attachments from Mac users. If you ever find yourself with a stray file ending in .MIM, the usual suggestion is to download and install Allume's *Stuffit Expander* (www.stuffit.com/win/expander/index.html). What you're actually doing is installing a 15-day trial version of *Stuffit Standard Edition* that includes the free *Expander* tool. If you'd prefer a much smaller (310K) download, try the freeware *Decode Shell Extension* from Funduc Software (www.funduc.com/decext.htm). This adds a Decode function to *Internet Explorer* that will extract multiple files from within a MIME one.

candidates, many of them are required for the normal running of Windows and are cryptically named.

As many third-party tasks are started each time you boot up Windows, it's generally more useful to search these out. Microsoft provide the System Configuration Utility, which you can launch by clicking Start, then Run, typing 'msconfig' into the text box and then pressing return. On the Startup page you'll find a full list of tasks that are either in your Startup folder or in the Run or Run Once sections of the Windows registry (Run Once tasks generally initialise something, while Run tasks continue to run behind the scenes as long as your PC is on). If you suspect that one of these tasks is causing a problem you can go to the General page and click on Selective Startup. Then you can individually tick or untick the boxes in the Startup page and re-boot to see if bypassing a specific task has cured the problem.

Alternatively, the easiest utility I've found to do all this is the freeware *Autoruns* from Sysinternals (www.sysinternals.com). It runs on all version of Windows, provides a clearer display with more meaningful names, offers icons to make each task easier to recognise, has the most comprehensive knowledge of auto-starting locations of any startup monitor, and even displays the entries in the order that Windows processes them.

If you ever find a task in any of these lists whose function is still obscure, try browsing through the excellent Task List Programs list on the Answers That Work web site (www.answersthatwork.com/Tasklist_pages/tasklist.htm). This provides 27 pages (numerical, plus one for each letter of the alphabet) crammed full of information on the huge number of tasks available from both third-party and Microsoft sources, complete with recommendations on whether or not you should disable them

Musicians with laptops also suffer occasional audio pauses, but for an entirely different reason. On many modern designs the power management functions try to maximise battery life and keep the device cool by throttling the CPU frequency and reducing its operating voltage in real time if you require less computing power, smoothly ramping it back up when you need it all. Unfortunately, on a few models each such change can result in an audio interruption. If you suspect this could be true of your laptop, try downloading Rightmark's *CPU Clock Utility* (see screen on first page of this article), from http://cpu.rightmark.org/download/rmclock_16_bin.exe, and monitoring the throttled clock frequency to see if changes coincide with these interruptions. If they do, you can contact your laptop supplier or manufacturer to see if there's any way to disable the power-management functions.

Finally, I've recently found another handy and reliable Windows cleaning tool that removes many unwanted files from your system, including those generated by browsers such as *Internet Explorer* and Mozilla's *Firefox* that compromise your Internet privacy, temporary files left by loads of third-party applications, and the usual temporary Windows files. It will also offer to separately clean the Windows Registry of similar detritus. *CCleaner* (www.ccleaner.com) is freeware, and has already been downloaded by over six million people, including me! SOS

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As the most upgradeable production console in the world, the Digital X Bus should remain the center of Snoopadelic Studios for years to come. Which is exactly what an icon deserves. Visit www.mackie.com/digitalxbus to learn more.

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Virtual Bassist in action within *Cubase SX*. This is the Play page. Note the five-string option at the top on the left, which provides some extra low end if you want it.

Steinberg Virtual Bassist

Bass Player VST Instrument For Mac & PC

Looking for a new bass player? If you'd consider a software candidate, Steinberg's *Virtual Bassist* is now ready for audition...

John Walden

Hot on the heels of Bornemark's *Broomstick Bass*, which I reviewed in these pages a few months back (see *SOS* May 2005), comes *Virtual Bassist* — Steinberg's take on the bass player for a software-based band. *Virtual Bassist* (or *VB*) is compatible with any VST, DXi and AU host, and a stand-alone version can be used with Rewire. *Virtual Bassist* will work under either Windows XP or Mac OS X 10.3.3 or higher, but you'll need a PC with at least an 800MHz Pentium III processor running Windows XP, or an 600MHz G3 Mac running at least Mac OS 10.3. Whichever platform you go for, you'll need at least 512MB of RAM, 850MB of free hard disk space, a DVD drive for installation, and a VST- or AU-compatible host (the latter, obviously, only applies to Mac users).

As with *Broomstick Bass*, *Virtual Bassist* offers a selection of musical styles (32 are provided in the initial release). Each Style has a suitable preset bass sound associated with it and offers a selection of phrases or riffs. *VB* refers to these phrases as 'Parts' and as many as 18 are provided for each style. These respond to either a root note input or a chord and any melodic/riff-based Parts are automatically adjusted to fit the chosen chord. The other major features include Groove Match (which, for example, allows the bass groove to be fine-tuned to match a drum groove) and the excellent 'Amp & FX' section, which, as its name suggests, is modelled, both in terms of its sound and its appearance, on a classic array of bass hardware. What's more, this section is also supplied as a separate VST plug-in, so it can be used to process other audio signals if required.

So, with Bornemark's excellent *Broomstick Bass* already in the market, how does *Virtual Bassist*, with the more considerable weight of the Steinberg name behind it, stack up?

SOUND ON SOUND

Steinberg *Virtual Bassist* £180

pros

- Well designed, easy to use and looks very cool.
- Capable of producing solid bass lines in a wide range of styles.
- Excellent amp and effects section, which can itself be used as a separate plug-in.

cons

- Single Note mode is somewhat limited.
- While *VB* is capable of a wide range of different bass sounds, they're not based on specific, easily identifiable bass guitar/amp combinations.
- Only electric bass sounds are provided.

summary

If you are looking for a reliable bass player to do sessions in your studio, *Virtual Bassist* is a more than capable performer. The inclusion of an excellent separate amp and effects modelling plug-in is a nice bonus!

What's In The Box?

VB is supplied on a single Mac/PC CD-ROM and includes a printed manual. Also enclosed is an Activation Key Code which is required in order to download a *Virtual Bassist* licence for your Steinberg USB Key. A hardware Key is not included, so if you do not already own one (as an owner of *Cubase SX*, for example), then you will face a small additional cost (in the UK, these can be obtained through Arbiter for £19.99).

As with most modern music software, installation proved unproblematic. Usefully, you're allowed to specify different hard drive locations for the plug-in and the sample/style library contents. The latter require approximately 5.5GB of hard drive space. Once installed, downloading the required licence to my Key also proved very straightforward using the usual Syncrosoft *Licence Control Centre* software.

Test Spec

PC REVIEW SYSTEM

- 3.2GHz P4 PC with 2GB of RAM running Windows XP Pro (Service Pack 2), with Echo Mia 24, Egosys Wami Rack 24 and Yamaha SW1000XG soundcards.
- Steinberg *Cubase SX* v3.0.1.
- Steinberg *Groove Agent* v2.
- Bornemark *Broomstick Bass* v1.
- *Virtual Bassist* version reviewed: v1.0.0 (Build 503).

Looking Cool

Jokes about the appearance of the typical bass player aside, *Virtual Bassist* certainly looks dark enough to deliver some low-end growl. The styling is not dissimilar to that of Steinberg's *Virtual Guitarist Electric Edition*, with black 'amp covering' dominating the background and the majority of the controls designed to look like the knobs and switches that might be found within a typical bass rig. Happily, the realistic styling does not get in the way — the cool looks are matched by a general ease of use. The key controls of *Virtual Bassist* are split across three main screens; Play, Groove Match and Amp & FX, accessed via the tabs along the top of the plug-in. To the right of these, the Steinberg logo gives access to the Settings screen, although these are mostly of the 'set and forget' type.

For most general use, the Play screen is where the key controls are located. Like *Virtual Guitarist*, *Virtual Bassist* includes a guitar graphic with some virtual controls built in. Pickup position, volume, tone, attack and note damping can all be adjusted from here. A switch to toggle between a four-string or five-string bass model is also included. If the five-string model is selected, all the Styles attempt to use the low 'B' string within the parts played. The small padlock icon to the bottom right of this section can be used to 'lock' the bass sound, allowing the user to switch styles but retain the overall bass sound.

The left-hand portion of the Play screen

Once a Style is selected, a list of individual Parts will be displayed in the Play page.

can be toggled between the Style list and, for the currently selected style, a list of the available Parts. Parts are laid out across the two octaves C1 to B2 on a MIDI keyboard. This section of the keyboard is termed the Remote Range and, as well as being used to select a particular Part from within the Style, it also includes controls for switching to Single Note mode (C1), for stopping *VB* playback (C#1), and for toggling between four- and five-string modes (C#2) and between Chord and Note mode (D#2). In Single Note mode, *VB*'s automatic functions are turned off, and the software then behaves like a normal VST instrument, allowing it to be played manually via MIDI.

The Parts move from simple at the lower end of the Remote Range (for example, '1-2 and 3 Pulse' on D1, from the 'Modern Rock' Style, which just plays root notes on those beats) through to more complex ('Melodic Riff 5' on B2, which plays a more complex riff with notes based on the current chord type). Also included within the Parts list are a number of special Parts, called Fills, all located on the black keys. If these are triggered, they are played only once before ▶

Back to Basics!

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tfpro

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The Groove Match page.

▶ *VB* returns to the previously selected Part. This is neat for adding a little variation or for providing a link to a different song section.

The key range between C3 and B4 is termed the Pitch Range, and it is this section that allows notes or chords to be played that control the pitch of *VB*'s output. This split-function keyboard layout is very similar in operation to that of *Broomstick Bass*, where the Control Octave is the equivalent of the *Virtual Bassist* Remote Range.

The central panel of the Play screen is fairly busy. Starting at the top, this includes a display of the current chord and a useful MIDI In 'LED'. To the right of this is the Chord/Note switch. In Chord mode, *VB* will play melodic riffs, while in Note mode, the rhythmic structure of the current Part is played using only the chord root note or octaves of it. *VB* recognises a wide selection of chord types (including major, minor, sus4, maj7, 7, 6, dim, m7, m6 and sus2) and, in most cases, it doesn't matter what inversion is played. While *VB* follows the tempo of the host sequencer, the Speed control also allows for half- and double-time playing, while Latch forces *VB* to play continuously, even if you release the note or chord being played in the Pitch Range section of the keyboard. The Retrig switch determines when *VB* responds to a change of Part. Normally, this would be left off and *VB* will only change Part at the end of a bar.

The Swing, Variance and Early/Late controls all influence the feel of the *VB* performance. Swing allows offbeat notes to be moved earlier (clockwise) or later (anti-clockwise), while the Variance control allows a degree of random imperfection to be introduced to the timing. The Early/Late control allows the whole performance to be moved slightly behind the beat (for a more laid-back feel) or ahead of the beat (for more urgency). Immediately beneath these controls is a large rotary dial that allows the basic character of the bass sound to be blended from three types (Classic, Vintage and Modern), while for some added realism, a degree of fret buzz and finger noise can be added. The final controls (Compression, Drive and Master) do pretty much what you'd expect and duplicate the same controls on the Amp & FX page, described more fully overleaf.

A selection of Modifers can be used to add variety to the preset Parts.

Groovy, Baby!

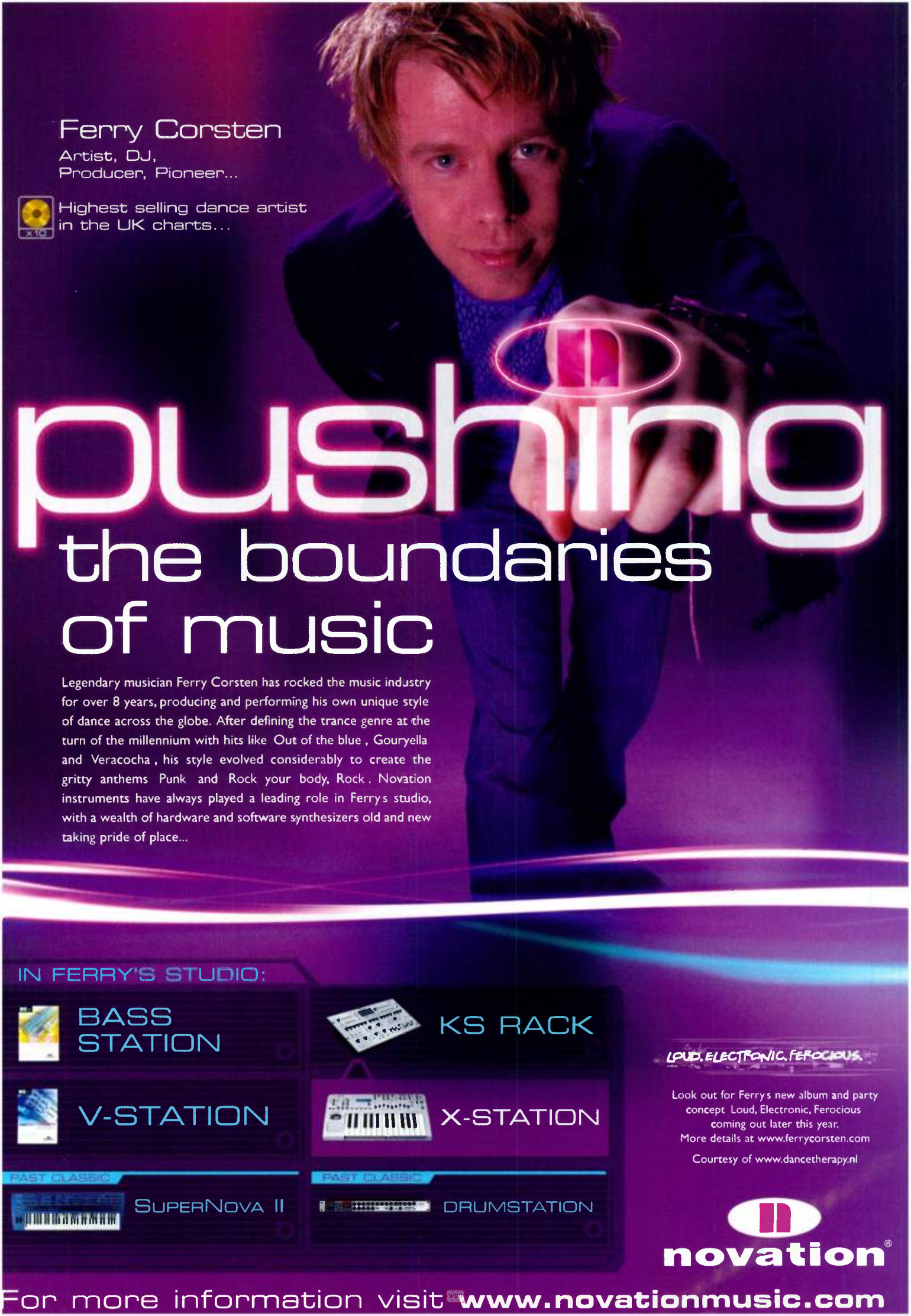
The Groove Match page allows some editing of Parts and Fills. Aside from the Part list located to the bottom right of the window, which duplicates that seen in the Play page, two main displays are presented. In the Macro Groove display, the overall rhythm and relative pitch of the Part (and Parts can be up to four bars in length) are displayed. As with a Piano Roll editor, notes can be repositioned within this display although, in this initial release, pitch can not be adjusted and changing note length is a little hit and miss. This said, it does provide extra flexibility — you are not stuck with just the preset Parts supplied with the plug-in. The vertical position of a note within this display is indicative of pitch, but of course the actual pitch differences between two notes will depend upon the chord type and root note that *VB* is trying to accompany.

The Micro Timing display operates as a basic, but functional, groove quantise facility. As well as offering some useful 16th-, eighth- and quarter-note swing presets, a groove can be manually adjusted by dragging the vertical red markers or activating the 'from MIDI' button, whereby the groove will be taken from the incoming MIDI signal. The Swing knob duplicates that found on the Play page and controls the overall strength of the applied swing. For easy tweaking of Parts, the Modifiers provide a range of preset patterns that can change a Part or Fill. Seven different Modifers are included in total (see screenshot, below left) ▶

Stylistics

The styles offered by *Virtual Bassist* cover a broad spectrum of contemporary music genres. While some of the rock and blues styles are fairly safe, the various funk styles have plenty of attitude (the 'Pop Fills' style provides a good example) with lots of slapping and popping going on. Another of my favourites is the 'Tapping' style which, as its name suggests, is based upon tapping rather than plucking the bass strings. This includes some virtuoso playing of busy arpeggios — they sound great, but I'm not quite sure what musical context I might use them in. The nu metal styles also work well and their character can be changed dramatically by use of the effects options — from bright, clean and powerful (think Linkin Park), through to grungy and snarling (more like System Of A Down).

The style palette is probably a little more contemporary than that provided with *Broomstick Bass* (for example, a hip-hop style is included), but the choice is broadly similar in both products.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The Amp & FX page.

▶ and each one is itself supplied with two variations. This all helps to add to the options at your disposal.

For FX Sake

Perhaps the most fun is to be had in the 'Amp & FX' page. This combines a fairly generic amp- and speaker-modelling function with six classic stomp-box-type effects — Wah, Fuzz, Octaver, Compressor, Flange/Chorus and Tremolo. A large collection of preset effects combinations is provided and these are listed to the right of the display. There are some pretty extreme settings amongst this lot, 'Grammophone', 'Sewerage Delight' and 'Weird Jet Ski' included — but there's also a good selection of solid, usable electric bass sounds suitable for almost all musical styles.

The amplifier can be switched between the more clinical Solid State and the warmer-sounding Tube models, while the Drive control simulates the gain fed to the preamp. Aside from the master volume control, the amp also features a three-band EQ, with a sweepable Mid band (although the bandwidth cannot be adjusted). Three routing switches are included, allowing the position of the EQ and the Compressor to be placed in front of the amp or after it (note that the Octaver, Fuzz and Wah effects are always before the EQ and Compresor). The DI signal can be switched between pre- and post-Drive control positions, with the Pre position giving an ultra-clean tone. Usefully, the Speaker simulation provides a slider that allows the virtual mic signal and the DI signal to be blended. For the virtual microphones, the choice is between dynamic and condenser types, with on- or off-axis positions available for both.

The stomp-box effects operate pretty much as expected and the key controls do their job in an efficient and unfussy fashion. The tempo-based effects can all be sync'ed to the host sequencer tempo. Usefully, almost all the controllers can be assigned to MIDI controllers by right-clicking and selecting the 'Learn' option from the pop-up menu that appears. The manual also lists the factory default MIDI Controller numbers for some of the key controls.

In Use

Knobs, switches and sliders aside, how did the plug-in actually perform as a virtual band-member? From a technical perspective, *Virtual Bassist* performed flawlessly throughout the entire test period, and I did not encounter a single problem in using it within Steinberg's own *Cubase SX*. During playback, a single instance of *Virtual Bassist* generated a fairly modest CPU load (between two and five percent) on my test system.

As mentioned earlier, when used to automatically generate a suitable bass line, the combination of the Pitch Range and the Remote Range makes the operation of *Virtual Bassist* quite similar to Bornemark's *Broomstick Bass*. As such, building an automated bass part based on an existing chord progression is a very simple process, as you can concentrate upon the Remote Range for Part selection and switching. The provision of the Fill Parts adds an extra dimension here, making it easy to add embellishments for linking song sections.

Steinberg provide a useful PDF that compares the *Virtual Bassist* styles with those in *Groove Agent 2*. While there are a good number of obvious matches (for example, *VB*'s '60s Soul' style, which matches *GA2*'s 'Tamla' style or *VB*'s 'Tribal Dance', which matches *GA2*'s 'Tribal Techno'), I was perhaps just a little surprised that there wasn't a somewhat closer integration between the styles of the two instruments. That said, much of the fun of experimenting with *Virtual Bassist* alongside *Groove Agent* was mixing and matching styles just to see what did work and what did not.

If you can't get exactly what you need from the supplied styles, *Virtual Bassist* can also be used 'manually' in Single Note

Who Done It?

As I mentioned in my May 2005 review of Bornemark's *Broomstick Bass* (see www.soundonsound.com/may05/articles/bornwmarkbass.htm), Sven Bornemark was a central figure in the production of both *Virtual Guitarist* and *Groove Agent* for Steinberg and, after finishing that review, I had the opportunity to ask Sven how the two virtual bass players came about. After the completion of *Groove Agent* in 2003, Paul Kellet, who programmed both *Virtual Guitarist* and *Groove Agent* as part of Sven Bornemark's team, was hired full-time by Wizoo and moved to Bremen where he eventually performed the programming for *Virtual Bassist*. While Sven Bornemark had had some discussions with Wizoo about the concept of a virtual bass player, it was clear that each wanted to approach the project from somewhat different directions. Sven therefore started work on his own vision with programmer Dave Brown and teamed up with MI7, a company based in Sven's own town of Malmö in Sweden. The result of all this is two completely independent 'virtual bass players', created by different teams in different countries.

A suitable range of speaker cabinet models is provided.

mode. While this works well enough, the actual character of the sound does not change a great deal with the dynamics of the playing, aside from velocity-sensitive increases in volume. This is in marked contrast to the phrases within many of the Styles where, for example, some of the funk styles include some excellent slaps and pops.

On a more positive note, the Amp & FX section is excellent. The simplicity of the stomp-box-style controls makes all the effects very easy to use, yet the degree of control allows for all sorts of creative possibilities. The fact that the same effects are available as a separate plug-in is a real bonus — I used it with synth and guitar parts and the results were very good indeed, with a very small CPU overhead.

There was one omission from the *VB* feature set that genuinely surprised me, especially as it is available in *Groove Agent*. At least, I think it's an omission: I could find no mention of it in the manual or on Steinberg's web site, and there is no appropriately labelled control within the plug-in. Quite simply, there's no MIDI Out option. In *Groove Agent*, this allows an entire performance to be output to the host sequencer, where detailed edits can be made as required. The absence of MIDI Out in *VB* may well be something to do with the exact way in which the program generates its bass performances, but, as there are few technical details about the plug-in's engine within the documentation, it is difficult to speculate further.

Who Gets The Gig?

With *Virtual Bassist* and *Broomstick Bass* so obviously aimed at the same function and being sold at a very similar price, it would be remiss of me not to make a direct comparison as part of this review. While the two plug-ins have been developed completely independently (see the 'Who Done It?' box for further details) and, I suspect, employ very different engines under the bonnet, the basic control method for the production of the automatic bass lines is remarkably similar. Both respond to MIDI chord input and can play back a number of phrases within any of the preset styles. Perhaps *Virtual Bassist* offers slightly more choices here within an individual style, particularly with the Fill options — but *Broomstick Bass* provides mod-wheel-controlled articulations.

There are, however, some notable differences that may make one product or the other preferable for individual purchasers. For example, *Broomstick Bass* undoubtedly has the more distinctive sample set; acoustic basses and keyboard instruments are included, and individual bass types are identified. *Broomstick Bass* also has the edge when played as a 'manual' VST instrument because of the performance articulations. On the other hand, the Amp & FX options within *Virtual Bassist* are excellent, and the ability to use the same effects as a separate plug-in is a real bonus. *Virtual Bassist* also offers more comprehensive quantise options.

Conclusions

Virtual Bassist does exactly what you would want from a virtual band member — it delivers a professional automated performance with a minimum of fuss, and sounds great within a mix. The playing styles cover a wide spectrum, from soul through to nu metal and, while *Virtual Bassist* is unlikely to throw any great musical surprises into your composition, it will hit all its cues, play in time and in tune. If only my own bass playing was as reliable!

Having used them both side by side within *Cubase SX*, the choice between *Virtual Bassist* and *Broomstick Bass* is a difficult one. In my own view, for basic automated bass-line construction — which is, after all, the key selling point of both — there is little to choose between the two products. However, the rest of the feature sets are quite distinctive, with each product having its own particular strengths. I hope that my two reviews will give all you potential purchasers enough of a flavour of these differences that you can determine which product might best suit your own particular needs. SOS

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Studio SOS

The *SOS* team purge the unwanted buzzes and hums from reader Jim Fish's new studio.

Hugh Robjohns

Jim's studio system was picking up unwanted noises from his new flat-screen monitors, but Hugh wasn't sure whether this was a problem with the LCD screens themselves or whether it indicated an underlying earthing problem. To test this, he powered a separate laptop, Jim's MOTU 828 audio interface, and one of the Fostex speakers from a separate plug socket. This test system picked up none of the noises which the main system was suffering from, indicating that the problem stemmed from earthing problems.

This month's Studio SOS visit came about because of a post on the *SOS* Web Forum in which reader Jim Fish complained of serious hum problems in his studio. He had recently moved house and was in the process of rebuilding his studio equipment into a large room above a timber-framed garage, but he had started to get such high levels of noise that it could clearly be heard in the next room! He was suspicious that the problem might have been caused by two new LCD computer screens, with which he had recently replaced the previous pair of 'legacy' CRT monitors.

He described his equipment as being based on a Dell PC coupled via Firewire to an original MOTU 828. Mixing was performed on a large Topaz eight-buss analogue mixer and monitored on a pair of Fostex PM2 active nearfields, with a range of outboard effects units and synths hooked into the system via various patchbays. His pair of 18-inch LCD screens were mounted on the wall behind the Topaz desk and hooked directly to a Radeon dual-head graphics card in the PC.

The symptoms of the problem were intriguing, as the hum apparently remained if the mixer or MOTU 828 were turned off, and it became louder if the Firewire link between computer and monitors was removed. The only thing that silenced the hum was turning off the LCD monitors or removing their video inputs (in which case they shut down anyway, of course). One monitor seemed to create a louder hum than the other, and they produced slightly different pitches too!

Jim had found that jiggling the monitor video connectors or power leads affected the hum (suggesting poor earthing perhaps), and after relocating the monitor VGA cables along the back wall (to move them away from mains and audio cables) the hum level was reduced — although that could just have been a coincidence of remaking the connections, and thus improving the earthing contacts in the process.

A number of other Forum posters had offered help, but to no real avail. The usual suggestions of moving the LCD screens' power supplies around, using balanced connections to the Fostex speakers, and changing the computer graphics card had already been tried and found to make no difference. Questions over noisy mains supplies appeared to have already been addressed as well, since Jim was feeding all his equipment via ETA power conditioners. Clearly, this was a complicated problem and it sounded like a suitable challenge for Studio SOS.

However, when Reviews Editor Mike Senior suggested a visit, Jim confessed to being a 'Hobnob scrooge', and we all know that the Paul White doesn't get out of bed nowadays unless there's a pack of chocolate Hobnobs in it! Fortunately for Jim, though, it turned out that Paul was going to be away anyway visiting a certain Antipodean microphone manufacturer, and since Mike doesn't suffer the same debilitating condition as our Editor In Chief, it fell upon him to join me in attempting to find a solution to this thorny problem.

SOS To The Rescue!

On our arrival in Bungay, Jim demonstrated the loud buzzy hum he was getting on the system, and how it disappeared completely if he turned the LCD monitors off. That suggested that the buzz was definitely being generated by his two LCD screens, but exactly where the noise was getting into the system was far from obvious.

To confirm the source, we substituted the two GNR-brand screens for a different LCD screen of a different make, borrowed from his office, and that produced a substantially lower level of buzz and noise. However, the replacement monitor wasn't capable of the very high screen resolutions that Jim was using on his two GNR monitors, and it is certainly possible that the additional demands placed on the monitor and its power supplies to provide such high screen resolutions were a significant factor in the level and quality of noise generated. Jim was very keen to maintain the current high screen resolutions, though, and, while switching to less demanding resolutions

The first problem in Jim's earthing system was quickly spotted when the *SOS* team began poking around under the main studio desk — one of the mains distribution boards had a European mains plug which had been forced into a UK socket. This effectively lifted the earth connection to the audio interface and mixer, not only rendering the studio potentially lethal, but also contributing to the noise problem. Mike fitted a new UK plug without delay!

may have helped, it clearly wasn't a proper solution to the problem.

Although it had already been tried, our first step was to experiment with moving the LCD screens' power supplies around. The specific angle, orientation, and distance of these separate switched-mode power lumps from other equipment and cabling can make a huge difference, as they usually emit electromagnetic radiation in specific patterns. However, after carefully turning them through 360 degrees in all directions we found no significant difference to the level of buzz. So direct radiation didn't appear to be the cause, and it looked much more like a complicated ground-loop problem.

Tracking Down Earthing Problems

The key to solving any kind of ground-loop problem like this is to work through the system logically and patiently. So the first step was to unplug the audio input to the Fostex speakers to make sure that they weren't picking the noise up directly through their mains power supplies, or via radio-frequency interference. Sure enough, the hum disappeared as soon as both speaker inputs were unplugged, proving that they were not faulty and that the hum was reaching them as a genuine audio signal.

At this stage, given the nature of the buzz and the confusing symptoms, it seemed fairly certain that the problem was the result of one or more earth loops. Jim had a lot of equipment hooked up to the desk, some balanced and some unbalanced, and the rat's nest of mains, audio, and computer cabling under the large custom desk probably wasn't helping either. So we decided it would be worth proving whether or not the suspect LCD monitors could be used in a minimalist system without creating the excessive hum apparent in the full system.

We disconnected the MOTU 828, one of the Fostex speakers and one of the LCD monitors from the main system, and re-connected them to a laptop computer, all powered from a separate mains extension fed from a different wall socket. An audio connection between one of the MOTU outputs and the Fostex input created no buzz at all — so we could now be confident that, while the LCD monitors were undoubtedly the source of the buzzing noises in the main system, sensible mains earthing and lack of ground loops could produce a quiet system.

Next we re-plugged the speaker, interface, and screen back into their original mains sockets under the desk... and the buzz returned! We hadn't changed any signal connections, so we hadn't created a ground loop that way, and the implication was therefore of a problem in the mains power distribution for the main system. A quick glance under the desk revealed an evil tangle of mains and audio cables, and Jim also admitted that the equipment was fed from two different wall sockets on opposite sides of the room. At this point we politely suggested a bit of rewiring...

Jim had no objections, so we were soon scrabbling around under the desk — a regular feature of Studio SOS visits! After a bit of pruning back of audio cables to reveal the mains distribution boards we spotted the first problem. A European mains plug had been forced into the first four-way plugboard coming off the left-hand wall socket. It turned out that this was feeding a (metal cased) switched mains distribution unit bolted into the left-hand desk rack — a unit purchased from a European supplier. This distribution panel was feeding both the MOTU interface and the Topaz mixer, amongst other things, and although the European plug was equipped with an earth terminal, the action of plugging it into a standard UK mains distribution board meant that it was left dangerously unearthed. So, neither the MOTU nor the console were actually earthed properly, which not only made them potentially lethal, but also made them a significant contributing factor in the buzz problem.

Mike volunteered to replace the European mains plug with a standard UK-style plug, and five minutes later when we re-powered the system the level of buzz was immediately improved, although it was still unacceptably audible. We were making some progress, and the system was definitely safer now, but clearly there were still some further problems to resolve.

Re-configuring The Mains Wiring

Since I was already under the desk, I set about unplugging all the equipment mains plugs and rewiring everything in a more sensible 'star' configuration, stemming from the wall socket on the left of the studio. ▶

Another lifted mains earth connection was discovered when Hugh spotted an earth wire protruding from the casing of a plug — a common way of indicating that an earth wire has been disconnected. Again, this earth wire was re-connected to avoid the risk of electric shock when using the studio.

Once the mains cables had been re-organised, the audio wiring was tied up out of the way of them using cup hooks and Velcro cable ties.

All the ancillary equipment — lights, phone chargers, and so on, were fed from the right-hand wall socket to keep them from degrading the mains quality of the audio setup.

While doing this, we came upon a second bit of comedy mains wiring — the mains plug of a Roland U110 sound module had its earth wire protruding from the plug casing. Someone had obviously isolated the earth wire, probably in an uneducated attempt to cure a hum problem. At least they'd had the sense to leave the earth wire showing so that we could all see that it was in a dangerous condition! I re-connected it and made a mental note to check on the hum level when we got the rest of the system sorted out.

At the same time as rewiring the mains, we also re-patched the audio cabling to the rackmounted equipment and suspended it all well away from the mains wiring using a cup hook and some velcro strips. Several eight-way snakes had been used to hook up the console inputs and outputs with the MOTU and patch bays, and in places these were coiled on top of mains cabling and power-supply transformers, which wouldn't have helped the system noise floor.

So, with the mains distribution re-organised, audio cables re-routed, and the MOTU, LCD screens, and Fostex speakers reinstated to their original configurations, we fired everything up again and had a listen. The bad news was that the buzz was still there, but the good news was that it was even quieter than it had been previously. The restructuring had obviously improved things further, but there was still a major problem somewhere.

Hunting Down The Final Earth Loop

After further head-scratching, we returned to the idea that there must still be earth-loop problems, and our suspicion initially fell on the right-hand side of the studio, where a number of unbalanced rack synths were being fed via a balanced patchbay to the mixer. However, removing the eight-way multicore link between the patchbay and desk made no appreciable difference to the level of buzz.

However, coincidentally at this point we noticed that the level and quality of the buzz varied a little if the Firewire or mains connections at the back of the MOTU interface were wiggled. Furthermore, we found that the buzz increased dramatically in volume if either the Firewire or mains cables were removed — something Jim had mentioned in his original forum post. Mike felt that this pointed the finger at possible earthing problems in the Dell PC, as it suggested to him that the computer was relying on the MOTU for its earth connection. We tried grounding the PC via a jack cable to the mixer (with the MOTU Firewire cable disconnected), but that yielded no improvement. We were also able to exonerate the PC by replacing it with the laptop — which also made no difference to the buzz.

With the computer re-connected, our attention finally turned to the potential for earth loops created via the MOTU's audio connections. The first step was to unplug all the audio cabling between the MOTU and the Topaz desk (we had already removed the synth rack connections), and that resulted in blissful silence. So the desk coupled to the Fostex speakers formed an inherently quiet system, which was encouraging.

Plugging the audio cabling from the synth racks on the right of the studio reinstated a very low level of buzz, and this was traced to one particular cable fed from one channel of an Emu sound module. The other channel was quiet, and the noise varied in level as the plug in the back of the unit was wiggled, so we suspected that the output socket was making a poor earthing connection — perhaps one of the internal contacts was bent or slightly corroded or dirty. This was a relatively minor problem, though, and the buzz was barely audible once we'd fiddled with the connections a bit. In the longer term the Emu unit would benefit from having the socket cleaned and/or replaced, but it obviously wasn't the cause of the annoying buzz problem.

Although the re-organisation of the studio wiring had reduced the levels of unwanted noise significantly, there still appeared to be earth-loop problems causing hum on the system. The noise remained even when the computer and all the sound modules were completely removed from the system. The shadow of suspicion therefore fell on the mixer and audio-interface connections.

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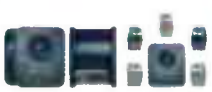

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We continued re-plugging various cables back into the mixer until we reached the loom carrying the eight outputs from the MOTU interface, which plugged into the first eight mixer channels. Everything remained delightfully free from hum until the moment we inserted the first of these plugs, when the buzz was immediately reinstated in all its glory. It looked, then, like the problem was one of a ground loop with the MOTU connections, and I suggested the simple test of lifting the earth in one of the audio cables between the MOTU and the desk, to see if that would solve the problem, given that these connections were balanced.

The hum finally vanished once the final connection between the mixer and the audio interface was unplugged, which suggested that the problematic earth loop was being created between these two pieces of equipment. Re-connecting a single audio cable via a DI box to lift the signal earth confirmed that this was indeed the problem.

Mike had brought a DI box with him just in case we wanted to try something like this, so we connected one of the MOTU's outputs to the DI box input and its XLR output back to the desk. Flipping the earth-lift switch on the DI box instantly cured the buzz, without affecting the signal quality at all, so we had finally found the ground-loop culprit.

A permanent solution would involve making or modifying a cable loom with the screens disconnected at the console end. All of Jim's ready-made looms had moulded connectors, which were impossible to modify in the way we needed, but he was able to find six individual balanced cables with Neutrik jack plugs on the ends, which we could dismantle and modify fairly easily. I showed Jim how to snip the earth connection at the desk-input end of each one, and we re-plugged the MOTU using these modified cables. With all six connected the buzz was completely gone, and on playing back one of Jim's mixes from the computer everything emerged in a nice clean state — much to everyone's relief! Jim resolved to locate another couple of cables and modify them to isolate the screen at the desk end after we had gone, completing the setup.

As Jim was still in the process of expanding his studio we had a few further suggestions for him to consider. Firstly, any other connections made to the mixer (he was planning to rig up the MOTU's inputs as well) which reinstated the hum should be tackled in a similar way. Secondly, if connecting any unbalanced gear to the mixer caused hum, then isolating transformers or DI boxes would be needed. In neither case should any mains earth be disconnected!

The synths on the right of the studio desk were being connected via a balanced patchbay to the balanced inputs of the desk, but many of the synths had unbalanced outputs. Sometimes this arrangement can create a 'one-legged' unbalanced signal for the desk, with low signal levels and obtrusive noise as a result. Proper unbalanced-to-balanced (pseudo-balanced) cables between the unbalanced synth and balanced patchbay would avoid this potential problem.

A Job Well Done

All in all, this had been a very challenging problem, with a number of interacting issues combining to create a seemingly illogical situation. The lack of a proper mains earth on one of the mains distribution units — because of its European plug — was worrying and proved to be a significant facet of the buzz problem. Other aspects included the unstructured mains distribution, the close proximity of audio and mains cabling, and the ground loops between the MOTU 828 audio interface and the mixing console. Clearly, the LCD screens were the source of the buzzing noise, and different monitors might have alleviated the problem completely, despite the other wiring issues, but with some logical experimentation and attention to detail we were able to cure the buzz completely and leave Jim with a clean and quiet system. SOS

Jim's Comments

"After a long day of head-scratching the guys did a fantastic job and got the buzz so it was nestled right down with the hiss from some of the effects units and such (which is only audible when the system is turned up twice as much as it would ever need to be). Well, as you can imagine, I was over the moon with this result, after two months of crippling my ear drums and literally giving myself a migraine whenever I tried to work on something. For the next week I was in a state of bliss, and I was finally able to get back to work. Unfortunately my happiness was short-lived, because the buzz crept back, although luckily still not even half as bad as it was before — I could just about keep on working. A few weeks after this, though, I got so peeved with my Dell PC for its constant crashing that I replaced it with a new custom-built model. Guess what? No buzz! Hooray! So the problem is finally solved, but really the whole thing still seems totally illogical. Encouraged only by my girlfriend, who likes to treat an illogical problem with an illogical solution, I have come to the conclusion that it was definitely the pixies playing tricks on me... yes, the pixies... that's what it was..."

Once Geoff realised he didn't need to shop around for the best pricing anymore, he was able to spend more time with his girlfriend.

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Sontronics Orpheus & Helios

Multi-pattern Condenser Microphones

With a characterful sound to match their striking retro styling, these new mics set themselves apart from the crowd.

Paul White

Photos: Mike Cameron

The solid-state Orpheus.

Sontronics are one of the latest companies to start having microphones built in Shanghai, China, but rather than go for the 'cheap as chips' market, they've set their sights on the middle ground and as such are offering unique designs, albeit based around fairly standard Chinese capsules. By setting a higher price, they've been able to buy higher-quality electronic components for their preamplifiers, and there are some interesting innovations in the physical design of the housing, which has a deliberately retro look.

Retro Styling

Both look quite similar from the outside, the main difference being that the Helios has a tube preamplifier while the Orpheus has a more conventional FET preamp. Viewed from the side, you can also see that the Orpheus has a more or less spherical basket while the Helios has a flattened, disc-shaped basket. Both are multi-pattern mics based around a dual-diaphragm, centre-terminated capsule 1.07 inches in diameter. The Orpheus patterns can be switched between omni, cardioid, and figure of eight. By contrast, the Helios pattern control is a knob on the external power supply and allows the pattern to be varied continuously.

Perhaps the most unusual aspect of the physical design is that there is an integral standmount, but no provision for fitting a shockmount. That's because the capsule is suspended in a miniature shockmount within the large mesh basket, and because the basket is so large and open (especially in the case of the Orpheus), there should be fewer local reflections to colour the frequency-response curve. The combination of the large basket, the swivel bracket, and the boxed electronics works well with the company logo and the metallic paint to give a very authentic retro, almost Art Deco feel.

Unlike on most capacitor mics, the XLR cable comes out of the back of the box rather out of the bottom (in the Helios this is a multi-pin XLR to link to the PSU) which helps keep it out of the way of the mic stand, though it can foul the swivel if you tilt the mic too much. The Orpheus also has a three-way slide switch to select the pattern, and another one that offers not only a 10dB pad, but also an additional 10dB of gain, which could be useful if your mic preamp isn't all that great. The Helios has no controls at all on the mic body — they're all on the PSU — and it has no added-gain position on its pad switch.

As supplied, the mics and their accessories come in good-quality aluminium cases, with the mics themselves in wooden boxes. Mechanically, the standard of engineering is solid without being over-fussy, and the only really sloppy feature I could find was that the mic thread at the bottom of the bracket was rather a loose fit for a conventional thread adaptor until fully tightened. Tighter ▶

SOUND ON SOUND

Sontronics Orpheus & Helios
£329/£449

pros
- Nice packaging.
- Wonderfully retro styling.
- Good intelligibility.
- Multi-pattern operation.

cons
- May not work so well with singers who have harsh voices.
- Metalwork could be better damped.

summary
It's nice to see mics that look and sound different to their contemporaries. While these mics won't suit all voices, they do have a definite character and can help lift weaker voices out of the mix.

Marjorie had nearly filled her third hard drive. It was time to give those nice boys at Digital Village another call.

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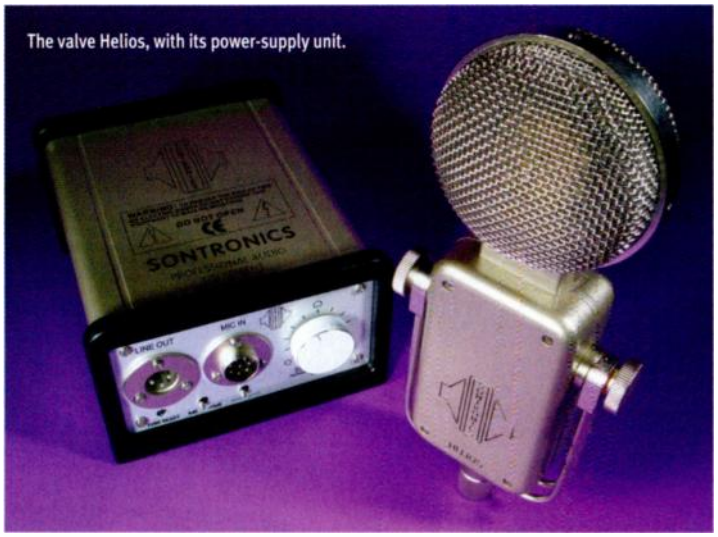
machining tolerances would fix this, but it didn't cause any problems in normal use provided that the thread adaptor was screwed in as far as possible.

The Helios power supply seems to be assembled rather like a giant DI box, with the components fixed to the end panels rather than to the main body, which makes it harder to open for servicing than a conventional PSU. A voltage-selection switch accompanies the IEC mains inlet, so the mic can be used on both 230V and 115V supplies. The mic input and XLR output sockets are on the opposite end, along with a turned-metal pattern-selection knob and two small toggle switches to activate the 10dB pad and low-cut filter. A recessed Tube Ready lamp lights when the system has warmed up sufficiently to be used. The FET Orpheus requires only a standard 48V phantom power source to operate.



The valve Helios, with its power-supply unit.

Technical Specifications

There is rather less technical spec provided with these mics than I'd like to see for microphones in this price range. Specifically, there's no response plot, so I couldn't see where the presence peak, (which my ears told me was definitely there), was located. Both mics have a quoted 20Hz-20kHz frequency response, but without saying how many decibels down the response is at the extremes, so the numbers are pretty meaningless.

Both mics have a 20mV/Pa sensitivity, which is in the same ball park as most other large-diaphragm capacitor mics, and the solid-state Orpheus has a 2dB better EIN figure than the tube-based Helios, which is quoted as 18dBA. While these figures are perfectly acceptable for most studio tasks (and as good as or better than most Chinese-built mics), they aren't as good as some of the newer designs from the more mainstream mic companies. For example, a modern-day Neumann U87 comes in at around 12dB EIN, and many of Rode's mics, which use a new generation of surface-mount circuitry, manage an astonishingly low 7dB EIN or better.

The maximum SPL handling is also a little lower than average at 125dB at 1kHz for 0.5 percent distortion. Most mics manage 135dB or thereabouts, with the most tolerant getting up above 140dB. Putting this into perspective, it isn't going to affect vocal recording, and that's mainly where this mic is aimed, but close-miking brass instruments or loud percussion could throw up problems. If you're using this as a conventional studio vocal mic or for instruments like acoustic guitar, then both the noise figure and the maximum SPL handling are absolutely no problem.

Studio Tests

To check out these mics, I used them on a studio session to record vocals, comparing them with several other mics in my collection. As expected, noise was simply not an issue when close-miking vocals, though the internal shockmounts work quite as effectively as a good external mount — and there's no easy way to fit an external shockmount. As long as you don't actually kick the mic stand while singing, they should get you through with no problem. I did notice some metalwork resonance problems with the mics insomuch as if you tap the metalwork anywhere, you can hear the bodywork ringing. A little more attention to damping, especially in the basket area, would improve this.

Both mics turned out to have a generally similar character, but the tube Helios sounded a little more 'rounded' and polished. The sound came over as strong and warm at the low end, though the top end was slightly more pronounced than on any of the mics I used for comparison, and there was a tendency for the mic to emphasise mid-range frequencies in a way that could give some singers a 'barking' or slightly harsh quality when singing hard. If you need more definition in the upper mid-range area, then either of these mics will work well, but you'll need to take care with positioning if you know that the singer suffers from harshness problems. I recorded a female vocal part and in general I was very happy with the sound, though I was constantly aware that when she sang hard the mic was making it rather obvious that she was doing so.

The various pattern modes all worked as predicted, with the omni sounding the most open and natural, but at the same time picking up noticeably more of the room ambience. The cardioid pattern has a nice focused sound, while the figure of eight is a useful addition when you want to record with better separation, as you can aim the null towards the sound you're trying to reject.

To test the solid-state Orpheus, I recorded an acoustic guitar piece kindly furnished by Gordon Giltrap, who just happened to be working on a project in my studio at the time of the review. The mic's slightly forward character worked well in delivering a detailed, nicely articulate sound, and because the room I was using had a hard floor I found the omni pattern gave the nicest subjective result. There's plenty of low end with both these mics, so the overall impression is of good tonal balance with a generous helping of high-end flattery.

Hit Or Myth?

Sontronics have come up with an interesting pair of microphones, and though I (predictably) preferred the sound of the tube model, both can sound good with the right type of vocalist. The slightly exaggerated presence peak is good for clarity of diction, making this a very good voice-over microphone, and it also helps focus those with woolly or restrained voices, though it can work against you where the singer already has a strident voice. I love the retro styling, and the idea of integrating the shockmount is intriguing, as is the possibility of switching in 10dB of extra gain in the Orpheus.

Being ruthlessly honest, I don't think these mics offer anything dramatically different other than their eye-catching styling and a sound which is more 'present' than usual, but on the other hand they are quite affordable and you can make great recordings using them. That extra definition can also really help when working with acoustic guitars or hand percussion. No one mic will ever be right for all singers, which is why most studios build up a collection, but these two Sontronics models have a definite character and might help balance out a mic collection dominated by models that are very warm or overly smooth sounding. SOS

information

£ Orpheus, £329; Helios, £449. Prices include VAT.
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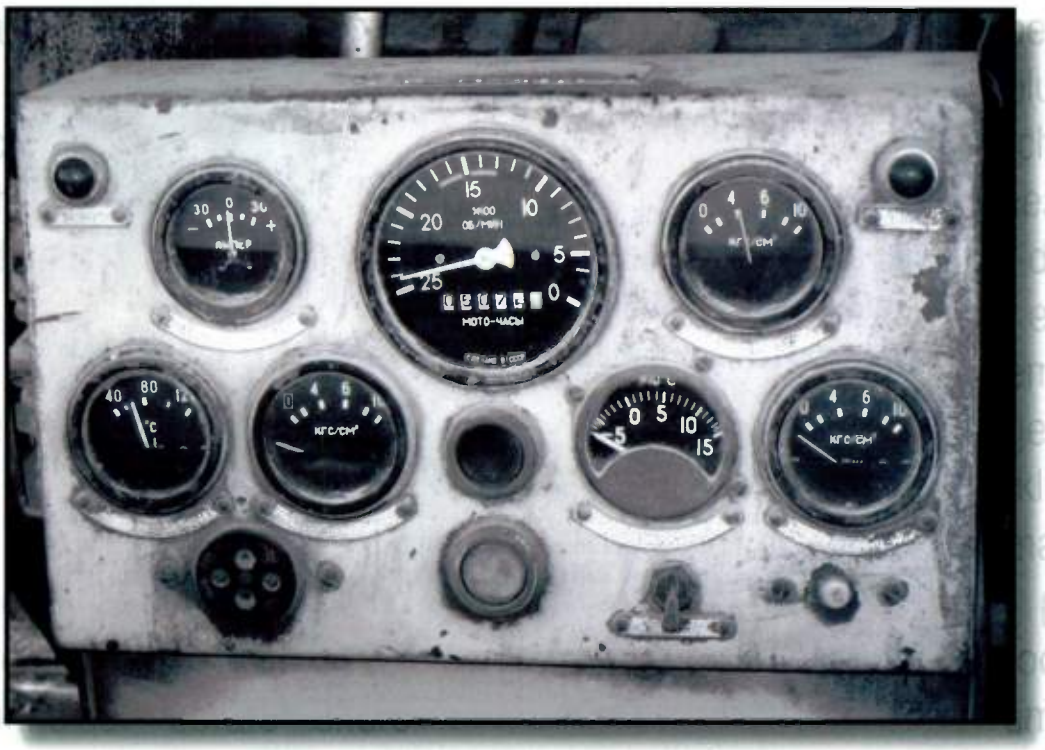
Roger didn't know quite what the Acme Valvomatic was supposed to do. But with this many dials, he just knew it was going to sound great.



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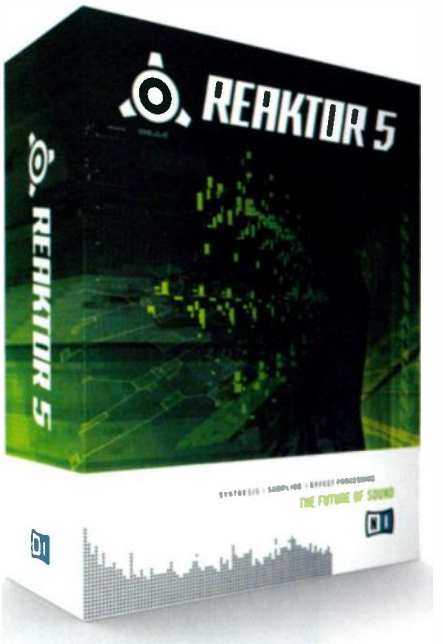
NI Reaktor 5

Virtual Modular Synth For Mac & PC



Native's sound-design software is back, and at v5, you have more control over your instruments than ever, with fully user-definable looks, the ability to construct your own modules from scratch, and an improved library. We get patching...

Martin Walker

It's been two years since the last *Reaktor* upgrade, and Native Instruments have certainly not been idle during that time — version 5 incorporates some major new features. The two biggest changes occur at the surface, where the graphics have been enhanced, and also down in the depths with a completely new set of 'Core'-level technology components. The first of these changes finally lets programmers abandon graphical convention and create any user interface imagainable, while the second liberates the sound designer from having to use the included modules when creating new synths. Instead, those with sufficient experience can write their own low-level Core cells, so if you don't like the sound of any of the existing filters, for instance, you can create your own.

Of course there are plenty of new functions as well, and changes to existing ones, plus some new modules. However, for many people, it will be the new bundled library that makes them sit up and take notice — not only has a considerable amount of work been put into designing new instruments and effects, but many of these also incorporate new filters, envelopes, and effects that use some of the new Core cells. The increased sophistication and sound quality is quite noticeable in some cases, while the various new and attractive user interfaces are, I suspect, just the beginning of what we will see in the future.

Terminology Update

For anyone still not familiar with *Reaktor*'s terminology, here's a brief recap. Ensembles comprise one or more Instruments that can each be driven from a different MIDI channel for multitimbral use. Each Instrument has its own Panel to house the various knobs, buttons and other controls, while the various Modules used in its design are connected together in the Structure windows with virtual patchcords, and there's also a handy library of predefined assemblies of modules named Macros, so that you don't have to start from scratch every time you design a new synth.

The main change in *Reaktor 5* is that since there's a new set of Core Structures that work at a much lower level, the previous Instruments, Macros, and Modules are now referred to as Primary Structures, to differentiate them from the new ones. The new Core cells act as a bridge between the primary and core levels of *Reaktor*, and contain their own Core Macros and Core Modules just like the higher-level Primary Structures. I personally think it's unfortunate that NI chose the term 'Cell' for the bridge between the two layers, since to my mind it suggests a lower-level function than the Core Macros and Core Modules. This initally caused me a lot of confusion when reading the various manuals, but once you get stuck into using the program, things become a lot clearer.

Given these extra layers of complexity under the surface, I'm please to report that the outward appearance of *Reaktor 5* is often less confusing than before, since NI no longer let you launch separate Panel windows for each instrument in an Ensemble. This ability has been abandoned in favour of a single Ensemble Panel window in which you can easily display any combination of currently loaded instrument panels, while the main *Reaktor* toolbar is

SOUND ON SOUND

NI *Reaktor 5* £380

pros

- New interface with total visual 'skinnability'.
- Core technology lets synth designers dig deeper and fly higher.
- Superb new factory library.
- Much better Macro library for DIY use.

cons

- Some users may be overwhelmed by the new Core Technology options.
- The extra graphical layers make examining the factory designs more difficult.

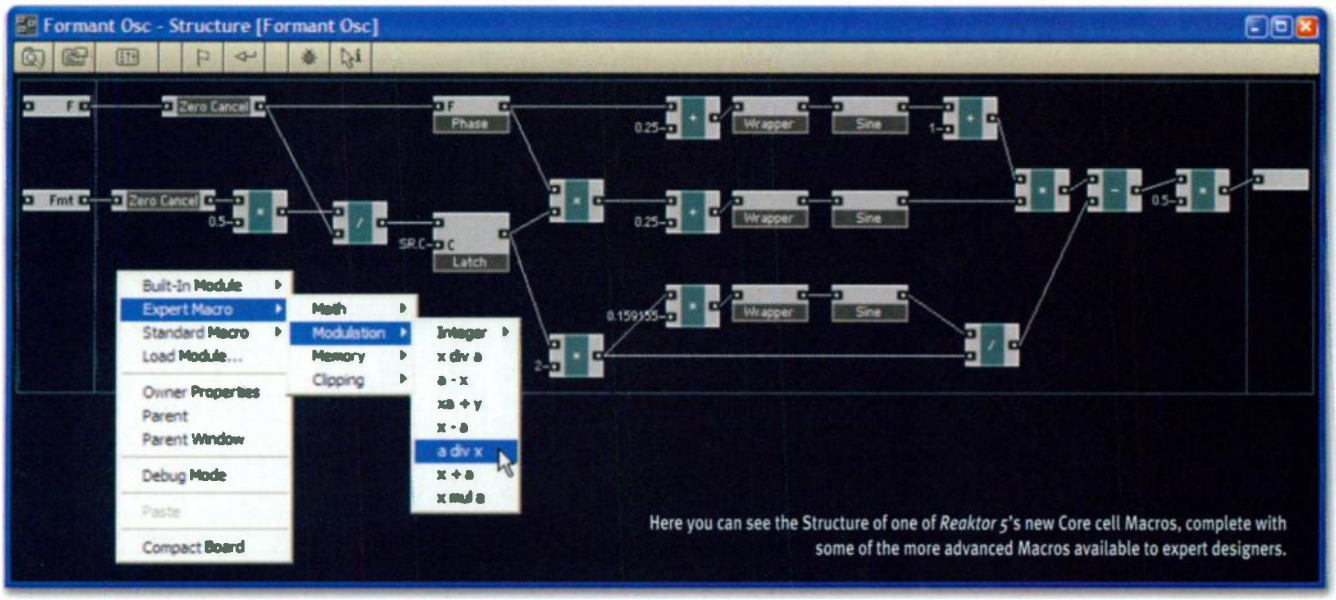
summary

Reaktor 5 is the latest but by far the greatest version of this already extremely popular synth-design package, and offers a huge bundle of sophisticated new instruments that should tempt all of its existing users to upgrade, and well as attracting plenty of new ones.

Before The Core

Back in 1999, Dr Sync (aka Vadim Zavalishin) introduced his *Sync Modular* software synth to the world. It ran under Windows and BeOS, and rapidly gained an enthusiastic following for its versatility and low CPU overhead.

Unfortunately, the interface of *Sync Modular* looked outwardly very similar to *Generator/Reaktor*, which soon brought it to the attention of Native Instruments. Happily, this resulted in NI asking Dr Sync if he'd like to work with them. So from June 2003, further *Sync Modular* development ceased, and existing users were offered the opportunity to crossgrade to *Reaktor*. And two years on, the technology that first appeared in *Sync Modular* has now resurfaced, in a rather more sophisticated form, as the new Core technology in *Reaktor 5*.



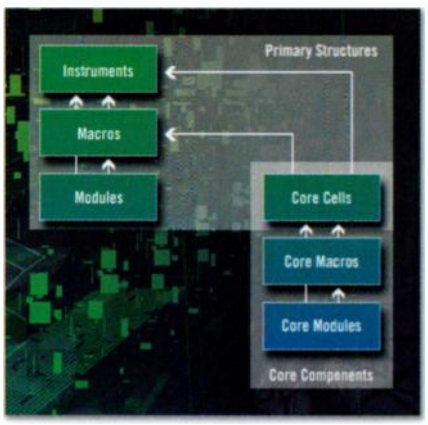
Here you can see the Structure of one of *Reaktor 5*'s new Core cell Macros, complete with some of the more advanced Macros available to expert designers.

now considerably less cluttered, since many of its elements now appear on the updated Ensemble toolbar.

The latter now provides icons that launch the Snapshots (presets) window, the Browser window to load in new items, the Properties dialogue box containing more detailed information about various aspects of each design, the Structure window, the Stop/Start clock buttons for sequenced instruments and the like, a tempo selector, a MIDI Learn button to quickly assign controllers to any front panel control, and the Show/Hide Info button, which displays more information about many of the *Reaktor* objects when you hover over them. I found these new placements far more convenient and quicker to use. There's also an icon to launch the new Panel Set bar, where you can store up to eight combinations of instrument panels (some visible and some hidden) and switch between them with a single mouse click — this makes managing complex setups a lot easier.

The Structure window now has its own toolbar, which provides Browser, Properties, and Show/Hide Info buttons. One of these launches the Ensemble Panel. There are helpful Bookmark and Jump to Bookmark buttons when navigating the various levels of your creations, and a Debug button for use with Core cells (more on these shortly). *Reaktor 5* now displays all Structures (Ensemble, Instrument, Primary Macro, Core cell, and Core Macro) in the same window, although you can open several Structures in separate windows if you wish.

The header bar at the top of each instrument has been changed in various ways since *Reaktor 4*, and now looks rather more sophisticated, with the A/B panel selector and Minimise buttons given a more prominent position on the left-hand side.



Reaktor 5 provides two levels of functionality to users intending to design new synths and effects: Primary and Core, each with its own Macros and modules.

There's a new dedicated button for the lock/unlock panel feature that switches between changing parameter values and physically moving the controls to another location, and there are now four MIDI indicators — the single MIDI activity lamp of version 4 is replaced by External and Internal MIDI In and MIDI Out, with drop-down In/Out menus, so that you can set parameters such as the MIDI channel that each instrument will respond to, the Audio output channel it's routed to on your interface, and the MIDI output it sends data to if applicable.

The header Mute/Solo buttons have disappeared altogether, although you can still perform these functions from the Instrument Properties page. New on the Properties page is more control over the number of voices — the voice allocation along with the minimum and maximum number of unison voices can now be locked, which is handy if you've found the optimum setting for a particular instrument to avoid unnecessary CPU overhead and don't want to accidentally disturb it. There's also a Voice and MIDI Slave option in the same page, so you can adjust polyphony and MIDI channels from one instrument in an Ensemble and have the others set to these same values automatically.

Test Spec

PC REVIEW SYSTEM
- 2.8GHz Pentium 4C-based PC with Hyperthreading enabled, an Asus P4P800 Deluxe motherboard, and an Intel 865PE chip set running an 800MHz Front Side Buss, with 1GB of DDR400 RAM, running Windows XP with Service Pack 2.
- Steinberg *Cubase SX* v3.0.2.
- Cakewalk *Sonar* v4.0.
- NI *Reaktor* version reviewed: v5.0.0.007.

Skins & Cores

Reaktor's predecessor *Generator* started life with a decidedly uncool laboratory look, complete with sky-blue panels and dark-blue knobs and buttons. When it morphed into *Reaktor* with the addition of audio functions, this colour scheme simply changed to green panels with black controls. By *Reaktor 3* there were user-definable colour schemes, and bitmap-import options so you could add custom logos and the like, but it was *Reaktor 4* that added the switched A and B panels to keep designs outwardly simpler, and graphical backgrounds with alpha channels (transparency) for the controls so they remained visible.

Reaktor 5 takes things a lot further with panel skins — faders, knobs, buttons, lamps, meters, and switches can all have their appearance customised. Fader skins can either be single-picture skins of the handle or multiple-picture animated skins, while the knob and most other skins are always animated. This removes the final graphical ▶

obstacle to truly innovative interface design, and the new bundled library incorporates quite a few radical looking panels, from the slick modernity of the new *Spacemaster2* reverb to the colourful minimalist look of the *Skrewell* visual sound design workstation and the almost toylike appearance of the *SQ8x8* step sequencer.

For those intent on a little DIY synth design, it's the new Core cell library that will probably be more interesting than anything else. When you right-click inside an instrument Structure window, there are now four types of object that you can add to your designs — another Instrument, one of the Built-In (primary) Modules, a ready-built Macro, or one of 50 new Core cells, sorted into various categories named Audio Shaper, Control, Delay, EQ, Oscillator, and VCF.

Given that all four object types can be wired into your creations in exactly the same way, the casual user can simply benefit from these new Core cell designs, and from new Core cells that will be made available as free downloads for registered users on the NI web site. NI are also putting more emphasis on developing new Core cells in the future rather than new primary modules, and they have already included quite a few new filters, oscillators, and effects in the new Core cell library that are used in many of the new Ensembles, instruments, and macros.

However, the new Core cells actually employ completely new concepts — while NI provide them with a similar visual design environment to the rest of *Reaktor*, they actually use an integrated run-time compiler that turns the underlying low-level code into new modules and allows designs to be tested immediately. Effectively, where before you could design synths by connecting together some of the supplied oscillators, filters, and amplifiers, now you can also design new oscillators, filters, and amplifiers from the ground up.

Reaktor 5 features slick new toolbars, the new Panel Sets window shown down the left-hand side, and graphical features like the tabbed panels across the bottom of this *Carbon 2* synth, courtesy of the new Stacked Macros module.

NI rightly claim that their new Core Technology is the largest technical advance in *Reaktor* since its first release nine years ago, and they are hoping that with access to these much lower-level Core cells, designers and educational establishments will now be able to create radically new *Reaktor* designs with unique sounds that just wouldn't be possible using the previous 'primary level' modules and Macros.

Those of you that intend to delve into these deeper areas of the program will notice that if you open up the Structure windows of a Core cell, it has slightly different colours, and the extra Debug toolbar button mentioned earlier, while the window itself is divided into three areas separated by vertical lines, with input modules on the left, normal ones in the middle, and outputs on the right.

In addition to being able to choose from items in the existing Core cell library, the Core cell menu also includes two extra options labelled New Audio and New Event, which let you create new Core cells of these two types. Event cells can only deal with data tasks, accepting other events as inputs, and outputting them in modified form, but they do consume significantly less CPU

New Modules & Smaller Improvements

Dedicated *Reaktor* users will welcome the heavily reworked Macro section of the library, which gathers together the various lower-level modules to form useful time-saving sub-assemblies for your own designs. These macros now include an enhanced collection of 'Classic Modular' Macros containing two new sections: Audio Modifiers contains waveshapers, slew limiters, and clippers amongst others, while Event Processing includes a quantiser and randomiser. Even better, the 'Building Blocks' section of the Macro library now includes such gems as the multi-stage envelope generators beloved of *Absynth* and *FM7* users, a MIDI monitor to allow you to examine the data coming into your instruments, a phase-correlation meter to display the stereo image information, and a good batch of basic effects blocks.

Reaktor 5 includes no new Primary audio or processing modules, because low-level functions will now be designed using the new Core-level functions. However, there are some new Primary modules concerned with other areas of the application, as well as various other smaller improvements. The Mouse Area module can read mouse movements, clicks, and drags, but NI say that it's more likely to be used in conjunction with the new Multi Display and Poly Display modules that generate and manipulate graphical objects, such as those generated by the *Game Of Life* used in the redone *Newscool* Ensemble, plus the new matrix sequencers (see the 'Bundled Library' box).

The Stacked Macro and Panel Index modules are designed so that multiple sets of controls can share the same area of the front panel. They are used to great effect in the *Carbon 2* synth (above), which incorporates three tabbed panels in its left-hand Oscillator section to control pitch modulation, waveform modulation, and sync, and three on its right-hand side in the Modulation/Master section, covering global properties, effects, and modulation sources. Switching between the six sets of controls using the tabs certainly results in a much smaller and far more elegant panel layout.

The MIDI In and MIDI Out sections of the library both have new Channel Message modules that receive and send a group of separate MIDI messages to or from other instruments internally, or to and from other external MIDI gear. For example, from a string of MIDI data received by the MIDI In Channel Message module there are four outputs transmitting the type of data (note, controller, and so on), its MIDI channel number, the note or program-change number, and its velocity or aftertouch value.

The Auxiliary library menu now includes a new Voice Shift option to rearrange polyphonic input values across output voices, and a Snap Value Array, so that you can for instance store sequencer data in snapshots. The IC (Internal Connection) Send and Receive modules can act like wireless connections between different instruments in an Ensemble, and the Numeric Readout module lets you display the current value of any internal parameter on the front panel.

Smaller improvements include a horizontal bar showing average, peak, and overload in different colours on the existing CPU meter, although as it's just one pixel high, I admit that I didn't even notice it until I read about it in the manual! You can also now delete Structure wires by dragging their input port end to a blank part of the Structure.

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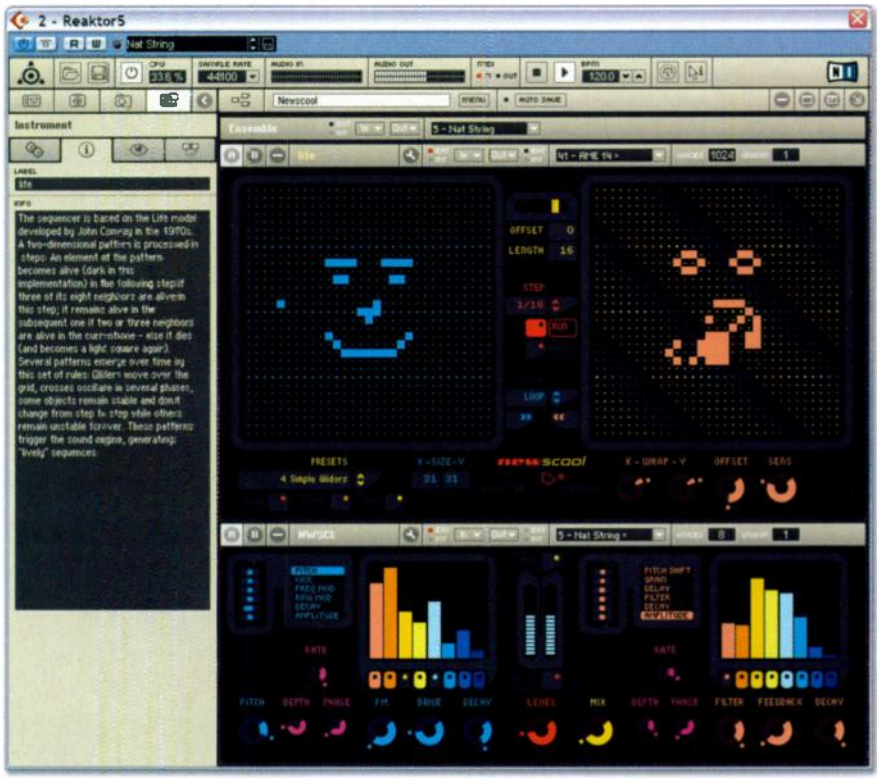
power than the Audio ones, which can accept either event or audio input signals, but always output audio ones. Essentially, audio cells are the ones to reach for when designing oscillators, filters, effects, and so on, while events are in charge of controls and other data manipulation.

Once a new Core cell appears in your design, you open up its Structure window and add items to it using a new selection of right-click menu options that are fairly similar to those for Primary Structures. There's a sub-menu of Built-in Modules, although this time they encompass very low-level tasks such as Maths (addition, subtraction, multiplication and division functions), Bit manipulations (such as AND, OR, XOR, and NOT), and basic Read and Write functions. The Expert Macro submenu contains further sections for higher-level maths, modulation, memory, and data-clipping functions, but I suspect most beginners will initially rely on the Standard Macro submenu selections, which contain far more familiar entries covering EQ, LFO, VCF, Delay, Logic, Event Processing, Enveloper, Control, Convert, Audio Mix-Amp, Oscillator, and Audio Shaper functions.

It's possible for those with sufficient knowledge to create Core cells that look fairly similar in Structure to diagrams of classic oscillators and filters in DSP text books, and NI provide a couple of examples on their web site showing Core Structures along with the textbook diagrams and equivalent C++ programming code to prove the point. We may see many more plug-in designs from *Reaktor* users as well, since it's probably easier to develop and debug them using this new graphical interface than with a traditional compiler.



The new graphical interface is well illustrated by this updated version of the *Newscool* module, which now incorporates Conway's *Game Of Life* running as a sequencer, as well as a very different set of knobs and buttons.

Thankfully, there's a separate 210-page manual devoted to the new core functions, with plenty of examples and explanations of how to build optimal Structures that minimise CPU overhead, the use of the Debug mode to trace signal values through your designs, and of course a set of appendices covering the various Core cells and Macros. As an ex-programmer myself, I found it generally well-written if a bit sluggish in places, but you really do need to work through it carefully from end to end to

The Bundled Library

Gone are the days when a synth-design package could be sold solely on its ease of use or its versatility. Many musicians want instant results, and plenty of them, so including a mature library that shows off the capabilities of the package is a must. With *Reaktor 5*, Native Instruments have pulled out all the stops with a collection of 23 new or significantly updated Ensembles created by 'renowned artists and designers', complete with extensive preset libraries, new interfaces, and their own 123-page manual. This new library now extends to some 760MB.

Long-term users haven't been forgotten either — not only are most of the Classic Ensembles from previous versions included alongside the New Additions, but on the CD-ROM you can find the complete set of Ensembles, Instruments, and Macros from *Reaktor 3* and *Reaktor 4*. I don't have the space to cover all the new designs in detail, but here are some of my favourites.

Carbon 2 is described as a classic subtractive synth, but that's something of an understatement — although its three oscillators, filter, and multi-effects sections are presented in a easily usable interface, many of its 85 presets are breathtaking in their subtlety and complexity. The oscillators and filters have been specially developed using new Core components, and the manual devotes 11 pages to describing the huge number of options.

Subharmonic offers a simple interface but with a complex underlying architecture comprising two synths — an additive sub-oscillator capable of rich chordal combinations and an entirely separate formant oscillator section. Together they can produce sounds from lead lines to rich pads.

My favourite in the Grooveboxes section is definitely *Massive*, whose six tracks start life as samples, but can then be sculpted in a variety of ways using filters, envelopes, and granular resynthesis, all triggered from a set of step sequencers with independent loop length for each track, plus copy and paste functions, and a further three modulation sequencers that you can map to a variety of parameters.

However, I can't finish this section of my review without mentioning the rebuilt *Newscool* (above), with an innovative new sequencer based on John Conway's *Life* model, where elements in the pattern 'live' or 'die' depending on the number of neighbours they currently have. These patterns trigger the aggressive metallic rhythms of the synth engine, and you can load in preset shapes, or draw them directly into the buffer screen using your mouse.

In the new Sound Generators section I loved *Space Drone*, whose collection of 96 parallel voices are based on the outputs from noise generators which are then envelope-shaped, band-pass-filtered, and placed in the stereo field. Its 61 presets range from ghostly winds, bird song, and metallic drones, to slowly evolving collages, which are great for science-fiction soundtracks and meditation. I must also mention the eight-oscillator *Skrewell*, whose large display is more like an art installation than a synth interface (see the final screenshot on page 82).

Finally, *Lurker* has at its heart two independent delay units, but its four internal sequencer tracks turn this into a rhythmic sequencing *tour de force*, by letting you map the parameter values to rearrange the incoming sounds. With a filter, envelope generator, and yet another delay, the sounds that emerge are often almost unrecognisable.

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▶ gain a thorough understanding of Core cell design. It's certainly not something to dip into during your coffee break!

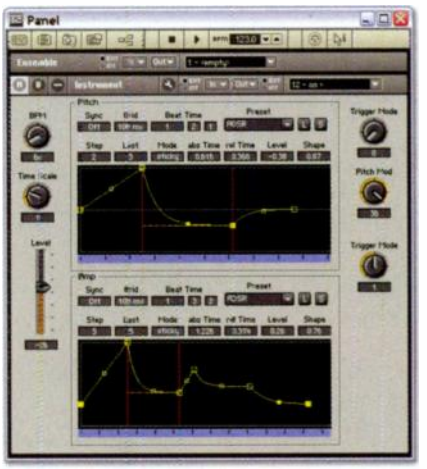
In Use

I had no problems installing *Reaktor 5* under Windows XP, and as with version 4, the copy protection is via challenge/response — when you first install the program, a System ID is generated from various hardware components in your computer, and this appears when you run the Registration Tool. To receive the corresponding Authorisation key you can either go on-line and click the Register Now button, or use the Save Registration File button to save an HTML page on your hard drive that you can transfer to another Internet-enabled computer.

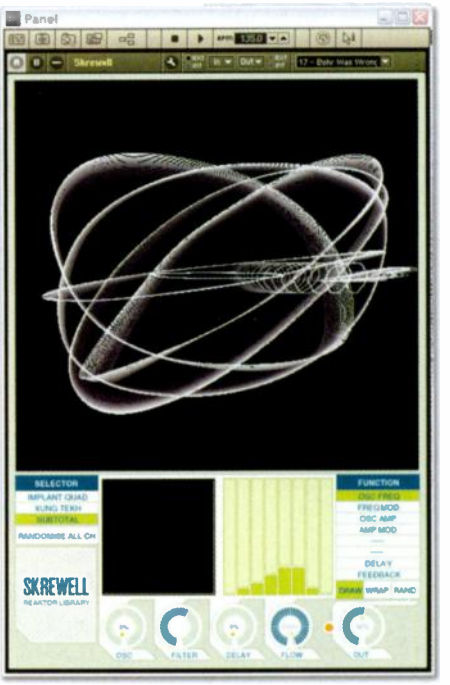
In either case, you'll receive an email containing your authorisation key, which you can then copy and paste into the appropriate area in the tool. You can even fill out a form and post your details to NI, although obviously this is a last resort. You'll need Internet access anyway if you want to download updates and items from the now bulging on-line user library that currently offers over 2000 instruments. Whatever you decide, there's a generous 30-day demo period, which means you have plenty of time to get your authorisation key before the program times out.

I initially installed *Reaktor 5* alongside my existing *Reaktor 4* installation, loaded both instances into *Cubase SX* as VST Instruments, and then loaded up the same Ensembles and instruments into each. Despite careful listening, I couldn't hear any audible differences, and the CPU overheads in each case were almost identical.

However, once I'd moved from the Classics library folder to the one labelled New Additions, both audio and visual improvements were immediately obvious — there are some gorgeous new designs on offer, while many of the sounds are simply wonderful (see the box on the library on the previous page). The toolbar changes all



There are lots of new Macros to incorporate in your own synths, including this multi-stage envelope with flexible breakpoints.



With an interface more like an art installation than a synth module, the *Skrewell* sound generator shows just how far you can now push *Reaktor*'s graphical interface.

made day-to-day use significantly easier than in previous versions, and I found the new Core cells library easy to use, although it's going to take many hours of diligent effort before I completely master the new Core-design features.

I didn't experience any glitches or other problems during the review period using the new library instruments, nor when working through the various core tutorials. However, I did suffer one bad crash while modifying parameters deep in one of the Properties pages, although perhaps I inadvertently chose some unsuitable values.

Conclusions

Reaktor 5 has added incredible capabilities at the surface level of the user interface and also deep down at the code-creation level, and professional designers must be rubbing their hands in glee at the prospect of creating even more sophisticated synths, samplers, and effects, with revolutionary interfaces and bespoke DSP programming. I suspect that some people will now be tempted to use *Reaktor 5* to create exciting new synths and effects that NI could even end up marketing as stand-alone products.

Casual users are also going to be bowled over by the capabilities of the excellent new bundled library, which should appeal to even more people than before, since it now caters for those who want delicate organic textures as well as those into harder soundscapes. I can think of absolutely no reason for existing owners not to upgrade other than lack of cash, or for existing users of the now discontinued and playback-only *Reaktor Session* not to do so to experience the new version 5 library (for a limited time *Reaktor 5* is available to them at the same upgrade price as other *Reaktor* users).

There are a few dissenting voices in the middle ground of enthusiastic amateurs who suggest that *Reaktor 5* and its bundled library is now too sophisticated to be understood by some of its followers, and that the element of raw DIY excitement has gone. I also suspect that new users may be overawed by the prospect of designing a new synth from scratch (despite the various tutorials on offer in the manual) or even attempting to modify some of the now incredibly advanced library instruments with their graphical overlays.

Ultimately, I suspect that the majority of users will probably rely on a few relatively expert ones to design and circulate new Core cells and new Ensembles that incorporate them. However, many of the v5 Ensembles have themselves evolved from much simpler beginnings, so I feel there's still plenty of room for the DIY approach.

Overall, *Reaktor 5* looks more sophisticated, sounds better than ever before, and is bundled with by far the best library to date. Even if you don't intend to become a synth designer, you should still get lots out of it! SOS

System Requirements

On Macs, OS 10.2.6 or later is required, along with a minimum of a G4 1GHz machine with 512MB of RAM, although NI recommend OS 10.3 or higher with a minimum G4 1.67GHz processor. PC owners will need Windows XP, a Pentium III 1GHz or similar processor and 512MB of RAM, but a P4 2GHz or Pentium-M 1.5GHz is recommended. In real terms, and particularly if you intend to run your sequencer on the same computer, I think we can safely say that the faster your processor, the more Ensembles you will be able to run at once inside your sequencer.

information

£ *Reaktor 5*, £379.99; upgrade for registered users from versions 3 or 4, £129. Prices include VAT.
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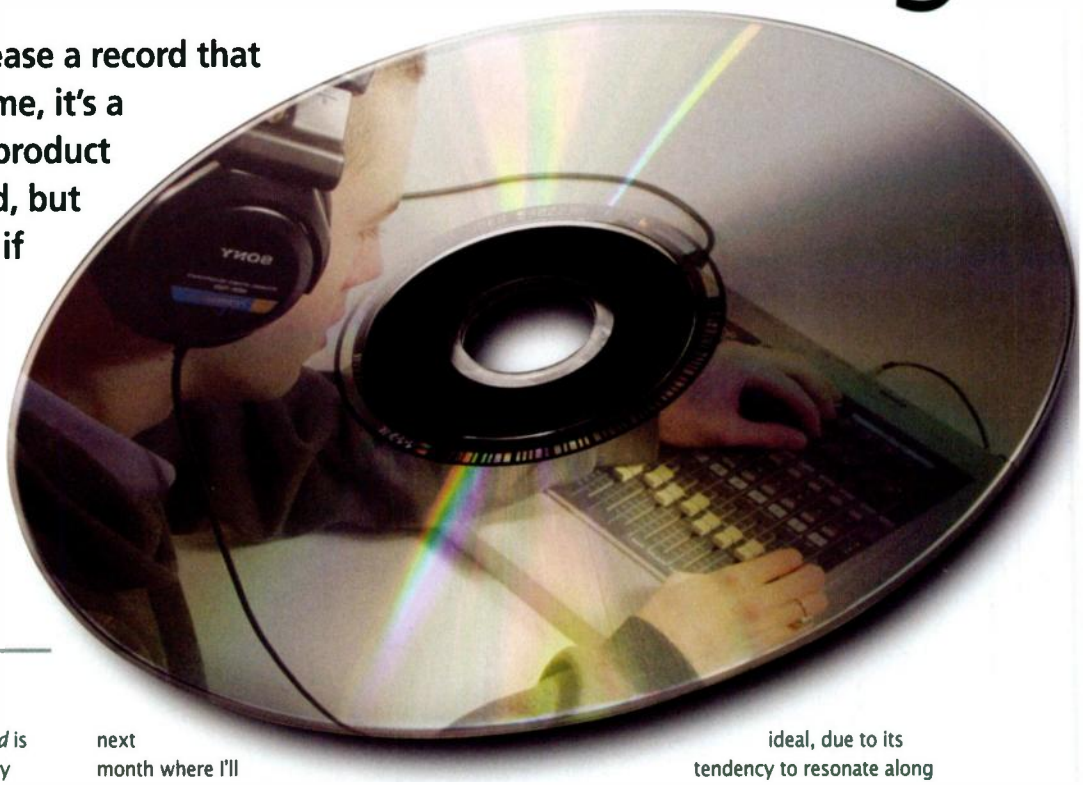
WRH

Preparing Your Music For Mastering

If you're looking to release a record that you've produced at home, it's a good idea to have the product professionally mastered, but it's not always obvious if a mix is adequately finished. We find out how to prepare your songs for the mastering house, and what the engineer can do for you.



Tom Flint

One of the questions *Sound On Sound* is asked by its readers most frequently goes something like this: 'Why don't my recordings sound as polished as a commercial record release?' The answer usually given is that the difference is probably a result of the mastering process, which tends to give recordings a cohesive and professional feel. It is understandable that so many people are confused, however; after all, most of us never get to hear the unmastered version of a record fresh from the mixing engineer's studio, so it remains a mystery what the pre-mastering mixes originally sounded like. Obviously professional mix engineers soon get to know what is required by the mastering house, but how does the humble home studio owner prepare their work for mastering?

In the following pages we'll find out by talking to a top mastering engineer. We'll also be discussing important formatting and financial issues, and finding out what to expect when attending a mastering session. While this article will deal with the issues arising during the preparation of an album ready for mastering, there'll also be an article next month where I'll document a day with the mastering engineer during a genuine recording session.

Case Study

Like a typical SOS reader, I've been recording and producing an album at home in a flawed acoustic environment using less than perfect monitoring and some budget gear! Most of the vocals, and the majority of the guitar parts, were recorded in a small box room sporadically lined with segments of acoustic foam and thick drapes. The rhythm section, organ sounds, and piano parts were mainly sourced from sound modules and therefore didn't pose too many problems. Mixing was done in an altogether larger room, measuring a little less than 4 x 4m. Once again, the acoustic treatment was rather makeshift and inexact, and was partly taken care of by soft furnishings, book shelves, and clutter! Structures like the fire breast and doorways helped disperse some potentially nasty reflections, but the wooden floor was not ideal, due to its tendency to resonate along with the bass.

For monitoring my mixes I used a pair of B&W DM303 speakers, which, although designed for hi-fi use, are known for their fairly neutral response. I constructed a set of speaker stands to reduce vibrations travelling to the wooden floor, and positioned them 0.5m from the back wall as recommended in the manual as a way of avoiding bass reinforcement. I couldn't quite get them the recommended 1.5m apart because of the location of two doors, but I placed them as far apart as possible in order to get a decent stereo image. In my mixing position I was seated on a large futon just beyond the centre of the room, so that my ear level was approximately in line with the monitors.

All mixes were double-checked through a pair of Sony MDR7509 headphones, which deliver quite a good level of bass, and I did some A/B testing with some JVC hi-fi speakers. The dramatic difference in sound between the different monitors convinced me that I could not be certain of determining the

most honest sound, so I tried to make sure each track worked well on the better monitors primarily, and didn't suffer at either very high or very low listening levels. Although I felt confident that I had tested my mixes fairly thoroughly, I still couldn't guess how they would sound after professional mastering, and I had no way of being certain that the room wasn't skewing my perception.

My chosen mastering engineer was Ray Staff at Alchemy Soho, in London. Picking the right engineer is a hard task, as it is difficult to guess what a record sounded like before it was mastered, and therefore impossible to assess what has been done by the engineer! I was lucky enough to know an experienced producer who could recommend a few people to me, and Ray was top of his list.

Costing The Job

For many people, price will be one of their main criteria for deciding whether to use one mastering service over another. Charges do vary a great deal, but a CD album typically costs somewhere between £900 and £1800 including VAT in the UK. Surround and vinyl masters differ considerably, and will need to be budgeted for separately. It's also worth noting that mastering houses tend to quote their prices excluding VAT, so it's worth clarifying this before the session if you're not VAT registered.

In most cases, though, mastering services are charged by the hour, so it is not always certain how much a project will eventually cost. Ray Staff explains: "An average album will take about a day's work, but how much that costs still depends on the length of the session. It could be eight or ten hours work. Sometimes I'll work on a record for a couple of days because there are so many bits to EQ or marry up. That's often because of differences in sound where people have worked in more than one studio. You can also find that a mix done in the middle of the night can sound very bright whereas another done during the day is fresh and sweet, but you've got to make them sit side by side. Until you get going you just don't know."

There are a number of services advertising on the web which offer cheap mastering for small labels. Most allow tracks to be sent for mastering via email, either one at a time or as part of an album project. Paying a little bit more for a more personal service may well be worthwhile in the end, though, largely because being present at the session is the only way to interact with the engineer. It also enables you to see what equipment is being used and who is doing the work.

I asked Ray what factors might account for the large differences in price between budget mastering jobs and the more expensive ones. "If someone is offering to master an album for £300, there will be a reason. It is not unusual for us to get calls from someone saying that the record company has sent it to somebody who thinks they are a mastering engineer because they have a PC at home. The artist has ended up being disappointed with the result and have come here to have it all done again. Some places use cheap equipment, software, and plug-ins, and bosh stuff up very quickly, breaking all the quality rules in the process.

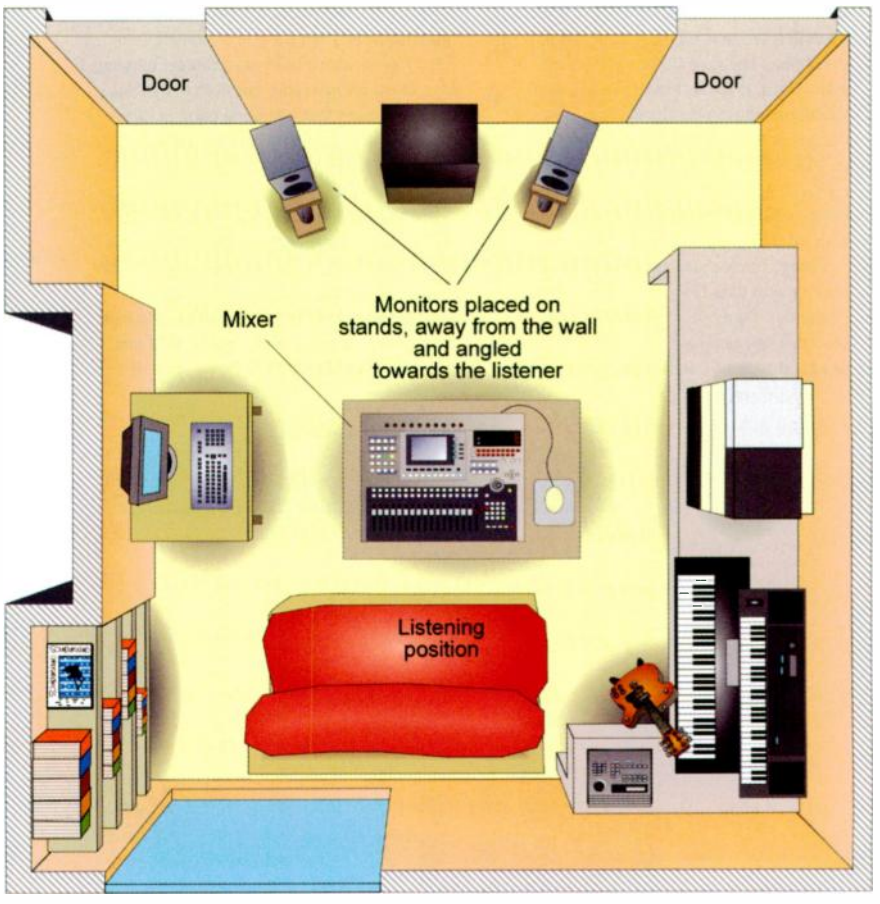
"This is particularly the case if you want to release your album on vinyl, because your engineer needs to have the relevant experience. I have often received masters prepared without this experience and they are totally unacceptable. There are many things that contribute to a good vinyl cut and they all have to be addressed.

"To do a good job for CD mastering you have to know how to hook up digital equipment properly, understand things like clocking and dithering, and how to increase levels while avoiding distortion. Digital is always sold as something that is perfect, but there is good digital and bad digital, as well as cheap and expensive digital. Off the top of my head, I can think of only three or four digital equalisers that I would say are OK. I also have a bee in my bonnet about people sending stuff to the factory on CD instead of using DDP format on Exabyte tape. To me, most CDs manufactured from a master CD sound crap, but that is the only format many of the cheaper places can give you."

Getting Started

Knowing that my room at home was quite likely to have uneven acoustics, I wanted to find out from Ray if there were any tests I could conduct to establish if my mixes were reasonably well balanced. Ray explained that unless I had a properly calibrated or acoustically treated room set up by a specialist, I could never be certain that my mixes would be free from problems. As few home studios have neutral acoustics, Ray allows people to send him tracks at the start of the mixing process so that they can be demoed on the mastering setup. He is then able to provide some sort of feedback and advice wherever necessary.

"The pitfall in doing that though," warns Ray, "is that other songs can have a completely different spectrum to the ones sent to us. For example, the person mixing may have a big hole in their monitoring at 60Hz which has not affected anything in the ▶



For the example project, mixing was carried out in a typical home-studio environment, with little in the way of acoustic treatment. However, consultation with the mastering engineer during the mixdown process ensured that the final mixes would respond well at the mastering stage.

sample song. If the next tracks have a bass guitar around that area then they could find themselves boosting those frequencies so that when it gets here everyone is wondering where all the extra bass has come from. So you can't be certain if the rest of the tracks will sound fine, you can only generalise and say that things seem about right.

"There are one or two people who have sent stuff in to ask our opinion prior to a mastering session who have subsequently gone away and mixed things differently. Recently, a chap brought in a recording that was so over-compressed that I had to say to him that there was not a lot I could do with it, but as the project was still in the recording process, he took it back to the studio, recalled the settings, and reduced the processing to make a nicer-sounding mix."

Spotting Mistakes

Although I'd spent many hours mulling over the relative levels of the various elements in my mixes, I wanted to know what sort of mistakes were commonly encountered by a mastering engineer so that I could check that I wasn't making any of them! "It is not uncommon for domestic stuff to sound really hard, especially if it's been recorded in the digital domain," says Ray. "You might think that it is a result of people using domestic hi-fi speakers that are too flattering, but a lot of modern monitors already sound quite brash, so it's surprising that people don't back off the mid-frequencies a bit. I think it's probably because they are trying to enhance the energy of the track, but have gone about it in the wrong way. I recently had an album to do where someone had really boosted

Format Issues

If your recordings have been made at 16-bit, 44.1kHz, you may be tempted to edit your songs into the right order, and burn them as CD Audio. However, as Ray explains, there may be some quality issues to consider: "If you have a choice of saving your recordings as some kind of file such as WAV, AIFF, or Sound Designer II, rather than as CD Audio, I promise you that the file will sound better every time, because CD Audio is inferior in many ways. It doesn't matter what word length or sample rate the file has, it is still a superior format. Of course you are restricted to 16 bits with CD Audio, so if you've recorded in 24 bit you'll have to dither down before mastering, and there can be problems with jitter and the error rate.

"Most studios won't have a problem dealing with data files, although Sound Designer II files can sometimes cause problems because, as I understand it, they are designed to reside on a Mac-formatted drive. If you are being charged by the hour, you don't want to spend time trying to get the files to play back, so the best thing anyone with a Pro Tools setup can do is back everything up as AIFF or WAV files.

"Sometimes there can be problems when reading disks, but if data is recorded onto a standard ISO9660-format CD-ROM it is usually readable by anything. If you're coming from a PC you shouldn't have any problem bringing files to us, for instance, but from a Mac you have to ensure that what you bring is PC compatible. In Roxio's *Toast* for example, there is a button that just says Make PC Compatible.

"Whatever the delivery format, though, you've got to start with the highest possible quality and work down. You can only extract or manipulate the sound well if it has a respectable sound in the first place. It's hard to start low and then downsize to MP3 and expect a good result."

Here you can see the options in Roxio's *Toast* which allow you to set the format of CDs you burn. ISO9660 is the most widely compatible format, so this is a good choice when you create CD-ROMs for sending final mix files for mastering.

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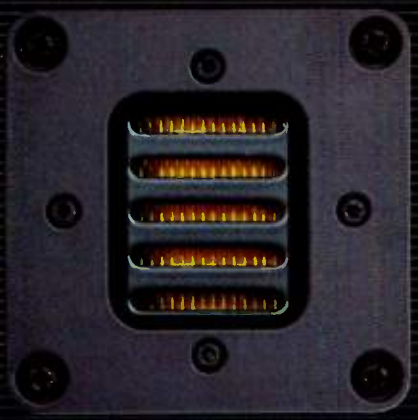

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the 3-5kHz range on a couple of tracks, making them sound brash and edgy. The rest of the mix elements were fine, but I couldn't just take the 3-5kHz region down, because all the song's energy was mashed up in that one area. In that situation, reducing the mid-frequencies is almost the same as lowering the volume, so problems like that are really hard to fix at this stage."

One of the hardest things to judge in a home environment is the bass end. This is because it takes a greater mass of material to attenuate lower frequencies than it does higher ones, so filling a room with soft furnishings will help reduce the highs, and can help remove flutter echo, but it usually takes custom-made acoustic bass traps to effectively neutralise bass hot spots. What's more, when recordings are made in rooms with wooden floors there is the possibility that the entire floor may resonate in sympathy with the bass, making it sound relatively powerful in relation to the mid-range and upper frequencies. To a certain extent, the mastering engineer can be expected to take care of bass problems, but any processing does come at a cost, as Ray explains: "It's quite common to get recordings where one note is very dominant, especially on the bass around 60Hz or 70Hz, but if you try filtering it out with EQ or compressing the bass end, the process affects everything else in that area. For example, taking the bass down sometimes affects the low end of the vocal, drum kit, or it can take the body out of the guitars. I can usually tidy up very low-end rumble at 20-35Hz, but loud bass notes force you to make bigger compromises.

"Every time I try to tackle an individual instrument it's a compromise, because the whole mix is affected. Bass isn't the only problem, though — aggressive sibilance is also common. There is no one area where everyone makes a mistake. A lot of people haven't experienced working in a studio with an engineer on a variety of material. In their studio it's been sounding great so there is huge disappointment when they get to the mastering stage and it doesn't sound right. Sometimes professional studios don't get it right either, though. It doesn't matter what kit they've got, just who's engineering. Good engineers with lots of experience often put things right so mastering is less fiddly. On the other hand, some small guys turn out really good work."

Some mastering companies, such as Soundmasters, offer a remote mastering service, where you send and receive the audio files over the Internet. While this approach is undoubtedly convenient, you'll miss out on observing and interacting with the mastering engineer during the session.

The Mix As A Whole

Apart from problematic frequencies within the mix, there is also the question of how the entire mix should be treated prior to mastering. I wanted to know if there were any processes I should apply to the stereo buss that would enable me to test if my mixes were actually finished enough for mastering. Ray: "I don't have a general rule because my choice is always designed to suit each individual song, and the style of music that's playing, and that's a matter of experience. Compression changes the sound and musicality of what you've got, so it has to be selected properly to be really effective.

"One thing I would say though is not to use too much compression. A lot of people working in the modern era tend to over-process their audio, but if something is over-compressed it will be too dense for us to manipulate further. You can only compress so far before it starts to take the energy out of the track and then everything starts to sound quiet. Before using a compressor you have to ask yourself why you need to use it, and what it is going to achieve. If compression raises the level, it's worth taking the master volume down to the level of an uncompressed file in order to compare the sound of the two to see what it is really doing, and if it is worthwhile. Originally, compression was used a lot on bass guitars because bass can go everywhere if it's not controlled, and that's a good reason for using it, but you still need the right kind. If it's not appropriate, don't do it."

"It also pays to avoid normalising everything up to maximum level. There's no

Mastering houses are inundated with CDs labelled 'Masters', so make sure to include as much relevant information as you can on your own CD-ROMs — CD/file formats, sampling frequency, bit depth, project name, track listing, and contact details can all be useful.

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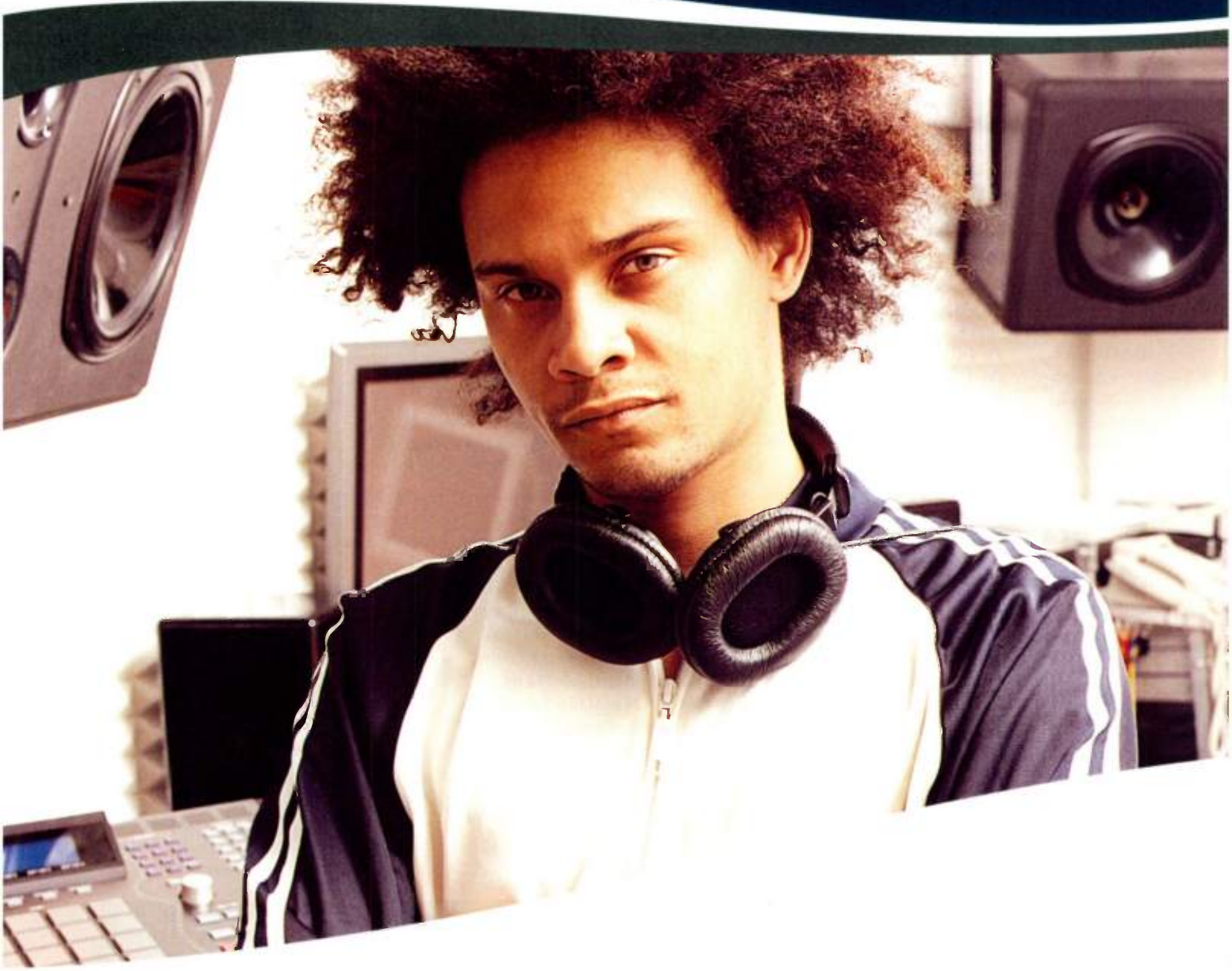

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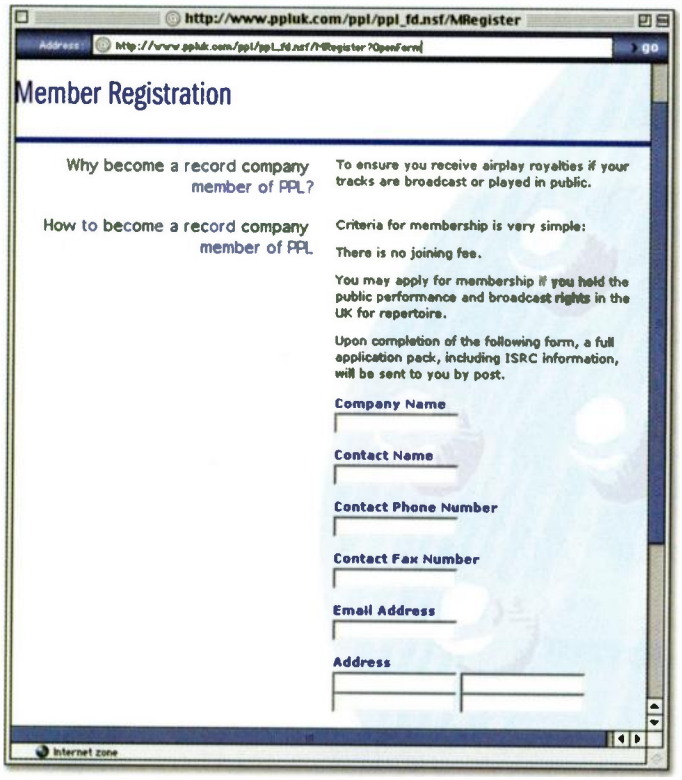


need to be hammering the end scale, so I suggest that people simply mix to a sensible level and don't normalise at all. It's not so problematic if I'm feeding a digital signal straight into the analogue domain, because I have to control the level anyway, but if it's staying within the digital system and it is very loud, the first thing I have to do is take the level down to regain some headroom, otherwise there's no space for adding a little bit of bass or top.

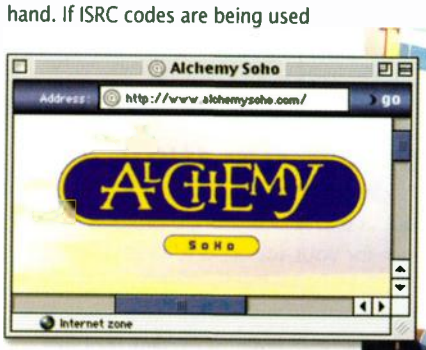
"Experienced engineers usually provide us with two mixes, one without any mix compression and one where they've compressed for listening purposes, just so they've had something that's a bit louder. Most just use a limiter plug-in like the Waves *L2 Ultramaximizer* and apply 2-4dB of lift. Having the two versions gives us the opportunity to take the uncompressed version and work on it further."

Supply & Demand

Apart from getting the music sounding right, it is just as important to supply the mastering engineer with the right information so that they can proceed with the job satisfactorily. Certainly any audio files sent to the mastering house prior to the session require detailed labelling so that they can be properly identified, but anyone attending a session also needs to have all the necessary information to hand. If ISRC codes are being used then, in the UK, these need to be obtained from Phonographic Performance Ltd (PPL) in advance, so that they can be allocated to each track at the end of the session. Ray explains what else is and isn't needed. "We don't need to know lyrics, just song titles and labelling to tell us who owns the project and who's the artist. It is not unusual to get given a CD that just says 'Masters', and in a place like this where there are hundreds of CDs flying around, that's really inadequate. The running order we do need to know. We can amend it, but it is much more cost effective if someone has sat at home and made the decision beforehand. Every time you make a change it will delay proceedings and/or cost more money."

There are also the all-important gaps between songs to consider. "Normally, I prefer people to attend the session and listen to the gaps for themselves, because opinions can differ. I've had people send me an unmastered CD saying that they've worked out all the gaps, so I've read their CD's Table Of Contents to get their timings, and matched mine up exactly. After hearing the master they've then decided that the gaps don't sound right. That's because they're hearing different detail, or because my fades are smoother making it sound different. If someone says 'I prefer my gaps tight', then that's fine, because I have a yardstick to work from, but there is no substitute for attending the session to confirm how the gaps sound.

"On the day we get them as good as we can, but you can only really be sure when you've sat back and listened through a couple of times. It's funny how gaps seem to vary according to what mood you're in. It's not unusual for people to say 'start the next one there' straight after the previous song has finished, and that's because they're not relaxed and are sitting there in anticipation. They often end up calling back later asking if we can add another second to every gap. If you have two energetic songs together you might place them straight after one another, but you might need a longer gap between a big lively song and a moody one, so you have to listen on a musical and emotional level, and do what feels right. Most mastering engineers are used to doing it and do it reasonably well."



Tom took preliminary mixes to Ray Staff at Alchemy Soho, who advised him on how to complete the mixing for the best mastered results.

Compare & Contrast

In an ideal world, the artist or producer would have time to sit down with the mastering engineer and discuss how the energy of each song is supposed to ebb and flow, as well as how every track relates to the others on the album. Of course, such a discourse would prevent the mastering engineer from getting any work done at all, and it would end up costing a fortune! Ray explains what can be done, though. "I advise people to bring a couple of CDs they know well so that they can listen to them in this room and get used to the environment. Not only does that help them feel comfortable in the studio, but it also gives me an idea of the sort of thing they are trying to emulate. The music has to be something they know and love, and perhaps something they are aspiring to sound like. Obviously if they've got a home recording that they want to sound like U2 then it isn't going to get there. I've had a couple of people who wanted the stuff they'd recorded at home for £5000 to sound like Anastacia, when she's probably spend $300000 making her album. I can't give them that quality, but I can take them in that direction so that it sits in the same stable."

Preparing The Ingredients

After taking into account Ray's advice, I completed my final mixes, burnt them as 24-bit WAV files to a CD-RW disc and transferred them to my PC where I could gather them together in a folder. The total size of all the tracks was larger than the capacity of one CD, so I split them into two groups. In *Easy CD Creator* I selected the option for creating a data CD-ROM and set it from Joliet to ISO9660, to be absolutely certain that it was going to be compatible with Ray's system (see the 'Formats Issues' box elsewhere in this article).

On the body of each CD-ROM, I wrote my name and telephone number, the band name, and the date. I also added information about the data saved onto each CD. I included the number of songs, the format, and bit rate, and the fact that they were saved in ISO9660 format. I repeated the same information on the jewel case's paper inlay, together with a complete list of the songs. I made sure that the CDs were labelled '1 of 2' and '2 of 2' so that it was clear they were together.

I posted the lot to the mastering house together with a covering letter explaining the content, and then followed up the posting with a phone call to let Ray know the recording was on its way. We agreed that I would phone back in a few days, giving him a chance to listen to the material. In case he didn't have time to check each file, in the covering letter I had highlighted one key track which I thought was representative, but when I rang back it turned out that Ray had actually listened to a snapshot of each track.

Fortunately there seemed to be no formatting problems and Ray felt the mixes were 'quite pliable' and in a state from which he could make them sound pretty much how I wanted. I had deliberately left off any mix-buss compression or EQ so that he would have more to work with, so I was glad to hear that this had turned out OK. The next step was to book a day for the mastering session, which was simply a matter of phoning the studio, giving my details, and making sure that Ray was working that day. In the mean time, I planned to revisit a couple of the mixes, slightly alter a few fader moves here and there, and take the results to the mastering session on a new CD-ROM.

Stay Tuned...

Next month, I'll take a look at what actually goes on during the mastering session, and find out how a humble home-mixed data file ends up fully mastered on a medium ripe for the pressing plant. SOS

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Focusrite Saffire

Firewire Interface For Mac & PC

Focusrite's first computer recording interface looks to cover all the bases with plentiful I/O, DSP effects and flexible monitoring arrangements.

Paul White

The Saffire Firewire audio interface signals a new direction from Focusrite, a company best known for their high-end analogue studio processors and the cost-effective Platinum range, and they've certainly tried to bring something different to the party. Rather than simply put an audio interface and a one-in, one-out MIDI interface in a box, the Focusrite engineers have given their unit 24-bit/192kHz processing capability and added on-board DSP so that the included reverb, compression, amp modelling and EQ plug-ins can be run without burdening the host CPU and without suffering latency if used during recording. On-board DSP isn't exactly unheard-of, but a neat touch is that these same plug-ins are also available to install as native AU and VST versions to be used more conventionally from within the host application if required. The internal DSP reverb is designed to be used when monitoring the source being recorded, so as to enable the performer to have 'comfort' reverb when overdubbing in latency-free monitoring mode.

Up to four inputs can be recorded at any one time, two via the analogue mic/line/instrument channels and two via the coaxial S/PDIF digital input. It's also possible to use the four inputs to record processed and unprocessed versions of the same stereo or dual mono inputs at the same time. The mic preamp is based on the circuitry used in the Focusrite Green range and is capable of very low noise and wide audio bandwidth. Oh yes, and you also get a fully functioning MIDI + Audio sequencer in the shape of Steinberg's *Cubase LE*.

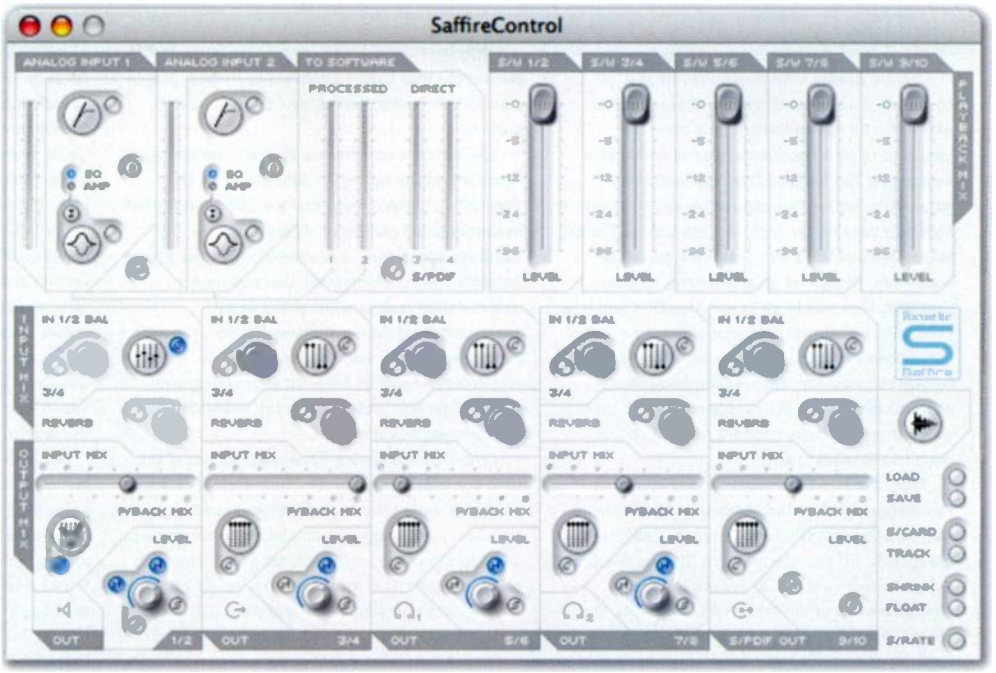
The compact desktop format of the Saffire hardware belies that fact that its stereo analogue and digital inputs are complemented by two S/PDIF and no fewer than eight balanced analogue line outputs. Each of the analogue output pairs has its own software level control, though the S/PDIF output level is fixed. The generous provision of outputs makes sophisticated monitoring or external mixing possible, and means that the Saffire is also well suited to surround mixing. Practical foldback and monitoring options are built in, and as many as five independent stereo mixes can be created based on a mix of the incoming signals and already recorded tracks. Two of these mixes also double as headphone mixes feeding the dual headphone outputs on the front panel.

The Saffire connects to the host computer, which can be a Windows PC or a Mac running OS X, via a Firewire 400 cable. The included driver is capable of very low latency, though with my G4 laptop it wasn't at all happy at the smallest buffer size of 32 samples — it sounded like a granular

synthesis experiment! A 128-sample setting seemed fine, though, and as a rule, that's as low as I tend to go with any interface.

The Hardware

The Saffire hardware looks very neat yet businesslike. Status and metering LEDs are provided where needed, though more visual feedback is available within the Saffire Control software. A swivel plate built into the base of the case can be rotated for greater desktop stability, and to keep everything tidy, all the connections except those for the headphones, microphones and two analogue line inputs are on the rear panel. Plugging into channel 1 or 2's Line/Instrument jack defeats the mic input for that channel. A single button switches 48 Volt phantom power to both mic inputs for use with capacitor mics or active DI boxes. The front panel includes input gain controls for channels 1 and 2 as well as basic three-LED metering — the LEDs light to indicate signal levels of -20dB, -6dB and clipping — and there's also a monitor level control with its own Dim and Mute buttons.



The Saffire Control utility allows you to submix the outputs from your recording application for monitoring, and to set up the plug-ins running on the Saffire's DSP.

Two stereo, quarter-inch headphone outputs are provided, each with its own level control, and the included software allows the user to balance the signal being overdubbed with the DAW mix to achieve the optimum monitoring balance for the performer. Focusrite have used a high current drive headphone-amp circuit so there's no shortage of level here! This can be set up separately for any of the stereo outputs and there's even a custom mix option that allows the user to set a different playback mix for each output, if necessary. The two inputs on the front panel also have Line/Instrument selection buttons, allowing electric guitars and other instruments that need to see a high impedance to be plugged in, while the unit's single MIDI In and Out connections have activity LEDs and a switch to turn the MIDI Out into a MIDI Thru. When in MIDI Thru button mode, the MIDI Input will be sent straight to the MIDI Output, regardless of whether the host sequencing software is active.

The Monitor level knob controls the level of one or more monitor signals, depending on how you configure the monitoring from within the support software supplied with Saffire. By default, it controls the levels from outputs 1 and 2, but it can also be configured to simultaneously control the level of multiple stereo outputs by activating the 'H' button next to the relevant output pair level control in the Saffire Control panel. This is clearly handy if you're monitoring via an active surround speaker system as it avoids the expense of a separate surround monitor controller. Similarly, the balance of each headphone signal can be set individually within the Saffire Control software; headphone 1 mirrors the 5/6 output mix and headphone 2 mirrors the 7/8 output mix.

On the rear panel is an AC input for the included power adaptor, phono connections for S/PDIF in and out and a pair of Firewire 400 six-pin connectors. The MIDI In and Out sockets are standard five-pin DINs, while the eight physical line outputs are all on numbered jacks with extra legending to identify them if they are used for 5.1 or 7.1 surround. In most cases, a six-pin Firewire cable will be able to supply enough power to run the Saffire, though the PSU will be needed if connecting to a four-pin Firewire port.

Saffire Control

Saffire settings are controlled using a software utility called Saffire Control. When not in use, the Saffire Control window can be reduced in size and can also be set to behave as a floating window that stays on top of the other windows in your sequencer application.

The main Saffire Control window is where sessions are configured, and comprises three key sections dedicated to input processing, balancing the sequencer outputs, and the additional processing and mix settings of the stereo monitor and headphone mixes. Within the Input section of the software panel, compression and a choice of EQ or amp simulation can be applied to analogue inputs 1 and 2, enabling them to be processed prior to recording. Reverb can also be applied, but this is audible at the monitor outs only and is not recorded. Pre and post-effect metering is provided and a stereo link button links the two analogue inputs such that both channels share the settings for input 1. The four inputs the Saffire passes to your recording software can be operated as discrete channels, but you can also set channels 3/4 to mirror channels 1/2, except with no processing. This could be useful if ▶

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pros

- Extremely attractive price.
- Good I/O provision.
- DSP effects plus native plug-in counterparts.
- Can function as a surround monitor controller.

cons

- Nothing you can complain about given the price!

summary

As an all-in-one product for desktop recording, the Saffire is going to be a tough act to follow, especially at the price. The combination of good mic amps, generous I/O and included effects is seriously attractive.

Effects & Processors

The Saffire comes with its own reverb, EQ, compressor and amp simulator effect, each of which can be run on the Saffire's own DSP hardware or as a host-based plug-in within your sequencer. The Saffire EQ is fully four-band parametric, with switchable shelving, band-pass or high/low-pass on the high and low bands. The EQ curves are modelled on Focusrite's analogue equalisers, though as an alternative, an amp simulator is available for processing DI'd guitar or even bass guitar with a choice of four amp types. For anyone who has used a modelling preamp before, the amp sim will hold few mysteries. A Drive control sets the overdrive amount, after which there's a three-band EQ section and an output level adjustment.

There are two EQ window modes known as Template and Advanced. Advanced allows normal manual operation whereas Template calls up job-specific EQ presets that can then be fine-tuned using the four controls to access the main characteristics of the selected EQ type. All the normal EQ controls are greyed out in this mode, though you can see them move as you adjust the 'broad strokes' controls at the top of the window. If the vocal Template is called up, for example, the four knobs adjust Warmth, Presence, Harshness and Breathiness by simultaneously adjusting cut/boost and bandwidth at the appropriate frequencies. EQ settings can be copied and then pasted to other Saffire channels or to their plug-in counterparts using dedicated copy and paste buttons.

The Saffire's compressor is, not surprisingly, modelled on the opto-gain circuit used in the Focusrite analogue units and aims to capture their essential sonic character. Again there's a Template mode and an Advanced mode, so anyone unfamiliar with compression can still hope to achieve good results without too much head-scratching. In the Advanced mode, the user has access to the usual Threshold, Ratio, Attack and Release controls followed by make-up gain. A gain-reduction meter shows the amount of compression being applied.

I think the designers have really captured the opto compressor feel nicely. This works really well on vocals and guitar to make them sound bigger than life, and though you can hear the compressor working when you hit it hard, the side-effects are musical rather than irritating. They've also given users a very comprehensive equaliser that sounds more analogue than it does digital, and having the option to switch the upper and lower curves to the different modes really extends its usefulness. Having the Template presets is also a great idea to get musicians started on mixing where full manual mode might be perceived as intimidating.

Focusrite is not a name you'd normally associate with reverb, but their engineers have come up with a very interesting twist on the standard approach by reducing the user interface to only three knobs. To me, the reverb sounds like 'plate meets spring' but without the undesirable artifacts of either, and while it may seem a little bland if heard in isolation, it really sits very nicely in the mix, supporting vocal and instrumental sounds rather than rolling all over them. The plug-in version sounds exactly the same to me as the DSP version and is much better than most synthesized reverb plug-ins, even though it doesn't offer much variety. In fact its only shortcoming is that it could use some pre-delay, though that's easy enough to add in your DAW with a simple delay plug-in before the reverb.

As guitar amp modelling plug-ins go, the one included here is extremely basic but still capable of some nice clean tones, especially if used with the compressor before it. The dirty sounds (the two middle models) fare less well to my ears, tending to get a bit fizzy, while the American model sounds as though it was modelled on an amp with a tube biasing fault as it's very honky and dissonant. Extra EQ and reverb can help, but Line 6 aren't going to lose any sleep over this one as it's not really a replacement for a dedicated modelling preamp or a serious amp plug-in. If you just add occasional guitar it should get you by, but if guitar is your main instrument, then it probably won't be sophisticated enough for you.

All of the Saffire's DSP effects are also included in VST and Audio Units formats, allowing you to run the same algorithms on your host machine.

▶ you want to record something with effects but at the same time record a dry copy, just in case your processing doesn't work out.

Once a DSP effect has been applied to an input, its GUI is available in a separate window for parameter adjustment, and the order of the EQ and compression can be flipped if the default 'compressor into EQ' routing doesn't suit you. The Input stage section also includes two sets of stereo meters covering the four physical input channels.

One aspect of the Saffire Control software that requires some explanation is the Mode button. Saffire Control defaults to S/card mode, which makes the unit behave like a standard soundcard, in as much as it always monitors only the DAW outputs. This is the mode of choice where you need to mix pre-recorded tracks played back from a sequencer or when you're happy to monitor via the DAW software because the system latency is adequately low.

To avoid all latency when recording, Saffire should be switched to Track mode so that both the inputs and outputs can be monitored together without latency affecting the part being overdubbed. The appropriate mode is selected at the bottom right of the Saffire Control window. Note that software input monitoring should be disabled within the DAW when working in Track mode; otherwise, both the direct input and the input after being passed through the DAW (with latency) will be audible together. In Track mode, you simply use a horizontal slider to adjust the relative level of the input and the recorded signal at your chosen monitor output. You can also add monitoring reverb to the input signal at the ▶

Test Spec

- Saffire driver version 1.0.
- Apple 933MHz G4 iBook with 512MB RAM running Mac OS 10.4.1.
- Tested with Apple *Logic Express* v7.1.

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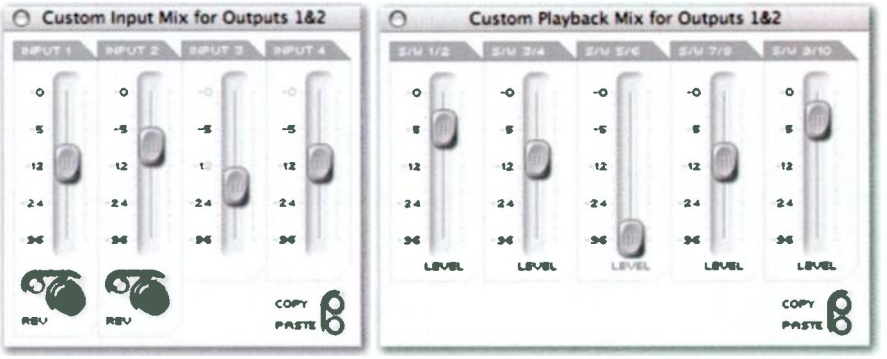
same point. Where two inputs are being recorded together, you can also adjust the balance of the two inputs sources in the monitor mix.

Because the Saffire can handle multiple audio streams from within the DAW application, the main window provides five stereo faders to balance the first 10 sequencer outputs. If an output's level is set to the default 0dB, the signal comes out at its original level as set in the sequencer. The final stereo mix is based on the summed stereo signal at the output of these faders, so you can think of this part of the Saffire as a submixer. You can also set up a separate custom stereo mix of the different stereo DAW outputs for each output pair, if you prefer, using the 'C' button adjacent to each output. Similarly, you can adjust the balance of inputs 1/2 or 3/4 heard in each monitor mix.

The user can adjust the amounts of monitor reverb added to input channels 1 and 2 from the monitor output section when the reverb is active, and different reverbs can be applied to the two inputs where necessary. Where a stereo signal is being recorded, the reverb appears as a single stereo control window. Though fairly simple by hardware standards, the reverb still allows the user to control the size (decay time) of the synthesized environment in addition to diffusion and tone. Where reverb or one of the other effects is needed for mixing, an AU/VST version is available to use within the host sequencer/recording software. A further S/rate button access the sample-rate conversion facility built into Saffire. To synchronise to an external digital source via the S/PDIF input, external sync mode must be selected, with a lock LED to show that sync has been achieved.



The Saffire's monitor mixing arrangements are incredibly flexible. Each pair of outputs can, if you wish, carry a separate Custom mix of the Saffire's inputs and the outputs from your recording software.

The Saffire's eight analogue outputs can be set up for surround monitoring, or they can be used to provide separate monitor mixes.

In The Studio

Using the Saffire in practice is a little easier in the flesh than it is to see everything written down, thanks largely to the intuitive main window. The ability to set up multiple monitor mixes is excellent, as is the ability to control all the output levels from one physical front-panel knob for surround work, and the idea of providing the inbuilt effects and processors as separate plug-ins that can run on an AU or VST host is also very welcome. The monitoring arrangement is particular pleasing, as you can use it in a very basic way or you can set up custom mixes for the inputs, custom mixes for the DAW outputs, then balance the two using a single fader to create the perfect monitor mix. If you don't opt to use the custom mix, you simply balance the 'as is' DAW mix with the signal you're currently overdubbing using the balance fader.

The subjective audio quality of the converters is good for the price, and they are perfectly good enough to do serious work. Having such a wide range of sample-rate support is also commendable, though I still feel that working at 192kHz in a home studio is a bit of a joke — in fact the benefits of working at anything other than 44.1kHz are debatable in the project studio where the end result is going to be a CD. The mic preamps are also worthy of a mention, as these are comparable with what you'd get in a good-quality rack unit, so you're not going to be shopping around for external voice channels or preamps.

It's clear that Focusrite are going after the market sector currently occupied by the likes of Digidesign's M Box (which they designed), and given that Saffire has four inputs, 10 outputs and Firewire connectivity, it is going to be hard act to follow, especially when you take into account its on-board DSP processors and effects. Of course it isn't the interface to choose if you need to record a whole band at once, but for situations where one or two musicians are likely to be overdubbing at a time, it is close to ideal.

As a contender in this marketplace, the Saffire has a lot going for it, not least the on-board Focusrite mic preamps, the ability to function as a surround controller, the inclusion of *Cubase LE*, and the fact that those DSP effects (see box) are also provided as native plug-ins. The manual is well written with a very useful 'getting started' guide and when it comes to price, the Saffire costs around what you'd normally expect to pay for a four-in, four-out USB audio interface. As a new entry into this tough market, the Saffire seems to be in an enviably strong position and I can't see how it can fail to do well for Focusrite, especially as it the included software manages to be both comprehensive and straightforward without forcing the user to trawl through menus. SOS

information

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Steve Albini

Steve Albini has become a legend in the world of alternative music by championing traditional engineering skills, respecting the opinions of the artists he records, and doing business ethically.

Paul Tingen

Photo: Paul Nelson

The big cliché about Steve Albini is that he has a reputation that precedes him. Regularly described in the press as 'controversial' and 'difficult', he has against-the-grain opinions on studio technology and on the role of the producer, and he's stigmatised as the Godfather of Grunge, the champion of heavily distorted, in-your-face, alternative rock. In person, however, he's easy-going and forthcoming, and it turns out that many of the other myths about him are just that: myths.

Take, for instance, the received wisdom that Albini mainly works with hard-hitting grunge bands, and imposes his own uncompromising sound on records. This perception is perhaps unsurprising, since Albini's most famous credits include Nirvana, PJ Harvey, the Pixies, Bush and Jimmy Page & Robert Plant. Moreover, the Chicagoan has been a guitarist in cult 1980s post-punk bands Big Black and Rapeman, while today he's part of the grunge band Shellac.

"I've recorded 1500-2000 records, and I know they are all quite different," protests Albini. "I've recorded acoustic albums hundreds of times, with acoustic guitars or strings, and so on. I can name hundreds of bands that I've recorded that have a completely different aesthetic than grunge. And I don't impose my taste on the bands I record. To me it's ridiculous to say that my records have a sound. I can understand why someone who has only heard three or four records I have worked on that are stylistically similar can make such a statement, but I think it is wrong."

Indeed, a refusal to impose his own sound on other people's recordings is a political issue for Steve Albini, as well as an aesthetic one. Here, the received wisdom is right on the mark: he has striking viewpoints on the machinations of the record industry in general and on the roles of the engineer and producer in particular. Type the name 'Albini' and the words 'The Problem With Music' into any search engine, for instance, and you'll hit on an article written by Albini in which he mercilessly takes the relationship between band and record company apart. In typically graphic manner, Albini offers the image of "a trench, about four feet wide and five feet deep, maybe 60 yards long, filled with runny, decaying shit." He asks us to picture the band on one end and "a faceless industry lackey at the other end holding a fountain pen and a contract waiting to be signed. Nobody can see what's printed on the contract. It's too far away, and besides, the shit stench is making everybody's eyes water."

The Engineer With No Name

The American clearly takes no prisoners on the subject of the music industry. But his

opinions on what's happening in the recording studio are equally radical and can be summarised as putting the artist's interests before everything else. He's averse, for instance, to the idea of a record producer, and thinks that taking royalties is "an insult to the band". Albini insists on defining himself as an engineer and sees the essence of his work as purely technical, rather than artistic. For this reason he will work with anyone who calls, regardless of musical style or ability, and would rather not see his name appear on record sleeves.

"I think that my name appearing on people's records is a little bit of a distraction," he says. "I don't think it's important, and in some ways it causes public relations problems for the band, who then have to defend me or defend their choice of working with me. I understand that people want to give credit, and that's fine. I'm not offended by it. But once I'm paid, I don't really need anything more.

"The cases where I'm credited as a producer are the result of someone at the record company writing that on the back of a record. I don't personally try to exert any influence on my credit. Whatever the band and the record company do with the packaging is their business. But from a position of accuracy, I don't really do anything that a producer does. A producer is someone who is completely responsible for a session, but in my case those decisions are made by the band, so I don't qualify as a producer in that sense. Ultimately what I'm trying to do is satisfy the band. Most of the time what they want is for me to record their organic sound, so that's what I'm trying to provide. If I'm asked to do something fantastic, then I will try to do something fantastic, but I don't start from a position that everything needs to be changed from what it was."

Albini's exhortations may sound almost naively utopian to some, but the man appears to walk his talk. The sessions for Nirvana's *In Utero* provide the most famous illustration, because Albini refused the offer of a royalty percentage, at the time (1993) estimated to be worth about $500,000, and instead proposed a flat fee of $100,000.

These days Albini doesn't only turn down any royalty fees, he's also prepared to forego his $450 daily fee (already peanuts in comparison with other 'name' producers and engineers) if a band say they can't afford it. So how does he survive?

"Well, most of the time I do get paid," laughed Albini, "but on occasion I do a record as a favour for a friend of mine, or a band runs out of money halfway through the sessions and it's either leave the record unfinished, or finish and not get paid. And I prefer to finish the record. Basically, anyone who calls on the phone I'm willing to work with. If someone rings because he wants to make a record, I say yes. I'm sure that some people call me because relative to other people who have the kind of experience that I have, I'm very inexpensive. I'm perfectly comfortable with that. I'm happy to be a bargain."

Don't Be Manipulative

Before readers call their travel agencies to inquire about the prices for a round trip to Chicago, they might want to consider Albini's working methods. He explains that he was very influenced by John Loder, "the engineer and producer who ran Southern Studios and Southern Records in London, and recorded a lot of the early punk rock singles that were really important to me. They also appeared on the Small Wonder label and Crass Records, and Rough Trade and so on. Those English labels had very distinctive-sounding records, and they were done cheaply and quickly in a small studio, and that really appeared to me. John Loder was the principal engineer on most of these records.

"When I was in Big Black we did a session with him, and I thought he was a terrific engineer. He showed me the potential for getting the most out of the equipment without making the equipment the focus of attention. He knew how to do things quickly and with great sensitivity to the band, and had a complete working knowledge of his equipment. In any situation he could snap his fingers and do the right thing, because he knew exactly how things worked and what to do.

"Working in the computer paradigm is much slower, because no-one knows their computer software well enough to be aware of every single thing it does. In the analogue domain you know what you're supposed to do, you plug something in, and it's done. Problems are solved instantly. In the digital domain you have to try lots of options and see if any of them work, and then you pray that your computer will follow your instructions and won't crash and that you don't need to restart or reinstall something."

Albini says that he spends on average "four to 10 days recording an album, including mixing. Two weeks would be an extraordinarily long time for me. Most of the bands that I work with don't have any spare money, so they have to work quickly to get the record finished."

The American also pays homage to engineer Iain Burgess, from whom he learned to avoid 1970s approaches like excessive overdubbing and processing, click-track recording, and trying to keep the sound as dead as possible, and instead to focus on recording a band live in the studio, as naturally as possible. All this led to Albini's current emphasis on the front end of recording — microphones, mic placement, mic preamps (see box) — and his love of ▶

Some of the more unusual rackmounting gear at Electrical Audio: from top, custom-built mid/sides matrix, Klark-Technic DN34 'Analogue Time Processor', Dbx 500 subharmonic generator and Skibbe 5-9C compressor.

▶ analogue recording equipment.

"Anyone who has made records for more than a very short period," commented Albini, "will recognise that trying to manipulate a sound after it has been recorded is never as effective as when it's recorded correctly in the first place. Unfortunately almost all the recording software in digital recording is designed to manipulate sound, rather than record it, and so most digital sessions are primarily about manipulating sound, rather than recording sound."

Electrical Engineering

Albini's recording preferences find their reflection in his Chicago studio, Electrical Audio, a place where he also lives. ("It's a matter of making things more simple on a day-to-day basis. I don't have to drive anywhere.") Electrical Audio opened its doors in 1997, and its live recording areas are set up to cater for every acoustic eventuality. There are two dead recording rooms, two sizeable live rooms with high ceilings, and a huge third (1200 square foot) live room with oak floors and adobe walls.

"Adobe," explains Albini, "is unfired earth brick. It's very heavy but also very soft, so very good for acoustic isolation, with a lot of high-frequency diffusion. Most studios have made compromises in their acoustic environments with recording spaces that are neither very live, nor very dead, and I feel that they're inappropriate in every situation. We've tried to create rooms that offer a range of big contrasts in their acoustics."

The studio also has two control rooms, each featuring desks from the relatively smalle Chicago company Neotek — a 96-input Elite and a 36-channel Series II. "I was very familiar with these desks," explains Albini, "because a lot of studios in Chicago have them. We wanted a number of custom changes made to our console, and some other console manufacturers weren't too keen to do this. But Neotek was happy to make all the changes to the Elite that we wanted."

Scrutinising Electrical Audio's equipment list further, aside from the Flying Faders automation on the Elite, perhaps the most striking aspect is the complete absence of computers and the very limited number of digital boxes, even in the outboard gear department. Electrical Audio must now be one of the few studios in the world today that's a computer-recording-free environment. Instead, pride of place goes to a number of analogue tape recorders, among them the Studer A820 16/24-track, an MCI JH16 eight-track, and Studer A820 and Ampex ATR102 two-tracks, which are "all refurbished, so effectively as new". Does Albini feel like he's holding the fort for a way of recording that's increasingly seen as outmoded?

"There are probably quite a few studios like us," objected Albini, "that don't have Pro Tools, but occasionally host digital sessions. When someone brings a project into our studio that was started on Pro Tools, they'll bring in a computer and carry on with it in here. And our studio is commercially available, so outside engineers sometimes bring Pro Tools sessions in. But for our normal day-to-day work it isn't necessary. I have always done things with the analogue method, and I still think it's the best method. So I have no reason to change. I've had a long time to accumulate equipment and microphones and techniques, and I've never been in a situation where I've had to say 'No, I can't do that, because we're working on tape.' If there were problems that I could not solve on tape, I might be compelled to use computers, but I've never encountered such a problem."

Albini also prefers analogue to digital for sonic reasons, although he reckons that high-resolution digital formats sound "OK". He adds "I like the high-resolution DSD/SACD consumer format, although SACD is now defunct as I understand it. I also think that from a convenience point of view, for people who want to play music in a boombox or in the car, or at work or something, CDs are great. The iPod is the same. It doesn't sound great, but it's wonderful for providing background music for people while they do other things. But for critical listening, or for music that means a lot to me, these formats aren't good enough. A well-made vinyl record still sounds infinitely better than anything else."

Having expertly demoted the once-prestigious CD to the status of the humble compact cassette, Albini carries on explaining that when working in his studio, he prefers recording to two-inch 16-track, which "sounds better than 24-track. There's less noise, less distortion, the bass response is flatter, and the high end is clearer. I record without Dolby, because I don't like the way noise reduction affects the sound. We do have Dolby HX Pro, which is a dynamic bias adjustment, built into our Studer A820 machines. When you modulate the bias dynamically, you can maintain headroom even with very bright, sharp transients. It doesn't affect the amount of hiss, it just creates more headroom. I've never found hiss a problem anyway."

As Live As You Can Get

Clearly, Electric Audio is an unusual recording environment rooted in an unusual philosophy. So what, exactly, happens there after a band arrives? "When the band arrives at the studio I have a conversation to find out how they want to make their record, what sort of sounds they want, how fast they want to work, who is in charge in the band, and then we get started. I'll have everyone playing in the same room or spread them out over different rooms, as required. The important thing is that there is

Steve Albini's Recording Tips

Acoustic Guitars

• Favourite microphones: Schoeps 221b, Neumann 56/54 and FM2, Audio Technica 4051, Lomo 1918, plus ribbon mics like the Coles STC 4038, various Royers, RCA 44DX, 74JR and 77DX.

• Favourite preamps: Massenburg 8400, Sytek MPX4.

"The Lomo is a Russian microphone made in the '60s and '70s. I use that a lot on acoustic guitar. They weren't standard in the West but they were quite common in the East and they have now made their way across. I'll use a ribbon microphone if it's a real bright guitar and I want to try thicken the sound a little bit. Where I place the microphone depends on whether someone is going to be singing and playing, or just playing. If they're singing and playing I have to minimise the vocal spillage, so I put the microphones quite close up. If there's no singing, then I can back the microphones off a little bit, I would say about two to three feet, and in that case it usually sounds better in a slightly live room. I don't necessarily point the microphone straight at the sound hole. Sometimes you want to get it up in the air a little bit, looking down at the guitar so you can get more of the strumming and less projection of the hole. If the guitar is a little thin-sounding, you want to have it more in front of the body. It varies. Sometimes you have to move your head around a little and see where it sounds best."

Electric Guitars

• Favourite microphones: Coles 4038, Royer 44/77, Neumann U67, Lomo 1909, Josephson E22p, various other condenser microphones.

• Favourite preamps: Ampex 351, John Hardy M2, Neve 3115, B002, Massenburg 8400.

"Normally I'll have two microphones on each cabinet, a dark mic and a bright mic, say a ribbon microphone and a condenser, or two different condensers with different characters. The idea is that you can adjust the balance until it sounds pretty much the way it does in the playing room. I point them straight to the middle of the speaker cone, the same distance away from the speakers, about 10 to 12 inches. If it's a loud amplifier you don't want the microphone too close. If it's a clean, round sound, or a very bright sound, then I might use a vocal microphone.

"For very distorted but very bright guitars I'll use a brighter mic preamp like the Ampex, but for heavier sounds or sounds with a very important bass content, I'll use the John Hardy, a Neve, or the Massenburg. I don't normally process the guitar while recording. If it doesn't

a clear line of sight for everyone. That's more important than whether they are physically in the same room.

"I prefer to record as much of the band in one live take as possible. If you do it any other way, the band is forced into an unnatural situation from the very beginning of the process. They play together in the rehearsal room and on stage, so it seems normal to me that they also play together when they come into the studio. With 90 percent of the records I do, the singing is recorded after the band, unless the singing is what leads the band. With folk-type records the singing often has to be done at the same time, otherwise it doesn't sound right."

Albini has gone on record as saying that recording a band is purely a technical issue, in the sense that he's doing little more than documenting what's happening as faithfully as possible. "I would very happy if my fingerprints weren't visible," he said seven years ago. In this sense his approach to engineering can be likened to realistic photography, although, as Albini concedes, even a photographer makes choices in how ▶

Electrical Audio's well-stocked mic locker.

sound right, I'll fix it by swapping or moving microphones, and then it goes straight to tape. I'll talk to the guitar player and ask him whether he's happy with the way his guitar sounds. If he's happy then I don't want to touch it. When I'm working on 16 tracks I'll submix the two guitar microphones before going to tape. With 24-track, I try to leave them separate."

Vocals

• Favourite microphones: Neumann U47, U48, AKG C12 or 451, Shure SM7, Electro-Voice RE20, Beyer M88, Sennheiser 421, Josephson 700A.

"Vocals are quite complicated to record. When the guitar player is playing the guitar, and someone's listening to him, they're hearing guitars, they're not hearing him. But with a singer, they're hearing the guy. That can be nerve-racking, and so it's important that singers are comfortable. I like the classic vocal microphones, but there are some situations where you have, for example, a crooner or someone with a very softly modulated voice, and they sound the best with a ribbon microphone. Conversely when you have someone who sings very quietly and you need a microphone with a lot of detail to make that sound realistic, I like the Josephson 700. It is a fantastic vocal microphone.

"Where I place the microphone depends on the singer. Normally I'll start with whatever their normal intuitive distance is from the microphone and then let them hear the results. If they think it sounds too boomy I'll have them move back and if they think it sounds too thin then I'll have them move forward. Vocals are the only instrument that you have to compress a little bit, otherwise the dynamic range is too wide. I normally compress the vocals about 4-6 dB or something like that — generally, at the quietest passages the compressor is not doing anything, and at the loudest passages it's doing 4-6 dB."

Bass

• Favourite microphones: Beyer 380, EV RE20, Josephson C42, E22s, Audio-Technica Pro 37R, AKG 451, Altec 165/175.

• Favourite preamps: John Hardy 2, Neotek desk.

"It's the same basic idea as with electric guitars. I'll try to have a dark [*Beyer, EV*], and a bright [*the rest*] microphone on the cabinet, the idea being that if you balance the low-frequency and high-frequency microphones, you can get a more accurate representation of what the cabinet sounds like. I normally run the low-frequency microphone through a soft compressor, at a ratio of 3:1 or 4:1, and it's not usually working more than 3-4 dB. I don't normally compress the brighter of the two microphones."

Drums

Favourite microphones:

• Bass drum front: AKG D112, EV RE20, Beyer M380.

• Bass drum back: small condenser or dynamic mic, often Shure SM98.

• Snare top: Altec 175, Sony C37p.

• Snare bottom (occasionally): Shure SM98, Altec 165/175.

• Toms: Josephson E22.

• Cymbals: Neumann SM2, AKG C24.

• Overheads: Coles STC4038, Beyer 160, Royer 122.

• Ambient: small-diaphragm condensers like Altec 150, Neumann 582.

"I have miked drums in quite a few different ways. Sometimes I'll just have an overhead microphone and a bass drum microphone. Normally there are close mics on all the drums, as well as ambient microphones, and a stereo microphone in front of the drum kit for cymbals. It's hard to describe where I place them and it varies a lot. If the drummer plays very lightly, then there's a lot of attack and not a lot of tone, and I want the microphone to look at the contact point of the snare drum. If the drummer is playing very hard and he's exciting the whole drum, I usually have to back the microphone off a little bit so that it's not overloading. For the ambient mics I'll walk around the room and see where it sounds good, and I usually have them on the floor to take advantage of the boundary effect, and to minimise early reflections.

"I'll occasionally compress the front bass-drum microphone while recording, in the same way as the bass guitar, at a low ratio of a couple of dBs. The snare drum tends to overwhelm the overhead microphones, so I'll have a very fast-acting peak limiter on the overhead to keep the snare drum from doing that. I don't normally compress the room but I'll sometimes delay the ambient microphones by a few milliseconds and that has the effect of getting rid of some of the slight phasing that you hear when you have microphones at a distance and up close. If you move them a little bit further away then they move out of what's called the Hass effect area, and when you move them far enough away they start sounding like acoustic reflections, which is what they are."

he depicts reality. "The idea that you can have an objective perspective in the studio is insane. I think great music is not made to suit objective criteria. Great music is made by people who are obsessed with something. I appreciate it when someone says 'That sounds good, but I hate it. I want it to sound more like this or like that.' I think it's an appropriate response for someone to say that they want something to sound strange in a specific way. And my job as an engineer is to make sure that the sound coming out of the speakers satisfies the band.

"But even at his most extreme, Brian Eno didn't manipulate records as much as any sophomore in college does these days the moment he gets a Pro Tools rig. The manipulation capabilities of the digital editing programs are now so elaborate that sonic manipulation has become a cliché. I don't see the studio as a laboratory as more important than the band as a performing unit. Anyone can do whatever he wants in the studio — I would never say 'No, you're not allowed to do this.' But in the same way that not every movie should look like *Star Wars*, I don't think every record should be manipulated to the extent that they often are. I don't understand where the impulse comes from to make a record that doesn't have any relationship to the sound of the real band. That seems crazy to me."

But what, for instance, if in his opinion an arrangement of a song doesn't work? Surely, many bands come to him because of his reputation and would therefore want him to comment or improve on what they're doing? "It's none of my business," replies Albini. "If the band has decided to do something, it's their record. I think it's rude for an engineer or producer to say 'You guys are wrong about your own music.' I think that's almost unforgivable. It's like saying 'Here, let me show you how to f**k your wife. You're doing it all wrong.' It just seems crazy.

"If a band asks me for my opinion, I'm happy to present them with options, but I'm not going to make their records for them. I know that my tastes are not the same as everyone else's. My tastes are actually f**ked up. I like music that is in a lot of cases unpleasant. If I were to try to satisfy my own tastes with every record that comes to me as an engineer, I'd make a lot of freakish records that wouldn't flatter the band in any way, and no-one would like them. So I could not possibly exert my own aesthetic on every record that comes in here."

Leave Well Alone

Although Albini is willing to do something "fantastic" when required, it doesn't come as a surprise that he's reluctant to apply many effects at any stage of the recording, whether recording or mixing. He takes issue with those engineers and producers who like to fix it in the mix, and even with respected studio forces like producer Daniel Lanois, who has described the mix as a performance. "I think that's a very egotistical statement," opines Albini. "I don't subscribe to the idea that you make a record during the mixing stage. That's putting too much emphasis on it.

"Ninety-nine percent of mixing is the balance. If you can hear what everyone is doing, and it all sounds flattering, then you can't really make any mistakes. In most cases there's a natural stereo balance that you try to duplicate. Panning is part of that balance. I'm not a fan of dynamically panning things, with things moving about. I tend to present things from the perspective of the musician: if you're sitting at the drums, then the hi-hat is at the left and the floor tom on the right, if you're a right-handed drummer."

Given the omnipresence of compression on today's recordings, particularly in grunge rock, it's perhaps surprising to find he doesn't actually like compression very much. "I'm not a fan of the sound of compression and I try to avoid it. I've used stereo buss compression on one of the hundreds of records I've made, and that was an experiment and I learned what I needed

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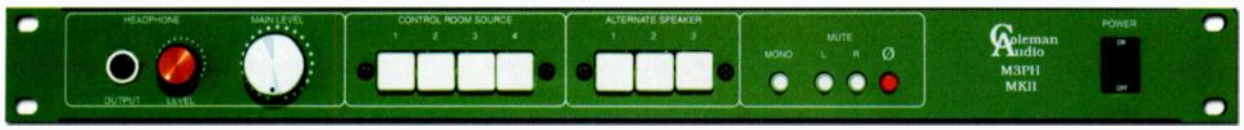

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from that. There will occasionally be compression on individual instruments in the mix, but not often. I don't normally try to get rid of wild dynamics. I try to incorporate them. If it sounds good, it sounds good, if it doesn't, it doesn't. When I can hear compression working I'm kind of irritated by it. It bothers me because it seems like I'm hearing this machine rather than the band."

Albini's tune is much the same with regard to other effects and processors. "Occasionally I'll use some EQ during the mixing, because you can have overlapping sounds that cause interference problems, and so you use EQ to open up the sound a little bit. I may use a gentle passive shelf equaliser rather than a resonant band-pass equaliser on the stereo buss, or on a stereo submix, if I need to brighten up the drum overhead microphones, or if I have a vocal that needs a little bit of brightening. I also sometimes put the NTI EQ3 or GML 8200 across the stereo buss.

"With regards to reverbs, we have the best in the world. We have a really nice, beautiful-sounding old plate reverb, the Echoplate, and we have a spring reverb tower, the AKG BX20, which in its day was the bee's knees for long reverbs. It was a $5000-10,000 device when it was made, in the late '60s and early '70s. It's about six feet tall and has two spiral reverb springs and it sounds lovely. We also have the Quantec XRS XL, which for my money is the best digital reverb ever, and with the Klark Teknik DN780 and the Lexicon PCM70, PCM80 and Prime Time, we have all the necessary options for reverb.

"I nevertheless don't find myself using reverb very often, because I don't think it's as necessary as most engineers and producers think it is. They use it almost a reaction, an automatic reflex: when a singer starts singing, they put reverb on it. It's a thing that's done *pro forma* a lot of the time. They put it on because they feel they're supposed to. I've never had that

Desk Mods

The advantage of dealing with a small, local desk manufacturer such as Neotek is that Steve Albini has been able to ask for numerous custom modifications to the Elite desk that's in one of Electrical Audio's control rooms. "One of the most important changes was to the stereo master output. In the original design there was a wide-bandwith power amplifier that was used as the output drive amplifier. The idea was that you would put your stereo outputs in parallel to this one output amplifier. We had separate output buffers installed for each stereo output, so if there's a problem with the CD recorder or DAT machine or digital converters, it won't fk up your master recording. Isolating all the stereo outputs made for a safer system as far as the stereo master is concerned.**

"The stereo master also has a pre-fader insert that wasn't on the original console. You can assign an auxiliary stereo buss from any of the channels, and this allows you to have parallel outboard processing on some channels. By using the return from that auxiliary stereo buss you can have, for example, a side mixer or an outboard Pro Tools rig or any number of things that you can add to the stereo buss, without having to go through channel electronics.

"In the original console there were a series of mute groups that you could assign using the solo and play buttons on the channels. Because we were using the Flying Faders and the solo and play function wasn't necessary, we had all of that removed just to avoid the possibility of muting parts of the desk.

"The subgroup outputs of the desk can be stereo submasters that go through a stereo mix or they can be submasters that go out of the desk as output busses. We had those converted so that there was an insert on each of those busses, again to allow for parallel processing. The subgroups now all have direct outputs as well. We envisioned that it would be useful for surround mixing if we were ever asked to do that. But surround mixing has basically disappeared, so I don't think that will ever happen."

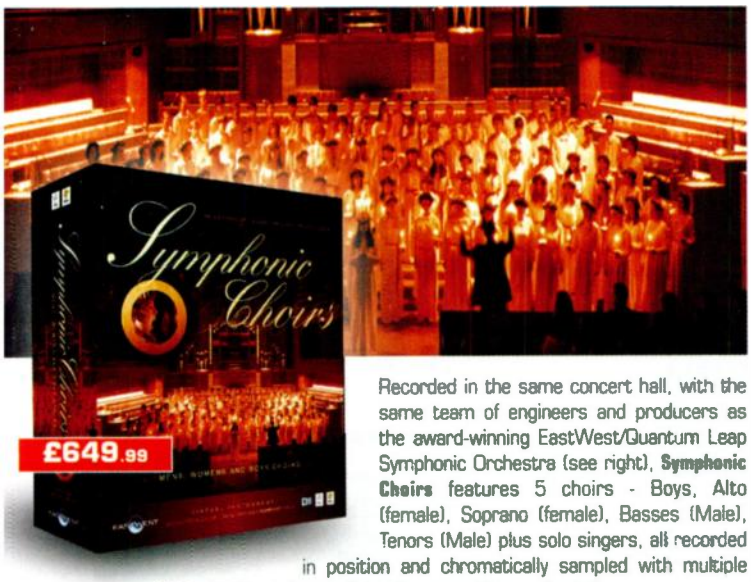
The Neotek Elite desk in the larger control room at Electrical Audio has been extensively modified.

response. I'll wait until someone says 'That sounds weird,' and then I'll try reverb. And if you do need reverb, it's great to have really nice ones available and not to have to make do with lots of artificial crap."

Albini lays down the final mixes at Electrical Audio on half-inch analogue tape, mostly using the Ampex ATR102. He's happy to make CD listening copies for the band, but insists on analogue mixdown because he reckons that the problems with the durability of digital storage media are as unresolved as ever. But with all the recent upheavals in analogue tape production, doesn't he worry about the longevity of the analogue medium? "I don't think that digital tape will be manufactured for much longer," reckons Albini, "but analogue tape is manufactured again as we speak."

Indeed, after being shut down because of bankruptcy at the end of 2004, Quantegy has recently been taken over by a company called Discount Tape and is back in production. Albini also points to the British company Zonal, which used to supply the BBC, and apparently plans to produce tape again, to a Dutch company that has bought a former Philips cassette tape plant and the rights to Agfa and Mtech tape, and to ATR Services in Pennsylvania. The latter intends to begin manufacturing analogue tape later this year under the name ATR Magnetics. But the latest word from Holland is that with Quantegy back in the market, the PDM company has for now suspended plans to enter the professional tape market.

Albini is unconcerned by all this uncertainty. "To be honest, I saw it coming, and we built up a huge stockpile of analogue tape here." In more ways than one, Albini remains ahead of the game. SOS



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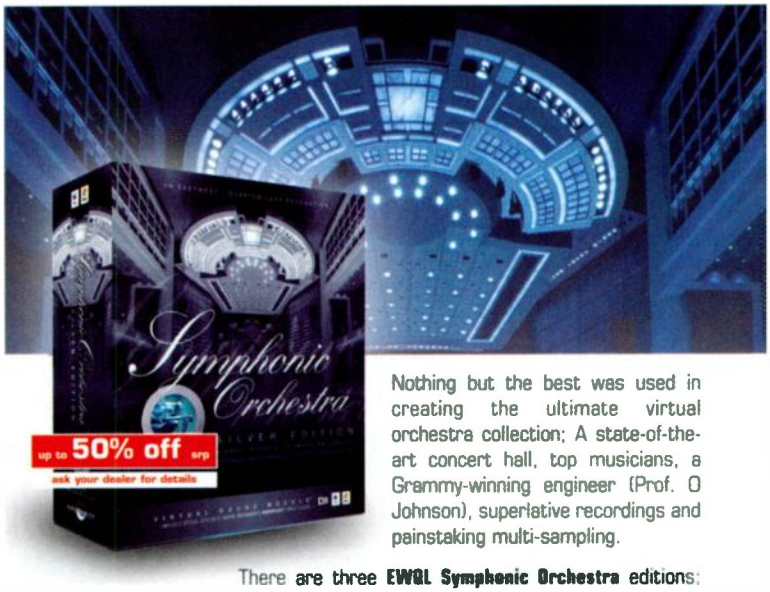

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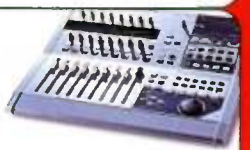

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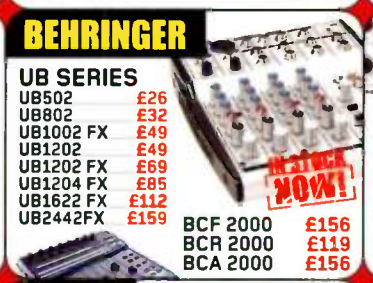

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Roland V-Synth XT

Variphrase Synthesizer & V-Synth OS v2: Part 1

The V-Synth repackaged Roland's groundbreaking Variphrase technology, creating a powerful new kind of sample-based synthesis. Now there's a rackmount V-Synth, and as you'll discover in our two-part review, it's more powerful than the first...

Gordon Reid

Five years ago, Roland released the VP9000 (reviewed back in *SOS* June 2000, and readable for free at www.soundonsound.com/sos/jun00/articles/rolandvp9000.htm), a 2U rackmount device that embodied a new audio-processing technology called Variphrase. This allowed you to pitch-shift, time-stretch, and shift the frequencies of formants independently of one another, whereas, on any conventional processor, they are inseparably linked to one another.

The VP9000 didn't quite live up to Roland's claim that it would permit you to distribute a single sample across a keyboard without munchkinisation, and apply time-stretching without loss of the original timbre or signal quality. Nobody has yet learned how to do these things without introducing artefacts. But despite its limited implementation in the VP9000 — six-voice polyphony and a maximum sampling time of 50 seconds — Variphrase did allow you to shift pitched samples over a fairly impressive range, and alter the pitch and tempo of percussive phrases to fit other elements of your music. These were big steps forward.

Unfortunately for Roland, the VP9000 was not easily pigeonholed — it was neither clearly a sampler nor a synth — and it never really caught on. But three years later, when Roland placed the Variphrase technology at the heart of a synthesizer, they resolved this problem. Offering sampling, extensive factory PCMs, Variphrase, analogue modelling, COSM effects, an arpeggiator, twin D-Beams and an extensive selection of other controllers, the V-Synth was one of the most interesting synths for years.

However, and not unlike the VP9000, the V-Synth confused potential customers. Some commentators criticised its low polyphony, judging it as though it was the poor cousin of a sample-based workstation, but I think that this happened as the result of a fundamental misconception. The V-Synth is not an emasculated workstation, nor is it just a novel sound-generation system... it's a synthesizer in the grand tradition of the Jupiter 8, the Super JX10, and the D50, although it's far more flexible than any of these. Indeed, you can argue that the V-Synth is more flexible than *any* previous synthesizer.

Now, two years after the appearance of the original keyboard V-Synth, we're looking at the second of the first-generation V-Synths, the V-Synth XT. This offers an enhanced version of the V-Synthesis engine (running OS v2) and comes with two expansion 'brains' pre-installed as standard: the VC1, which emulates the Roland D50, and the VC2, a powerful vocal synthesizer, processor, and vocoder.

Given the wealth of options on offer, we're going to look at the XT in two parts. Next month, I'll look at the VC1 and VC2 expansions, and see how the various parts of the XT fit together into a coherent whole. But, before then, I'll describe the synth itself and take at look at the latest goodies in the v2 V-Synth OS.

Introducing The XT

It's no surprise that the new V-Synth is a module. What's surprising is that it's such an attractive one. In these days of uninspiring rackmounts, the 4U, wedge-shaped XT looks the business. And its beauty goes beyond its outward appearance. The XT retains the 320x240 pixel, touch-sensitive colour screen of the V-Synth, has eight assignable knobs, offers friendly, backlit buttons, and its handles give it a reassuringly professional appearance. You can even see the attention to detail when you look at the rack ears. Not just bits of bent metal, these allow you to rotate the entire module when the XT is rackmounted simply by loosening two bolts and sliding the rack-ear assembly, as you can see from the close-up picture on page 112. Alternatively, you can use it as a desktop unit (as I did), in which case you'll find that it's perfectly angled for maximum comfort and controllability. If that sounds like an advert, I make no apologies; the XT is very well designed.

Inevitably, the XT has lost many of the controls found on the top surface of the V-Synth itself. Half the knobs have gone, as have the sliders and the spin-wheel, the 'Time Trip' pad, and the twin D-Beams. However, I'm not dismayed by any of this, because I find the touchscreen to be extremely useable, whether using a fingertip or the blunt end of a pencil. You can point to select functions, 'drag' parameter values up and down, and even adjust graphics by dragging 'handles'. As for performance control... who would want to lean towards a rack of 19-inch modules to use D-Beams? It's much more sensible to make sure that the XT responds correctly to the D-Beams on your MIDI controller (if it has them) or to standard MIDI CCs, which is precisely what Roland have done.

Despite its apparent complexity, a V-Synth patch is very 'analogue' in concept, whether you base it on the available 'virtual-analogue' waveforms, PCM samples, or external audio streamed in through the analogue, digital or USB inputs. Each patch comprises two oscillators, a mixer/modulator, two COSM processors, an amplifier, and an output effects section. You can configure these building blocks in three so-called Structures, but these turn out to be just different ways of directing the signals from the oscillators to the COSM processors.

Inevitably, each module is a complex beast, although this complexity is in the number of options and controls available rather than in mind-numbing concepts. For example, each oscillator and COSM processor module offers numerous sub-pages of context-sensitive controls that adapt to the nature of the oscillator or processor type chosen. Furthermore, almost every element in a module can be modulated, whether by using dedicated envelope generators, dedicated LFOs, or by directing MIDI CCs and performance messages to the appropriate destinations. All of this means that there are a *lot* of parameters.

Oscillators & Mixer

Starting at the beginning of the signal path, the first sound generator option in the oscillators provides a range of digitally modelled 'analogue' waveforms. On the earliest V-Synths, there were just nine of these, but the five waveforms added in OS v1.51 and v2 have enhanced things considerably. The new D50 sawtooth and square waves offer subtly different timbres to the standard waveforms. The Supersaw (which will be familiar to owners of Roland products from the JP8000 and JP8080 onwards) sounds like multiple, detuned oscillators, and this can be the basis for bass and lead sounds as well as pads. Next comes the Feedback oscillator, also introduced on the JP8000, whose harsh, harmonic-laden excesses are ideal for aggressive lead sounds. Finally, there's the new Xmod oscillator, which uses the output of Oscillator 2 to modulate the frequency of Oscillator 1, providing you with what amounts to two-operator FM synthesis.

Once you've selected the wave that you require, the oscillators' sub-pages change to provide the appropriate controls: pulse width and pulse-width modulation for the square waves, feedback amount and ▶

The Upgrade Path (So Far)

In his review of the original V-Synth (in *SOS* May 2003, or at www.soundonsound.com/sos/may03/articles/rolandvsynth.asp), Paul Nagle took a detailed look at version 1 of the V-Synth's sound engine. Roland have upgraded this a couple of times since then: first to v1.51, and most recently to v2. However, there have been no fewer than seven software upgrades for the V-Synth family.

The first three were drivers that made it possible to use the instrument's USB capabilities. Next came a clean-up utility that allowed you to uninstall the USB audio/MIDI drivers for a range of Roland products, including the V-Synth.

Things started to get more interesting with Version 1.51 of the V-Synth OS. This added two new waveforms to the 'analogue' oscillators (the LA synthesis sawtooth and square), and a detunable sub-oscillator. There were also 18 new PCMs, and the 'TB' filter was added to the COSM processors.

Next, Roland released version 2.00. This added more waveforms (the Supersaw, the Feedback Oscillator, and the Xmod Oscillator) as well as some new programming features discussed elsewhere in this article (the multi-step modulator, rhythm sets, and the sound shaper). However, there's a price to be paid. Due to the differences in the sound engines, patches designed under the v1 OS that use PCMs are incompatible with the v2 OS. 'Analogue' patches designed under the v1 OS, and those that process external audio, *are* compatible, although they don't take advantage of the new facilities, for obvious reasons.

Most recently, V-Synth XT driver version 1.1.0 has appeared for the Macintosh. This supports Mac OS X 10.4 (Tiger) and offers improved support for handling recording and playback latencies.

harmonic content for a Feedback oscillator, and so on. But, despite the nature of the waveforms, the XT's grittiness and zipper noise ensure that it is rarely going to be mistaken for a virtual-analogue synth — or a genuine one, for that matter.

The second sound-generator option is PCM, and it is this that makes Variphrase processing possible. When you first switch on the XT (or when you jump into V-Synth mode from either of the expansion modes, which we'll discuss next month), it loads 32MB of PCMs from Internal storage into working RAM ready for use. Loading takes about 40 seconds, which is far too slow for my liking, but I had to forgive this nonetheless, because this architecture has a huge advantage over a ROM-based implementation: it allows you to alter the PCMs used by the V-Synth, replacing them or adding your own, up to a total of 50MB.

There are two ways to create new PCMs; you can sample, or you can import WAVs and AIFF files from elsewhere. Selecting the sampling mode and capturing audio is simple. Just select an empty memory location, press the Sampling tab on screen, choose an input and any input processing required, set up the metronome and the other bits and bobs, and hit 'Start'. When you've finished, you hit Stop, and the XT will then guide you through sample editing and the necessary Variphrase 'encoding' prior to naming and saving the new sound in the working memory. Editing is simple, with a clear display and all the standard zooming, trimming, normalising, looping and zero-crossing tools. The Variphrase encoding process, which detects and/or allows you to identify events so that Variphrase can perform its processing tricks, is equally straightforward, with just four encoding options; one optimised for solo sounds, one for ensemble sounds, one for percussion, and one for general-purpose use.

Having completed these stages, you can use your sample as you would any other PCM. With Variphrase 'off', it will track the keyboard, becoming munchkinised at high pitches, and sounding like the voices of doom at low ones. With Variphrase 'on', it will still track the keyboard, but the duration of the audio and its formant characteristics will — if the encoding has worked correctly — remain constant. You can now do things that would be otherwise impossible, such as locking the sample tempo to a clock (perfect for synchronising different samples), or turning a sample into a monotone so that the XT can replay it in perfect pitch according to the notes that you play. You can also specify one of four playback modes for each encoded sample.

We *still* haven't got bored of seeing touchscreens on synthesizers! This one acts as a replacement for the Time Trip pad on the original V-Synth, too, which seems at first to be missing on the XT.

In the Retrigger mode, the XT acts as a conventional sampler would, starting each new note at the beginning of the sample. In contrast, Legato mode allows you to add notes at the point at which existing notes are playing, which is ideal for playing long, looped phrases. If you want to play snippets of an extended sample in order, but control the time at which each occurs, you select Step mode. This plays the first encoded event when you press a key, the second encoded event when you play the next key, and so on. Lastly, Event mode assigns each event to a different key, allowing you to play the snippets as and when you wish. This has obvious applications for chopping up vocal performances into lines and phrases, and even more obvious ones for manipulating drum loops. Since the real power of Variphrase lies in its ability to handle user samples, I would urge XT purchasers to get sampling as quickly as possible. With 999 memory slots (only 224 of which are occupied by factory PCMs) it's unlikely that you will ever run out of locations.

Having defined your oscillators, you're ready to mix them before passing them to the COSM processors that replace the filters of a conventional synthesizer. You do this in the snappily titled Mod module, which offers mixing, two types of ring modulation, further FM, and oscillator sync of the 'analogue' waveforms. There are no level controls as such, the amplitudes of the oscillators being defined within Oscillator modules 1 and 2, but you can add the original signals back into the ring-modulated and frequency-modulated outputs at any amplitude from zero to unity gain before the audio passes on to the next stage in the signal path.

The Sound Shaper

Roland provide a system called the Sound Shaper for those new to what the V-Synth is capable of. This provides 17 sound categories with up to 10 patch templates in each. When you select one of the templates, just eight switches and knobs are provided — the ones that Roland's designers think are most appropriate to the nature of the sound that you've chosen. Likewise, a second page provides simplified control over the output effects, and a third provides a simplified substitute for the Time Trip screen, allowing you to control two 'X' and two 'Y' parameters in real time.

COSM & The TVA

Roland introduced COSM (Composite Object Sound Modelling) in 1995. In essence, this is a method of modelling the various elements in a signal path and reducing the results to a single algorithm... or, to put it more simply, a method of digitally modelling effects and processors. First used in the GP100 guitar processor, COSM has become the basis of the effects in almost every Roland product since.

There are two COSM processors in the XT. Each of these offers the 15 algorithms found in the V-Synth, including the remarkable 'side-band filters'. These are, perhaps, the definitive processes in the Variphrase engine, making it possible to synthesize new sounds by extracting pitched information from noisy signals such as percussion. Roland's demonstrators love to show how you can use these filters to process, say, a conga sample, extract the tonal elements, and make the results the basis of new, innovative timbres.

In addition to the original set of algorithms, the XT also offers the new 'TB filter'. You might assume that this is an emulation of the TB303's famous filter, but it isn't. It incorporates independent low-pass and high-pass filters with all manner of modulation options, and it sounds quite different. Nonetheless, it's a valuable addition, because its character is distinct from that of the other COSM filters.

Once the signal has passed through the COSM processors, the TVA appears tame by comparison, but this is not the case. In addition to numerous other control mechanisms, all three temporal parameters — Attack, Decay and Release — can be controlled by velocity, according to your choice of velocity curve from the eight available. This can be extremely expressive. And in fact, all the ADSR envelope generators in the XT can be controlled in this way, making it possible to articulate functions such as pitch changes, filter cutoff changes, and mixes, as well as overall loudness, using nothing more than your ability to hit keys harder or softer, as required.

Zones & Effects

Finally, the sound reaches the effects processors. Hmm... that's not quite correct. What's not apparent when you first program the XT is that every patch can have up to 16 non-overlapping zones, with independent oscillators, mod settings, COSM processes and amplification in each — and it's the sum of *these* that reaches the effects processors! I don't think that Roland have been given enough credit for this structure, because the V-Synth is also 16-part multitimbral, which means that a different sound can be played by every MIDI note — within the limits of the MIDI specification and the V-Synth XT's maximum polyphony of 24 notes, of course. Unfortunately, the effects settings from Zone 1 of Part 1 are used across all zones and all channels, although you can determine the amount of each sound that is sent to the effects processors.

There are three of these, offering 41 MFX algorithms, eight choruses and 10 reverbs. There's no complex routing to allow you to rearrange the processors, but you can pass the signal from the MFX to the chorus and/or the reverb, or both in series, specifying the input levels and obtaining an output from each as desired.

As you would expect, the MFX algorithms offer the greatest scope for sound sculpting. These include EQs, filters, distortion, ▶

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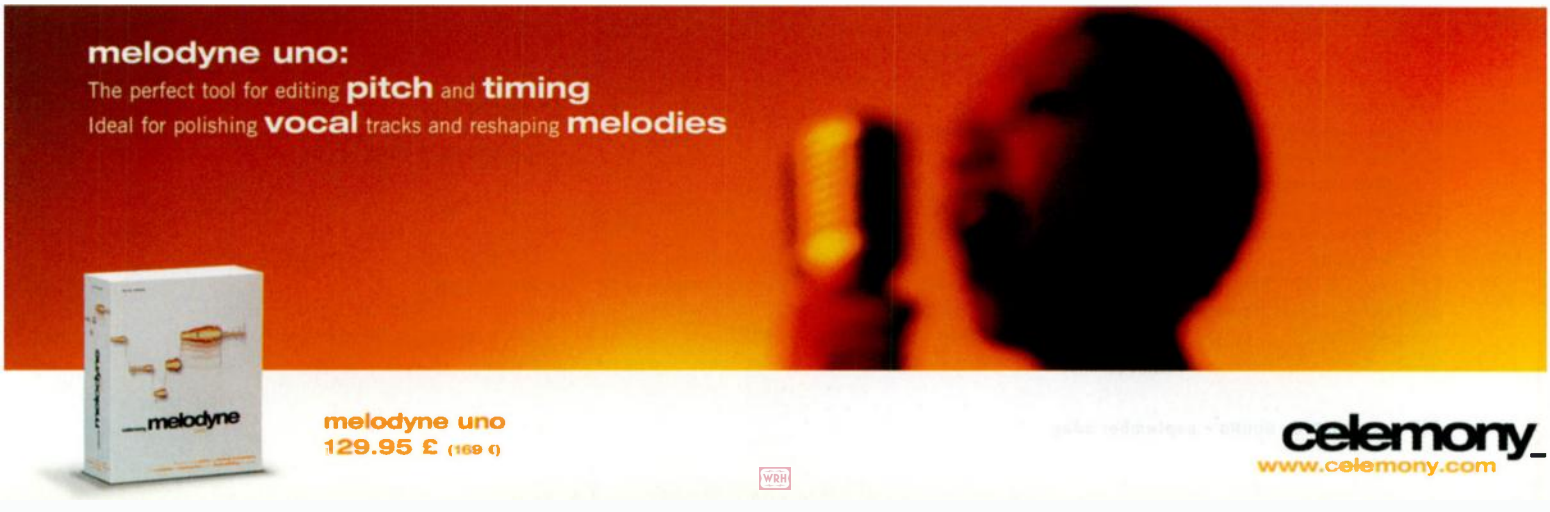

overdrive, numerous amp simulators and speaker models, wah, a 'humaniser', dynamics processors, echoes and delays, choruses, phasers, a rotary effect, a pitch-shifter, tremolo, auto-pan, enhancers, and a decimator, plus 'multi' programs that incorporate up to five Boss-style effects in a single MFX. There are even algorithms that let you add scratches, clicks and hiss to recreate the noise, distortion, and limited bandwidth of unrestored old records and poor AM radio reception. If the XT were 'merely' an effects unit, it would still command a sizeable review!

Having created a sound, the XT offers many ways to spice it up. For example, the v2 OS adds a Multi-Step modulator with four 'tracks' of 16 steps that you can direct to your choices from 77 possible destinations. You can loop the step sequences and even apply smoothing, which allows you to use them as arpeggiators, LFOs, and quasi-random voltage generators. Roland provide a number of templates as well as a range of programming tools that allow you to develop your own modulation sequences quickly and easily.

In addition, the XT includes a true arpeggiator, although this is basic by the standards of the rest of the synth. For one thing, it works on the whole patch, no matter how many zones you define within it, and only on Part 1 in a multitimbral setup. Nevertheless, it's a useful module that allows you to program polyphonic phrases of up to 32 steps in addition to its conventional patterns. This couldn't be simpler; if you're brave enough to enter notes in real time, just press the Real Rec button in the Pattern Edit screen and give it a go. Alternatively, press Step Rec, and play discrete notes (or groups of notes) until you've entered as many steps as you want. All other things being equal, your phrase will now play correctly and track any note you press on the keyboard. If you've also programmed pitch changes into the Multi-Step modulator, the resulting patterns can become very complex, very quickly.

Loosening the large bolt (and its companion at the other end of the V-Synth XT) allows you to slide the rack ears so that you can mount the XT flush or angled in your rack — a nice touch.

Even cleverer is the way in which Roland have compensated for the lack of the V-Synth keyboard's 'Time Trip' pad. Lacking the space for a physical controller, the designers have turned it into a virtual pad, creating a full-size representation on the XT's LCD. This acts as on the original V-Synth, with two modes: X-Y for standard control functions, and TT (circular) to scan backwards and forwards through a sample. Don't overlook this; despite the XT's almost uncanny knack of conjuring something worthwhile from serendipitous twiddling, it's worth thinking ahead when programming, because patches can leap to life if you use aftertouch, the Time Trip pad or (if available) the dual D-Beams to which it can respond.

In addition to all of the above, the XT allows you to resample its main left and right outputs, thus turning complex sounds,

V-Synth XT Abridged Specification

VOICING
- Oscillators per voice: Two.
- Oscillator types: PCM, Variphrase, Virtual Analogue.
- Virtual-analogue waveforms: 14.
- Oscillator sub-modules: Four envelopes, one LFO (per oscillator).
- 'Mod' mixer/modulator: Five algorithms.
- COSM processors per voice: Two.
- COSM types: 16 algorithms.
- COSM sub-modules: Two envelopes, one LFO (per processor).
- Amplifiers (TVAs) per voice: One.
- TVA sub-modules: One envelope, one LFO (per voice).

EFFECTS
- MFX effects: 41.
- Chorus effects: Eight.
- Reverb effects: 10.
- System EQ: One.

MEMORY
- Patches: 512.
- Waveforms: 999.
- RAM: 50MB.
- Memory used for preset waves: 32MB.
- Card formats: PC Card, Compact Flash, Smart Media (Compact Flash and Smart cards require an optional adaptor).
- Audio file formats: AIFF, WAV.

LAYERING, POLYPHONY & MULTITIMBRALITY
- Zones per patch: 16 maximum.
- Multitimbral parts: 16 maximum.
- Polyphony: 24 voices maximum.

INTERFACE
- Screen: 320x240 touch-sensitive colour LCD.
- Assignable controllers: Eight.

DIGITAL SPECIFICATION
- Sample rate: 44.1kHz.
- I/O: 24-bit resolution, with 44.1, 48, or 96kHz sampling rate.
- Internal signal path: 32-bit floating-point.
- Effects resolution: 24-bit fixed-point.

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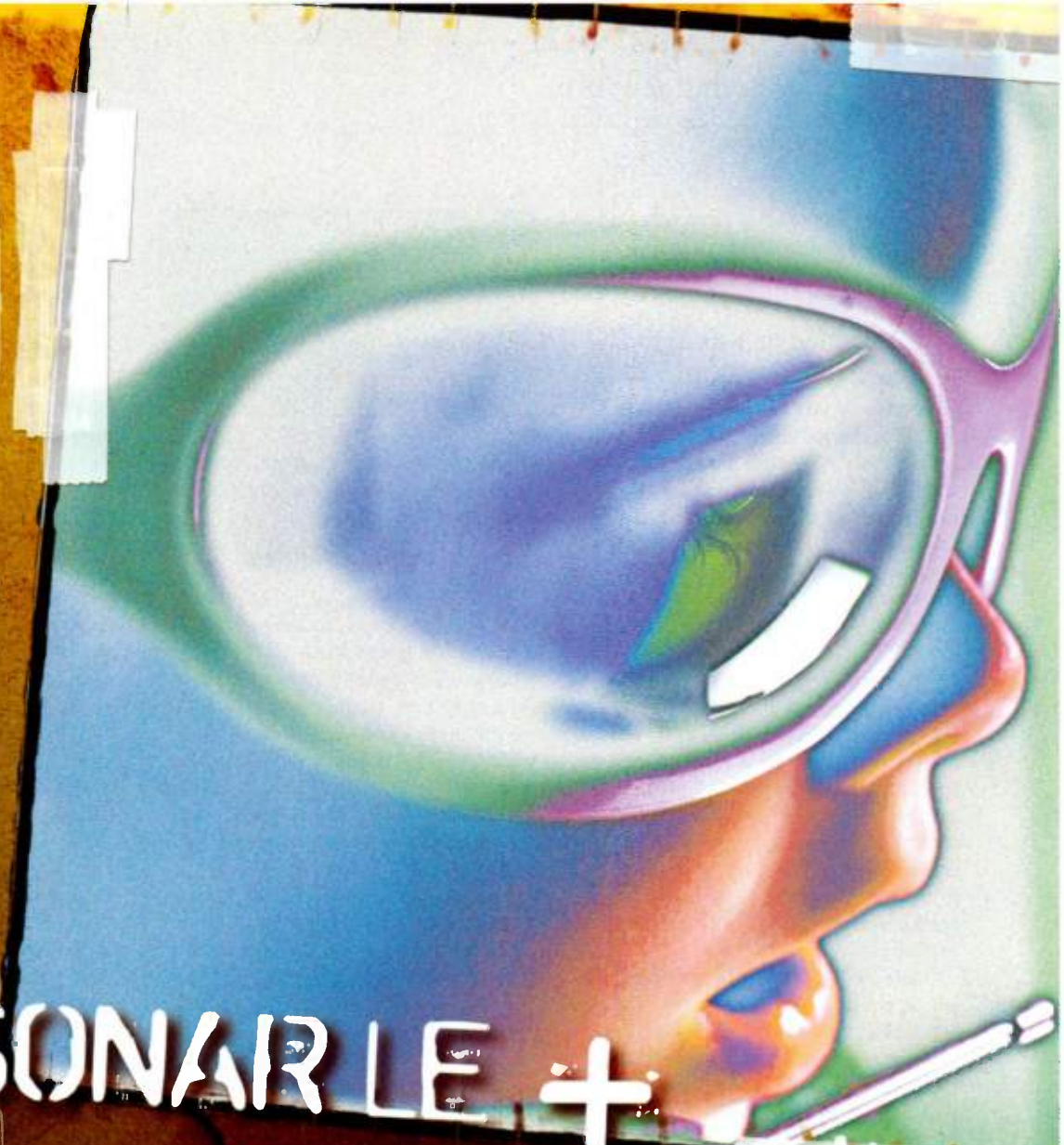

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Rhythm Kits

Also new in the v2 V-Synth OS, Rhythm Mode allows you to distribute (up to) five patches across the range C2 to C7, for a maximum of 61 sounds in a so-called Rhythm Kit. However, you can't assign these patches freely. The lowest starts on C2, and you can allocate its first 12 zones up to B3. Similarly, the second patch occupies 12 notes from C3 to B4... all the way up to the fifth patch, which has 13 zones from C6 to C7.

The patches in a Rhythm Kit are not entirely independent of one another, and they share effects settings and the arpeggiator. Indeed, the effects that you specify for the first patch in a Kit will be used for all the other sounds in a multitimbral setup and, if there's a Kit present (it must be part 1), only 11 further parts (part 2 to part 12) are available for non-Kit patches; parts 13 to 16 become unavailable.

There are four Kit memories available and, as shipped, these are called 'BreakWild', 'House&Ele', 'HiTech&Nz', and 'HipTronic': names that tell you pretty much how they sound. Clearly, the XT is not intended as a source of conventional drum kits, although you could create one by sampling (or importing) suitable sounds and building the kit yourself. To be honest, though, I wouldn't bother. Surely the *raison d'être* of the XT's Kits is to assemble the weird and wacky percussion sounds generated by Variphrase, arpeggiate them, modulate them, and otherwise mangle them, not to imitate a Dr Rhythm box that you could pick up for next to nothing through the *SOS* Readers' Ads?

Test Spec

MAC REVIEW SYSTEM
- 1GHz Apple G4 Powerbook with 1GB of RAM, running Mac OS v10.2.8.
- Plogue *Bidule* v0.8002 (used as I/O host).
- Roland V-Synth XT OS revision used: v2.0.
- V-Synth XT driver version used: v1.0.0.

Sound Designing

In 2003, Roland left half of the V-Synth's patch memories empty, supposedly to 'confirm the V-Synth's status as an instrument you'll want to program', as they put it at the time. Maybe they simply hadn't completed the sound set when v1 of the V-Synth OS was shipped! In programming the v2 sounds, Roland have taken a different direction from before. The V-Synth arrived stuffed with atmospheres and ambient pads, but the XT contains more conventional sounds, although the warped, twisty textures are still present (you may remember that Korg made a similar move to more conventional sounds when they upgraded the original Wavestation to the Wavestation EX).

Anyway, the XT now offers damn good percussive patches, vocal patches, lead synths, bass synths, strings, brass, wind instruments... and most other things. What else would you expect from something that is, after all, a sexed-up sampler?

For decades, Roland and other manufacturers have placed the patch most likely to raise eyebrows in patch location #001, and 'Da 'V' Code' is an excellent example of this. It's a very simple patch, with limited COSM filtering and simple effects, but the combination of a drone based on the Supersaw waveform and a Latin chant (PCM #117, 'VOC-LatinPhr') is sufficient to make you want to don a purple cloak and offer funny handshakes to people.

The best illustration I can give of the V-Synth's power comes from some programming I did whilst in the middle of my review. Eager to prove that I could derive something useable from the most unlikely of sources, I used a fraction of the XT's capabilities, creating a slowly shifting, metallic texture with vocoder-like overtones from an AIFF file assigned to a single oscillator, passed through a single COSM processor, and then processed using some simple stomp-box-like effects. I then invited various listeners to guess at the source file. Some were reminded of Vangelis, while others marvelled at its ethereal, evolving quality, but nobody ever guessed that I had started with the sound of the Crazy Frog.

The other major use for the XT is as a real-time signal processor, so I plugged a guitar directly into the quarter-inch socket on the front and experimented with the COSM processes and effects. The results ranged from subtle to monstrous, and I urge everyone to try this. Ignoring the obvious processes (like the Amp and Speaker models) I selected one of the side-band filters to extract the pitched elements of the guitar's already (largely) pitched sound, and immediately produced all manner of Eastern twangs and drones that would have made George Harrison very happy on a wet weekend in 1968. I then found that waveshaping the guitar's output created an interesting new range of distortions that you would otherwise find hard to obtain. Players of a more 21st-century bent will also

Ins & Outs

The XT is well endowed with inputs and outputs. Starting with the front panel, this is where you'll find the microphone input, which accommodates unbalanced and balanced quarter-inch jacks as well as three-pin XLRs. There's an input-level control and a three-position switch that offers high-impedance, normal and 'phantom on' settings, so the XT will accept signals from just about anything sensible. The other three connections on the front panel are a USB socket (for audio, MIDI and file transfer), a stereo headphones output, and a PC Card slot.

The PC slot is designed to take memory cards, but Compact Flash and Smart Media cards can be used with a suitable adaptor. Roland's web site identifies several Compact Flash cards and adaptors compatible with the original V-Synth, although at the time of writing, they hadn't yet been tested on the XT module.

Round the back of the XT, you'll find MIDI In, Out, and Thru sockets, two analogue stereo output pairs, an analogue stereo input pair, plus coaxial and optical S/PDIF inputs and outputs — the digital outs carry the same signal as the main analogue outputs. Finally, there's an IEC socket for the universal power supply, which accepts US and European mains power (115 to 240V, at either 50 or 60Hz).

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Version 3.10 is a free upgrade to the GigaStudio 3 sampling software, adding many new features and increasing the functionality of this already-powerful sampling package. This update adds new iMIDI templates, making it easier to use iMIDI rules for adding life to instrument sounds, and a host of new iMIDI rules and features. The Stack Instrument Selection feature allows you to quickly assign keyswitches to swap sounds on a MIDI channel during a performance effectively shattering previous limits on the number of Dimensions possible. Version 3.10 also adds drag & drop creation of GigaPulse presets, user interface enhancements, new comprehensive keyboard shortcuts and a list of other improvements.

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▶ discover that the XT can act as a powerful filter bank for processing the outputs from other synths. But, good though all of this is, there's a problem. The XT has no 'Hold' function, so I had to use a dagger to jam down a key on my controller keyboard to keep the signal path open. Oh, all right... it wasn't a dagger exactly, but without it, silence reigned.

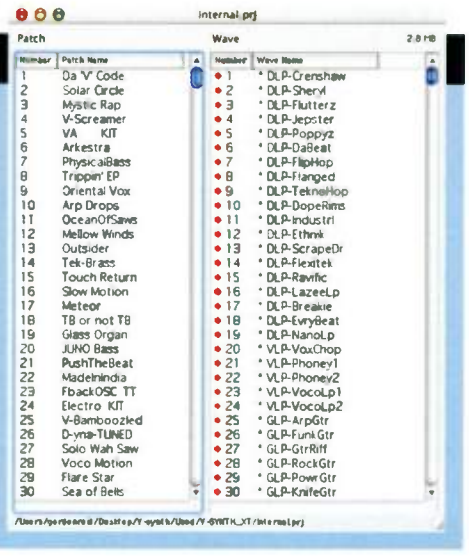
In Use

If you want to reinitialise the XT, you can perform a factory reset at the touch of just a couple of buttons. Alternatively, if you like what you've created, and want to archive the current 'project', you can dump the internal memory to a PC card. Of course, this is a relatively expensive way to archive sounds, so the XT comes with a CD-ROM containing Windows and Mac drivers for USB communication, so that you can transfer files to your Mac or PC and store them there. However, according to Roland, to do this you need at least a 500MHz G3 Mac running Mac OS 10.2.3 or later and with 256MB of RAM, or a PC running Windows 98 or later with at least 128MB of RAM.

I loaded the right driver onto my Mac G4, whereupon the XT appeared in Mac OS and other applications as both an audio input and output, and as a MIDI input and output. Using the XT as a real-time stereo audio interface was then trivial; I simply replaced the Tascam US428 that normally hangs off the end of my USB cable, and everything worked without further ado. Using USB MIDI was equally straightforward: I connected my Korg Legacy MS20 controller to one USB port on my Mac, connected the XT to the other, and linked the Korg's MIDI Out to the Roland's MIDI In within my chosen MIDI + Audio host, Plogue's *Bidule*. And it worked — the Korg played the Roland, and the mod wheel and master volume control performed their appointed tasks without additional configuration. I found that I could even play the XT simultaneously from the MS20 controller and the D50 that I was using as a standard MIDI controller. However, when I attempted to use the Mac as a storage device, things were a little trickier...

The V-Synth Librarian

The Librarian supplied on the V-Synth XT's accompanying CD-ROM is a Mac/PC application for managing Projects, patches and waves. Using the XT's USB storage mode, you can transfer a Project to your computer, break the connection (in software, not physically) and then copy, move, rename or delete files in Windows or Mac OS X. Once you've carried out your housekeeping, you can then save the project, whereupon you re-establish the computer's connection to the XT and load the revised data into the working memory. It's all somewhat arcane, but it works.



The V-Synth's software Librarian running on the review Mac G4.

Following Roland's instructions, I selected USB Mode in the XT's Mode Menu page, whereupon the XT asked if I wanted to connect the Internal storage to the Mac (the PC Card icon was greyed out because I had no PC Card inserted). I touched 'Internal', and the message 'Connecting' appeared as the XT and Mac established communication with one another. I then tried to exit the USB page, whereupon the XT asked me "Disconnection Will Be Done Before Ejecting — Are You Sure?" In other words, it's not possible to adjust anything on the XT or play it while using USB for storage. This gets the thumbs-down from me.

By this time, a drive icon entitled 'V-SYNTH_XT' had appeared on my Mac's desktop. I could open this and copy to or from it as I would any other drive, but there was no way to discover whether the appropriate changes were being made within the XT itself. To find out, you have to exit USB Mode... except that you can't. If you try to leave, nothing happens; you have to eject the drive from the Mac's desktop before the XT will allow you to Exit and return to normal use.

Once back in Patch mode, I searched for the WAV files I had copied onto the V-SYNTH_XT volume, but the XT's sample list had not been updated because, although the files were now inside it somewhere, I still had to import them into working memory using the Disk Mode commands.

Arcane though this is, the storage mechanism only failed once during the review period when — for reasons I have yet to fathom — a sample that accompanied a saved and reloaded patch disappeared. Cursing under my breath, I hit the buttons to invoke USB Storage mode but, on this occasion, the V-SYNTH_XT icon did not appear on my desktop! I had to power-cycle the XT (which took nearly a minute) before it would do so, after which I re-copied my sample into the Wave folder on the virtual drive, ejected the virtual drive, exited USB Mode, re-imported the sample in Disk Mode, and finally reinserted it into my patch. Simple once understood, this is a clumsy system, and it's going to trip you up more than once before you get used to it.

The ability of the XT to produce innovative sounds quickly and easily is remarkable, although it's not always obvious what you're going to get when you start working on a patch. For example, I changed the PCMs in a woodwind patch to analogue-style waves, adjusted the COSM filters, and ended up with the brassy, polyphonic keyboard parts to 'Fanfare For The Common Man'. A while later, with a somewhat greater amount of twiddling and fine-tuning, I had a single patch with zone 2 approximating an ARP monosynth, while zone 1 (below it, keyboard-wise) was producing a sound not a million miles from a rusty old Hammond. These patches weren't perfect imitations, but they nevertheless demonstrated that the XT is capable of a very wide palette of timbres, from emulations of classic synths to the most modern textures and grooves.

Sure, the XT has its shortcomings, but apart from the unfriendly storage functions, you have to dig deep to find them. Limited polyphony...? Well, that's par for the course for a true synthesizer. A limited number of outputs...? That's acceptable, because the XT is not trying to be a multitimbral workstation. The inability to overlap zones in the patches to create complex, layered sounds? It's an irritating limitation, but, given the complexity of the individual sounds generated by the V-Synth engine, it's not a huge problem. The inability to read existing sample libraries...? That's frustrating, but understandable given the nature of Variphrase. What about the limited, non-expandable sample memory? Admittedly, that's not so good, and the ability to store Projects on PC Cards or externally is of little comfort if the samples you want to load are too big for the working memory. It would be nice if Roland could address this point.

Nevertheless, I can't find it within me to hold any grudges against the XT. It has operated almost entirely without glitches or nasty surprises, and its user interface is superb. Consequently, I found myself playing it more and more, and writing about it less and less, losing an unhealthy amount of sleep during the course of this review. One morning, my ever-patient girlfriend even sent me to bed as she got ready to go to work. Given that I was supposed to leave the house myself just two hours later, that was not a good thing.

One of the reasons for this was because, sometime during the night, I had pressed the on-screen buttons that led me to the pre-installed VC1 and VC2 expansion cards. Next month, I'll tell you all about these, and reach some conclusions about how well they work within the context of the XT itself. Until then... SOS

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Forgotten Science

The Lost Art Of Sampling: Part 2

As we saw last month, sampling is really just a form of digital recording — but to use short recordings to emulate real instruments, you soon need to understand new concepts like multisampling, looping, and velocity switching. We explain all...

Steve Howell

Last month, we saw how digital recording lies at the heart of sampling, and explained some basic digital recording concepts, including that of analogue-to-digital conversion and sampling rate. During the digital conversion process, an incoming audio waveform is sliced up into tiny sections and its amplitude in each of these slices (or samples) is measured and stored as a series of binary numbers that can be understood and manipulated by a digital audio processor and/or a computer. As we have seen, to reproduce any given frequency accurately with minimal side-effects, it is necessary to slice at at least twice the rate of the highest frequency you wish to record digitally. As the upper limit of human hearing is supposedly 20kHz, the industry-standard sampling rate for CD-quality digital audio was set at 44,100 times per second (or 44.1kHz, as it is more usually written).

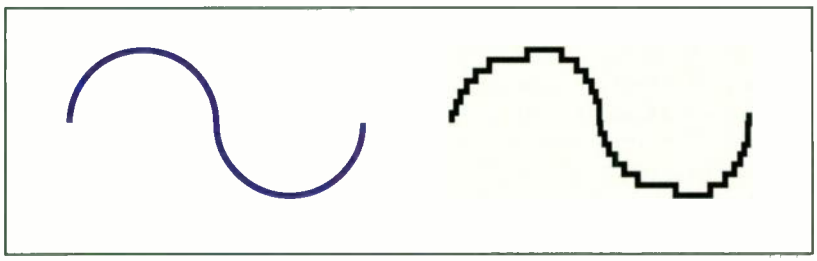
Bits & Pieces

However, there's more to digital recording than sampling rates. Whilst this rate determines the maximum *frequency* that can be accurately recorded, what determines the maximum amplitude, or volume, of the signal being sampled? This is determined by the analogue-to-digital converter's 'bit depth' or 'quantisation' (not to be confused with the timing quantisation found on sequencers). Fortunately, this concept is much less complicated than it sounds — basically, the bit depth refers to the number of binary bits (values of either 0 or 1) which are used to digitally store the waveform amplitude measurements in each of the thousands of samples made per second.

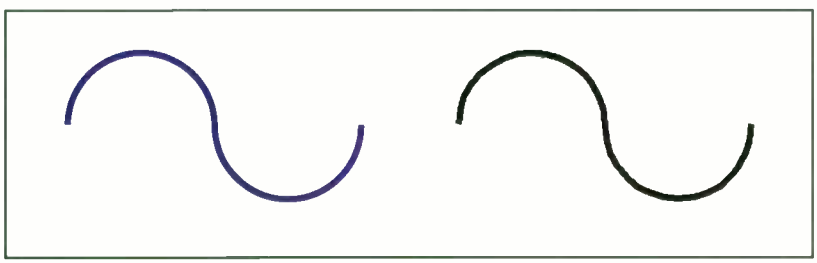
Just as the highest frequency it's possible to accurately record in a digital system increases as you up the sampling rate, so the accuracy with which you can digitally store the volume changes in an analogue signal increases as you up the number of binary bits used to store the amplitude measurements. At one extreme, if you use only a single bit, this can only have a value of 0 or 1 — so the signal is either on at maximum volume, or off completely. Clearly, this isn't ideal for measuring subtle changes in the dynamics of a waveform! If you use two binary bits, you can store four different amplitude levels (00, 01, 10 and 11), and enjoy a system that recognises 'completely off' 'a third of maximum volume', 'two-thirds of maximum volume', and 'maximum volume'. Clearly, this isn't ideal either, but fortunately, as you increase the number of bits, the range of possible amplitude values (and thus the potential dynamic range of your digital recording system) increases *exponentially*. A three-bit recording system can store eight possible amplitude values, a four-bit system can store 16 possible values, and so on.

In the very early days of sampling technology (the late '70s and early '80s), samplers used eight-bit analogue-to-digital

converters, which could assign only 256 (two to the power of eight) different amplitude values to any incoming audio. The use of these converters meant that these early samplers sounded pretty 'lumpy', particularly as they also worked at low sampling rates, which further affected the quality of the sampled sounds in an adverse way. You can see why by taking a look at the graphs below. If sampling rate determines the *horizontal* resolution on this graph (the accuracy with which the frequencies are depicted), then the bit depth or quantisation represents the



The effects of converting a sine waveform to digital at a low bit rate. A higher sampling rate wouldn't help this blocky waveform: this would mean there would be more individual samples, but the same low number of amplitude values (vertical values on this graph) to which the samples could be assigned.



With a higher bit rate, there are more possible amplitude values, so there's more vertical resolution to the converted digital waveform, and it resembles the input waveform more closely. With some filtering to smooth out the rough edges, the output here will sound almost indistinguishable from the original input waveform.

vertical resolution, or the accuracy with which the amplitude is represented. An eight-bit system has, at its theoretical best, a dynamic range/signal-to-noise ratio of 49dB, which is less than that of a cassette recorder.

Fortunately, as the '80s progressed, we saw the arrival of 12-bit samplers and then, of course, 16-bit samplers, and these were the standard through most of the '90s. A 12-bit sampling system can handle 4096 different amplitude values and has a dynamic range of 60dB, while a 16-bit system can handle 65,536 amplitude values, and has a pretty respectable theoretical dynamic range of 96dB. Clearly, this is much more well suited to the level of dynamics in full-range musical or audio recordings, which is doubtless why the 16-bit, 44.1kHz sampling rate specification for CD digital audio survived for over a decade unchallenged.

However, just as faster sampling rates of 96kHz and beyond are now being used, 24-bit converters and systems are now all the rage. And on the face of it, you can see why. A 24-bit sampling system can distinguish between over 16 *million* different amplitude levels (16,777,216, to be precise), and has a theoretical maximum dynamic range of 144dB — surely a clear improvement over a 16-bit system?

Well, theoretically, this *is* true, but as I did with higher sampling rates last month, I feel bound to point out a few things about greater bit depths. A symphony orchestra's dynamic range is around 110dB (from the quietest whisper of a mildly bowed violin to all the performers going at full tilt), so clearly, if you make your living from recording orchestral music, you may experience better results by using a 24-bit system. There are those that argue that the higher quantisation resolution of a 24-bit system is going to give a more accurate representation of the audio you're recording, and that's fair enough. I can certainly understand why someone would want to record and mix complete performances using 24-bit digital systems, especially when recording sources with a high dynamic range. And having a higher bit depth certainly offers greater resolution for digital signal processing and mixing. But in the context of *samples* — recordings of single notes triggered in different tonal combinations over MIDI, which can itself only offer a maximum of 128 possible velocity values, there is less to be gained. Instrument samples recorded at (or

normalised to) 0dB in a 24-bit system and triggered via MIDI will sound pretty much exactly the same as their 16-bit counterparts! So recording a highly dynamic performance on a full drum kit at 24-bit resolution is perhaps a good idea, but recording a set of full-level samples of single drums from the kit will yield fewer benefits, in my opinion.

What's more, if you examine the real-world specs of a typical 24-bit D-A converter, the quoted dynamic range may be (at best) in the region of 118dB, which equates to a real-world performance a little less than that of a 20-bit system. And many D-As offer a dynamic range of only 102dB, which is not a huge improvement over the theoretical range of a 16-bit system!

Nevertheless, as with the argument over higher sampling rates, I can't deny that there are plenty of people who have listened to 24-bit samples and declare the sound superior to that of samples recorded on 16-bit systems. However, I'd be failing in my duty to fully explain the world of sampling if I didn't point out that sampling at 24-bit resolution, or playing back pre-recorded 24-bit libraries, can reduce the polyphony available in hardware samplers (assuming you can find one of the few that can cope with high-resolution audio) and/or put more strain on the CPU host in the case of software samplers. And 24-bit sample files themselves are larger, which can lead to increased loading times and fill your sample storage drives faster. Those caveats aside, the choice is yours.

What Else Is There To Know?

So now you understand the basic concepts behind digital recording, bit depths and sample rates, what more do you need to know? Well, if you're creating abstract and/or unpitched samples (for use as atmospheric washes or in *musique concrète*-type compositions), there isn't all that much more to know, other than how to capture the audio on (or import it to) the sampler of your choice, and how to set up the recordings so that they can be triggered from a keyboard, or other controller of your choice. I'll say more about all of those procedures next month. However, if, like a lot of people, you're interested in sampling as a means of gaining access to the sound of real instruments, by triggering short recordings of said instruments from a keyboard, then I should introduce a few other concepts before the end of this month's instalment, such as multisampling, looping (see the box below), and velocity switching.

The concept of being able to trigger digitally recorded instrument sounds from a keyboard was what really excited hi-tech musicians about samplers in the early '80s, and thinking back to some of the music technology history I covered last month, it's not hard to see why. The 1950s idea of being able to link recordings of real instruments at different pitches to the appropriate keys of a keyboard was tremendous, in theory giving keyboard players access to the sound of any instrument. But the analogue and mechanical attempts to realise this idea, such as the Chamberlin and Mellotron, had been a disappointment, broadly speaking (although they inspired a great deal of affection in those who could get access to them). Because they required different recordings, different tapes and therefore different tape-playback mechanisms to be associated with *each key*, they were, mechanically, tremendously complex beasts. They were therefore expensive, and prone to mechanical faults. But because the Fairlight stored its instrument recordings digitally, processing the recordings so that they could play back at different pitches was a relatively simple matter. Unlike the Mellotron, which required dozens of tapes of, say, a cello at different pitches, with the

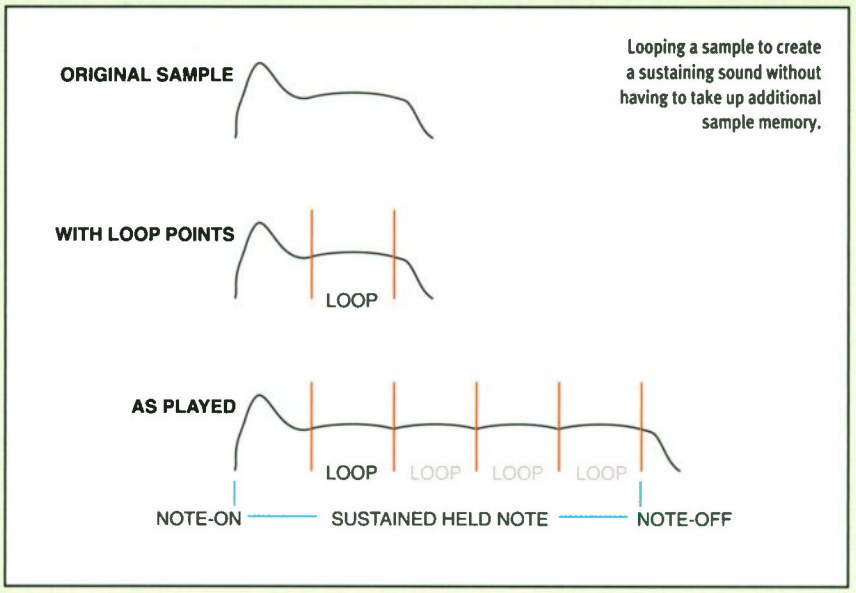
Why Loop Instrument Samples?

Many people now regard the need to loop instrument samples as a thing of the past, and it's certainly true that it came about in the early days because of technical restrictions. When samplers first appeared, sample RAM was hideously expensive, and so most early samplers offered only a few seconds of sampling time, at most — figures of 512K or 750K of memory were touted as cutting-edge specs, and I recall trying to fit entire sampled grand pianos into 750K of RAM. Sampling short sounds, like bass-drum or snare hits, wasn't a problem, but sustained piano notes or long trumpet blasts were right out.

The technique developed to get around this problem was looping. Most sounds, once they've completed the initial part of their development, or 'attack', settle into a sustaining phase of roughly even loudness, and by taking a section from this sustain phase and repeating it for as long as the sample was being triggered, sample designers could make their sounds sustain indefinitely without having to take up too much sample memory to achieve this (see the diagram on the right, which should make this clearer). Of course, the points at which the loop began and ended had to be chosen carefully, or the note would glitch or click each time it entered the loop cycle, so samplists developed a number of techniques (and sample-editing tools) for finding smooth-sounding loop points.

Of course, the memory restrictions of the early '80s are no longer with us, and these days, we have software samplers that can use the host computer's complement of RAM, meaning that we can now have several *Gigabytes* of sample RAM at our disposal if we wish. For the past few years, too, we've had software samplers that can stream samples directly from hard disk, so your samples can theoretically be as long as a hard disk can hold. As a result, many modern samplists make samples that are longer than they'll ever need them to sustain, and never have to create looped samples. Nevertheless, the technique can still be put to good use.

Sample libraries consisting entirely of full-length samples with no loops can be very large, and consequently very slow to load into RAM, and hard-disk streaming (sometimes known as a 'direct from disk' facility in some software samplers) places further strain on your host computer's CPU, not to mention the disk drive itself. Accessing sample data on a hard drive is also slower than accessing it from RAM, so polyphony (in other words, the number of sampled notes you can access simultaneously) can often be compromised and/or unpredictable. Acquiring good looping techniques can do much to optimise your sound library, making for faster load/save times and lessening storage requirements, as well as reducing demands on your computer's CPU. We'll look at these techniques later in this series.



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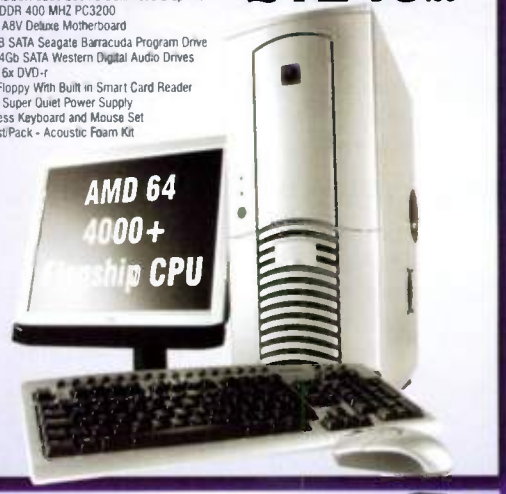

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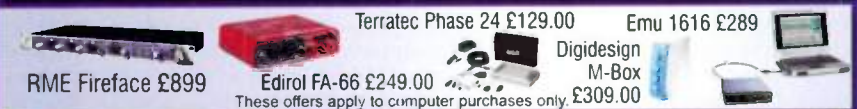

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Fairlight, it was simple. Just sample the cello playing a middle 'C', and then slow the sound down or speed it up to play it at any pitch from the keyboard. The result — a perfect, digitally stored, keyboard-playable cello!

Except, of course, it wasn't. You only have to listen to some of the Fairlight string sounds on Kate Bush's 1980 album *Never For Ever*, made in the days when producers were in the first flush of their Fairlight infatuations, to realise that this idea was a mistake ('Army Dreamers' is particularly bad). And there are several reasons why...

Of Formants & Munchkins

Firstly, simply speeding up a sample to pitch it higher, or slowing it down to pitch it lower, creates exactly the same problems a tape-based recording has when it's varispeeded. We all know what happens when you speed up or slow down a recording of your voice by a large amount — the result sounds very unnatural and unrealistic, and the same is true of recordings of instruments.

The reason for this is that the sound of the human voice (and the sound of most instruments) contains what are known as 'formants': fixed-frequency 'resonances' that stay constant even when the pitch of the instrument or voice changes. For example, the sound of the oboe exhibits two fixed formant frequencies of 1400Hz and 3000Hz, which remain constant regardless of the note being played. When you speed up or slow down a tape-based or digital recording with no further processing, the pitch of everything, including the formants, is shifted, and it's the shifted formants that give the end result its unnatural character. In the context of sampling, this means that the sampled instrument sounds less and less like the real instrument the further up or down the keyboard you play from the pitch at which the note was originally sampled. This problem is known as 'munchkinsation', after the Munchkins, the little people in the classic film *The Wizard Of Oz*, whose peculiar squeaky voices were created by recording their voices on tape at one speed and playing the lines back faster.

But the problems don't end there. The timbre of many common acoustic instruments varies, sometimes quite dramatically, over their range. The piano is a prime example. When played normally, it sounds like a balanced instrument, but sit down and just play individual notes in isolation, from the lowest key to the highest, and you can hear the wide range of tones available. Low notes are deep and full, and last a long time. High notes, on the other hand, are short and 'plinky' in nature, lasting less than a second. The same can be said of a guitar. Pluck the lowest note and then the highest note to hear the difference. Also, just pluck the different open strings to hear tonal differences between them. Most instruments are the same, and exhibit tonal change across their range. Simply taking a piano sample at one note and pitching it up two octaves is not going to produce a result anything like that of a real piano being played two octaves further up, even allowing for munchkinisation.

"Unlikely objects can become quite interesting sound sources... your vacuum cleaner could be transformed into a menacing bass sound, or a squirt of your air freshener could be a good cabasa... and slamming your studio door could be just the snare-drum substitute you're looking for!"

And there are further problems. The very nature of playing back a sample slower or faster means that natural characteristics of the instrument, such as its attack and/or vibrato, or its decay, or release will also slow down and speed up the further any sample is transposed away from the original sampled note (the diagram opposite should make this clearer).

The Need For Interpolation

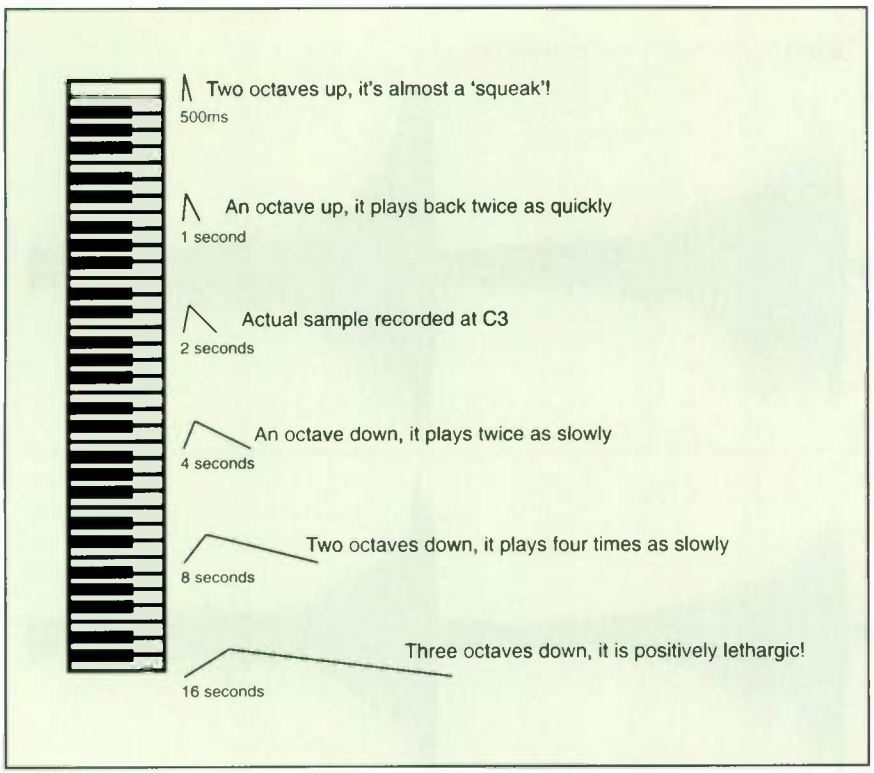
As if all these problems inherent in the sound weren't bad enough, the sampler you're using can itself contribute to the difficulties with transposition. In the very early days of sampling, samples would be repitched simply by altering the rate of the sampler's digital playback clock, and if you listen to 1970s samples, you can hear this. For example, if a sample was recorded at a sample rate of, say, 32kHz (a popular sampling rate in the early days, giving a bandwidth of around 15kHz), then when the sample was transposed down an octave, the sample clock would be running at 16kHz, in the upper reaches of our hearing range. If you played the sample a further octave down, the sample clock would operate at 8kHz, well within the range of human hearing, and exhibit itself as a high-pitched whistle. All sorts of filters were employed to keep this to a minimum, but you can hear it nevertheless. I have some original Fairlight samples, and you can hear the

Creative Transposition

Sometimes the perfection of a beautifully multisampled instrument is not what you seek; the hideous distortions caused by transposing a sample far from its original pitch produce some delightfully creative sounds. Sometimes you don't even have to take things that far. For example, a single, sustained voice sample can sound fantastic played across the keyboard — it can be deep and menacing down low, or thin and ethereal higher up. Many of the vocal pad sounds you find on synths are just that — a single 'Ooooh' or 'Aaaah' looped and played across the keyboard. Possibly the most famous of these was the Fairlight IIx's 'Arr1', which featured on famous records of the '80s by artists such as Tears For Fears, Tom Dolby, Jan Hammer and others, and has been copied by manufacturers ever since.

Other sounds, too, can sound great when played out of their natural range. More often than not, samples take on a better character when played lower (when played higher, everything speeds up, often with comic results). A middle 'C' on a piano pitched down three octaves and run through some reverb can be a powerful bass sound. Other sounds can also take on a life of their own when pitched down, and the most innocuous item can be transformed. For example, my mother has a stainless-steel washing-up bowl which I tapped with a beater and sampled some years ago. At its normal pitch, it sounded nice enough, with a pleasant tubular bell-like quality about it, but pitched down an octave or two, it turned into a surreal gong sound, especially when augmented by subtle flanging and reverb. I also partially filled the bowl with water and, as I struck it, I moved the bowl so that the water shifted and changed the pitch as the sound decayed. A few octaves down, this became an eerie, sinister sound that wouldn't be out of place in a Hollywood horror movie.

In fact, sound effects for films and TV programmes are often made like this — for example, a tub of Swarfega (a jelly-like substance for cleaning oil off your hands), when squelched about, sampled and pitched down a few octaves, can suddenly become a primordial swamp bubbling with volcanic activity. Film sound effects are also created using layers of different samples played at different pitches. In other words, unlikely objects can become quite interesting or even inspirational sound sources, especially when transposed up or down. Just think... your vacuum cleaner could be transformed into a menacing bass sound, or a squirt of your air freshener could be a good cabasa... and slamming your studio door could be just the snare-drum substitute you're looking for!



A simple diagram showing how a single percussive sample, originally taken at C_3, would speed up and down, and shorten and lengthen, as you play it over the range of the keyboard. Of course, in addition to the amplitude envelope being affected, other qualities inherent in the sound would also be altered by the transposition, such as vibrato and attack characteristics (scrape or rasp sounds, for example).

whistle gradually creeping in as you play lower down the keyboard.

To get around this, later samplers (and indeed all modern samplers) used a fixed sample-playback rate, and employed a process known as interpolation to allow samples to be transposed. When samples are played out slower, the interpolation process has to fill in the gaps to reconstruct the waveform as accurately as possible at lower pitches, and when played back higher, it has to seamlessly remove tiny snippets of data in order for the sound to be played back faster. And all of this takes place in real time!

If this seems confusing, think of resizing a photo in an image editor such as *Photoshop*, which uses a similar process. If you enlarge the photo, the image editor has to somehow fill in the pixels so that the enlarged image isn't horribly distorted. It can't enlarge the actual pixels that make up the image; it has to interpolate and add new pixels that fit with the existing image and don't look out of place. It's similar when you're playing a sample lower in pitch — audio 'pixels' have to be inserted to create the longer transposed samples. And when you reduce the size of a picture in *Photoshop*, pixels have to be removed, because they can't be made smaller. It's much the same when transposing a sample upwards — audio 'pixels' somehow have to be removed. All of this is taken care of with a real-time interpolation algorithm.

Anyone who has used an image-editing package such as *Photoshop* will have noticed that there are often different interpolation algorithms that can be used to fill in/add or remove pixels with differing levels of quality. Different samplers also use different interpolation methods to play back sounds at different pitches. Some samplers use the most basic interpolation, and, as a result, it is not possible to transpose a sample far beyond the note at which it was sampled without interpolation distortion being quite evident. In cases like these, transposing sounds several octaves up or down can render them almost unrecognisable, although these side-effects can be used in a positive way for creative purposes (see the box opposite). A good sampler should use high-quality interpolation algorithms that are far kinder on samples, even when they are transposed in either

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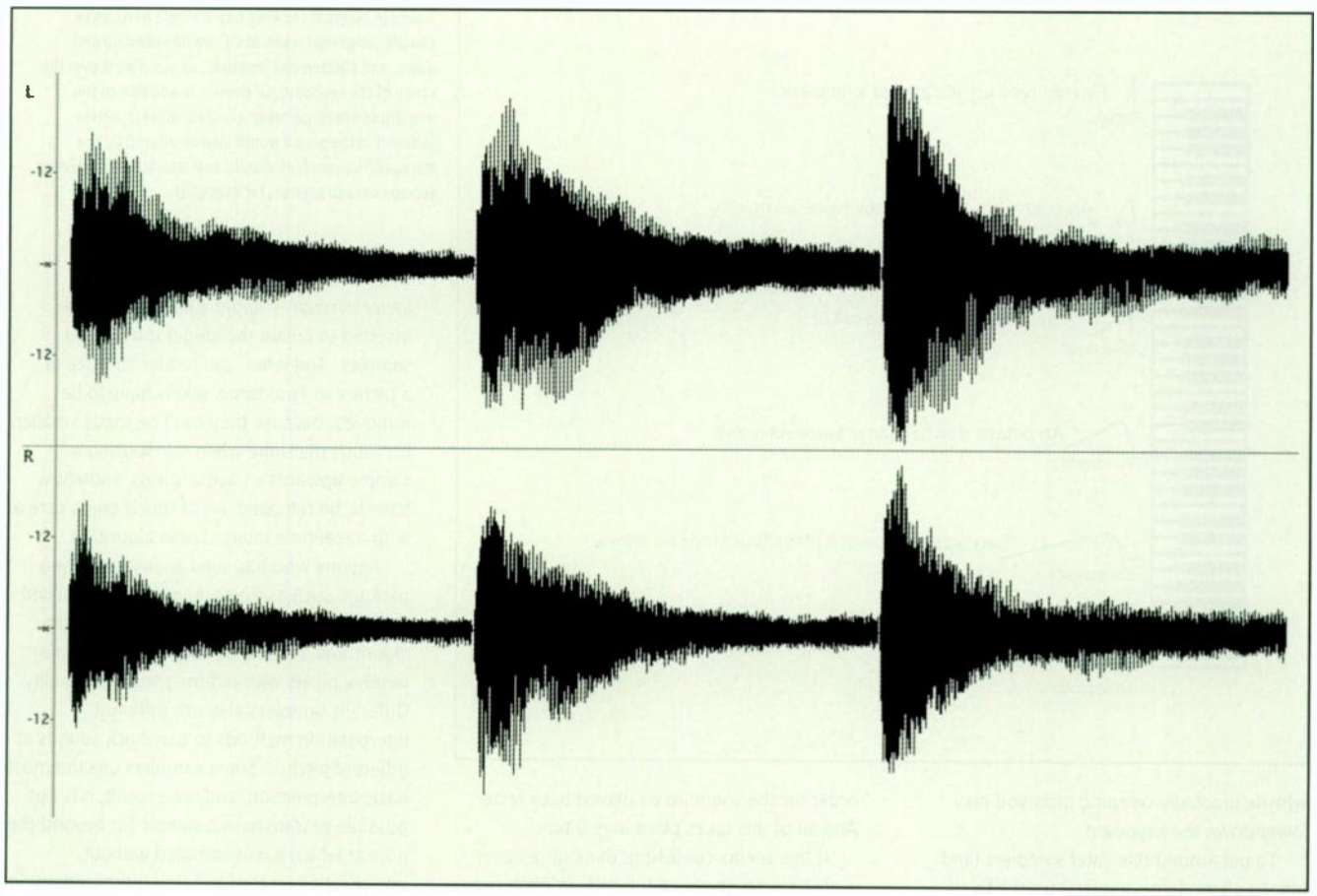

One demonstration of why velocity switching is necessary. Shown here in a stereo editor are three separate performances of the same combination of notes (three G#s in different octaves), each louder than the last, from Alfred Brendel's classic 1972 piano performance of Movement 3 of Beethoven's 'Moonlight Sonata'. As you can see from the shape of the waveforms, even the same notes played more loudly or quietly on a grand piano produce very different waves, with the louder notes creating more high frequencies. You certainly can't achieve a realistic sampled piano sound by sampling the notes at one velocity, and making these samples play back more loudly with increasing velocity.

▶ direction some distance from their base pitch. As samplers developed, though, the progression wasn't always smooth — for example, the Akai S1000 and S1100 used so-called 'eight-point windowed sinc interpolation', which was a good algorithm allowing a good deal of transposition in either direction, and which introduced artefacts only with extreme transpositions. But the later S2000 and S3000 family used linear interpolation, one of the most basic methods available, as a cost-cutting exercise to make the range of samplers more affordable. In practice, this meant that samples couldn't be transposed too far away from their base pitch without transposition artefacts being heard (a kind of metallic 'mush'). In my experience, hardware samplers seem to handle transposition better than software ones, perhaps because hardware samplers have dedicated circuitry built into them devoted to interpolation, and maybe also because the software that drives this hardware will often be written in the lowest level of machine code to ensure optimal performance under all circumstances, unlike the software interpolation 'emulators' responsible for transposition in a software sampler. Of course, low-quality interpolation will have no effect on recordings when they are played at their sampled pitch, but the usefulness of a sampler is reduced if it can't transpose audio too far away from its original pitch.

Multisampling

To overcome all these transposition-related problems, the concept of 'multisampling' was devised. Ironically, this involved returning to a situation more like that on the pre-digital Mellotron, where each note had its own associated tape recording. When multisampling an instrument, you make recordings of the instrument playing at several different pitches across its range, and then map the right ones to the appropriate keys of your keyboard. Fortunately, with decent transposition/interpolation algorithms, you don't usually have to go as far as taking a sample for *every* note, although you can if your sampler's memory allows this. It depends on the instrument you're sampling, and how realistic you want the sampled instrument to sound. With some instruments, two samples every octave — on 'C' and 'G', say — might suffice, although you might notice envelopes and other characteristics of the sound speeding up and slowing down as you move further from the original pitches of the samples. Of course, in these days of plentiful memory, it's tempting to have a separate sample for every note, although as with my comments in the box on looping a couple of pages back, I think such 'modern' practices make for very memory-intensive sample libraries, which can take a long time to load, and which can put a lot of strain on the host CPU in the case of software samplers.

When multisampling, I find a good compromise is to have a sample every minor third in every octave the instrument covers. This way, a sample is never transposed more than one semitone up or down, so you're unikely to hear any serious 'munchkinisation' or transposition distortion, and for the vast majority of instruments, this will be more than enough to give an accurate representation. Admittedly, if it's an instrument that will be featured in isolation, such as solo piano, this might not be sufficiently realisitic, but in a mix with other instruments, you'll find that this compromise works well enough even with potentially troublesome sound sources like the human voice, acoustic piano, saxophone and so on.

From a practical and technical point of view, an instrument sampled this way is also going to be a third of the size of the same instrument sampled on every note. Even if you're not doing your own sampling, it can be a worthwhile exercise going through some of the enormous sample libraries currently available and trimming them down, using samples only every minor third to create your own 'lite' versions. These can be useful for situations where absolute realism isn't required — for use in a busy mix or for when playing live, for example.

Whilst recording multisamples seems to make a great deal of sense, it brings with it many considerations, not least of which is maintaining an even playing technique for each of the notes you sample. Obviously, if some notes in your multisample were played more loudly when they were sampled than others, then the sampled instrument will sound very strange when played up and down the keyboard, with different notes potentially sounding louder than others. Actually, overall level is less of a problem, as samples can all be normalised or otherwise level-balanced in the sampler once they've been taken, but the source instrument's tone will invariably be brighter or darker when played more loudly or softly, so it is important to play the instrument such that the recordings making up the multisample sound consistent.

"When multisampling, I find a good compromise is to have a sample every minor third in every octave the instrument covers. This way, a sample is never transposed more than one semitone up or down."

Velocity Switching

This brings us neatly to the final concept I'll introduce this month, namely velocity switching. As already mentioned, most instruments vary in the brightness (or otherwise) of their tone, but this is not not only the case across their frequency range — they can vary tremendously within one note, depending on how this is played. Once again, the piano is a good example of this; stroke a key lightly, and the hammer will barely hit the strings, creating a soft attack and a muted tone with few harmonics, because the strings haven't been 'excited' too much. However, hit the same note hard and you'll get a highly pronounced, percussive attack as the hammer smacks those strings, producing a brighter sound rich in upper harmonics which will also tend to sustain for longer. Sometimes, even the same notes played at similar volumes can sound very different, as the piano chords depicted in the screenshot opposite show.

The same is true of many other instruments. Guitar, bass guitar, electric piano... all have a lot of tonal variation within their dynamic range. And when stringed instruments such as the violin and cello are played softly, their attack is slow and languid, and the tone is smooth and somewhat muted — but when they're played aggressively, there is a pronounced 'scrape' during the attack and a rich, bright tone during the sustain portion of the sound. Flutes or pan pipes are also good examples — they produce a soft, almost sine-wave-like sound when played gently, with just a hint of breath noise, but they can be percussive and 'chiffy' when blown hard. You get the picture. For maximum realism, therefore, you should ideally sample any given instrument not only at multiple pitches, but also softly and loudly at all those pitches, in order to capture these different tonal characteristics. These samples at different 'velocities' can then be triggered from your controller by appropriate MIDI velocities, so that more softly played notes on your MIDI controller keyboard trigger suitably 'soft' samples, and so on. Hence the term velocity switching.

Next Month

Fortunately, as with multisampling, you don't always have to sample every possible volume articulation of your instrument to obtain a realistic result. Of course, if you're a professional sound-library developer intent on delivering the ultimate orchestral library, or the ultimate Bösendorfer grand piano (and charging for it) then such attention to detail *is* probably merited. However, for most of us, it's not strictly necessary — there are short cuts that allow you to obtain reasonably realistic results without resorting to an orgy of velocity switching. But I'll say more about those next month... SOS

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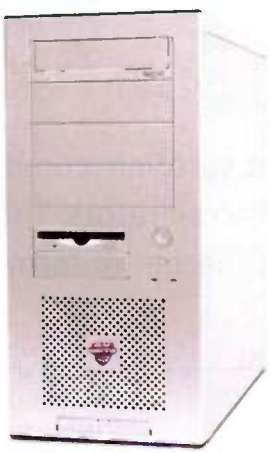

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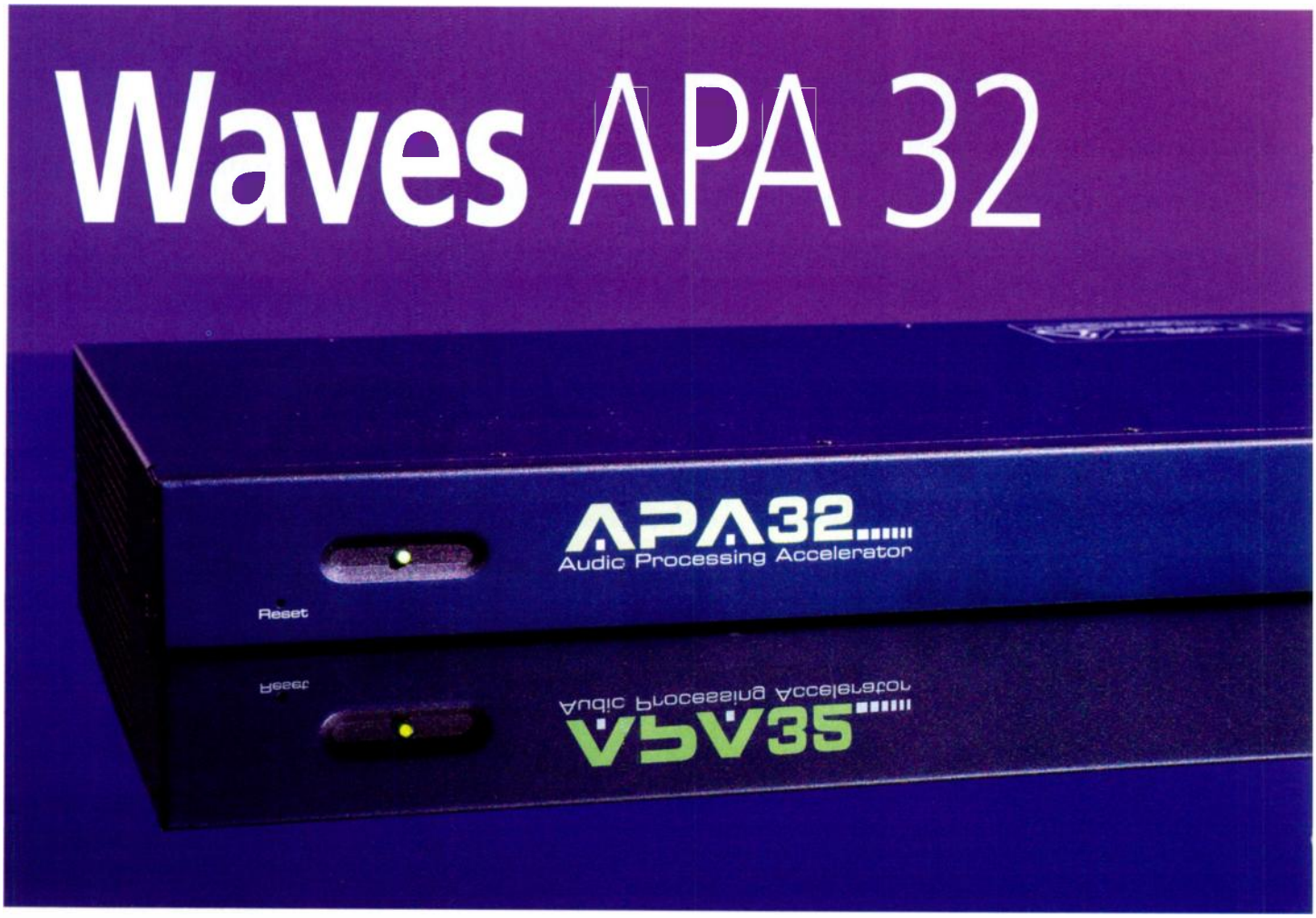


DSP Plug-in Host For Mac & PC

Waves are the latest software company to launch their own hardware DSP accelerators. The APA 32 and 44-M can be linked over Ethernet to form massively powerful plug-in farms.

Sam Inglis

At the height of the dot.com boom six years ago, the world of music software was gripped by an optimism that seems unimaginable today. With the power of off-the-shelf computers constantly increasing, it seemed only a matter of time before hardware DSP boards and proprietary plug-in protocols became obsolete. Just as Sequential, Yamaha and Roland had come together to create the MIDI standard in the early '80s, so the major software companies would agree on a universal format for native plug-ins. The 21st century would be a golden age of open standards and native processing, where Mac and PC owners could choose whatever software they wanted without having to navigate a minefield of standards and compatibility issues.

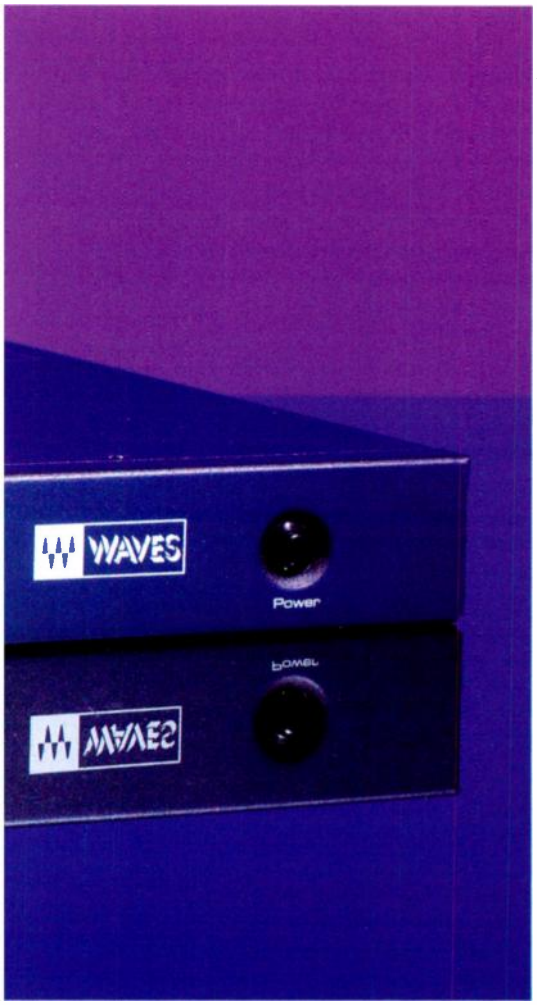
Of course, it didn't work out like that. Steinberg, Emagic, MOTU and Cakewalk all ended up supporting different native formats, and the plug-in manufacturers struggled to sell their wares in any of them. Increasingly baroque copy-protection systems failed to curb illegal redistribution, while competition from freeware and shareware developers also threatened the more established companies.

It also became clear that the limitations of host-based processing would not fall away as many people had predicted. Sure, the newest Mac or PC could run hundreds of basic plug-ins, but the realisation was dawning that basic plug-ins didn't always sound very good. Meanwhile, new technologies such as convolution and sample streaming placed further demands on the power of our computers.

Digidesign's decision to stick with DSP acceleration hardware and proprietary standards soon began to look like a good one, and the early years of this century saw other companies follow their lead. TC Electronic turned their attentions from native plug-ins to their own Powercore platform, while Universal Audio's UAD1 PCI card likewise hosted powerful plug-ins that were not available in native formats, and Digi themselves introduced the new HD and Accel systems.

Standing Waves

Throughout all of this, Israeli software developers Waves have retained an impressive commitment to supporting all possible plug-in formats. Virtually all of their many effects and processors are available both in TDM format for Pro Tools systems and in all the major native plug-in formats on both Mac OS and Windows. And although the company have now introduced their own hardware DSP units, it seems clear that they



Photos: Mark Ewing

don't intend to abandon development for these other platforms. Rather, it seems that Waves' hardware boxes are designed to complement a native or TDM workstation.

The APA 32 and APA 44-M are, respectively, a 1U rackmounting box and a half-rack-width desktop device. The two models are functionally identical, except that the smaller 44-M is more powerful, and more expensive, than its larger sibling. They connect to the host computer via Ethernet, and can be 'stacked' to create still more powerful systems containing up to eight APAs per computer. Many of Waves' most processor-intensive plug-ins, including the *IR1* convolution reverb, can be run on the APA's DSP chips, thus taking the load off your host computer's CPU. However, because there is a system overhead involved in transferring data between a host machine and a DSP accelerator, Waves say that there would be no point in creating APA-hosted versions of plug-ins that don't tax the host CPU very much in any case.

Test Spec

- Waves plug-ins version 5.2.
- Inta Audio Centrino laptop with 2.0GHz Pentium-M processor and 2GB RAM, running Windows XP Home Edition SP2, with built-in 100Mbps Ethernet adapter.
- Tested with Digidesign *Pro Tools M-Powered* v6.8 and Steinberg *Cubase SX* v3.0.2.

The Naked APA

The review unit we received was the larger APA 32, which is apparently "designed for use in a machine room". The meaning of this sank in when I switched it on for the first time to be greeted by a noise like a Red Arrows flypast. The first unit we were sent was a pre-production model, and I was hoping the production version would be better, but alas there was no difference. The fan noise remains constant while the APA 32 is switched on, and means that you really do need to put some walls between you and it: recording or even mixing in the same room would be out of the question. Fortunately, there are no physical controls on the unit, and the Ethernet protocol allows far longer cable runs than Firewire or USB — the APA 32 ships with a 10m cable, and Waves say they've tested it with a 100m cable. Those without a machine room will have to opt for the more expensive APA 44-M, which is claimed to be almost silent, but was not available for this review.

The APA 32 is solidly constructed, with few external features. The front panel just features a momentary on/off switch, plus a small hole that you can poke a pin in to reset the unit in an emergency. A green LED confirms that it's switched on if the racket hasn't already given the game away. The only sockets accessible from the rear panel are an IEC mains inlet with associated on/off rocker switch, and a single RJ45 socket for connection to a computer. However, if you peek through the metal cage at the back, you can see a bank of connectors that look suspiciously like serial, parallel and USB ports. Taking the lid off the unit confirmed that it is, in essence, a PC based around an ATX-format motherboard, with 512MB RAM and an AMD Sempron CPU. This discovery rather puts the APA 32's £1200 price tag in perspective, and it's disappointing that Waves didn't stretch their component budget to cover some quieter fans.

Where a single APA unit is connected directly to a computer, you need to use a crossed Ethernet cable, which is the type supplied with the unit. If, however, you wish to connect multiple APA units to a single computer, you will need an Ethernet switch (not a hub), and standard non-crossed cables to connect the computer and APA units to the switch. It is also possible to share a group of APAs between several computers, by setting up separate virtual networks for each machine using a managed Ethernet switch that supports the V-LAN protocol. A single Waves plug-in authorisation will cover multiple APAs connected to a single Mac or PC, but every computer you connect will need its own separate authorisation. Each individual APA unit can only work with one computer at a time, but the networking approach allows APAs to be reassigned from one computer to another as needed. Waves recommend that each computer connected to an APA does so using a dedicated Ethernet adapter, but it is possible to hook APAs up to an existing general-purpose network, again by creating a virtual network. Gigabit (1000Mbps) Ethernet is required for all configurations involving an APA 44-M, and for all APA 32 setups except the most basic, where a single computer is directly connected to a single APA 32; this is the one case where you can get away with a 100Mbps connection.

SOUND ON SOUND

Waves APA 32 £1199

pros

- More power than an Accel card, but less expensive.
- Seamless integration with your recording software.
- Multiple APA processors can be stacked on a network, and accessed from more than one computer.
- Ethernet connection permits long cable runs, and doesn't take Firewire bandwidth away from hard drives or audio interfaces.

cons

- Only bundled with two plug-ins, and that's an introductory special offer.
- APA 32 is very, very noisy.
- It's yet another proprietary system that won't run other manufacturers' plug-ins.

summary

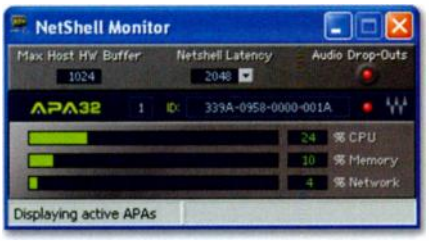
If you're already a Waves user and you need more power, the question to ask is not 'Should I buy an APA?' but 'Which APA should I buy?' If you're not, the availability of the APA processors is another good reason to look at the Waves range, although some people will find that other options are more cost-effective.

To Put It In A Netshell...

Initially, Waves are shipping two plug-ins free with the APA 32 and APA 44-M: the new *Q-Clone* EQ emulator, and a 'light' version of their *IR1* convolution reverb. This is a special offer which won't last for ever, but anyone who already owns any of the Waves plug-ins that are APA-compatible can download the new versions without the need to reauthorise them, as long as their existing authorisation covers the latest version 5. The APA-enabled versions have been given the version number 5.2, and v5.2 installers for all of the Waves bundles ▶

that include APA-compatible plug-ins are available for download from their site.

Existing Waves users will be familiar with the concept of the Waveshell, a layer of code that sits between the plug-in algorithm itself and your MIDI + Audio sequencer, allowing the sequencer to 'see' the plug-in in a format that it recognises. Likewise, plug-ins loaded onto the APA unit are made accessible in your sequencer by a utility called Netshell. The Netshell itself is totally transparent in operation, but a separate Netshell Monitor



application allows you to view the status of each of your APAs.

Netshell Monitor is a small 'always on top' window that indicates the amount of CPU power, memory and network bandwidth available on each connected APA unit. It also allows you to specify the 'round trip' latency that will be incurred by sending data to and from the APA. As with the Powercore and UAD1, the minimum latency achievable is dependent on the buffer size being used by the host application to communicate with your audio interface. In essence, the APA latency must be at least as large as the interface's 'round trip' latency, which equals the audio buffer size doubled. Thus, when you specify a latency for the APA in Netshell Monitor, it helpfully tells you the maximum hardware buffer size compatible with that latency, so that you can change your soundcard settings to suit. The minimum possible APA latency is 256 samples, which requires a hardware buffer size of 128 samples, and equates to a delay of about 6ms at 44.1kHz. In most cases, it should be easy to achieve a latency which is small enough to be accommodated by the host application's plug-in delay compensation feature, if it has one.

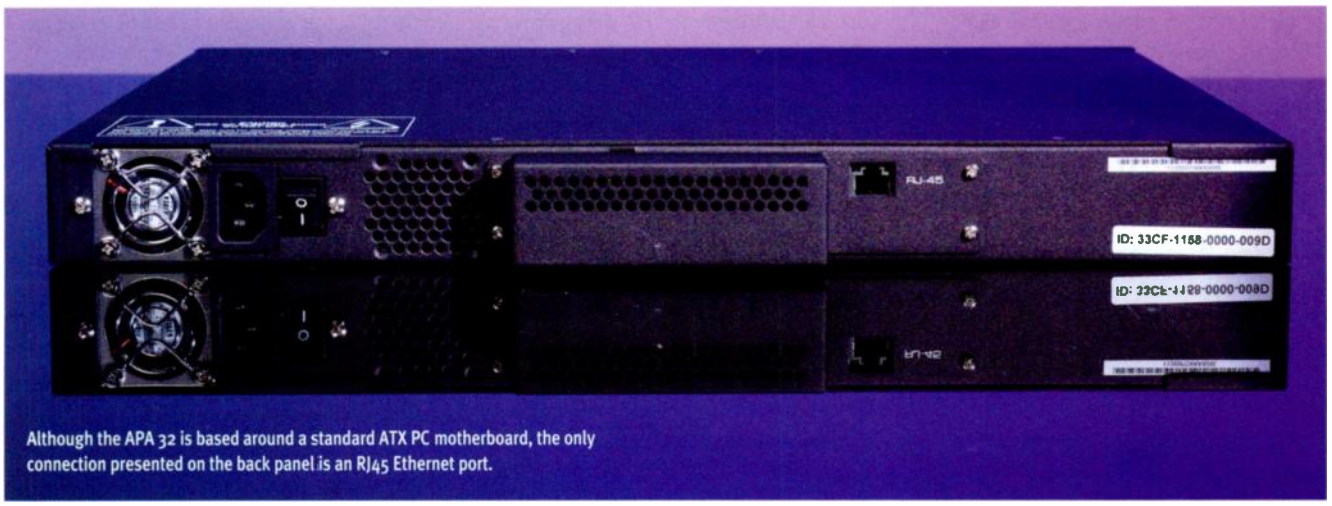
The only other feature of Netshell Monitor is a small virtual LED indicating 'Audio Drop-outs'. These can occur if you get your buffer sizes wrong or if there are network problems, but also because it's possible in certain circumstances to overload the APA's CPU. The Netshell is intelligent enough to prevent you from straightforwardly overloading an APA by opening too many plug-ins, but there are circumstances where changing the settings on an already active plug-in can increase its CPU consumption — for instance, by loading a longer *IR1* impulse response — and this can push a fully loaded APA over the edge.

Getting Installed

I tested the APA 32 on a Centrino laptop running Windows XP, with Waves' *Diamond Bundle*, *IR1* and *L3* mastering processor installed. When you run the v5.2 installers, which should be done with the APA connected but not switched on, they begin by uninstalling the previous versions, before replacing them with the new ones. The first one you install configures your network settings as necessary, and adds a shortcut to the Netshell Monitor utility to your desktop. Waves recommend having this utility open whenever you are using an APA.

Initially, I had some problems getting my computer to see the APA. The installers did their job, and claimed to have successfully configured the computer's network settings, but when I launched Netshell Monitor and switched on the APA, I got repeated messages from Windows telling me that a network cable was unplugged, and that the network had no connectivity. I reinstalled the software several times and tried different Ethernet cables, all to no effect, and I was just at the point of giving up and phoning Waves' technical support when it suddenly began to work perfectly for no apparent reason. I never tracked down the cause of the problem, which recurred when I reinstalled the Waves plug-ins a few days later. I did wonder if it might have to do with the fact that my machine is only equipped with 100Mbps rather than Gigabit Ethernet, although this meets Waves' minimum specification.

Once everything was up and running, there's little to say beyond the fact that it worked. I tested the APA with both *Pro Tools M-Powered* v6.8 and *Cubase SX* v3.0.2, and encountered no problems in either application. In each case, Netshell-enabled Waves plug-ins show up in the plug-in list twice — the second time, with the word 'Net' appended to the name (which can make for a very long series of nested plug-in menus in *Cubase* or *Nuendo*, where all the Waves plug-ins appear under a single submenu). If you choose the first version, the plug-in is instantiated on your host CPU, or on an HD or Accel card in a TDM rig. If you choose the Net version, it's sent off to the APA to be run remotely, and you'll see the CPU and Memory readings in Netshell Monitor change to match. In either case, the plug-in appears to work in exactly the same way. There are no restrictions as to where you can place plug-ins in the signal flow, and it's no problem to have multiple Netshell-enabled processors alternating with host-powered ones within a single mixer channel. *Cubase*'s Freeze function worked fine with plug-ins running on an APA, too. If you do try to squeeze too much out of your APA, you'll get a polite message telling you that the last plug-in you inserted can't be activated. It's hard to find fault with such a transparent system, though I suppose that *Pro Tools* users who are used to switching between TDM and RTAS versions of the same plug-in with a single click might wish for a similar feature here.



Although the APA 32 is based around a standard ATX PC motherboard, the only connection presented on the back panel is an RJ45 Ethernet port.

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WRH

The Waves site includes a table detailing how many instances of each plug-in type you can expect to get out of each APA unit. I won't reproduce that list here, but my tests broadly confirmed Waves' own findings. They say, for instance, that you can expect to get six instances of the *IR1* convolution reverb running on either an APA 32 or an APA 44-M, although which version of *IR1* they used is not stated. I found that five stereo-to-stereo instances of the most demanding, *IR1 Full Net*, with the default Concert Hall preset, took the Netshell Monitor CPU reading to around 95 percent in *Pro Tools*, and to exactly 100 percent in *Cubase SX*. All of them appeared to function correctly without dropouts, even this close to the edge. By comparison, five instances of the native *IR1 Full* took up about 60 percent of my computer's own 2.0GHz Pentium-M CPU, according to *Cubase*'s VST Performance meter. If those figures are representative, then it would seem fair to say that adding an APA 32 to my system increased the plug-in power available to me by approximately 60 percent — assuming, of course, that I wanted to use that power to run Waves plug-ins. Extrapolating that figure to a network of eight APA 32 units should thus increase the total power of the system by about five times, although with that much network traffic, the load on the host computer itself would be non-trivial. (According to *SX*'s VST Performance meter, the CPU overhead for a single fully loaded APA 32 was about 5 percent on my PC.)

Summing Up

At first glance, the APA 32 seems pricey when you compare it to the likes of TC's Firewire Powercore or Universal Audio's UAD1. Not only is the hardware itself more expensive, but the APA doesn't ship with plug-ins as standard, so you need to own one of the larger Waves bundles to make it a worthwhile investment. Moreover, the average home-studio user won't be able to exploit high-end features such as the ability to stack multiple APAs on a network. And the APA 32 doesn't just face competition from dedicated DSP processors: given that it is, at heart, little more than a modestly specified PC, some will see better value for money in buying a second computer and networking it via FX Teleport or Logic Node.

However, the point of the APA units becomes clear when you consider what they have to offer Pro Tools TDM users. Here is a device that costs less than a single Accel card, yet offers far more processing power — it's not possible to run *IR1* as a TDM plug-in at all, yet even the APA 32 can host at least five instances. The TDM Waves Netshell plug-ins appear in the HTDM plug-in selector menu, so you can use them in Aux and Master busses as well as audio tracks. Many Pro Tools owners have already bought into the Waves range, and the APAs may well represent the most cost-effective way to expand these users' rigs, especially in cases where a PCI expansion chassis would be needed to add more Accel cards.

I like the choice of Ethernet for connecting the APAs, too. Now that many of us are using Firewire audio interfaces and hard drives, the last thing we need is a DSP processor that drains Firewire bandwidth, while the PCI format has its own drawbacks: you can't share or move PCI devices between computers, you can't use them with laptops, and there's always a limited number of PCI slots. The APA can even piggy-back onto an existing network in your studio, if needs be, and long cable runs are no problem. Of course, it would be even more welcome if it supported other people's plug-ins, too, but the Waves range of processors and effects is comprehensive, and the APA hardware allows us to use as many of them as we could possibly want. As usual, Waves haven't been the first company to market with a product of this type, and theirs is not the cheapest, but they've taken the time to get it right. SOS

Compatible Plug-ins

The Waves range now encompasses some 50 different plug-ins, most of which are sold in themed collections such as the *Restoration Bundle* and *Masters Bundle*. Of those plug-ins, 14 are now available in Netshell-compatible versions for use with an APA 32 or 44-M.

- **The *L3 Multimaximizer* and *Ultramaximizer* multi-band mastering limiters were reviewed in last month's *SOS* (www.soundonsound.com/sos/aug05/articles/wavesl3.htm), and use Waves' proprietary Peak Limiting Mixer technology to increase gain reduction whilst avoiding intermodulation distortion.**
- **Waves' *IR1* convolution reverb was reviewed in *SOS* May 2004 (www.soundonsound.com/sos/may04/articles/wavesir1.htm). The new *IR1* v2 can be run on an APA, as can the *IR-L* 'light' version which is currently being given away with the APAs, and the Mac-only *IR360* surround convolution reverb.**
- ***Q-Clone*, the other plug-in presently being bundled with the APAs, also uses convolution technology to 'sample' hardware equalisers. Expect a review in *SOS* soon.**
- **The two most processor-intensive plug-ins in the vintage-themed *Renaissance Maxx* bundle (reviewed in *SOS* August 2003: www.soundonsound.com/sos/aug03/articles/wavesmaxx.htm), *Renaissance Reverb* and *Renaissance Channel*, are both now available in Netshell versions, although it's not possible to route an external side-chain to *Renaissance Channel* when running on an APA unit.**
- **From the *Masters Bundle* (reviewed in *SOS* August 2002: www.soundonsound.com/sos/Aug02/articles/plugin0802.asp), Waves' Linear Phase algorithms offer impressive sonic clarity, but have always been CPU-hogs, so fans will be pleased to see that the *Linear Phase Equalizer* and *Linear Phase Multiband* processors can both now be hosted on an APA box. The same is true of the powerful *C4* multi-band dynamics plug-in.**
- **From the *Transform Bundle* (reviewed in *SOS* December 2004: www.soundonsound.com/sos/dec04/articles/wavestb.htm), the *Soundshifter* real-time pitch shifter and *Morphoder* vocoder have both been converted to Netshell format, as has the multi-band version of the *TransX* transient processor.**

information

£ APA 32 £1199; APA 44-M £1799. Prices include VAT.
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Ta Horng iSmart

Flexible MIDI Controller

Mike Senior

Taiwanese outfit Ta Horng produce a range of flexible rubber MIDI keyboards, including the three-octave iSmart under review here. Portability is the main selling point; wrapping the keyboard around its plastic control panel produces something about the size of an early-'90s mobile phone.

The USB/mains socket is the sole one, and using the iSmart on an iMac running Mac OS 10.3.3 required nothing other than plugging in the USB cable. The three-octave keyboard can be transposed using the Octave keys to access the full range of MIDI note numbers, but there is no velocity sensitivity. Above are two buttons which are used with 11 of the white keys to set the MIDI channel, send Program Change messages, or change the fixed-output velocity value (99 by default).

As a MIDI data-entry device, the iSmart works fine, triggering notes reliably when the keyboard is on a hard surface. The sensors extend the length of each key, although the 'playing experience' offers much of the touch and expression of my old Renault 5's floor mats. Also, because the black notes are at the same level as the white notes, it's much more difficult to play accurately. That said, you can hardly expect a decent playing action from a sub-£70 bunch of long-chain polymers...

All in all, this is an odd product which has rather divided opinions in the *SOS* office. Some consider a rubber keyboard about as useful as a rubber violin, no matter how portable. Others think the iSmart could be useful for data entry where budget and space restrictions are at their tightest. Hopefully you should know which camp you belong to by now, and will use your wallet accordingly! SOS

SOUND ON SOUND

pros
- Small, portable, and, at £70, affordable.
- Fine for MIDI data entry.

cons
- I've played more expressive rubber chickens.

summary
'The most flexible MIDI controller on the market' is perhaps not the accolade it once was. However, if you need a basic data-entry device small enough to tuck behind your ear, the iSmart will do the job for under 70 quid.

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Enhanced Audio M600

Universal Microphone Mount

Hugh Robjohns

Mic capsules are sensitive to mechanical vibrations, which manifest themselves as low rumbles, masking low-level audio signals. The accepted practice is to employ an elastic suspension to decouple the mic from the stand, but an Irish manufacturer has now come up with an alternative.

The aluminium M600 is a simple, tiltable clamp arrangement, with a 3/8-inch thread adaptor to convert the 5/8-inch standard thread. The component parts are secured tightly to each other with Allen bolts, and extending through each of the two support rings are three black threaded bolts at 120-degree intervals. These are fitted with a knurled adjustment disc on the outside, and a pivoted plastic flat 'foot' on the inside. Pretty much any mic with a body up to 65mm in diameter can be secured quickly by passing it through the two rings and screwing the clamps down to hold it firmly. All of the parts and finish are of a very high standard, and the threaded bolts allow easy, quick adjustments.

A range of impressive sonic claims are made for this unusual design, but the physics behind it remains unclear (to me, at least). Certainly, mics are held very securely, and such that they cannot vibrate along any one particular axis. However, kicking the mic stand reveals that large-amplitude vibrations are not suppressed at all. Having said that, when testing the mount with a range of capacitor mics, I perceived a change to the lower mid range which often sounded slightly clearer and more detailed, with an impression of tighter bass transients, so the M600, despite its high price, does appear to affect microphone sonics in a positive way. However, I'd say that conventional suspensions are still more suitable where mic stands are likely to be thumped. SOS

SOUND ON SOUND

pros
- Nicely engineered, and suits virtually any mic.
- Subjectively, seems to subtly enhance the sound.

cons
- Provides no isolation from physical shocks.
- Expensive.

summary
This superbly engineered, expensive mount is capable of supporting almost any mic, but although it claims to offer sonic benefits, the differences are small and subjective.

information
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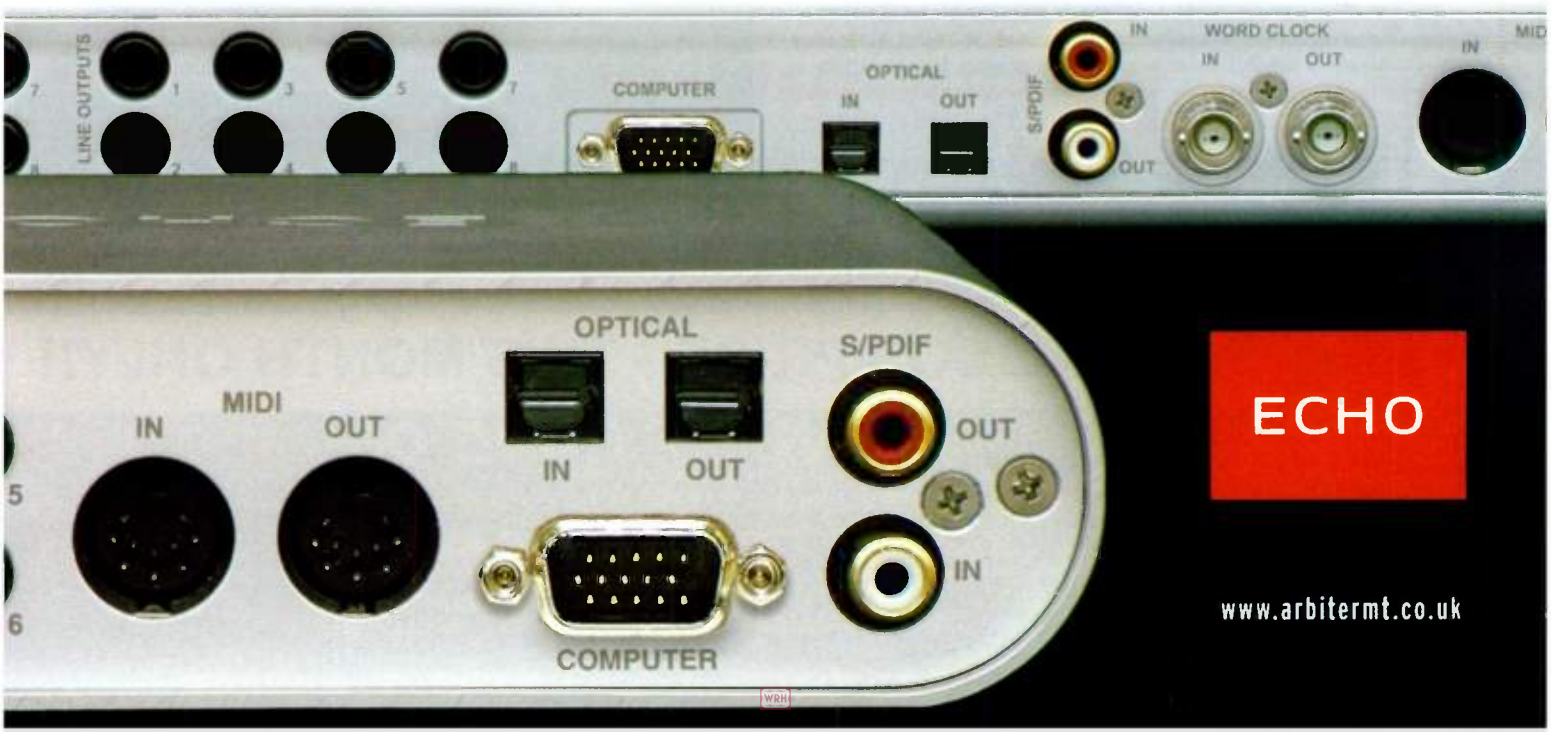

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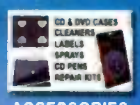

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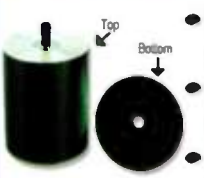

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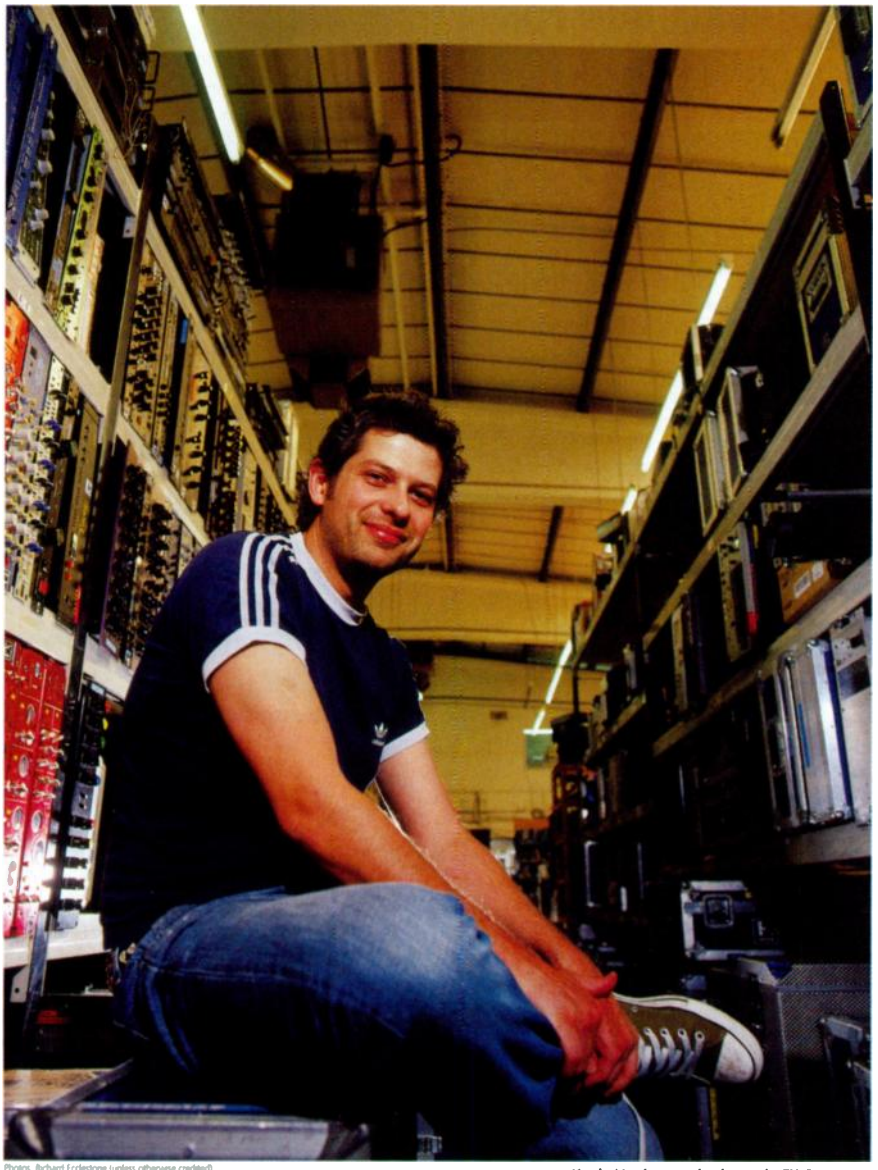

Photos: Richard Ecclestone (unless otherwise credited)

Kevin Vanbergen in the main FX Group warehouse, with some of FX Rentals' amazing hire gear behind him.

- FX Copyroom
- Kevin Vanbergen
- Tape Salvage & Transfer

We've seen some curious studios in *SOS* over the years, but not many have included a warehouse full of vintage hardware, Pro Tools HD rigs, and thermostatic ovens. But it's all part of the daily routine at FX Copyroom...

Matt Bell

Tucked away at the back of a warehouse on an industrial estate in North-west London lies one of the music business's quiet success stories. Once a small offshoot of the FX group of companies that includes equipment-hire company FX Rentals, the FX Copyroom have long since outgrown their humble beginnings as a lowly tape-copying and CD-duplication service, and have become renowned throughout the music industry for their ability to save poorly archived or decaying analogue tapes, restore them to health, and transfer their contents to more modern digital media. At the same time, they've gone from occupying a cable-festooned corner of the FX Rentals warehouse to having four permanent Pro Tools-based studios crammed with a dazzling variety of gear, from obsolete analogue and digital multitrackers and processors to the latest and greatest recording technology has to offer. Reassuringly, though, there are still cables all over the place!

The Copyroom offer their services to everybody from bedroom studio owners right up to the higher echelons of the worldwide music industry — as former studio engineer and current FX Copyroom Manager Kevin Vanbergen proudly puts it, "We've dealt with the tapes of pretty much all the world's top-selling artists, apart from The Beatles — although we're not always allowed to talk about exactly who we've worked with". Clients the Copyroom *can* talk about, for whom they've rescued and/or transferred material over the course of their six-year history include Led Zeppelin, the Live Aid organisation, producers like Tony

Visconti (David Bowie, T Rex), and the Estate of Bob Marley, to say nothing of the many members of the public who have lovingly brought them hissy tapes of weddings, pub gigs, and the Portastudio-based noodlings of long-forgotten sixth-form bands. And they've learned all about the arcane art of analogue tape-baking along the way — of which more later in this article.

From Engineer To Master Baker

The Copyroom's roots lie in an attempt by equipment-hire company FX Rentals to diversify at the end of the '90s. As more and more musicians and producers set up their own computer- and software-based recording systems, the number of professional recording studios began to diminish (a process still continuing today), and the hardware studio-equipment hire business began to slow down. Seeking to formalise their existing *ad hoc* duplication business, FX Rentals began to market a tape-copying and CD-duplication service, which gradually developed for a year or so before Kevin joined the company. "FX offered me an incentive scheme to expand the Copyroom. The first thing I did was stop doing CD duplication; instead, we targeted other business, mainly multitrack transfer at first, backing up analogue multitracks digitally, either to CD-R or to DAT. When we first started up in 1999, there was a real demand for what was called DATstreaming — that is, backing up all the parts of a multitrack onto DAT one track at a time, with timecode on one stereo channel and one track on the other, maybe 48 times over. That was very profitable for a while, because at that point, people weren't sure how best to back up their multitracks digitally, and stereo DAT seemed like the best option. People were paying 600 quid for 48 tracks of one song!"

In The Vault Or On The Skip?

Over the first couple of years after Kevin joined the Copyroom, the transfer of analogue multitracks to digital storage media and the backup of existing digital recordings became the company's main business, and a great success. Much of this work came from major record labels, one reason the Copyroom were so successful. In past decades, some record companies would periodically purge their archives, with the result that multitrack tapes by even very famous artists were simply thrown away, but according to Kevin Vanbergen, most major record companies now recognise the value of their archives, and want to preserve them. "Even 10 years ago, record companies were still throwing away a lot of their tapes. They would say, 'well, this group aren't successful any more, and they aren't signed to us now either... let's put the tapes in the skip'. I've seen that happen, and I've seen fans, who get tipped off, come down and fish multitrack tapes by famous artists out of the skip and go home with them. I've done it, too. One time, a record company associated with the studio I was working at went down, and the receivers emptied the shelves into this skip. What they were throwing away was absolutely priceless, so I pulled everything out and returned it to the artists.

"These days, though, it's mainly small companies that do silly things, if they're worried about storage costs. The majors realise that these recordings are their assets — simply put, if you have multitrack tapes full of unreleased takes, the chances are that they will one day make you money — so they want to keep them, and to back them up. We targeted that business, and soon a lot of people were ringing us up and asking how much it would cost to have fresh analogue copies made. The answer, of course, was always an arm and a leg — but doing it digitally was much more affordable, and that business really took off. We do a lot of transfers of live concerts, too. People don't like to record live gigs to hard disk recorders, so they'll put them on to DA98s or something, and then we'll transfer it for them. All studios do a little bit of transferring on the side if they can, but it's always a secondary function, whereas we've always offered a dedicated service.

"We've also been a bit of a help desk to the major record companies over the past few years. A lot of them are given Firewire drives as their final album masters now, and they often ring up and say 'a courier has dropped off some sort of computer drive thing... what is it?' and we'll transfer it for them. But record companies are now getting much better at knowing what needs to be done. One record company sent two team leaders to us, and I spent a morning teaching them to recognise various different formats of hard drive. Sometimes, though, they don't realise that there isn't a backup — I've often asked them if there are copies of these drives with finished albums on them anywhere else, and they say things like, 'Oh... the producer might have a copy, I think'. I usually advise them not to leave it on a Firewire drive, because all it takes is for the disk not to be spun up for a few months, and it could be unplayable."

Like all the studios at the Copyroom, Room 1 has a permanently installed Pro Tools system, but at the time of our visit, there was also an old Mitsubishi X850 digital 32-track (in the far right corner), an Otari MTR90 analogue multitracker (the large white recorder to the right of the Mitsubishi), and an IZ Radar (in the middle at the back). Some of this gear is from FX Rentals' stock, wheeled in for as long as it's needed, and then replaced.

Old Masters

Unplayable media is a concern at both ends of the transfer process, but even when vintage tapes sent for transfer play back without problems, they're often not what they seem, and documentation about what they contain is frequently inaccurate or missing altogether. Reels claiming to be the production masters for well-known projects can turn out to have different track lineups to the commercially released albums, contain different mixes, or worst of all, have different sections of songs, such as variant bridges or outros, spliced on to them. In order to archive tapes accurately, Kevin often has to resort to buying a commercial CD of an album and then comparing it track by track with the mysterious tapes he's been sent. "It helps if you're a fan, or at least if ▶

you know the material — it makes transfer work so much easier. It's a really strange feeling when you've been transferring a tape of loads of unfamiliar takes of, say, U2 playing, and then you hear them counting in to do another one, and you realise it's the master take of 'Pride' or something that you've heard a million times before — you can spot it a mile off."

On the other hand, spotting that all is not what it seems in less familiar material is much harder. "We were sent a one-inch eight-track in a beautiful handmade box that was supposed to be the master to Free's 1970 *Fire & Water* album to do a high-resolution transfer for 'All Right Now', but when I listened to it, something didn't seem quite right. Eventually, it dawned on me that the basic backing track was the same, but that this tape had claves overdubbed on it instead of the famous cowbell. A bigger Free fan would have spotted that straight away."

The fame of an artist is no guarantee that their work will be diligently archived. The Beatles, who nearly always recorded at Abbey Road, and whose tapes were therefore carefully collected and stored in one place, are very much the exception to the rule. While Kevin was collecting Mark Bolan's master tapes for transfer into high-resolution Pro Tools Sessions, so that original producer Tony Visconti could remix Bolan's back catalogue for release on SACD, he found that two songs were missing. The rights to the tapes in question had allegedly passed to third-party companies following Bolan's death, although they were eventually tracked down. Strangest of all, the FX Copyroom were contacted last year by the management behind one of the best-selling bands of all time. The idea was that Kevin would carry out the digital transfer work in preparation for a surround mix of the band's best-known album. Contracts were drawn up, but when the band's management enquired further, they discovered that the company they had believed were securely holding the album's master tapes thought that the management had them — and the entire project ground to a halt. Sadly, Kevin is naming no names! "There were a lot of worried faces. I just wondered how this could possibly happen to the master tapes for one of the biggest albums of all time?"

From Magnetic Tape To HD

DAT didn't remain the most popular output medium for the Copyroom's digital transfers for long. Soon customers were asking for audio as WAV files, or in the formats of the major sequencers and DAWs. Early on, Kevin established Digidesign Pro Tools TDM systems as the main digital workhorses in the Copyroom. These have now been upgraded to HD systems, and additional DAWs and sequencers are available for use when clients need or request them, such as *Logic*, *Cubase*, *Sonar* and iZ's RADAR. FX have recently installed a Pyramix system to allow compatibility with even more users. But increasingly, Kevin is being asked to simply output everything as multitrack Pro Tools Sessions. "Everyone just seems to have gone with Pro Tools; Digidesign have got a huge monopoly on the market. Now that HD systems are capable of 96kHz files, you can't really do *Sound Designer II* files any more. The last few years have been one of those transitional times, but now it's whittling down to a few choices. Broadcast WAV is the other common one."

Of course, the Copyroom's location

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Some of the recording history which has passed through the Copyroom for digital transfer— the master tapes for Free's 1970 *Fire & Water* album. 'All Right Now' can just be made out from the hand-drawn tape labels.

within the FX Rentals warehouse has proven perfect for their expanding workload, as they've always had the right gear for their immediate needs to hand. Even if old tapes come in to the Copyroom in the strangest of obsolete digital tape formats, the chances are that the right playback machine is lurking somewhere in a forgotten corner of the FX Rentals gear store. And Kevin has deliberately sought out obsolete tape machines over the past few years, so it's now rare for them to encounter tapes they can't play. Looking around the Copyroom's studios, there's a strange mix of gear. Studer and Otari analogue multitrackers the size of washing machines squat next to Mitsubishi X850 and Sony 3348HR digital multitrackers — state of the art in the 1980s, and now literally impossible to give away — and threaten to overshadow the shiny Apple G5s and elegant Prism A-Ds.

Strangest of all, in a corner of the FX Copyroom studios stand three cupboard-like constructions with temperature control panels on their doors: the Copyroom's tape-baking ovens.

Baker Man

If you're unfamiliar with the concept of baking magnetic tape, check out Paul White's article on the subject from *SOS* May 1996, or at www.soundonsound.com/sos/1996_articles/may96/salvagearchives.html.

To briefly recap, tape baking is necessary with magnetic recording tape stock of a certain vintage (mid-'70s to early '80s). In such tapes, the adhesive binding the plastic tape to the magnetic oxide that stores the recorded signal dries out or becomes unstable after a few years. It can then absorb moisture from the air, causing the oxide on the tape to become raised and sticky. If the tape is played back while in this condition, the sticky oxide can be pulled from the tape as it passes through the playback heads, resulting in dropouts and/or the complete destruction of the signal recorded on the tape. However, gentle baking for several days in a special oven designed to produce a carefully controlled, uniform heat can drive the absorbed moisture from the adhesive, rendering the tape playable once again.

Shortly after directing the Copyroom into multitrack transfer work, Kevin Vanbergen began to encounter 'sticky' tapes from record companies and members of the public that had to be baked before they could be transferred. At that time, the only tape-baking facility was at the Quantegy (formerly Ampex) tape factory outside Reading, which had been set up by Ampex ▶

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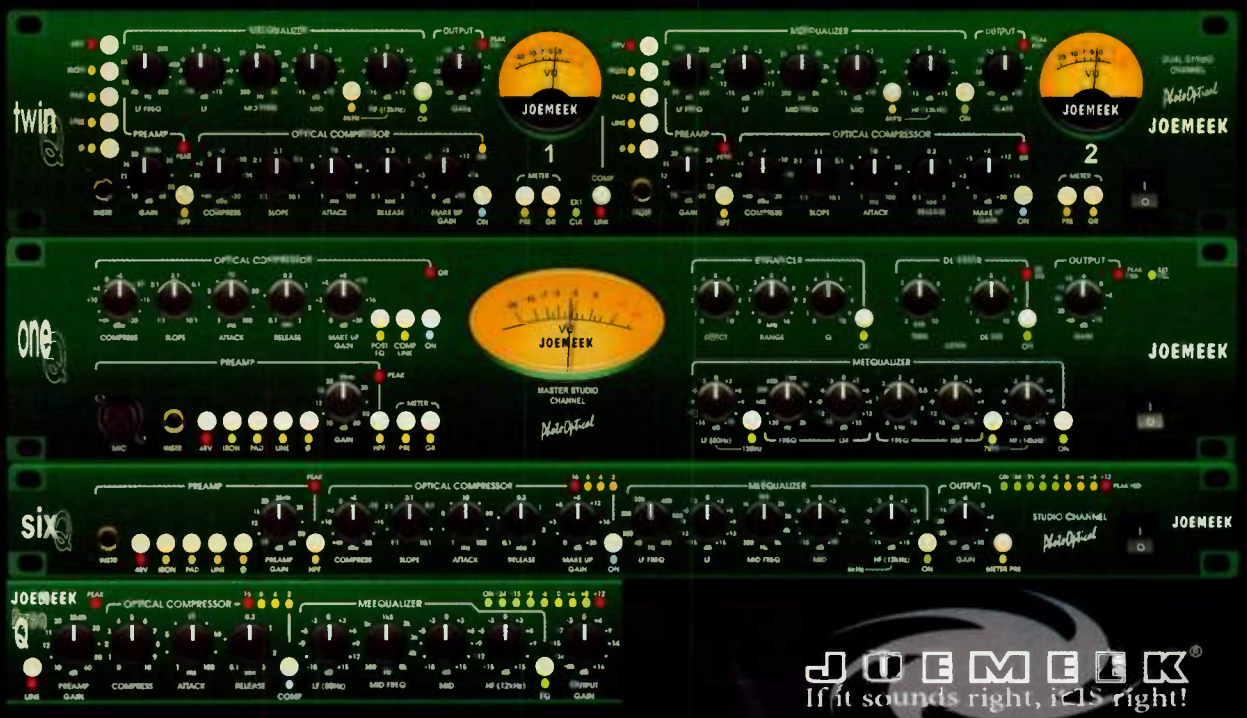

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in the early '80s when the so-called 'sticky shed syndrome' was first noticed in stocks of the company's 456 and 406 tape. Kevin recalls: "Ampex felt they had a responsibility to their customers, so they baked tapes for free for a while, but when they noticed that it was happening to other brands of tape as well, they realised it wasn't necessarily their fault, and handed over reponsibility for baking to this other guy, and started charging for it. I used to send tapes that needed baking to him, but I soon got fed up of sending tapes back and forth to Reading, so I asked Quantegy what kind of oven was required for the job, and we got one here with capacity for about 15 to 20 two-inch tapes. When clients in London realised they didn't have to ship tapes to Reading any more, our baking business took off, and we bought two more ovens, each with room for about 50 tapes.

"We get phone calls every day about tape baking now, and we often have to explain why it's needed. There's a lot of urban myths; I've heard even quite well-respected, technical people say 'Oh, you can bake the tape, but then you get one go at transferring it, and if that doesn't work, it'll be lost forever.' But that's not the case. It usually makes the tape playable for about 20 or 30 days, during which time you can transfer it. Once we've explained this to potential customers, we can either bake the tape and leave the digital transfer to them, or do the whole process for them, in which case the tape baking is free."

The Copyroom's tape-baking clients range from members of the public wanting to transfer low-quality audio recordings of late relatives right up to the top names in the recording industry. One day, following a phone call in which the Copyroom were asked if they could help save 50 unspecified tapes, one such 'name' client dropped by the FX premises in a stretch limo. It turned out to be none other than Rita Marley, widow of Bob. And she bought a crate with her...

The Copyroom's three temperature-controlled ovens, used to cure old analogue tapes of 'sticky shed' syndrome.

"When we got it open, the tapes were covered in mould — at first I thought they *were* mould. They'd been stored in a hot garage in Jamaica. Moisture's bad, but at least you can bake that away; heat is the real killer. Some of the tapes were fine, but some had just fused into a block. At the time, I had no idea what to do with those, so we had to set them aside. But we managed to bake and clean about 25, with some help from Quantegy.

"It was like archaeology — first the tapes were baked, and then it was a slow process of unwinding them by hand, using paintbrushes and an anti-static lint Quantegy had recommended to clean the mould from the surface of the tape. We worked pretty much around the clock for a couple of weeks, but we managed to get those 25 done. They were all multitrack live recordings — Bob Marley live at the Lyceum, at the Rainbow Theatre, at the Hammersmith Apollo, stuff like that. Rita Marley came back and listened to the finished results, and was very happy and quite emotional about it. I guess it could all have been lost for ever.

"I've actually worked out a way of getting the tapes in the worst condition to play, now. A guy came in off the street one day with a tape of a prominent African artist that wouldn't play, and when I opened the box, the oxide was just falling off, as though the binding had completely dried out. I suggested to the owner that a lubricant might help, and said I could try soaking it in de-ionised water, but there was no guarantee it would work. The tape was completely unplayable as it was, though, so he had nothing to lose. I soaked the tape for about two hours — it absorbed water like a sponge at first — until I could see the outer layers beginning to peel away. It was a judgement call, as I didn't want to leave it too long and cause it to swell. It took several more attempts before the water penetrated to the middle of the tape, and only then could I safely unwind it by hand without ripping the oxide off. And after that, it had to be baked six times before it was playable. It took about a month in all. But finally, it played — and it sounded absolutely fine.

"After that, I did the same for the master of Althea and Donna's 'Uptown Top Ranking'. That tape was the same, but having tried it once, I was more confident, and it worked. We'll do that for anyone with badly fused tapes now, but we have to charge a lot for it — over a thousand pounds a tape in some cases — because it takes so many man-hours to get the tape to the point where you can transfer it, and it's painstaking, careful work. Obviously, some people decide it's not worth it."

Old Splice

Aged splicing and leader tape, it seems, can be the bane of Kevin's life, especially when he's trying to encourage a sticky tape to spool. "When tapes with splices in them have been baked, and you're slow-winding them, sometimes the tape can stick to the back of the splices. You can hear it happening. There's a kind of clicking as the tape is pulled apart, and some of the surface starts to pull away — and then you have to leap for the tape machine to stop it winding, as fast as you can! Often, I'll wind the tape by hand really slowly, but it'll still stick to the splicing tape, in which case I have to put fresh tape over the old splice to stop the tape sticking to it.

"Also, I don't know what era it comes from, but there was a time when tapes were made using this funny leader tape with red stripes through it. Nowadays it's white, red, or green, so this stuff stands out. The problem is, the red stripes are actually paint or some kind of ink that's become sticky over the years, and they tear the oxide right off the tape when you wind past it, unless you wind it *really* slowly. That happened to me the first time I encountered one of these tapes; luckily, the audio on it didn't start until 30 or 40 seconds later. But when you get a production master with that leader tape between the tracks, you know you're in for trouble, and a lot of *very* slow, careful winding. It's almost like peeling a plaster off your leg..."

Vision On?

The FX Copyroom is continuing to branch out — at the time of writing, they're getting into restoring and transferring video tape. After six years, Kevin Vanbergen is still delighted that he put an end to the CD-duplication activities. "Through doing this year after year, we've gained a really good reputation for being able to save recordings people thought were lost for good, and for putting them into formats people can use more easily. And so a lot of stuff comes through us, whether it's live or studio productions. Someone recently called the FX Copyroom 'the Spaghetti Junction' of the UK music industry. I'd like to think of that as a compliment!" SOS

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MX4 as it appears inside Ableton *Live*, a great package that also happens to be an Audio Units host.

MOTU MX4

Version 2 Software Synth For Mac OS X

Every major sequencer manufacturer now sells software synths for use with their recording applications, but MOTU's *MX4* had not been out long before an updated version was announced. We find out whether v2 was worth the wait...

Derek Johnson

Mark of the Unicorn certainly got a few things things right with the launch of their *Mach Five* multitimbral sample player/editor. It's one of the most flexible products of its type, sounds great and is easy to use. Check out our December 2004 review (located at www.soundonsound.com/sos/dec04/articles/motumach5.htm). And if a company sells a software sampler, they usually have a software synth. MOTU are no exception; the synth is *MX4*, version 2 of which is the subject of this review.

Knowledge of *Mach Five*'s spec could lead you to make some snap assumptions about *MX4*, many of which would be incorrect. Though the two packages look graphically similar, the underlying engines are rather different. *Mach Five* is based solely on samples, using the excellent UVI Engine licensed from Ultimate Sound Bank. *MX4* is modelling all the way as far as its signal path is concerned, and its oscillators appear to use a mix of modelling and specially processed samples for sound generation. *Mach Five* is multitimbral and can run as a stand-alone instrument (as of v2.0); *MX4* isn't, and can't.

The two packages also differ in another significant way. *Mach Five* is a cross-platform plug-in capable of running under almost any Mac or PC software host, no doubt because the original UVI engine was designed in this way. Sadly, *MX4* is resolutely Mac-only, supporting MOTU's own MAS, Digidesign's RTAS and Apple's Audio Units protocols (Apple's *Logic* and Ableton's *Live* offer AU support; I ran *MX4* under the latter). You read that correctly: not only is *MX4* not available for PC, there is no Mac OS VST

SOUND ON SOUND

MOTU *MX4* £199

pros

- Awesome sound.
- Easy to use.
- Powerful synth features, great modulation options.

cons

- For Mac users only!
- No VSTi version.

summary

It's a shame that this is a Mac-only instrument, because it's a top-notch synth. It's so simple to use, yet has so much flexibility, and quietly puts a lot of the competition in the shade.

version provided either. I can't help thinking MOTU are limiting their sales here.

The two packages do have some common features: on the one hand both use the irritating iLok security device, and on the other both are bundled with a detailed printed manual. The latter is good, by the way, though a little more detail in the explanations and illustrative examples might have been helpful. Each package also offers a feature set that tries to cover all the relevant bases without drowning its user with multiple OS levels. And, getting ahead of myself a little bit, *MX4* also sounds great, like *Mach Five*.

Architect's Sketch

MX4's architecture is essentially that of the classic analogue subtractive synth — it's a three-oscillator instrument, with two multi-mode filters, six LFOs, four envelope generators, and a comprehensive modulation matrix. Monophonic or polyphonic operation is possible, with portamento options. A pair of deceptively simple effects processors round out the sound.

MOTU make some claims (and, on the whole, not *too* exaggerated ones) for *MX4*'s multi-architecture synthesis engine. Certainly, *MX4*'s oscillators are equipped with wavetables in addition to standard 'analogue' waveforms, but its three-operator Frequency Modulation (FM) implementation is appealingly straightforward rather than a rival for Yamaha-derived six-operator systems. AM (Amplitude Modulation) is also trumpeted in MOTU's publicity, but is really just an implicit extension of sound design — modulation with a patch — rather than a proper synthesis architecture.

More than *Mach Five*, *MX4* is a one-window package for editing purposes. Until v2 arrived, subsidiary pages weren't directly involved with sound design. And even without v2's new page of modulation sources, it's perfectly possible to hone a patch from the Main window. It's an admittedly large window, but it's one of the designers' achievements that you don't have to delve into a many-layered OS in such a complex and powerful synth.

As an aside, if *MX4* (or multiple instances of it) makes your desktop too busy, it can be reduced in two ways: the effects can be folded away, and all but a thin strip of the window can be hidden if you're not editing. Patches can still be selected from the strip (shown over the page), and subsidiary pages may be accessed if required.

Operational simplicity means experienced synthesists can dig in immediately and start tweaking, but newcomers can still have a good stab at sound design without having to get a double first in physics and psychoacoustics before installation. I will note that some on-screen elements seem rather small or obscured by controls. A large display near the top of the Main window helps, by showing the changing value of any currently selected parameter. This takes some getting used to if you're expecting tool tips to pop up as you move the mouse across parameters. Pop-up menus are used, though, to assign modulation sources and MIDI controllers to parameters, as well as for copying and randomising parameter values.

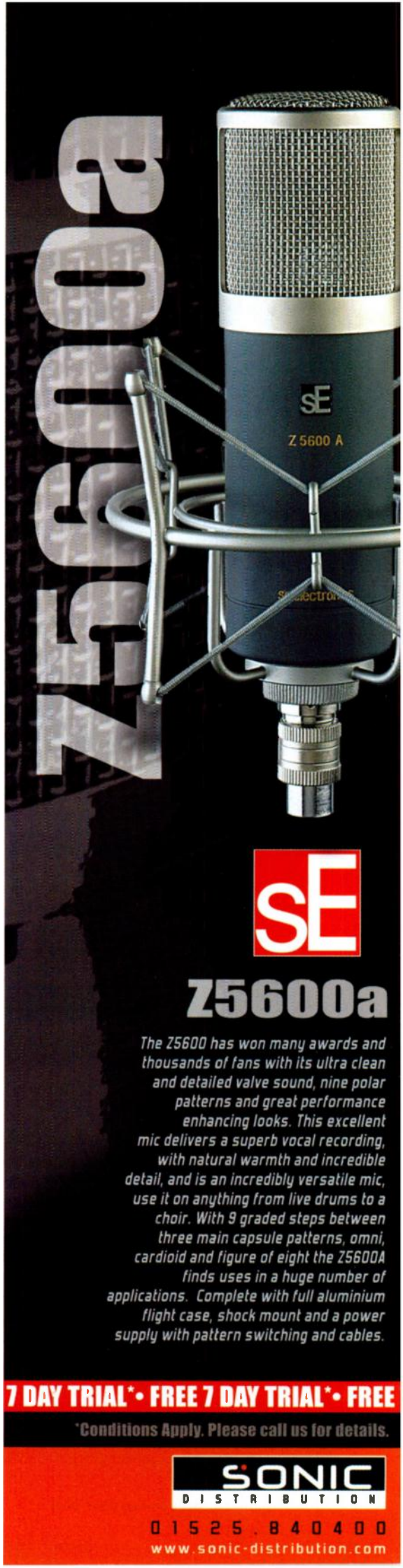
Oscillations

Sonically, everything starts with the three oscillators. You can create with one or two oscillators if you wish: disabling oscillators reduces CPU load and there are still huge possibilities offered by single- and dual-oscillator patches. Each can produce one of a standard set of analogue synth waveforms — sine, sawtooth and rectangle waves, and white and pink noise are also available. In addition, 'digital' variations of the sawtooth and rectangle waves are provided; they use less DSP power, but they do tend to create audible aliasing effects, which suggests to me that the 'normal' waves

Test Spec

MAC REVIEW SYSTEM

- 450MHz Apple Mac G4 with 896MB of RAM, running Mac OS v10.3.9.
- Ableton *Live* v4.1.2.
- *MX4* version reviewed: v2.0.



If *MX4* is taking up too much screen space, reduce it to this little strip. You'll still be able to select patches and move to other pages.

▶ may be DSP-generated while the 'digital' ones may be samples. In practice, though, there's not much to choose between them; aliasing generally only becomes an issue when using an oscillator as a modulator of some kind.

Then there are the wavetables, in two groups of 98 (the second was added with *MX4* v2; the original wavetables, now dubbed 'digital', maintain compatibility with v1 patches). For those not in the know, wavetables are complex collections of processed sampled waveforms, which can be played back in series to create evolving sonic textures. Wavetable playback is governed by the Index parameters, which can be modulated to create textural and timbral effects that are hard to emulate with more conventional synthesis types. Depending on the wavetable you're using, you may hear noise, digital precision, delicate tones, or samples of synth waveforms.

There's not a lot of help regarding the wavetables, not even a list in the manual. Names such as Bosch, Monopoly, Sufi and Vintage Mini are evocative, but don't really tell you the whole story. Others with names such as 'Square <-> Saw' are instantly comprehensible — here, the table morphs from a pure square wave to a pure sawtooth, providing you with every mix in between. A little oscillator waveform display helps enormously; you might not know precisely what's in the table, but seeing its waveform change as you sweep through it keeps you informed.

No matter which waveform is selected, you have access to a Symmetry parameter. This is essentially a pulse-width control, normally dedicated to square waves but here adding oft-extreme (and modulatable) timbral changes to the most unexpected material. Other oscillator facilities are identical for Oscillators 1 and 2, with slight variations for Oscillator 3. For example, all three have a pitch slider, but that for Oscillators 1 and 2 has a range of -60 to +84 semitones, with cent resolution, if 'key follow' is engaged (the normal state of affairs if you're playing *MX4* melodically). If you disable this function, the oscillators produce a fixed pitch over a range of 8.2Hz to 22.1kHz. This is great for modulation, and also for producing test tones, as illustrated by a range of 'factory' patches.

Oscillator 3's pitch slider has a range of -192 to +84 semitones, allowing it to be used as a sophisticated LFO; its key-tracking parameter is a fully variable slider rather than a button, which means that the LFO effect can track the keyboard, an interesting option rarely found elsewhere. The full range of waveforms (including wavetables) makes this aspect of *MX4* well worth exploring. In addition, Oscillator 3 is the modulator for the other two Oscillators in a simple FM 'algorithm' that can be stretched further than expected due to the wide range of source waveforms available for each 'operator', and saying nothing of the conventional modulation options on offer (of which more in a moment). In this mode, Oscillator 3 doesn't even have to be enabled.

Oscillator sync is provided between Oscillators 1 and 2, enabling classic powerful analogue leads and basses to be created, and ring modulation is another blast from the past, producing the expected clangorous tones from the first two oscillators. Ring mod is actually placed in *MX4*'s basic mixer section, not illogically. This option encompasses the Level and Pan controls for each oscillator (the latter only when stereo operation is enabled), plus the controls for the synth's audio input. Signals appearing at ▶

Files & Folders

Name and organise your patches, complete with user-definable keyword searching, in the comprehensive File page.

MX4's 720-strong patch library is handily organised into themed folders with names like Vintage Synths, Leads, Pads, and so on. Summarising the collection is practically impossible; it ranges from jaw-on-the-floor over-the-top to delicate, and from commercial sounds to the rather strange. The simulations of classic synths are rather good, too. Anything in the Rhythmic Sync, Sequenced or Arpeggiated folders is worth a listen — you won't believe it's a single synth producing some of these rhythmic and textural sounds. At the other end of the complexity spectrum, MOTU also provide a handful of 'initial' basic patches to get you programming from scratch.

Users are free to create their own folders for custom patches. It might seem like overkill, and can be very strange to work with, but a whole page — the File page — is dedicated to setting up folders, and making notes about your patches. The resulting folders join the main factory list on the Main page. In addition, new patches can be saved from the Main page, where there's also a Compare switch to check out the effect of your latest edits, and a Revert button that takes you back to the original patch if it turns out that you don't like what you've done!

Incidentally, if you've hit a dead end and are looking for a quick sonic way out, head over to the Random page. This does exactly what it says on the tin, except that MOTU have given you control over which bits of a patch will be randomised, taking the current patch as a starting point. You can randomise the oscillators (while constraining the pitches to octaves and unisons or fourths and fifths if desired, to avoid dissonance), or the filters (including FM and topography — the filter and distortion routing options), or the LFOs and Envelopes.

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the latter are mixed with the synth sound proper before being treated to the synth's filters and effects. The mixer also offers a 'Fundamental' knob, which makes sense if you've created a heavily filtered, modulated patch that sounds great but has lost its tonal centre: this knob, derived from Oscillator 1, returns a sense of pitch to the sound.

Follow The Path

Next stop in the signal path is a pair of mixable multi-mode filters and a distortion unit. On the face of it, the filters are well specified, providing what you would expect: low-pass, high-pass, band-pass and band-reject types with slopes of 6dB, 12dB, 18dB or 24dB. You have control over frequency and resonance (to self-oscillation), as well as key tracking. But things get more interesting — and not just because you can drag the filter response curves with the mouse to edit them. MOTU have added an FM option for each filter, with Oscillator 3 again the modulator. There's real room to play around inside a sound here, especially if you exploit the modulation options; a filter with a modulated FM parameter produces a somewhat different effect than if the same modulation was being applied to cutoff frequency or resonance. Best of all, though, is the choice of serial and parallel configurations of the two filters and the distortion module. Sonically, these are meaty, characterful filters, and MOTU have obviously taken the American classics (Moog, Sequential and so on) as their inspiration.

There is no dedicated filter envelope generator, but with four possible EGs, I'm sure you can set one aside for the task. The EGs are largely the same, with all offering a five-point envelope plus delay parameter. Attack, Decay, Sustain and Release are joined by a 'Hold' value between the Decay and Sustain stages. Envelope 1 is fixed to amplitude (level), though it can, along with the other three EGs, be assigned to any modulation target (practically any parameter). A range of triggering options include polyphonic, mono, and external MIDI, and a funky, mouse-draggable display shows the envelope curve. My only gripe here is that there's only one set of controls and one display shared between the four EGs.

The Mods page introduced with *MX4* v2 offers all sorts of neat toys. Used together, the arpeggiator, pattern gate, pattern sequencer and trigger sequencer almost create the effect of composing algorithmically.

Three oscillators, two filters, four EGs... the numbers are flying thick and fast. Now how about six LFOs? Another great display finishes off this neat design — check out the circular feature in the middle of the window. It's a little strange at first, and some of the text is obscured by the sliders, but you soon get the hang of it. The main controls are ranged around the waveform display, and the LFO to be edited is selected by a clearly labelled button. There are no fixed routings for the LFOs, apart from a couple that show up in the patches MOTU provide; you're free to make those decisions yourself.

The waveforms offered by the LFOs are sine, sawtooth, rectangle, sample-and-hold, sample-and-ramp, and 'random walk'. The remaining parameters include the straightforward — Delay and Rate — and the creatively unexpected. As with the main oscillators, we have a Symmetry parameter (like pulse width for an LFO), plus a Phase slider. The last of these selects where in the waveform's cycle the LFO 'effect' starts; there's an option for random and free-running phase. A free-running LFO just keeps oscillating regardless of whether you're playing any notes or not.

As if six LFOs weren't enough, each has a polyphonic option, which causes the modulation to trigger for each new note played. The effect is of more movement and richness, and it sounds as though you're using more LFOs than you are. Last of all, the LFOs can be locked to MIDI Clock, with an incredibly wide range of note sub-divisions — the cycle can last anywhere between 16 bars and a 64th note! Oddly, there's no dedicated Depth parameter for the LFOs. Interaction with, say, the mod wheel can have impact on the perceived depth, though, so read on...

It's A Mod World

Even before version 2 of *MX4* was released, the instrument had a pretty good spec, with plenty of modulation options which are still

Effects

It should come as no surprise that *MX4* includes some basic effects processing — to be precise, a modulation processor and a time-based processor. In v1 of *MX4*, just chorus and delay were provided, but with the launch of version 2, you can select from chorus, flange and phaser in the modulation processor, while the time-based processor offers delay and reverb. CPU load is relatively low, but there is some impact: watch yourself if your Mac (like mine!) is a little slower than the current norm.

There aren't many controls, and you can still only have two effects running at once, but the result is pretty good nonetheless. Being able to save effects as part of a patch, and to freely assign parameters as modulation targets, helps stretch the effects even further.

The modulation section has just four parameters. Mix, Rate and Depth are always the first three, and the Chorus has Delay as the fourth. The Flanger has Feedback as the fourth, while the Phaser offers Width.

The new reverb also has just four parameters: up to 60 seconds of Decay Time, a High-frequency Damping parameter, Stereo Spread and Mix. The delay, however, which has a tempo-sync option, has eight parameters. The left and right channels have independently tweakable delay times, with positive or negative feedback: the range is 0 to 2000 milliseconds in free-running mode, or a 64th note to a bar in sync mode. Dotted and triplet values are included in a comprehensive list.

Further sonic manipulation is possible courtesy of a filter: high-pass, low-pass, band-pass and notch types are available, with independent left/right frequency controls plus Resonance. It's ideal for creating retro low-bandwidth effects.

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present and correct. Sources can be routed and cross-modulated with ease to create complex patches with real movement, thanks to the built-in modulation matrix, which offers 16 sources that can be freely assigned to any parameter on the synth — and any number of parameters can be assigned to one modulation source if you like. Assigned parameters change their appearance: they split so that you can set a modulation range and centre point, and you're able to see the modulation effect take place, though the graphics involved in each parameter are rather small.

With four EGs, six LFOs, aftertouch, mod wheel and almost any other incoming MIDI data selectable as a source, an *MX4* patch can really 'move', either free-running or responding to playing style. Not only that, but the modulation source itself can be further 'shaped', or modulated, either by another modulator or one of the new shapers I'll come to in a moment. A simple example would be to cause an LFO effect to increase with the tweaking of a mod wheel or velocity.

Version 2 of *MX4* further enhances this already-impressive spec with the new Mods page, which adds an arpeggiator, pattern sequencer, pattern gate and trigger sequencer. The arpeggiator has no real surprises, but is well specified: direction, octave range, note value, swing and arpeggiator pattern can be tweaked by the user.

The pattern sequencer is like a cross between a programmable arpeggiator and a step sequencer, though it can modulate any parameter, not just pitch: it offers up to 16 steps, each with a range of ±60 (these units are semitones if the sequencer is routed to pitch), with Note Length and Swing parameters.

The Pattern Gate is allied in a way to the effects: it slices up *MX4*'s audio output in response to a pattern of up to 16 pulses. There are Note Length and Swing parameters, and a four-stage envelope for the pulses. In a similar vein, the new trigger sequencer allows rhythmic patterns to be applied to the envelope generators, for rhythmic effects within a sound, rather than chopping it up like the Pattern Gate. All four of these new options automatically derive their tempo from that of the host application when the sync option is selected, as do the LFOs (and the Delay effect). There is no option to set an independent tempo inside *MX4*.

The Mods page also adds a handful of 'modular' type processors. For example, an Envelope Follower uses the amplitude of the audio input as a control signal for *MX4* parameters. Then there's a lag processor that applies a simple envelope-type effect to a modulator's output. This helps smooth out the signal's response, and with a pitched modulation target, the result can be rather portamento-like.

In a creative rut? Pushing a few buttons on the Randomise page might get you in the groove again. The currently selected patch is taken as the starting point.

Sample and hold, another new Mods option, can be applied to any modulator. It performs in a similar manner to the S&H waveform provided for the LFOs, although it's less random and offers much more user input over its response. A circular display, similar to that used by the LFOs, shows off the new Transform Shaper; apply this to a modulator's output and you can alter its response, or invert it completely. Lastly, the new Quantiser Shaper works with a pitch-based interface, but can be used to constrain the range of modulation sources in very particular ways. The most audible results will be heard when the modulator is routed to a pitch-based target.

Conclusions

MX4 is one of the best straight-ahead synths I've played with. It does pretty much everything you'd want a basic classic 'analogue' synth to do, and then some. It has a sound that soars, and just poking around with the modulation options quickly produces sounds that move and respond to your playing.

There is little to complain about. Had I been reviewing v1.0, most of the features offered in v2.0's Mods page might have been on my wish list, but MOTU have obviously been thinking hard about this one. Even the price seems right. The lack of multitimbrality is countered by being able to load multiple instances, and the CPU load when you do this is surprisingly manageable, especially if you have an up-to-date Mac and you're careful with your programming. For example, enabling filters means more CPU overhead, so why not audition a few wavetables that might produce the sound you're after? To give you a practical idea, my old wreck of a 450MHz G4 — I really must get this updated! — managed four instances of *MX4* loaded with sensible but not overly complex patches inside *Live*, alongside a drum machine plug-in. With more complex patches involving both filters and the arpeggiator, and with the pattern sequencer and pattern gate enabled, I was starting to experience problems with just two instances running.

MX4 may lack the real modular approach of some hyper-detailed synthesis environments, but the modulation matrix puts a lot of this functionality easily within reach, courtesy of a transparent user interface. In short, it's a deep synth with a simple front end — the best combination!

Of course, if you're a PC user, you won't even be able to try out a demo. And if your application hosts nothing but VST instruments, then MOTU aren't on your side either. For everybody else, though, *MX4* is more than worth a listen. It's practically worth buying unheard — and I don't say that lightly! SOS

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Solid State Logic

Boss RC20XL

Loop Recorder Stomp Box

Photo: Mark Ewing

Record loops and overdub in real time for lightning-quick track creation live or in the studio.

Paul White

You might reasonably ask what a review of a stomp-style guitar pedal is doing in *Sound On Sound*, so let's get that out of the way right now. Firstly, the RC20XL builds on the concept of the now discontinued Lexicon Jam Man (and the looping functions of the more recent Line 6 Delay Modeller) insomuch as you can record loops (called Phrases in Roland-speak) and then overdub onto them live. The Jam Man elicited a lot of interest from our readers, especially when Lexicon stopped building it — it seems that you always want most that which you can't have! The second reason I find this product interesting is from a technology standpoint, as to my knowledge it is the first looper to use flash memory, which means segments of audio can be retained in memory indefinitely for live performance use. Better still, as memory is now much cheaper than it was, the recording time is measured in minutes rather than seconds. In fact a maximum of 16 minutes of memory is available, split between the various loops you wish to record. Clearly this pedal is ideal for admirers of Robert Fripp's guitar wizardry who want to play semi-experimental music live, but it can also be a creative studio tool, as you can build up loops in a very intuitive manner before recording them into your sequencer for future use as the basis for a new song.

Loop Recorder Stomp Box

The pedal itself follows a familiar Boss format with two footswitches controlling most of the live action. Two further footswitches (one of which can be a dual up/down pedal) can be connected via rear-panel jacks to control Phrase Shift, which I'll talk about a little later, and Reverse, which does just what it says —

plays the recorded loop backwards. Although this unit is designed for use mainly with guitar, there's also an unbalanced jack mic input, though I wouldn't recommend this for serious recording work. However, it is useful for those high-street busking sessions with a digeridoo (or whatever) and you can even use the mic and instrument inputs at the same time if need be. The output of the unit is strictly mono and power can come from an optional PSU or from six AA batteries. Digital units like this tend to be fairly hungry on batteries, so the mains adaptor is a good idea — unless you're busking in the high street using a battery amplifier!

Working with loops can be a problem, because if you get an overdub wrong, you generally have to go back to square one. However, that's no problem here, as there's a very welcome Undo/Redo button. To help timing, there's also a useful metronome and a facility for having the loop recording end precisely on a beat rather than exactly where you hit the pedal. This is really helpful in creating tight-sounding loops. Once a loop has been recorded, its tempo can be changed without altering its pitch, though as with most time/pitch manipulation there's only so far you can go before the processing artefacts start to show.

Other live performance niceties include the ability to store multiple Phrases, then decide whether each should play back as a 'one shot' performance or loop continuously. Because this pedal can store multiple Phrases, and store them after power down, you could load up a few backing tracks into it (from CD, your computer or any other suitable audio source) ready to perform. There's no way to back up loops other than to record the audio output, though, and from my own perspective the ability to dump and load audio files via USB would have made a lot of sense.

SOUND ON SOUND

Boss RC20XL £249

pros

- Flash memory allows long-term storage of your material.
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cons

- Memory can't be expanded.
- Extra pedals needed for full operational flexibility.
- Mono playback only.
- No memory back-up option other than recording the audio out.

summary

The RC20XL is a good compromise between a technological monster and a no-brainer guitar stomp box. It allows the experimental player to perform magical things live, it has a memory not reliant on being left powered up, yet it is affordable and not over-complicated.

Controls

There are relatively few controls on the front panel, but it's worth going through them as their functions are not always as straightforward as they might seem. The Level control sets the playback volume, but from its position on the left-hand side it would be easy to mistake it as some kind of input-gain adjustment, which it isn't. A second level control, labelled Guide, adjusts the level of the guide rhythm part, which is best thought of as a cross between a click track and a simple drum machine. The controls that actually adjust the line and mic levels are located on the far right of the machine, the logic being that this is the side your input jack goes in (to suit right-handed players). Below this is a Tap Tempo button for setting the click tempo in the usual way, but by pressing and holding it you enter a mode where you can step through a number of alternative time signatures, so you don't have to do everything as 'four to the floor'. Furthermore, if the Tap Tempo button is used in conjunction with the shift button, you can select different guide patterns to play along to.

The Phrase Select knob is a rotary switch with 11 numbered positions, each relating to the Phrase you're saving or playing back. A Loop Phrase indicator LED lights if a loop Phrase has been saved in the currently selected location and if this flashes rapidly when you're trying to overdub or save, it means you have insufficient memory left. It also blinks during Phrase playback. Once a Phrase has been recorded, it needs to be stored into internal memory using the Write button, otherwise it will be lost when the unit is powered down. Using Write and Shift together deletes the currently selected Phrase. A second LED does a similar job for a one-shot Phrase being recorded or played back.

Auto Start is a neat feature and allows recording to be triggered by the first note of the performance, rather like the automatic ▶

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WRH

interview nainita desai

Nainita Desai

Building A Career In Music For Picture

Tom Flint

For over a decade, Nainita Desai has earned her living designing sounds and composing for film and television. She speaks about her experiences in the industry, and explains what opportunities there are for newcomers who want to get their foot in the door.

What aspiring scorewriter wouldn't want to have written a cinema classic like Lalo Schifrin's super-slick theme for *Bullitt*, John Williams' poignant *Deer Hunter* score or one of John Barry's perennial Bond numbers? In truth, few of us have a hope of emulating the success of the people mentioned above, but that doesn't mean to say there aren't other more realistic industry opportunities waiting for those who are prepared to fight for them. Every year, thousands of small independent film and TV programmes are being made, each one requiring a soundtrack of some sort. There are other important sound jobs too: every production requires a team of people to record and edit the sound, create effects, and then mix the whole lot together.

Foot In The Door

These days, Nainita Desai is known primarily as a composer for film and television, nevertheless, she wouldn't have got to the enviable position she enjoys today if she hadn't been prepared to take on a variety of interesting sound production jobs along the way.

After completing a university degree in mathematics and programming, and a postgraduate diploma in Music Technology, Nainita could conceivably have found employment with a music software company. Instead, she used her thesis research for her diploma (written on the subject of DAWs and the latest film and television post-production techniques) to

open a few doors. "I contacted all the big London film studios and also De Lane Lea Studio, and interviewed sound editors and dubbing mixers," she explains. "I got to sit in on the dubs for various big films at Pinewood and soaked up everything that was going on. After the course I used my contacts and talked the people at De Lane Lea into giving me a paid job: I offered to build them a sound effects database so that the editors working in the studios would have a custom library of sounds to call upon." Nainita's sound-designing skills didn't go unnoticed at the studio, and before long her name was passed on to a sound editor who was looking for an assistant to join him on a six-month contract at Touchdown Studios near Munich.

"Sound editing for film is split into dialogue, ADR, sound effects and foleys, and I was doing foleys," says Nainita. "They're things like doors being open and shut, cups being put down on tables, punches, footsteps and so on. In this country there are four or five top foley artists who turn up with their own bag of tricks containing everything they need to create sounds."

One of Nainita's first sound editing jobs was working on the US TV series *Ironside*, which the studio was re-dubbing in German. "The Americans would supply us with the music and effects tracks called M&Es, and they'd always do a very good job of the US dub, but for foreign countries they'd slap it together a bit so it needed redoing. The main character, Ironside, was in a wheelchair, so I was creating the sound of his chair as he wheeled about. I actually used the squeaky handle of a little brown suitcase to create the wheelchair sound!

"There's a lot of creativity and lateral thinking involved in foley work because the most convincing sounds are often created by the unlikeliest of activities. For example, I had to design the sound of a roses growing rapidly from the ground for the film *Little Buddha*, and for that I used the combined sound of a sweet paper being unwrapped and a piece of silk being ruffled. I layered the two in the DAW and tweaked the EQ parameters to form a composite sound. Finding the right combination takes a lot of experimentation and it's often a matter of using the attack of one thing, and combining it with the body of another."

While foley work gave Nainita the opportunity to develop her skills in sound creation and manipulation, her stint as a dialogue editor, notably on the film *August*, proved to be a great exercise in audio editing. "When sound is recorded on location, there is a great deal of detailed work involved in cleaning and editing the multitracked dialogue and location sound so it flows smoothly," she explains. "Also, if an aeroplane is going overhead while an actor is speaking, or if the director doesn't like the delivery of a line, the actor has to overdub their lines in the studio. Then, in the DAW, you have to cut the words and syllables to match the lips precisely. After that the dubbing editor beds the dubs in with the rest of the dialogue and all the other sound effects."

Opening The Scoring

Nainita eventually made the leap to score writing by working on low-budget films offering what is known as 'deferred payment'. The payment method could more accurately be described as non-payment, used when there is little up-front capital available to the film makers. In practice, the crew work for nothing on the understanding that they'll get a share of the profits if the film is a success. "You know that in reality you're never going to get your money back or earn a penny, so you do it for love," admits Nainita, "and you hope that the film goes on to do well on the festival circuit. There are several festivals for every week of the year; most specialising in different subject areas like wildlife, animation or short films."

Pitching for deferred payment commissions is one way to get a foot on the ladder, and the odds of landing a job are reasonable, as very few established composers will be competing for unpaid work. Nainita suggests that anyone interested in independent film work should try contacting some of the nation's film schools. "They all need composers so it's not a bad idea to offer your skills. The London Film School, Surrey Institute of Art and Design, and Ravensbourne College all spring to mind, and the National Film School is also a good one. They have a music department with a few students but more films are made ▶

Nainita's Equipment

- 2.7GHz Apple Power Mac G5 (x2).
- Carillon PC running Tascam *Gigastudio*.
- Mackie Control Universal control surface.
- MOTU 2408 Mk2 and 24 I/O audio interfaces.
- Drawmer M-Clock master clock.
- RME ADI 4DD converter running digital connections to Fostex DAT recorder.
- Roland XV5080 sound module with *Orchestral* and *Asia* expansion boards.
- Presonus Central Station monitor controller.
- Apple *Logic* 7.1 sequencer, plus various soft synths and samplers.
- Dynaudio BM6A monitors and BX30 subwoofer.
- Miglia Director's Cut video conversion box.
- M Audio Keystation Pro 88 master keyboard.

Trailer Tracks

One of Nainita Desai's specialities is writing the music for film trailers, particularly those belonging to big blockbuster movies produced in Asian countries such as Korea, Japan and Hong Kong. She explains what is involved. "My job is to capture the essence of the feature in 90 seconds, and to make the films appeal to a European audience. Unlike most Hollywood films, a single Asian film often covers several genres. For instance, a serious thriller can contain slapstick humor and romance. Nevertheless, so as not to confuse the audience the music has to be composed in the style of the main genre. Trailers tend to get broken up into three main sections, starting with a 20-second introduction that builds into the main action sequence. The body of the piece is usually an epic orchestral track lasting about one minute, which is finished off by a 15-second outro.

"I usually get sent a copy of the film before having a meeting with the editor and producer to discuss the overall musical direction. Sometimes, I play them guide tracks or refer to other visual sources to give an indication of the ideas I have in mind. After that, I'll go away and write the first 30 seconds or so, submit it for approval, and modify the work according to any feedback. Sometimes I'm given a rough cut of the trailer with guide music already laid on for me to interpret in my own style. For inspiration I've built a library of trailers from the Apple Quicktime web site. You learn the tricks of the trade very quickly by looking at other examples.

"When a film is released on DVD, it usually needs additional music for the motion menus, documentaries and cast and crew interviews. If it's a score to go along with an interview it may be playing from anything from three to 10 minutes. In these instances I have to work very closely with the picture editor who designs the graphics and does all the editing.

"Creating customised showreels is vital to getting the job. I submit a DVD showreel containing excerpts from a variety of my work along with an audio CD of edited tracks I think is suitable to the project. Producers have very little time to devote to choosing a composer and have to be spoon-fed. If I have a day or so, I'll write something specific to help to clinch the deal, and sometimes I obtain a piece of relevant film footage and write something to picture. It is not uncommon for over 100 composers to submit reels for a job mentioned in the industry press so you have to become thick-skinned to cope with rejection, and you have to be ingenious at coming up with ways to make an impact once through to the relevant executive. Then, once you've clinched the job, you have to be flexible and give the client what they want."

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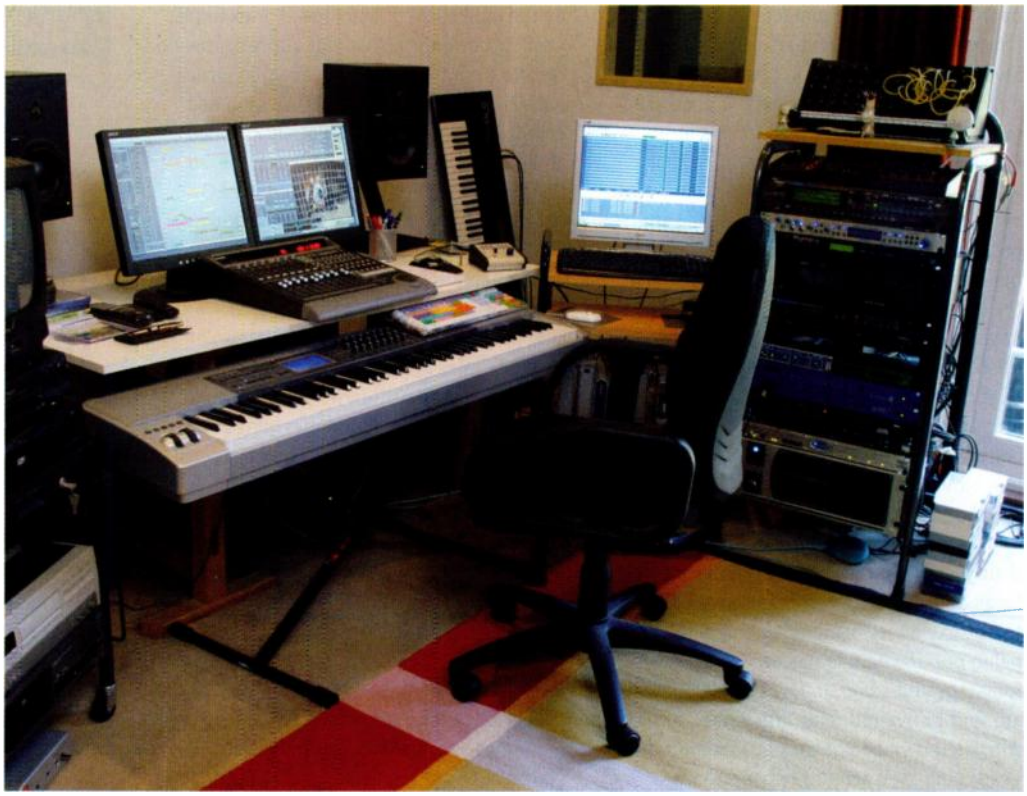

Nainita Desai's studio is based around two Apple G5 Power Macs running *Logic*, with a Mackie Control controller and M Audio Keystation Pro 88 master keyboard.

than that they can cope with, so they do look for outside composers. I got a lot of my film work by taking a scholarship in sound at the National Film School. The training was based on practical experience, so I was working on student films doing location sound, boom operating, sound editing and dubbing. From that I got to work on *Little Buddha*, and that led to me doing sound editing work on *Interview With The Vampire*, *Backbeat*, *Fatherland*, *Great Expectations* and *August*.

"The best web sites to look at to find independent film makers who are casting and crewing are www.talentcircle.co.uk, and http://shootingpeople.org. Shootingpeople has a free membership but if you pay to join you get information quicker. They have lots of ads for composers but there are about 6,500 members around the country so it's still pretty competitive. I spoke to one filmmaker who'd had 200 responses from people interested in composing the music to their film and there wasn't a single penny involved! Some music students think that it is easier to get into writing music for film and TV than it is for a rock or pop band to get a record deal, but that is an illusion — there are thousand of people out there who dream of becoming a film score composer.

"In a Hollywood production you're looking at 20 or more people working in sound and post production, and everyone has an assistant, but Britain's film industry is much smaller; you typically have six or less people in the sound department. On an independent low-budget short film you are often doing everything yourself, and in some ways that's easier because you are in charge of everything."

Big Deals

Television adverts are much more lucrative form of score work, although getting the work in the first place is even harder. "Anyone wanting to work on TV commercials should get themselves an agent," advises Nainita. "Many ad companies only deal with music production houses which consist of either an agent, who represent a number of composers, or a group of composers who cover different styles between them. I have an agent who represents about 20 composers. For each job she picks the composer she considers most suitable to pitch for the job.

"Ad agencies tend to be quite specific about the style they want, be it orchestral or a piece of hip-hop, and they'll often quote artists that they want copied. I do my research by downloading the reference tracks from iTunes. I work out what I need to do by breaking a track into its basic elements and then reconstructing it. It's all about understanding the essence of a track and then creating a new piece of music in that style.

"I sketch out my ideas very quickly, then embellish them later. You still have to allow time for experimentation, so I often throw in a lot of ideas at the start, although the strongest one is what I play to the client. If the ad company is very specific I'll provide one idea, otherwise I give them three approaches even if they've asked for one. The more variations, the more likely they are to pick one.

"Ad agencies negotiate a fee with the composer based on the number of territories the ad is supposed to be shown in. Then the publishing royalties and the fee are split between the agent/publishing house and composer. Agents can take a huge chunk of the royalties because the income can be quite high. For example, I've been offered a 55/45 percentage deal in my favour.

"Times are changing, though, because ad agencies want a slice of the pie and are doing 50/50 publishing deals directly with composers to cut out the music agencies altogether. They might, for example, offer

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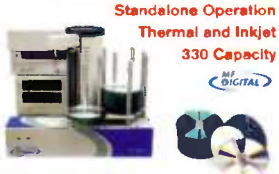

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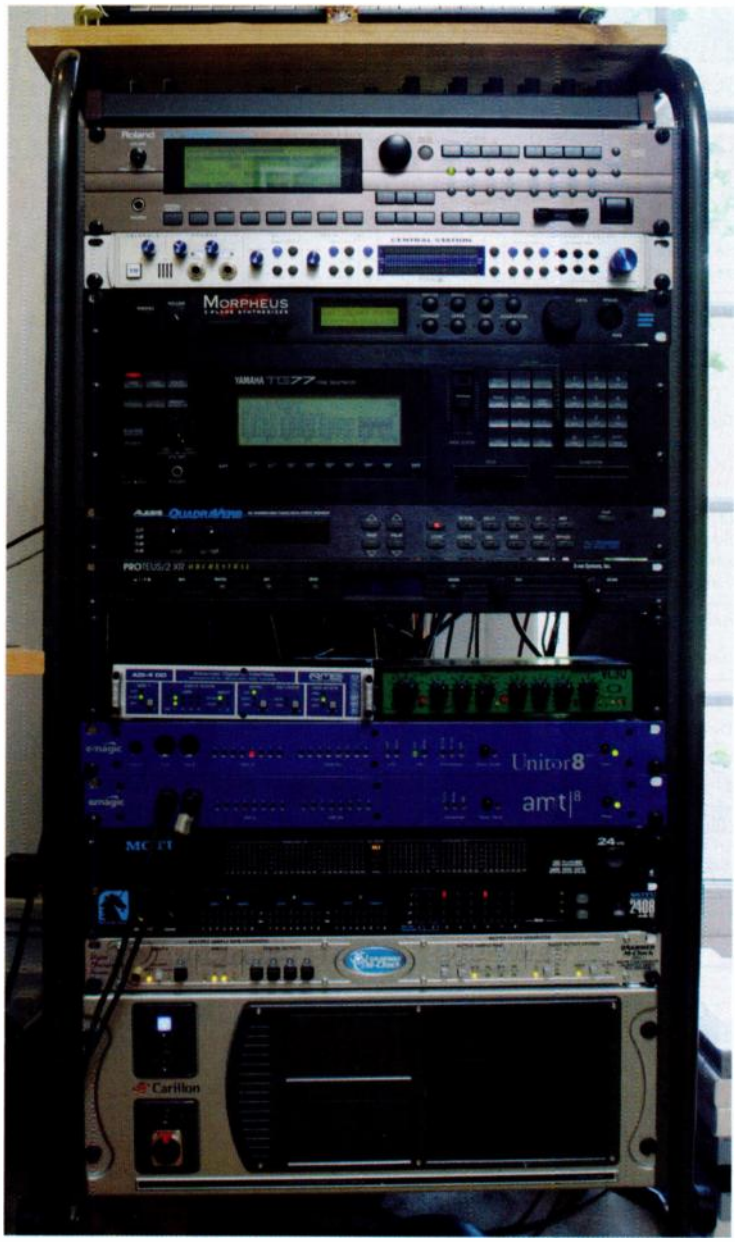
the composer a flat fee of £5000 and then split the royalties 50/50. You can find contact details for ad agencies in directories like *The Knowledge*, and even the *Yellow Pages*, and they all have web sites. They also do poster campaigns, so you have to specifically contact the TV departments and ask for the account managers, the head of television, or the producer. They do get bombarded by stuff, though, so you're still best off getting an agent."

These days, the majority of Nainita's income comes from score work for television films and series. She reveals the sort of fees one can expect to earn. "For a one-hour film the fee usually varies from £2000 to £10,000. I just got a job to write wall-to-wall music for a one-hour film where the budget is £4000 and the product has to be delivered in three-and-a-half weeks. Everything has to come out of that budget including session musicians, hire equipment and studios. Recently the BBC commissioned me to write an orchestral score for a series called *Cathedral*, but the budget wasn't nearly big enough to hire a real orchestra, so I had no choice other than to use sample libraries. You don't get additional fees if the film is sold to other territories, but you do get royalties. Publishing royalty amounts depend on who you are working for and the deal you've struck. Some film companies, like Granada, for example, automatically take 50 percent of the publishing, whereas the BBC give me 100 percent.

"The time you get to do the work varies considerably. I had to do a one-hour film for Channel Four in three days because they'd sacked the composer. It was very tight but at least I had a final edit to work from. As a total luxury, though, someone like the BBC's Natural History Unit give you five or six weeks."

Nainita inevitably has to re-edit her work at a moment's notice every time she receives new rushes, so she sometimes ends up with a number of projects on the go at the same time. "In most cases, editing is being done right up to the last minute, and I'm having to write music that's frame-accurate, very closely to the visuals, so I have to juggle lots of commitments, and I can't really have an off day," she says. "I have to write a certain amount of music every day otherwise it won't get done, and computer breakdowns are not an option. I back up constantly, but I've been very lucky to have only lost about half a day's work in the last 10 years. I've chosen my gear very carefully and the only major problems I've had is with the power supplies in the Emu Proteus modules. I don't use synth modules any more other than the Roland XV5080 and Access Virus B out of faithfulness. Everything else is done using soft synths."



The main outboard rack in Nainita Desai's studio. From top: Roland XV5080 sound module, Presonus Central Station monitor controller, Emu Morpheus and Yamaha TG77 sound modules, Alesis Quadraverb effects, Emu Proteus 2/XR Orchestral sound module, RME ADI4 converter, Joemeek VC3Q preamp, Emagic Unitor8 and AMT8 MIDI interfaces, MOTU 24 I/O and 2408 Mk2 audio interfaces, Drawmer M-Clock master clock and Carillon custom PC.

The Composer's Studio

These days, thanks to modern technology, Nainita finds that she can successfully tackle most film and TV score commissions using nothing other than her own studio, situated in her old dining room. "Nowadays, virtually every composer I know uses soft synths and sound libraries, which means they no longer need proper isolated recording areas," Nainita remarks. "I have done a certain amount of acoustic treatment: I've lowered the ceilings and installed a couple of huge bass traps. I hired Max Hodges of Maxtech Audio to sort it out, and he also laid out all my digital connections via lightpipe and has everything sync'ed using word clock. There are no analogue connections apart from the one to my vocal booth, and I have just one microphone preamp.

"My setup is very straightforward and I've honed it down to the bare minimum. I'm usually working to tight deadlines so I don't have time to mess around with analogue synths. I might be writing electronic music in the style of Kraftwerk one day, and an orchestral score for a battle scene the next, so the most important thing is having a huge library of sounds that can cater for every eventuality. I have everything stored in a database labelled from 'A' to 'Z'. I sub-label things in categories such as Accordion, African effects, Ambiences, and each one of those is divided further.

"Most composers have sounds they turn to time and again. I can even tell which composer has written a film or television score from the sounds they've used. I recently bought the East West *Quantum Leap String Orchestra*, and found it to have a richer, fuller sound than the Vienna *String Orchestra*, which has a more European feel.

Educating Nainita

It goes without saying that having a good musical education is a massive advantage for anyone trying to break into the industry. Nainita got off to a good start by joining every band, orchestra, and choir she could during her school days, and studied both violin and sitar from an early age. When it came to going to university, however, music had to take a back seat. "Asian people tend to become doctors or accountants," says Nainita, "so I kept my parents happy by doing a maths and computing degree, but I had the ulterior ambition of using it in a more creative way, so I did my thesis on the maths and physics of sound. I tried to incorporate music whenever I could. The course included computer programming so I wrote a little program in an attempt to create a new form of synthesis. It involved manipulating the wave equation to output values that were triggered by a graphical shape such as a skin, wind or stringed instrument to create unimaginable sounds. In a way it was like the basics of physical modelling and sampling."

By the end of her degree, Nainita's exploration into sound design had convinced her that there existed career opportunities which were quite promising for someone with her qualifications. Realising she would benefit from some extra training using the latest state-of-the-art equipment, she enrolled on a diploma course in Music Technology. "Sound design for film was a growing industry in the early '90s, and digital audio workstations were starting to make sound manipulation much easier to do, so it seemed to me that there was huge scope in that area. We now take it for granted, but in the past, apart from things like the Theremin, you didn't have many satisfactory sound-mangling tools.

"On the course we were using Apple Macs running Opcode and *Hypercard* and I got into MIDI programming. I've always been interest in Indian classical rhythms so I created a bit of software using *Hypercard* that enabled you to type in complicated time signatures and have the computer play back the rhythm. In Indian music you are often doing things like speaking a rhythm in 7/4, but actually playing in 5/4. It's all based on a very strict foundation of raagas, or scales, and my software allowed you to program that sort of thing."

The *QLSO* sound is also quite popular with clients who have described the scores I've used it on as sounding more 'Hollywood' or 'commercial'. The Vienna library is amazing but its strength is also its weakness because the possibilities are endless in terms of things like playing techniques. The *QLSO* is easier to use and that saves time: you simply have the same sound three times with different ambiences, each one providing a bigger and bigger sound. I mix and match sound libraries to get the right sound but you do go through phases, and at the moment I am putting the *QLSO* on everything!"

The Epilogue

Although dedication and determination have played a major part in Nainita's continued success in the audiovisual sector of the music industry, technology has also played its part. Nainita readily admits that without sequencing software such as *Logic Audio* and the excellent sound libraries that are now available she would never have been able to become a composer, having had no formal orchestration training. She also reckons that the great efforts she's made to avoid being pigeonholed have been vital to her career. "I didn't want to just get Asian commissions because I'm Indian," she reflects. "Once people put you in a box your market shrinks and it's harder for you to get work. But with the facilities I have I can write any style of music and mix it down to CD without leaving my home studio. Being able to do that is fantastic for creative people today." SOS

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AVI Pro Nine Plus

These high-spec passive monitors use well-established engineering principles to achieve a smooth and revealing sound.

Paul White

AVI have established a reputation for fastidious amplifier and speaker design, largely because their designer Martin Grindrod prefers to combine established engineering principles with the best possible components rather than relying on gimmicks or so-called revolutionary design concepts. Because of this attention to detail, AVI speakers aren't exactly cheap, but compared with their peers they still offer remarkably good value.

AVI's passive Pro Nine Plus loudspeakers, which are an evolution of the company's original Pro Nine model, are designed as high-performance, two-way compact monitors and need to be teamed with a good-quality amplifier, such as AVI's 200W integrated amplifier, to give the best results. They are intended for stand mounting but can be wall or shelf mounted when there is no other choice. As with all such monitors, the sweet spot is widest when the speakers are mounted vertically, but the asymmetrical geometry of the baffle allows these speakers to be used on their sides with very little compromise.

Whereas most small monitors use drivers that cost only a few dollars each, the Pro Nine Plus combines a high-end Scanspeak 28mm soft-dome tweeter with a highly specified Vifa 6.5-inch cone driver. Martin apparently spent a long time auditioning drive units to find a pair that would work together as well as these clearly do. The woofer, which has a one-inch voice coil, features a curvilinear cone made from doped wood pulp, a material that combines stiffness with good self damping. The crossover is AVI's own 14-element, phase-correct design resulting in speakers that are both sensitive and very easy to drive. With a maximum SPL of 111dB and a frequency response flat within ±2dB from 90Hz to 27kHz, the design is well suited both to discerning listening and studio monitoring. They don't seem to suffer from power compression in the same way as lesser designs and so retain great integrity, even when driven hard.

Because of the honest way in which the frequency response is specified, the bass end is actually a lot more solid sounding than the paper numbers might lead you to believe. With a sensitivity of 88.7dB/W/m, the speakers can be driven from an amplifier with as little as 50W per channel, with a maximum recommended amplifier power of 300W per channel. My own view is that a good amplifier of between 100W and 200W per channel would be ideal for most applications.

AVI also build their speakers into beautiful cabinets, and the Pro Nine Plus is no exception. Measuring 340 X 230 X 255mm, the 12 litre cabinets, which are front ported, are built from heavy 18mm MDF and veneered with real cherry wood or black ash, though custom finishes are available to special order. As the cabinets are relatively small, no internal bracing is required, but damping panels are affixed to some of the

SOUND ON SOUND

AVI Pro Nine Plus £799

pros

- Tonally very accurate.

cons

- Relatively costly for passive monitors.

summary

Where you need the accuracy to finish mixes to a high standard, particularly in the area of acoustic music, these speakers are very hard to beat in their UK price range. However, if you're doing mainly dance music, then there are cheaper alternatives that will probably serve you adequately well.

inner surfaces of the box and a natural wool damping material is used to completely fill the internal space. The drivers are mounted into machined recesses in the baffle using cap-head screws, and the bass/mid-range driver also sits on a very effective airtight gasket. A single pair of terminals is used to connect the speakers, as the designers aren't really sold on the benefits of bi-wiring. There's even a mounting recommendation that the speakers be placed on pads of Blu-Tac rather than on fancy (and expensive) spikes.

Listening Tests

I tested these speakers with one of AVI's original integrated amplifiers, which is rated at around 100W per channel and so is perhaps not quite as well suited as AVI's new and more powerful model. Nevertheless, it proved more than adequate. While most of the hi-fi mag reviews have been very favourable, there have been comments that the speakers tend to over-project vocals very slightly. In the studio world where monitors tend to be voiced more aggressively than the hi-fi fraternity would like, this attribute would probably not even be noticed, or if it was, it would probably be considered favourable.

Overall, the sound is reassuringly smooth and open with a good degree of depth, excellent stereo imaging, and negligible audible coloration due to the cabinet, even at high listening levels. I already have a pair of AVI's very nice, though controversially named, Biggatrons, but the Pro Nine Plus monitors sound noticeably tighter and generally more believable, especially at the low end. They are designed to be used fairly close to a wall rather than standing in the middle of the floor, so they should suit the majority of small studio rooms, and, unlike many speakers designed by hi-fi companies, the headroom and sound output (111dBSPL maximum) are suitable for serious monitoring — provided that you don't play dance mixes at club levels.

Because the AVI Pro Nine Plus isn't a 'brute force' monitor, it is probably not the best choice for mixing dance music, but powered from a decent amplifier it makes an excellent monitor for mixing acoustic projects and jazz or pop music that has high production values. Furthermore, because of its hi-fi provenance, it should produce mixes that translate better to home hi-fi than some of the bigger, more aggressively voiced studio monitors.

AVI's monitors have always had a lot of finesse and so are best suited to engineers who like to really hear into their mixes rather than those who use their monitors just to set up a 'broad strokes' tonal balance. This model is one of the best speakers of its size I've heard, and I think it's AVI's best mid-sized speaker so far. It's not a cheap option, especially when you have to budget for a good-quality amplifier (and stands) as well, but it is capable of superb results. No monitor is perfect — existing technology just doesn't allow for it — but this one is extremely good and is capable of outclassing some competitors costing significantly more. As suggested earlier, if you're doing dance music, there are probably more effective ways to spend your money, but if you do many projects involving acoustic instruments and voices, pop music, blues or jazz, they're very well suited to the task. SOS

information

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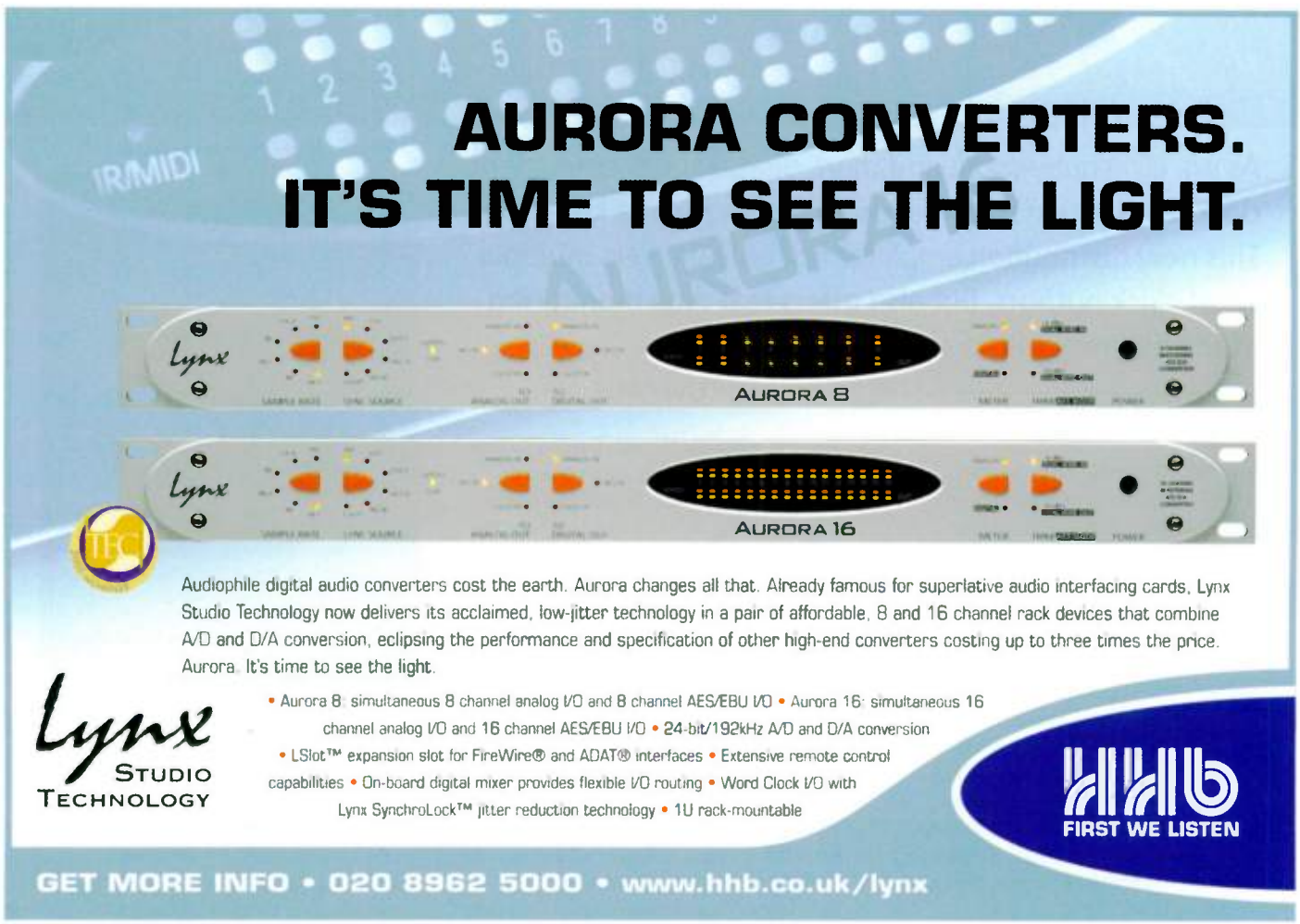

Drawmer D-Clock

Word-clock Distribution Amplifier

As we all acquire more and more digital audio equipment, clock distribution becomes more and more of a key issue. This new distribution amplifier not only delivers multiple word-clock outputs, but also offers real-time monitoring of the accuracy of the source clock signal.

Hugh Robjohns

Although best known for a highly respected range of analogue signal processors, British manufacturer Drawmer also produce some highly innovative digital equipment, including the unique M-Clock master clock generator with its four built-in sample-rate converters.

Their latest digital product is a sister product to the M-Clock: the D-Clock word-clock distribution amplifier. However, in the same way that the M-Clock is not just a master clock generator, the new D-Clock is not just a clock distribution unit. It also incorporates a unique word-clock frequency measurement facility to display the actual clock rate and hopefully reassure the user that everything is working as it should.

Overview

Styled to match the M-Clock, the new D-Clock is housed in a 1U rackmounting case that measures 145mm front to back and weighs a modest 1.7kg. As you might anticipate, the rear panel is crammed full of connectors, starting with the usual IEC mains inlet complete with integral fuse holder. The internal power supply is a switched-mode design that can accept mains voltages between 85V and 250V, at 50Hz or 60Hz.

The D-Clock distributes only word-clock outputs, but the input reference clock signal can be supplied as either a standard word clock or as an AES-EBU signal. The word-clock input is connected via the usual BNC socket, while the AES input is hooked up with an XLR. Usefully, both inputs have associated 'zero-latency' loop-through outputs — in other words output connectors which are wired in parallel with the inputs. A pair of slide switches enables the correct impedance termination to be selected (75Ω for the BNC and 110Ω for the XLR). If left unterminated, the D-Clock inputs present a very high impedance to the signal which will not load the source. Thus the clock signal can be ▶

SOUND ON SOUND

Drawmer D-Clock £460

pros

- A compact and well-designed distribution amplifier.
- Both word-clock and AES reference inputs.
- Accurate and clear clock-rate displays.
- Alternative viewing modes to suit different users' requirements.

cons

- Unspecified propagation delay.

summary

A novel word-clock distribution amplifier with the added value of a clock-frequency display. Accepting both AES and standard word-clock references, the D-Clock provides twenty buffered outputs, plus loop-throughs of both sources and selectable termination modes.

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routed on to other distribution units from the loop-through connector. However, the last unit in the clock chain should be correctly terminated, of course, to prevent reflections back along the cable which could disturb or even destroy the clock integrity.

The majority of the D-Clock's word-clock outputs are presented on 16 individually buffered BNC sockets on the rear panel. In addition, there are four more BNC sockets on the front panel to make it easier to accommodate temporary equipment needing a clock reference.

The front panel is finished with a brushed-metal effect and contains a blue 'lozenge' logo in the centre to match that of the M-Clock. However, embedded within the lozenge is a very clear 16-character blue liquid-crystal display which provides the input's clock-frequency measurement. To the left are the four BNC clock outputs mentioned above, while to the right are two small square buttons and seven yellow LEDs.

The first button selects the LCD measurement mode, with LEDs to confirm the current status. There are three options, the first being the actual clock frequency, shown in kilohertz to four decimal places — for example, '44.1000kHz'. The second mode shows the assumed nominal clock frequency, with any error given as parts per million — such as '48.0k +00001ppm'. The third and final mode provides the nominal sample rate again, but with any error shown as a percentage — '48.0k -00004%'. The D-Clock remembers the selected display mode when powered down and restarts in the same condition. The display accuracy is to 0.1Hz or 2ppm (according to the display mode) at all clock rates.

The second button selects the required input clock source: either the word-clock input or the AES signal, again with LEDs to confirm the current status. The final pair of LEDs simply register the presence of a valid clock signal on each input. It's picky of me, I know, but there is an inconsistency in nomenclature here. The panel legends refer to the clock input options as BNC and AES — where the first refers to a style of connector and the second to a signal format. A pedant would insist that the panel should therefore read either BNC and XLR, or Word Clock and AES — the latter being the technically correct solution. Still, I think we all know what is meant and this is a very trivial point...

Practicalities

Although the D-Clock is clearly styled to match Drawmer's M-Clock, it can be used equally well with any master word-clock generator: it is a simple word-clock distribution amplifier, after all. Connecting the unit to the clock source and other equipment is child's play, as it simply involves plugging in BNC cables, and the only configuration required is to select the clock source and input termination.

The specifications given in the handbook don't list the propagation delay through the unit, but from the word-clock BNC input it is an insignificant 35ns. The decoding involved in extracting the embedded clock from the AES input imposes a slightly longer delay of 175ns at 48kHz (125ns at 96kHz), but again this is insignificant. The AES specifications require a phase synchronisation between clock signals within a quarter of a word-clock frame, which is 5000ns at 48kHz — something which the D-Clock achieves easily.

The D-Clock can distribute (and display) any clock frequency between 32-768kHz when using the BNC word-clock input, although the AES input can only accept sample rates between 32-192kHz. The clock-rate display is obviously only as accurate as its own internal reference, but Drawmer have used a similar temperature-compensated crystal oscillator to that employed in the M-Clock, and every unit is calibrated against a Prism D-Scope at the factory.

Being able to view the clock rate in three different ways is useful, although the raw rate display will probably be the one most people will use. However, the parts per million error display is handy for revealing the size of any rate errors in a more meaningful way, and the percentage display makes life much easier in the audio-for-video environment where complicated 'pull-up' and 'pull-down' rates are required to accommodate film-to-video transfers and 30fps-to-29.97fps NTSC frame-rate conversions.

Studio Tests

My own semi-permanent digital rig is not really large enough to require a clock-distribution unit — there are enough outputs on the master clock unit itself — but I rigged the D-Clock to clock the entire array in order to make sure everything behaved as it should. The connected equipment consisted of a Yamaha DM1000 mixer, a Genex 8500 hard disk recorder, Drawmer Masterflow DC2476 processor, Roland M1000 line mixer, Focusrite ISA428 preamp with A-D converter, and Apogee PSX100 converters. I used mainly VDC word-clock cables and, needless to say, everything worked exactly as expected.

As a clock source I used both my own Drawmer M-Clock (which normally acts as a local clock source for my SADiE DAW), and an Aardvark Aardsync II. The M-Clock can generate clock rates up to 96kHz plus Superclock — although at roughly 11MHz it's not surprising that the latter was not recognised as a valid reference by the D-Clock! It was interesting to note that the 44.1kHz and 88.2kHz rates from my M-CLock were indicated on the D-Clock as having a -2ppm error and raw rate readings of 44.0999kHz and 88.1998kHz, whereas the 48kHz and 96kHz rates (which are generated by a second crystal in the M-Clock) were both spot on, occasionally tripping the display to show a momentary +0.0001% error.

I was able to check the accuracy of the D-Clock's percentage display by changing to the Aardsync master clock, as this is equipped with a comprehensive collection of alternative sample rates. Besides the standard 32, 44.1, and 48kHz rates — all of which were absolutely spot on, according to the D-Clock — it also provides ±0.1 percent and ±4.1666 percent variants of the 44.1kHz and 48kHz rates for the TV industry. Hence it boasts such odd rates as 42.336, 44.056, 44.144, 45.937, 46.080, 47.952, 48.048, and 50.000kHz. Checking all of these variants with the D-Clock resulted in each one being detected with the correct reference rate (44.1kHz or 48kHz) and percentage error.

Overall, the D-Clock works extremely well, and the unique display provides useful reassurance that all is working as it should be. If you can make use of up to twenty word-clock outputs in your digital environment, this is a very cost-effective and useful item to add to your rack. SOS

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Cycling 74 Pluggo

Plug-in Collection For Mac OS & Windows

Paul Sellars

Cycling 74's *Pluggo* plug-in bundle continues to grow, and now encompasses over 100 effects, synths and modulation sources.

Pluggo is a collection of more than 100 instrument, effects and 'modulation' plug-ins, all of which are accessible via the VST, Audio Units and RTAS protocols under Windows XP and Mac OS X. It's produced by Cycling 74, whose Max/MSP programming environment has long been a mainstay of experimentally minded computer musicians, and in fact all of the *Pluggo* plug-ins have been created with Max/MSP. The boxed *Pluggo* package includes installation CDs for both Windows and Mac OS, although full installers can also be downloaded from the Cycling 74 web site. In either case the software will run in 'demo mode', emitting an annoying buzz every minute or so, until the software has been authorised.

Pluggo uses a Pace copy-protection system which allows you either to store your authorisation on an iLok hardware dongle (not supplied), or to authorise your computer's hard drive by completing a challenge-and-response process on-line. Cycling 74 aim to respond to authorisation requests submitted via their web site 'within a day or so', and I received my authorisation within about three hours of submitting a request.

SOUND ON SOUND

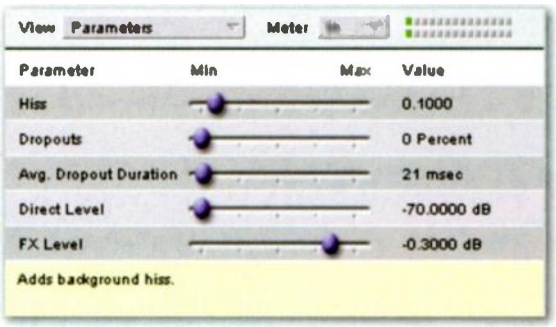
Cycling 74 *Pluggo* £117

pros
- A very large library of interesting plug-ins.
- Support for VST, RTAS and Audio Units hosts.
- Some original and enjoyable effects.
- Pluggo Buss and Pluggo Sync are potentially very useful.

cons
- Some plug-ins can be quite slow to open.
- A few plug-ins' user interfaces seem a bit sluggish and unresponsive.

summary
Pluggo is an original, enjoyable and extensive collection of plug-ins: unusual, in the best sense of the word.

The *Pluggo* installer installs not only the plug-ins and associated files, but also some very good documentation, in PDF format. Printed versions are sadly absent, but the PDFs are nonetheless well-written and helpful.



Lots Of Plug-ins

Pluggo presents an unusual problem for a reviewer: it contains so many different plug-ins that even to write the most perfunctory review of every one would would be impossible in the space available. Instead I'll limit myself to some general comments about the bundle, and highlight a few favourites of my own. A complete list of the *Pluggo* plug-ins (with a brief description of each) is provided in the 'Plug-ins By Category' box.

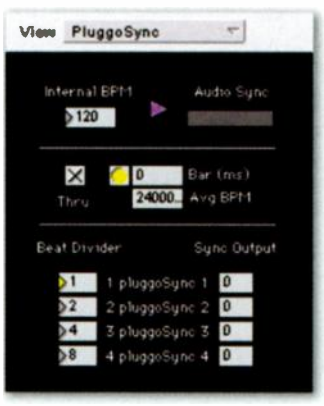
There are several features common to all or most of the *Pluggo* plug-ins. The first and most obvious is the generic user interface (as sported by *Phone Filter*, above). All the plug-ins use the same basic set of graphical sliders, menus, buttons and so on, which are basic but perfectly functional. Most of the plug-ins feature a 'View' pop-up menu at the top of the editor window, which can be used to choose between displaying the plug-in's custom graphical user interface, if it has one, or its parameters presented as one or more pages of generic controls, and one or more Info pages.

The generic interface contains a useful feature whereby right-clicking (Ctrl-clicking on a Mac) on any slider opens a contextual menu, from which various handy functions can be selected. Depending on the plug-in, these can include Touch Parameters (which sends automation messages to the host application describing the current position of the controls), the self-explanatory Undo Last Change and Randomize All, and Evolve All, which nudges each parameter randomly up or down by up to five percent. Individual parameters may also be Randomized or Evolved.

Another handy feature of the *Pluggo*'s generic interface is a hint box at the bottom of the editor window, in which a brief but useful explanation of a parameter's function can be displayed when the mouse pointer is held over the relevant slider or other control. Some plug-ins also provide a simple level meter, which can switched to show either input or output signal level.

Sync, Modulate & Buss

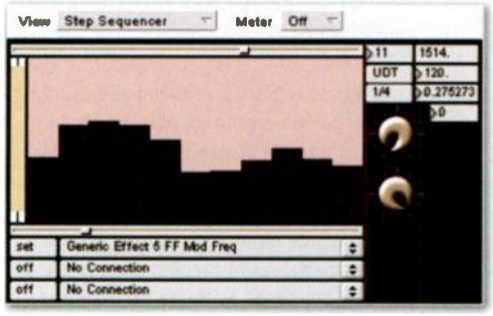
Many of the plug-ins in the *Pluggo* bundle support tempo synchronisation with the host application, either via the standard VST or Audio Unit implementations, or via *Pluggo*'s own *Pluggo Sync* plug-in (left). *Pluggo Sync* generates synchronisation data in one of two ways: either by 'listening to' and following an audio

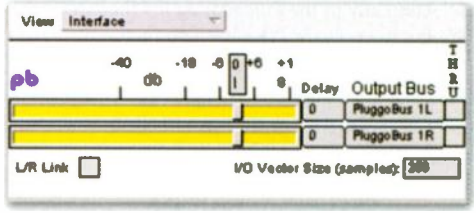


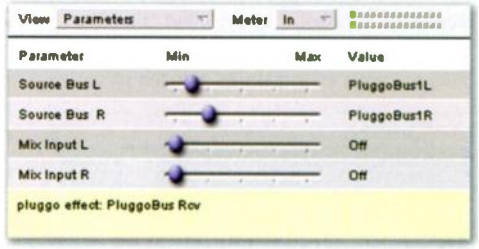
click track that you supply, or by running its own internal clock. Both methods work well enough, although the former requires a good, loud, unambiguous click to be reliable. A number of *Pluggo* plug-ins are *Pluggo Sync*-aware and can have time-based parameters controlled in this way.

A dozen or so of *Pluggo*'s plug-ins neither process nor generate any sound at all. These are the 'modulator' plug-ins, which use a variety of different methods to produce varying control signals which may be used to modulate other plug-ins' parameters in a number of different ways. Modulator plug-ins typically pass audio signals straight through unaltered, so they can be inserted just about anywhere your host application allows. You can then choose to assign their control signal outputs to any modulatable parameters in any other *Pluggo* plug-ins that happen to be open. For example, you might patch the *LFO* modulator plug-in to control *Chamberverb*'s Filter Cutoff parameter, or you could use *Step Sequencer* (below) to drive the FF Mod Freq parameter in *Generic Effect*.

Experimenting with combinations of modulation and effect plug-ins allows you to create some some extremely complicated processing chains, and some correspondingly unpredictable sounds. The possibilities are quite mind-boggling!







Another powerful feature of the *Pluggo* bundle is the '*Pluggo* Buss', a virtual audio buss supporting eight independent channels, which provides a powerful and convenient way to send audio signals between *Pluggo* plug-ins. Signals are sent to the *Pluggo* Buss, surprisingly enough, via a plug-in called *PluggoBus Send*. This is straightforward enough. There are sliders to control the input gain, and you can choose whether or not you want to echo the input signal to the plug-in's outputs as well as on to the *Pluggo* Buss. You can also choose to delay the signal by a number of samples, which can be useful for compensating for any delays introduced by other plug-ins elsewhere in the chain.

Once audio is on the *Pluggo* Buss, it can be retrieved either by using the similarly straightforward *PluggoBus Rcv* plug-in, or by ▶

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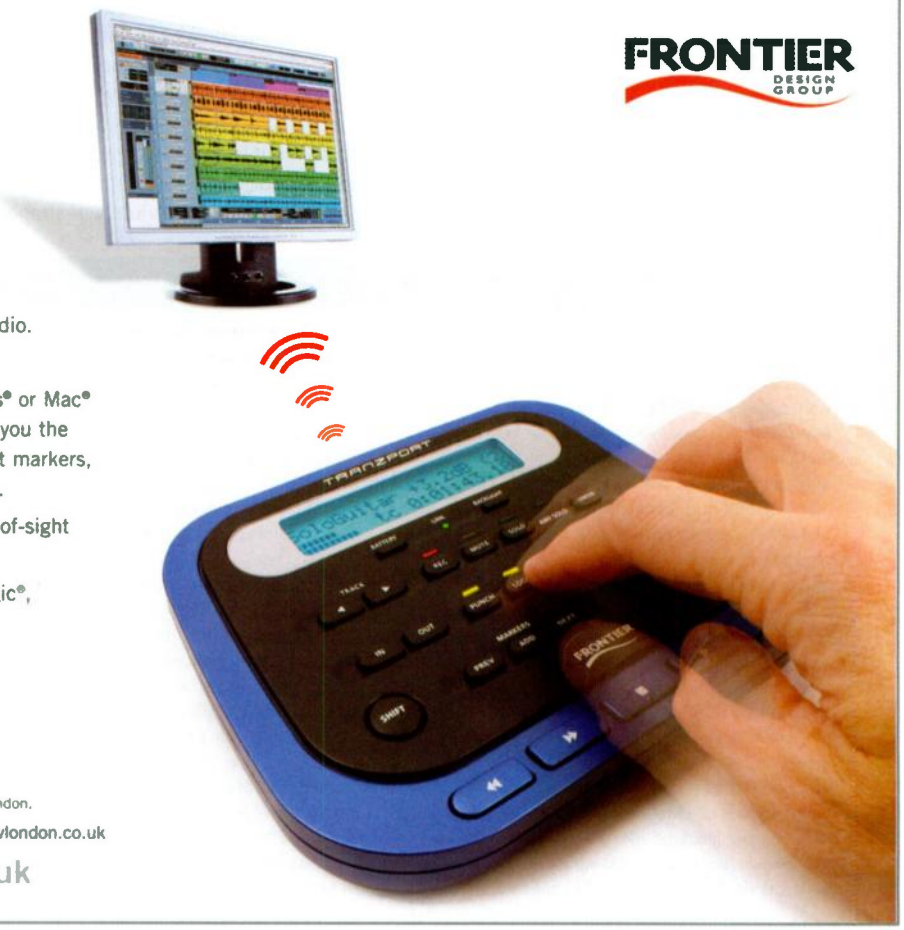

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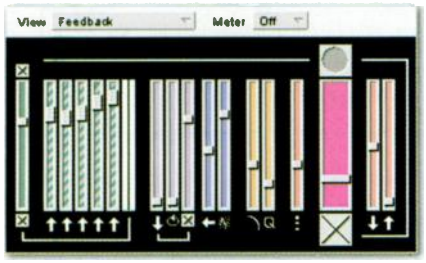
selecting any of the *Pluggo* plug-ins that are *Pluggo* 'Buss-aware'. The *Vocoder* plug-ins, for example, both allow you to use a *Pluggo* Buss signal as their carrier signal. Likewise the *Convolver* cross-synthesis effect can accept input from the *Pluggo* Buss.

Feedback Network

Feedback Network is, to my mind, almost the perfect example of the kind of thing *Pluggo* excels at. It features a dozen or so



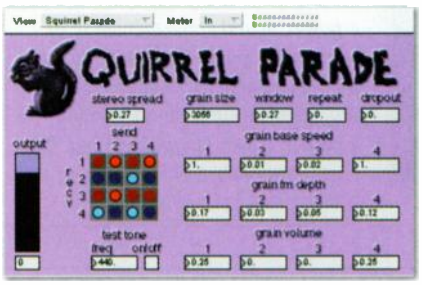
sliders, half of which move randomly of their own accord. It has a large Randomize button, which doesn't do quite what you expect it to, and no amount of familiarity with conventional effects processors will give you the faintest idea what to expect when you pass a signal through it. With the dry level slider turned down, in fact, the input signal is almost irrelevant, as you won't hear much resembling it in *Feedback Network*'s output. Instead, what you get is a largely unpredictable, slowly evolving textural mass of feedback and associated noise, suggestive of old science-fiction movie soundtracks and half-remembered nightmares.

The *Pluggo* reference manual sheds a bit of light on the inner workings of the plug-in, but not too much. It seems to involve five feedback delay lines, each with a band-pass filter, and all capable of feeding into one another in different configurations; the Randomize button shuffles how they're interconnected. Knowing how Feedback Network works is not really the point, in any case. This is not a plug-in you want to be able to control. It's a plug-in you can feed just about any old sound into and begin to get something interesting out of after a mouse click or two. Used on its own, it provides an almost inexhaustible source of enjoyably abstract sounds. Used in conjunction with one or more of *Pluggo*'s other effects, the possibilities are well-nigh endless.

Squirrel Parade

Squirrel Parade is designed to "turn any input into a parade of squirrels".

I have never reviewed a squirrel

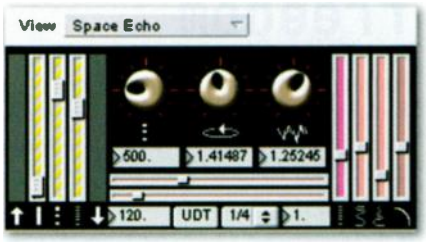


parade-generating plug-in before, but squirrel parading apparently consists of a complicated process of frequency-modulated granular synthesis, wherein the frequency of one 'grain' of the incoming signal can modulate the frequency of other grains. A modulation matrix controls exactly what affects what. A wide variety of strange chirping, chattering, wobbling and burbling sounds can be produced, and there's an optional internal test-tone generator which can be used to produce great storms of sample-and-hold synth noise.

When processing external signals the effects are harder to predict, and more atonal. Sometimes, with the right kind of input, and your eyes half-closed, that chirping, chattering noise really does conjure images of rodents... scores of rodents, all marching in a line...

Space Echo

Space Echo was apparently inspired by Roland's classic RE201 tape echo, and accordingly provides reverb and delay



effects, with a couple of parameters thrown in to mimic some of the more endearing idiosyncrasies of machines of that vintage. Warble Speed, Warble Amount and Tape Inertia all allow you to interfere with the virtual 'tape speed', while Clip can be used to introduce some distortion into the proceedings. High-pass and low-pass filters can be used to to imitate the limited frequency response of well-worn tape.

Used subtly, *Space Echo* is capable of producing some very convincing 'vintage' sounds. Push these parameters to their extremes and the sound moves beyond the boundaries of authenticity, and into newer and noisier territories! It's a relatively simple effect, but one with plenty of character, and certainly one of my favourites.

Pluggo Junior

The *Pluggo* download page is home not only to the complete *Pluggo* installer, but also to *Pluggo Junior*, a set of 12 fully working plug-ins taken from the *Pluggo* collection and available free of charge. Included are *Average Injector, Chamberverb, Feedback Network, Filter Taps, Generic Effect, HF Ring Mod, Jet, Limi, Nebula, Resonation, Resosweep*, and *Spectral Filter*. This is a generous move on Cycling 74's part, and I'd encourage anyone who's at all curious about *Pluggo* to download *Pluggo Junior*. It provides a fairly representative sample of the complete bundle, and a good opportunity to try out *Pluggo* plug-ins in some real-world situations (and your preferred host applications). At the time of writing, *Pluggo Junior* is available for Windows only, although a Mac version is promised 'soon'.

To The Max

All the *Pluggo* plug-ins began life the same way: as patches created in Cycling 74's Max/MSP visual programming environment. Why, then, would you want to buy *Pluggo*? Couldn't you just buy Max/MSP, and make your own plug-ins instead? The short answer is 'yes, you could', although it may not be quite as simple as it first appears.

Max/MSP is an enormously powerful, flexible and rather complex system, which requires a significant investment of time and effort to master. While its interface is reasonably user-friendly, with a visual 'patch cord' system reminiscent of some software synthesis applications, Max/MSP is a lot more than a modular synth. It might be more appropriate to think of Max/MSP as a special kind of programming language, and of patches as programs written in that language. While Max/MSP is a lot less intimidating and a lot easier to pick up than a general-purpose programming language like C++, it nevertheless has its own 'grammar' and programming conventions, which you'll need to learn before you can really get the best out of it. What's more, many of the *Pluggo* plug-ins embody clever and sophisticated designs, which would not be trivial to recreate! You can be sure that *Pluggo* hasn't just been thrown together: plenty of hard work has gone into developing these effects and instruments.

That said, if you're curious about using Max/MSP, a demo version is available from the Cycling 74 web site, along with some good introductory documentation. Give it a whirl, and see how you get on. You might also want to investigate Pd (Max/MSP's free, open-source cousin), which can be found on the Web at www-crca.ucsd.edu/~msp/software.html. Max/MSP presents the patient user with almost endless possibilities, allowing the most outlandish experiments with audio, MIDI and even (via the additional Jitter objects) video. You can do a lot more than just make plug-ins with Max/MSP! (See www.soundonsound.com/sos/aug03/articles/cyclingradial.htm for another example of what's possible.)

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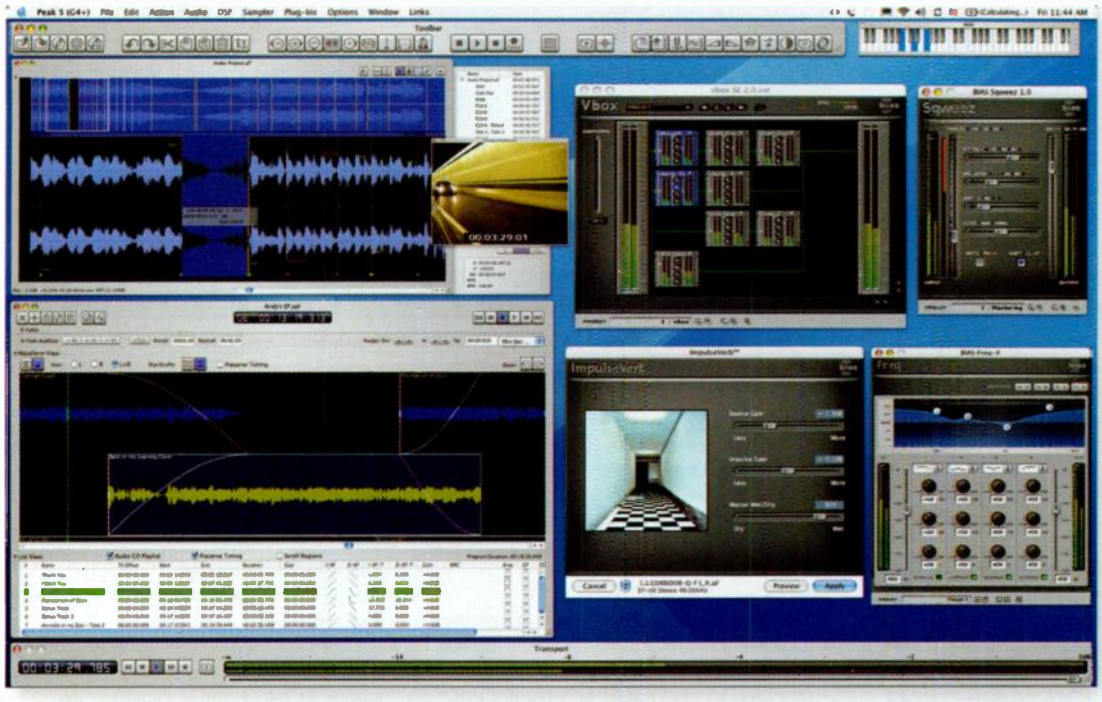

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Harmonic Dreamz

Harmonic Dreamz is a simple, easy-to-use additive synthesizer, with 16 sliders for adjusting the relative amplitudes of the first 16 harmonics in the sound. It has a straightforward ADSR envelope generator, and a random Detune effect to introduce a little unpredictability into the sound. It also has an LFO patched to amplitude, suitable for creating nice, fluttery tremolo effects. Unusually, the LFO can also be switched to a high-frequency mode, to produce some interesting amplitude-modulation sounds.

Harmonic Dreamz is not the most complex or flexible synthesizer you'll ever come across, but its simplicity is arguably its strength. You can quickly and easily dial up some very pleasant drawbar organ-type sounds, and even some quite nice pseudo-Rhodes pianos. Equally, tweaking the envelope generator for slow attack and long decay transforms *Harmonic Dreamz* into a nice little ambient pad synth, capable of a

Plug-ins By Category

Audio Routing
- *Center Channel*: subtracts one of its input channels from the other.
- *PluggoBus Rcv*: accepts audio input from the Pluggo Buss and sends it to its outputs.
- *PluggoBus Send*: sends its audio input signal(s) to the *Pluggo* Buss so that they can be sent to other plug-ins that are '*Pluggo* Buss aware'.

Delay Effects
- *Chorus X2*: chorusing and short delay effects.
- *Comber*: modulated comb filters.
- *Flange-o-tron*: a flanger driven by two step sequencers.
- *Generic Effect*: a modulated comb filter, suitable for vibrato, chorus, flange and other 'standard' effects.
- *Jet*: 'vintage' flanging effects.
- *Long Stereo Delay*: long stereo delay, with vibrato and filter effects.
- *Space Echo*: see main text.
- *Tap Net*: a flexible four-tap, tempo-sync'ed delay.
- *Tapped Delay*: delay line with 16 equally spaced output taps.
- *Very Long Delay*: a 30-second delay, with vibrato and resonant filters.

Distortion
- *Average Injector*: modulates the delay time and amplitude of its input based on an average of the signal's amplitude.
- *Degrader*: reduces the effective sampling rate and bit depth of its input.
- *Feedback Network*: see main text.
- *Fragulator*: chops the input signal into fragments, and loops each fragment either forwards or backwards at varying speeds.
- *HF Ring Mod*: flexible ring modulator.
- *Mangle Filter*: affects amplitude and delay time based on the average amplitude of its input.
- *Monstercrunch*: amplification followed by clipping (distortion) and low-pass filtering.
- *Noyzckippr*: multiplies the input signal by band-pass-filtered white noise.
- *Pluggo Fuzz*: a fuzzy distortion effect.
- *Ring Modulator*: ring modulation.
- *Waveshaper*: waveshaping distortion with a mouse-editable transfer curve.

Filter
- *Cyclotron*: a step-sequencer controlled band-pass or low-pass filter.
- *Harmonic Filter*: 25 band-pass filters, controlled by a 'cellular automata algorithm'.
- *Moving Filters*: LFO-controlled parallel band-pass filters.
- *Multi-Filter*: a linkable pair of multi-mode resonant filters.
- *Phase Shifter*: a straightforward phasing effect.
- *Phone Filter*: a very convincing 'telephone' distortion effect.
- *Swish*: four filters and two LFOs to create complex sweeping effects.
- *Vocoder*: analogue vocoder emulation (10- and 16-band versions).
- *Waste Band*: splits each stereo channel into three frequency ranges and allows you to mute, pass or overdrive each band individually.

Filter/Delay
- *Filter Taps*: a six-tap delay line with independent band-pass filters, plus control over gain and pan positions.
- *Plug Loop*: an audio looping and sampling tool.
- *Raindrops*: a network of band-pass filters, each one offering "a tiny peek into the frequency spectrum".
- *Resonation*: 12 parallel band-pass filters, tuned in semitone intervals, each followed by a delay.
- *Resosweep*: six independent resonant filters, plus short delays.
- *Sizzle Delays*: a stereo delay line, with high-pass filters in the feedback loop.

Granulation
- *Granular-to-Go*: a granular synthesis effect.
- *Pendulum*: a four-tap delay with two taps per channel where delay times are controlled by a ramp wave oscillator.
- *Rye*: another granular synthesis effect.
- *Shuffler*: records incoming audio into a loop, then plays back slices of that loop in real time.
- *Slice-n-Dice*: continuously records its input signal and slices it into 32 pieces of equal length, while playing back one or more of the previously recorded 32 slices.
- *Squirrel Parade*: see main text.
- *Stutterer*: plays back fragments of its input signal in various different ways.
- *Wheat*: a granular synthesis effect with a pitch envelope for grains.

Modulators
- *Audio2Control*: creates a control signal by sampling an incoming audio signal.
- *Breakpoints*: generates a 12-point breakpoint envelope, which can be applied to an audio signal or sent as modulation data to other plug-in parameters.
- *Control2Audio*: generates a 'control voltage' audio signal from a control signal.
- *Env Follower*: generates a control signal by tracking the amplitude of the incoming signal.
- *Key Triggers*: allows certain keys on the QWERTY keyboard to send control signals to other plug-ins.
- *Knave Stories*: uses the Navier-Stokes equation (apparently) to generate pseudo-random modulation sources.
- *LFO*: a low-frequency oscillator, outputting a control signal.
- *M2M*: converts MIDI data into modulation data.
- *Mouse Mod*: generates modulation data from mouse movements.
- *Plug Logic*: shapes and alters control signals.
- *Randomizer*: generates random control signals for other plug-ins' parameters.
- *Step Sequencer*: generates control signals with a step sequencer.

Multi-channel
- *Audio Rate Pan*: can create complex effects by modulating the relative amplitudes of the incoming channels.
- *Nebula*: amplitude and phase-inversion changes, to create a swirling stereo illusion.
- *One By Eight*: a one-input, eight-output matrix mixer.
- *Stereo Adjuster*: adjusts the width of a stereo signal.
- *Stereo Faker*: uses comb filters to create a 'fake' stereo image from a mono signal.
- *Swirl*: delay-based 'panning' and similar 'motion' effects.
- *Tremellow*: a stereo panning effect.
- *Xformer*: rhythmically mutes and accents incoming audio.

Pitch Effects
- *Frequency Shift*: frequency (not pitch) shifting.
- *Speed Shifter*: like running your signal through two tape loops, each running at a different speed with a different length of tape, feeding back into each other.
- *Vibrato Cauldron*: a pair of all-pass filters modulated by a 'smoothed random process'.
- *Warble*: changes the playback speed of the incoming signal.
- *Warpoon*: an 'ambient' chorus effect.

Reverb
- *Chamberverb*: a reverb with a bit of character.
- *Rough Reverb*: a harsh-sounding reverb.

Dynamics
- *Dynamical*: compression, expansion, gating and more.
- *Limi*: a general-purpose limiter.

Spectral Effects
- *Convolver*: a real-time cross-synthesis (convolution) effect.
- *Spectral Filter*: a 253-band graphic EQ, with a curve that can be drawn in.

Synchronisation
- *Pluggo Sync*: generates synchronisation control signals for other plug-ins.

very respectable range of different tones and timbres.

FM 4-op

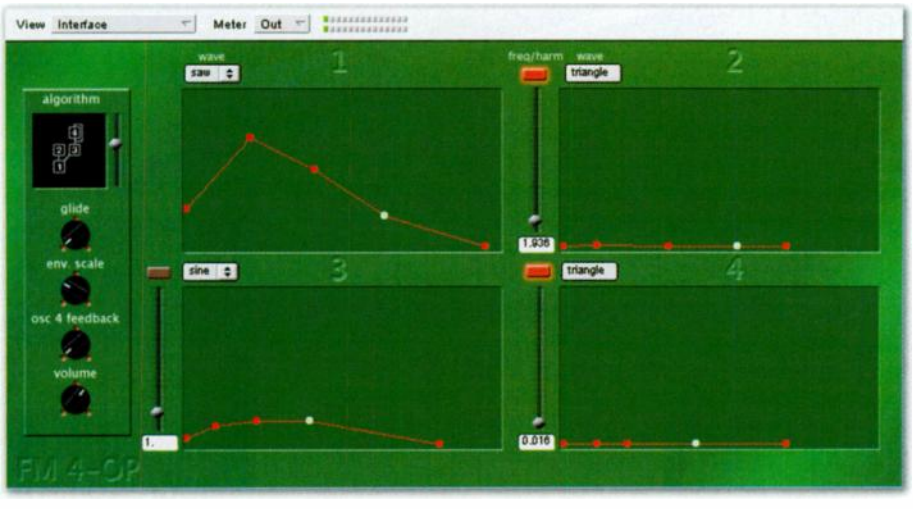
FM 4-op is a four-operator frequency-modulation synthesizer, vaguely reminiscent of Yamaha's four-operator FM synths like the TX81Z and DX100. Unlike either of these, however, *FM 4-op* provides an easy-to-use point-and-click graphical user interface, which makes programming new sounds easy and intuitive. You don't need to be an FM expert to use this plug-in — in fact it could be a useful tool for anybody wanting to learn a bit about the mysterious world of frequency modulation.

The standard eight 'algorithms' are all there, complete with feedback for operator number four. Envelopes are edited by simply clicking and dragging, and operator waveforms can be switched from a drop-down menu at the top corner of each display. A good selection of presets is included to demonstrate the kind of sounds that are possible, but the real fun comes when you start programming your own. All kinds of strange twanging, clanging, cold, metallic noises are there for the taking!

Plugslow?

For the most part, I found working with *Pluggo* quite trouble-free, encountering no crashes or serious glitches in the course of my testing. That said, I did find that at least some of the *Pluggo* plug-ins could be a little bit on the 'slow' side. By 'slow', I don't mean that their performance as audio processors was in any way lacking. On the contrary, most of them seemed to be quite economical with CPU resources.

However, on my system at least, several of the plug-ins were really quite slow to load, with a delay of perhaps three or four seconds between selecting the plug-in the host application, and having it become available to use. I contacted Cycling 74 about this, who told me that this is a known issue which seems to affect a minority of Windows users. Imminent *Pluggo* upgrades are expected to bring improvements in this respect. I also found that one or two of the custom graphical user interfaces on some of the plug-ins could be a bit sluggish and unresponsive, even with a relatively low CPU load. Switching to the default parameter view solved this problem, so it was hardly a major inconvenience.



Minor quibbles aside, I have to say that I thoroughly enjoyed reviewing *Pluggo*. While the bundle as a whole is impressive, in my opinion its greatest strengths are its more unconventional effects. What *Pluggo* offers — and what many commercial plug-in bundles don't — are unusual, original and often inspiring tools for twisting audio signals into new and unexpected shapes. It's a bit different from the useful but ubiquitous software recreations of conventional studio hardware devices.

Combining the effects, the modulation plug-ins and the *Pluggo* Buss, *Pluggo* operates as a flexible modular system capable of routing, wrangling and mangling audio signals in some outlandish ways that would be quite impossible with conventional host applications and plug-ins. *Pluggo*'s instruments range from the very usable, through the quite interesting to the 'novel', but all are worth having, and add value to the bundle as a whole. With more than 100 different plug-ins included, I'm very aware that I haven't mentioned some deserving candidates. *Fragulator* and *Degrader*, for example, both appealed to me enormously. *Wheat* and *Rye* also proved capable of a range of interesting, textural noises.

I could go on — but my editor wouldn't stand for it. If this review has piqued your curiosity in the slightest, I'd encourage you to download the *Pluggo* installer and explore it for yourself! SOS

Synthesis Plug-ins

- ***Analog Drums***: an analogue drum machine emulation.
- ***Analogue Percussion***: an analogue-style percussion synthesizer.
- ***Bass Line***: a bass synth vaguely reminiscent of the Roland TB303.
- ***Big Ben Bell***: an FM-based bell sound synthesizer.
- ***Deep Bass***: an analogue-style monosynth, with integrated cutoff and pitch sequencers.
- ***Easy Sampler***: a basic sample-playback plug-in.
- ***Filtered Drums***: an eight-channel sampled drum sound module.
- ***Flying Waves***: a mouse-controlled Theremin emulation.
- ***FM 4-op***: see main text.
- ***Harmonic Dreamz***: see main text.
- ***Laverne***: a basic subtractive synth.
- ***Lo-fi Drums***: a drum machine using gritty eight-bit sampled sounds.
- ***Moving Waves***: an unusual 'crossfading synth'.
- ***PGS1***: a comprehensive analogue monosynth emulation.
- ***QSynth***: a simple but effective synthesizer.
- ***Quick Drums***: a simple drum machine that's easy on the CPU.
- ***Shape Synth***: a waveshaping synthesizer.
- ***Shepard Tones***: generates the aural illusion of constantly falling or rising pitch.
- ***Sine Bank***: an unusual synthesizer, generating up to 32 simultaneous sine wave tones.
- ***Wavy Waves***: a wave-sequencing synthesizer.
- ***White Grains***: a neat granular synthesizer.
- ***Xmod Synth***: an analogue synth emulation, with a nice 'modulation matrix'.

Visual Display

- ***Beat N***: a tempo/delay calculator plug-in.
- ***D-Meter***: a mastering meter.
- ***Light Organ***: a visual toy that responds to audio input.
- ***Phase Scope***: a utility to check the phase alignment of a stereo signal.

Test Spec

- PC with 1.8GHz AMD Athlon CPU and 512MB RAM, running Windows XP Service Pack 2.
- Tested with *Audiomulch*, Fasoft *N-Track Studio*.

Information

£	£117 including VAT.
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W	www.cycling74.com

MIDI Controller

M Audio Trigger Finger

The Trigger Finger is clearly intended for those of us who prefer hitting to clicking when it comes to percussion, but, as we discover, there's much more to it than that...

Nicholas Rowland

Some clever stick once said that attaching a keyboard to early synthesizers was probably one of the worst things anyone ever did. I think their point was that as an interface, a piano keyboard simply wasn't versatile enough to exploit the creative potential of the new technology.

I'm not sure I agree wholeheartedly with that statement — it was probably made by someone resentful of the fact that their band's keyboard player had more musical knowledge in their little finger than all the other members put together. But one belief I would carry a card for is that keyboards and drum sounds don't make for a particularly happy mix. Not only does it seem so much more intuitive to trigger a percussion sound with a percussive action, it's physically a lot easier to get the right kind of dynamics by hitting a surface with a stick or drumming your fingers on a pad than it is to try pressing keys on a keyboard.

That's certainly the train of thought that has led to the launch of M Audio's new Trigger Finger, a USB/MIDI control surface designed primarily for software-based musicians to tap out rhythms and trigger percussion loops. Its main attribute is a four-by-four matrix of finger-sized, velocity sensitive pads — similar to the arrangement you'd find on Akai's MPC range of sampling rhythm workstations. But the Trigger Finger goes much further than just being a set of disembodied drum machine

Enigma Variations

The included *Enigma* software allows you to edit and save patches with a simple, one-screen interface.

The first question about *Enigma* has to be why M Audio decided to call it that. Editor/Librarian software should ideally take the mystery out of programming a hardware device by allowing you access to all the parameters at a glance, but this name makes it sound as though interacting with the target device is going to be an obscure, difficult experience!

Happily, this software belies its name and proves to be exceptionally easy to use. It also really opens up the bonnet of the device and allows you to more easily exploit all of its programming features. Before continuing, I should also make it clear that *Enigma* doesn't just work with the Trigger Finger; it also supports a range of M Audio controller devices, specifically the Keystation Pro 88, the MK425C, MK449C, MK461C, the 02, Ozonic, the UC33 and the X-Session. So if you're a proud owner of any one of these, it's worth pointing your browser to www.m-audio.com and downloading it for free now.

***Enigma* is available for both Mac and PC. As you can see from the screen shot above, I was testing out the Mac version, but functionally the PC version is the same. Loading up the main window normally gives you a graphical representation of the Trigger Finger (or indeed any of the other M Audio devices that the software supports). To the left, a menu pane allows you to switch between devices and/or select various presets for any connected devices for editing. In its initial state, *Enigma* loads with the Trigger Finger's 16 default factory 'kits' which are a good place to start for creating your own patches. A new user set is easily created by pressing the '+' button, and it's then a simple matter to copy the defaults into these new locations for further tweaking.**

There are various methods of programming the values for each of the eight knobs, four sliders or 16 drum pads. Generally speaking, it's simply a case of double-clicking on the virtual knob or slider to launch a pop-up Editor menu which gives you access to the available parameters for that particular control. The pads actually have three clickable areas each — for note assignment, continuous controller value and program change number — and clicking on any of these will bring up the appropriate Editor window.

The Editor menus also allow access to certain global parameters, such as the Global MIDI channel and the overall Velocity curve settings. Obviously, if you change these values in one window, then they'll apply to all the others. Usefully, each window also has a comments field, so you can write memos to remind yourself what you were trying to do.

Apart from entering values via the Editor menu, you can also drag and drop MIDI note numbers and/or controller values or parameters from the menu which, in the Mac version, slides out on the right of the main window. Simply pop them on top of the desired button or slider and they are assigned. The right-hand menu offers an extensive range of controller 'libraries'. Some are generic (such as General MIDI, GM2, XG/GS and MIDI Machine Control messages), but many are dedicated to specific software synths, samplers, effects and the like. This can be a very painless way of setting up the Trigger Finger's knobs and sliders to control elements of your software studio.

Transferring patches between computer and the Trigger Finger is then a simple matter of hitting the Upload or Download buttons as appropriate.

It's all very slick, and so much more transparent than trying to program the unit from its own control surface. Which explains why the manual encourages you to use *Enigma* if at all you can — advice which I would recommend you follow.

pads. With eight assignable knobs, four sliders and a high degree of overall programmability, it offers the level of general MIDI parameter control that you would normally expect to find on a controller keyboard, potentially making it a very versatile member of any musician's MIDI studio.

Overview

Physically, the unit is a neat, chunky thing, smartly presented in today's essential colour — silver. Although the casing is plastic, it seems pretty robust and feels as though it would be well able to stand up to a life on the Highway Of Rock. For that purpose, you'll find a threaded socket on the back panel which will allow you to mount it on a mic stand, though it probably works better sitting squarely on something which supports its entire surface area.

Along with the Trigger Finger itself, the box contains a multi-lingual Quick Start guide, a six-foot USB cable and two CD-ROMs. One of the CDs contains a much more detailed User Guide in PDF format, plus Editor/Librarian software (see the box above). There's also a copy of *Live Lite 4* on the second CD-ROM (a cut-down version of Ableton's rather nifty sequencing software), which allows you put the Trigger Finger through its paces straight away.

If you're running Windows XP or Mac OS 10.2 or above, then interfacing the Trigger Finger with your computer is a straightforward plug-and-play experience

SOUND ON SOUND

M Audio Trigger Finger £169

pros

- The programmability makes the Trigger Finger far more than just a set of drum pads in a box.
- Pressure sensitivity offers creative possibilities.
- Excellent Editor software.
- Good value for money.

cons

- There could be more onboard memories.
- Unwieldy to program without *Enigma*.

summary

Even if you don't think of yourself as a beat-based musician, the Trigger Finger is worth checking out, as it offers a different way of interfacing with your sounds.

— just connect the USB cable and away you go. The snag is that Windows will only support the use of USB devices like this with one music program at a time. So if you want to use the Trigger Finger across several applications running simultaneously (and most people will), it's a question of taking a three-minute detour to install the included multi-client driver. Job done.

Normally, the Trigger Finger is powered from the USB connection too. But if you have too many USB devices hanging off your hub already, or if you have a spare mains socket that you want to fill up (who am I trying to kid?) then you can always resort to an optional 9V wall-wart adaptor. Of course, such an adaptor will become a necessity if you want to hook up the Trigger Finger via its MIDI Out — for example, if you're using a different operating system to the ones mentioned above, or if you're connecting it directly to another piece of MIDI hardware, such as a synth or sampler, without going via a computer.

First Lights

Once power is supplied, by whatever means, the Trigger Finger's triple LCD springs to life and you're ready for the off. As it arrives from the factory, the unit's 16 patch memories are already filled with templates of note and controller assignments designed to work with typical setups. So there are templates for using the Trigger Finger with GM and XG Drum sound sets and for popular software packages (or at least popular software packages as distributed by M Audio) notably *Reason*, *iDrum* and *Ableton Live*. While this is approach is meant to take the sweat out of getting down to some serious tapping as fast as possible, in practice you'll probably need to shift straight into Edit mode to start integrating the Trigger Finger into your specific setup.

It's as you start to work on your own patches that you begin to appreciate the degree of programmability on offer. For example, the pads can transmit note data on one channel and program and bank change information on another. As well as being velocity sensitive, they are also pressure sensitive, enabling you to send programmable MIDI controller information based on how hard you press them down. It's similar to aftertouch on a keyboard and offers some very creative possibilities. For example, you can create more realistic-sounding tablas or African drums by using pressure to transmit pitch bend. You can also set up the pads so that crash cymbals 'choke' (the sound cuts off) when the pad is pressed down. Also you could assign some pads as controls to affect a whole kit globally. So while you might tap out rhythms by playing a set of pads with one set of fingers, you can use the fingers on the other hand to press down on other pads to change overall volume, pan position, pitch, effect levels and so on.

The Trigger Finger offers a number of options to take this kind of control a bit further. Programmable Maximum and Minimum values allow you to set the upper and lower range of the pad's pressure controls, even enabling you to invert the pad's response under pressure — so pressing harder sends a lower CC value than pressing lightly. This Max/Min feature is also found on the knobs and sliders, which in Performance mode are normally used to send continuous controller data to the target software or hardware. Again, like the pads, each control can transmit on its own MIDI channel, or it can use the channel that has been globally set for the unit.

As I've already mentioned, the 16 drum pads are velocity sensitive with global

Seeing The Light(s)

M Audio have crammed an awful lot of functionality into the Trigger Finger and the three-segment LCD leads a hectic life telling you all about what's going on. For example, in Performance mode, the display normally tells you the number of the currently selected kit. When you hit a pad, the LCD briefly displays the velocity value and then shows you the name of the note assigned to that pad. This is quite useful when you are just checking which note number is assigned to which pad, but once you start playing more complex rhythms, the resultant lightshow becomes a little bit distracting.

Definitely of real practical use though is the fact that as soon as you move a knob or slider, the LCD gives a readout of its value. What's more the Trigger Finger also offers a Control Mute function, allowing you to move knobs and sliders to new positions without actually transmitting the corresponding MIDI data. You still see the changing value though, which means you can precisely match the controls to a software or hardware instrument without causing jumps in the sound. For good measure the Trigger Finger also offers a Note Mute function, whereby the pads stop transmitting notes but continue to transmit controller values as do the knobs and sliders. The thinking behind this function is to make it easier to interface with software or hardware that has a MIDI Learn function, so that you're not confusing things by transmitting note information every time you hit a pad.

The back-panel view, featuring simply MIDI Out and USB sockets and a 9V power input.

programmability of their responsiveness set via nine predefined velocity curves. There are also three fixed velocity options that set the velocity of all pads to values of 64, 100 or 127 respectively. At the touch of a dedicated button, the Trigger Finger also adopts one of two other velocity modes: Full and Locked. Activating Full Velocity means that all the pads will transmit notes at the maximum fixed velocity of 127, regardless of how hard you actually tap the pads. Locked Velocity, on the other hand, means that each pad will transmit a specific velocity value, which can be programmed as part of an individual pad setup. This feature is great; by way of example, it can be used to set up the Trigger Finger so that you have an ascending spread of velocities across all of the 16 pads, for precise programming of a single drum sound.

In Edit mode, the knobs and sliders become the means by which you program the Trigger Finger itself. In this state they become automatically 'hard-wired' to specific parameters: for example, knob 1 controls the programmed note value for the selected control while slider two becomes responsible for setting its MIDI channel value. The principle of the system is pretty straightforward, though in general it can get a bit confusing as to what exactly you're editing — a three-digit LCD is not the most intuitive of feedback mechanisms.

Fortunately, there's a much more user-friendly alternative in the form of M Audio's *Enigma* Editor/Librarian (see the box on the previous page), which not only gives you a better idea of what's going on visually, but also gives you control over several more parameters than the hardware interface allows.

Conclusions

There are lots of musicians I know who would claim they couldn't play the drums to save their lives, but they can tap out a rhythm on a table top with no problems. The Trigger Finger is ideal for this kind of purpose — it makes programming rhythms into sequencers generally faster and more intuitive. But with the bonus of pressure sensitivity on the pads, plus the added knobs and sliders, it really should be seen as more than just a tool for beat junkies. In fact, it's probably nearer the mark to think of the Trigger Finger like a controller keyboard, only with pads instead of keys.

Probably the only feature I'd like to see added is the ability to create layered sounds by being able to assign more than one note number to a pad, and then setting up a velocity crossfade between the sounds. But as it stands, the Trigger Finger would prove a versatile addition to any MIDI studio. And at this price, nobody needs much of an excuse to give one a home. SOS

information

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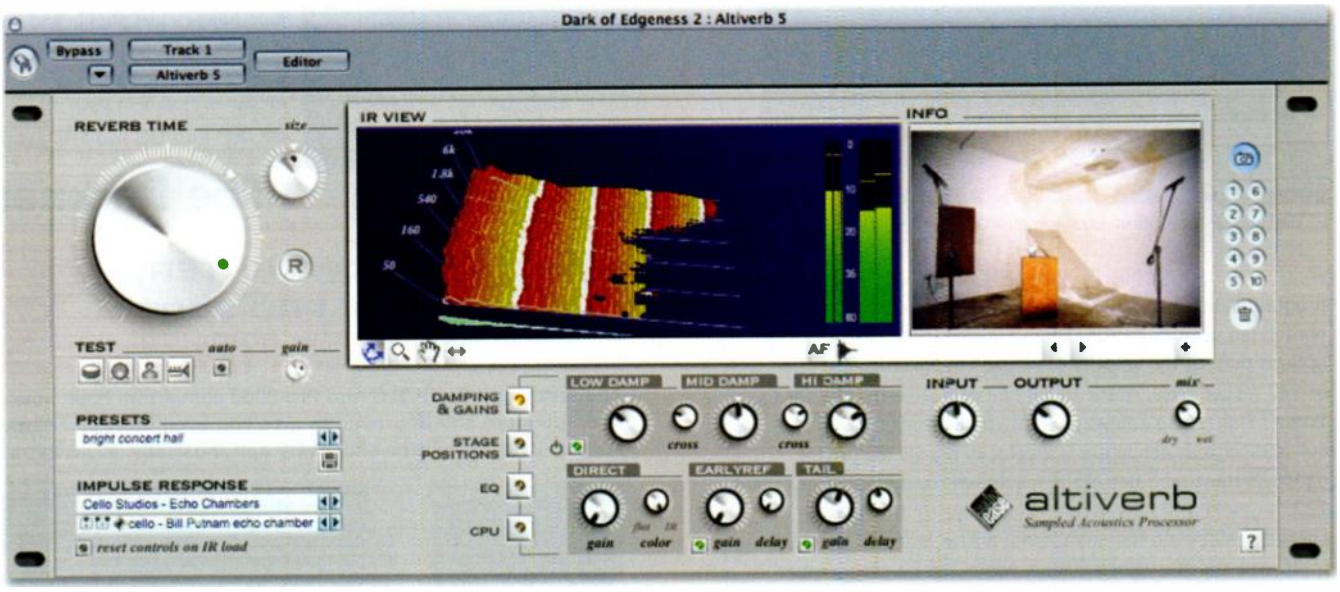

Audio Ease Altiverb 5

Convolution Reverb For Mac OS X

Altiverb was one of the first convolution reverbs. Is it still the best?

Paul White

Since we first reviewed Audio Ease's *Altiverb* Mac-based convolution reverb plug-in back in 2002, many more convolution-based plug-ins have sprung up, but *Altiverb* still has a reputation for sounding a little bit special. All convolution-based reverbs are extremely processor-intensive, and back in 2002 when the Mac G4 was the epitome of power processing, running a convolution algorithm ate up a lot of the available processing power. These days, however, we can take advantage of what they have to offer without trading that off against the use of other plug-ins.

Normally you work from a library of impulse responses recorded in concert halls, studios, clubs and other acoustically useful places, but it is also possible to create your own. The included *Altiverb IR Pre-processor* is a separate software application that allows you to use sine sweeps, balloon bursts or starting-pistol shots to sample your own spaces. Like most convolution devices, *Altiverb* can also be used to sample other linear processes, by which I mean ones that don't include time envelopes, pitch modulation or distortion. You could for example, use it to model the response of a favourite equaliser setting or even a guitar speaker cabinet, and it will also sample delay effects (including hardware reverb devices that don't use internal modulation), though anything that uses modulation, such as chorus, flanging and vibrato, can't be captured this way. Similarly, amplifier distortion and compression can't be emulated using conventional convolution.

Growing Up

Altiverb has evolved since its inception, with perhaps the most significant addition being the ability to produce surround reverb effects, though the way this is achieved is rather different to the way some competing products handle it. The two basic surround formats are mono-in, quad-out and stereo-in, quad-out, which Audio Ease feel produce the best subjective sound for music. Where reverb is required in the centre channel, they have a mode where the rear reverbs are summed to mono and then delayed before being fed to the centre speaker, though this is recommended mainly for film work rather than music. The all-important IR library has also been extended and of course there's support for plug-in formats that didn't even exist back in 2002, such as Audio Units. *Altiverb* v2 was the last version to support Mac OS 9, and the current version is strictly OS X-only. Authorisation is via the Audio Ease web site using a challenge-and-response system or to an iLok key, which has the advantage of allowing you to move the program between computers more easily.

Altiverb's plug-in window is a hint on the wide side and offers relatively few controls; the reason for the amount of real estate is the colourful reverb display, which can show either the IR decay profiles or a 3D waterfall plot. A help function can be switched on or off to show the relevant information when you pass the mouse over a specific control area, and further information on the reverberant space is displayed to the right of the decay graphics. Convolution reverbs traditionally have the limitation that what you record is

SOUND ON SOUND

Audio Ease *Altiverb* 5
£382/£576

pros
- Polished, professional sound.
- Offers adequate user adjustment.
- Large IR library.
- Works in surround mode.

cons
- Quite pricey.

summary
Altiverb is a truly professional-quality software reverb capable of producing excellent stereo and surround results in both music and video post-production environments.

what you get, but (as Waves did with *IR1*) Audio Ease have put in place a few processing tricks for modifying the impulse response to allow, for example, the reverb time and tonal content to be modified. When you adjust these, the impulse response has to be recalculated, which takes a second or two, but there's a user preference that switches the changes from being continuously recalculated to being recalculated only when you release the mouse button, the latter being the most practical option.

Reverb Time is adjustable both upwards and downwards (in earlier versions it was only downwards) via a large on-screen knob, while selecting impulse responses and the choice of miking setups where available is done using conventional menus. Two operating modes are available; one achieves a lower processor load at the expense of a latency of around one second, while the other offers zero latency at the expense of higher processor load. As with all convolution reverbs, the longer the reverb tail, the more processing is required. For this reason, you can opt to truncate the tail to save on CPU power; in many cases this can be done with little or no audible effect to the sound. *Altiverb* can be used in sessions at any sample rate providing the buffer size is set to a multiple of 256 samples, though its internal processing is always done at 44.1kHz or 48kHz. Audio Ease say that their designers found no useful reverberant audio information above 17kHz, and increasing the sample rate would have dramatically increased the processing load.

Photos of the environments in which the IRs were recorded can be viewed at the right-hand side of the screen and many now include a 3D virtual-reality panning camera shot of the venue. This section also includes diagrams of the mic and speaker placement used. When the 'position' parameter is being adjusted, a graphic of a speaker on a wooden floor is shown, and you can drag the speaker around to change the left/right position (or stereo width for stereo-input reverbs) and the distance.

The other key controls provide a two-band Baxandall equaliser to modify the reverb sound and a set of three-band damping controls to change the relative decay time at different frequencies — a process that entails processing and recalculating the IR. In addition to being able to adjust the level of the direct, early and late reverb components individually, it is also possible to change their delay times relative to each other. Yet another nice touch is that up to 10 preset slots can be set up with different reverb settings to be called up by automation from within the host sequencer.

All the IRs include the direct sound from the speaker, which is of course the first sound to arrive at the mic used to record the IRs. This is coloured by the sound of the speaker and mic used as well as suffering a little high-frequency loss from air absorption, so there is the option of replacing this with the uncoloured direct sound from the source being processed, if preferred. The level of the early reflections and later reverb tail can also be controlled independently, as can the virtual room size, a process that works by shifting the pitch of the room resonances. How well changing the room size works depends on the original sound and how far you want to adjust it, but used over a sensible range it is very effective. To help the user evaluate the adjustments, there's a little panel that can be used to trigger four types of test sample, including drums, horns and vocal, to hear what the reverb sounds like without having to play back an audio file. These cycle round a few examples each time they are used and if you switch on the adjacent Auto button, one of the drum sounds fires every time you adjust the IR so that you can hear what effect your changes have had.

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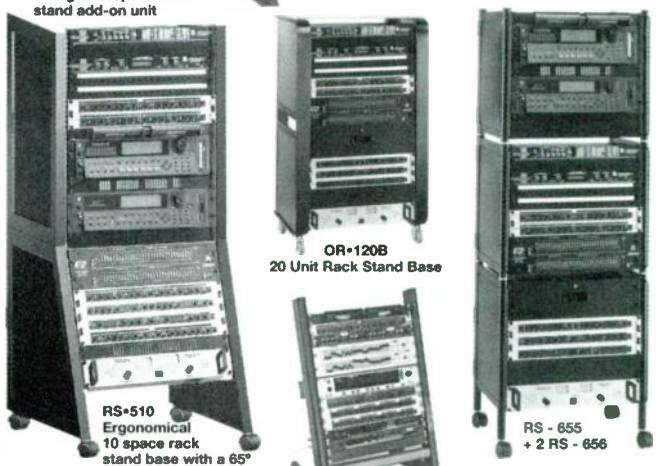

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Testing *Altiverb*

I checked out *Altiverb* running as an Audio Unit plug-in within *Logic* 7.1 running on a dual 2.7GHz G5 fitted with 4GB of RAM, so I wasn't short of CPU power. In fact *Altiverb* uses rather less CPU resources than any other convolution reverb I've tried (though more in quad mode, understandably), and providing you only use a few instances in your mix, the load is quite acceptable. The library of IRs has expanded enormously since we last looked at *Altiverb* and now includes some very nice EMT plates and sampled hardware reverb units as well as a splendid range of concert halls, churches, cathedrals, smaller venues, rooms and other interesting spaces. Many of the presets open up a further choice of miking arrangements and distances, so the library is actually a lot bigger than it might at first appear.

I don't know whether it's something about the *Altiverb* engine or just the way the impulse responses are recorded, but these reverbs sit fantastically well in the mix, almost regardless of which one you choose — within reason. There's just the right sense of space and density, without the original sound seeming overwhelmed or disembodied, and the best way I can describe the sound is as 'expensive'. There are some particularly nice echo rooms that work brilliantly on vocals, and extra IRs are being added to the Audio Ease site every few weeks — once you've registered, you can download these free of charge.

Testing anything surround in *Logic* is a bit tricky because there's no direct way to insert multi-channel effects in audio tracks or busses — at least, none that I can find. You can, however, set up a surround instrument track, insert *Altiverb* into that as a multi-channel effect, then use the side-chain input selector in the *Altiverb* window to select your usual effects buss as an input source. This gives you mono in or stereo in depending on whether the source is a mono or stereo buss, but the reverb output is in surround and routed to the designated surround outputs set up in *Logic*'s surround preferences. As explained earlier, the reverb is really quad, with a mix of signals being used to feed the centre (and LFE) channel, but I can't see any real reason for putting reverb in the LFE channel anyway unless you're making disaster movies, and music sounds wider if the reverb isn't fed to the centre channel.

To my ears the surround reverbs are very effective, adding the necessary front-to-back perspective without getting in the way. However there is what seems to be an operating anomaly, insomuch as when you call up a new preset, the ones that don't conform to your required channel arrangement are greyed out. It would make more sense to me to perhaps show you all the 'greyed out' presets in another colour to warn you but to still allow you to load them with their own choice of configurations. Also, where a surround option isn't available, it would be really handy to be able to select one stereo reverb as the front speaker feed and a different one for the rear speaker feed. It may not be the 'proper' way to create surround reverb, but sometimes such trickery can work very well on an artistic level.

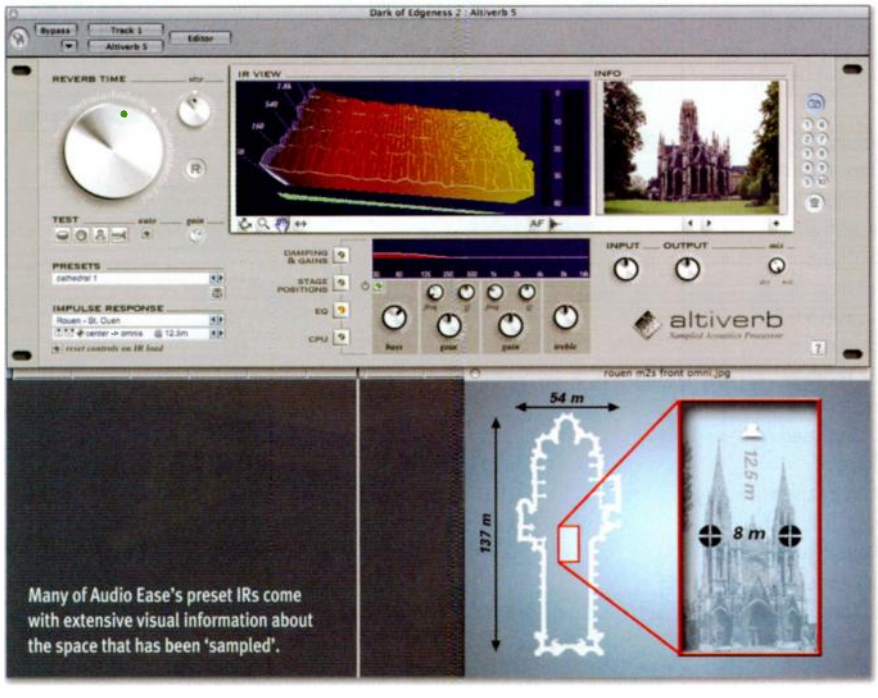
How Convolution Works

The idea behind convolution reverb is that if you were to generate a sound impulse just one sample in length within a real reverberant environment and then record the resulting reverb, you'd be able to apply that reverb tail to each individual sample in your new recordings, add the results together in real time and recreate the sound of your track playing in that original acoustic space. However, because a single-sample impulse doesn't provide enough acoustic energy to make a reliable recording, it's now more common to use a sine-wave sweep and then mathematically transform the resultant recording into what you would have got had you used an impulse in the first place. This short audio decay tail is, not surprisingly, called an impulse response or IR. Depending on where the speakers and mics are set up in the room, you can recreate the effect of the performers and listeners being in different parts of the room. The reason convolution reverbs are so processor-intensive is that there's a lot of brute-force number-crunching involved, even though the basic concept is fairly straightforward.

High Altitude

Altiverb is one of the more expensive native plug-ins, but there's no arguing that it delivers on both quality and variety. The user interface allows a realistic amount of tonal tweaking without destroying the natural character of the IR you're working on, but the real star of the show is the way the reverbs integrate into a mix, adding that magical sparkle and gloss to everything but without sounding overstated or messy. The surround modes are hassle-free and as simple to use as your host DAW allows, and the bonus of new IRs available from the Audio Ease site is the icing on what is already a very nice cake. Whether *Logic Pro* users will feel it worthwhile paying the extra for *Altiverb* when they already have *Space Designer* is questionable, but to me the plug-ins have very different characters, so professional users may well still go for it.

Compared with earlier versions, *Altiverb 5* offers more adjustment and a bigger IR library, not to mention some seriously flashy graphics — waterfall plots and 3D venue tours not being the least of them. It can also produce some very natural-sounding surround reverbs. When it was first released, it was thought by many to be the best software reverb available at any price, and from what I've heard, it just might retain that reputation. SOS



Many of Audio Ease's preset IRs come with extensive visual information about the space that has been 'sampled'.

information

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Universal Audio *Boss CE1*

Formats: Mac & PC UAD1

It's no secret that Roland/Boss have produced some of the most musical-sounding chorus processors ever, and what is so extraordinary is that they got the process sounding right first time around. Those early devices were based around analogue, charge-coupled delay lines, which gave them their soft, musical character — many subsequent digital chorus effects ended up sounding too clinical and hard-edged. In an agreement between Roland and Universal Audio, which will hopefully see the modelling of more Roland classics (oh, a Space Echo and Dimension D — please!), Universal Audio have developed and very accurately crafted an emulation of the classic Boss CE1 stomp box for their UAD1 PCI card. The CE1 is a very simple pedal with very few controls, which can generate either chorus or true pitch vibrato. It sounds 'right' on almost any sound source, especially guitar and fretless bass; it also suits keyboards particularly well.

The vibrato-chorus switch on the lovingly rendered plug-in (complete with vintage paint chips and scrapes) toggles between Vibrato and Chorus modes, while the other switch is really a bypass button. A single control knob adjusts the chorus intensity by simultaneously controlling both depth and rate, while two further knobs adjust the vibrato depth and rate when the pedal is in Vibrato mode. Universal Audio have, however, taken one liberty with the original design by adding a new stereo mode. In Classic mode, the left output signal is the direct dry audio while the delayed, modulated version is sent to the right output. This is how the original pedal worked to create a pseudo-stereo signal from a mono source; when only the mono output was used, the delayed and dry signals were summed as they still are in most guitar stomp chorus pedals. However, the new Dual mode works as two CE1s that can be fed from a mono or stereo input, and the two outputs carry the summed dry plus delay/modulation components for each channel, but with the modulating low-frequency oscillators running 90 degrees out of phase with each other to create a wide stereo image. In other words, it's like having separate chorus pedals in the right and left-hand signal paths, but with their LFOs locked 90 degrees apart.

I've owned a number of Boss chorus units over the years and listening to the Universal Audio *CE1* made me feel quite nostalgic. Chorus is now a much overused effect, but in situations where you need it, it has to sound right, and this one does, achieving the smooth, liquid sound usually associated only with analogue pedals. It's particularly good on clean guitar. Universal Audio have done a great job with the modelling, and though the pedal has very few controls and looks simple, I'm sure they had to meet a few challenges to get the sound this close. The vibrato option also works well when used gently and can add depth and interest to an otherwise static sound. If you want that old classic analogue chorus sound in a plug-in format, and you own a UAD1 card, then *CE1* should make you very happy.

Paul White

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TC Electronic *Nonlin2 Stereo Effects Reverb*

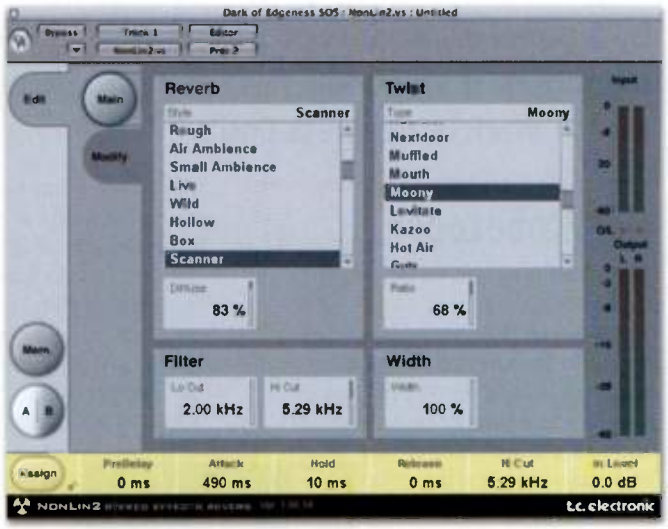
Formats: Mac & PC Powercore

TC's *Nonlin2 Stereo Effects Reverb* is yet another algorithm that has made the transition from the System 6000 to the TC Powercore platform, and like its travelling companions, it has retained the System 6000 style of user interface and can import patches from that platform. The Powercore is now very well catered for by way of reverbs but *Nonlin2* is rather different, being a dedicated special effects plug-in rather than a room or plate simulator. By applying unnatural attack and decay envelopes to the reverb signal, *Nonlin2* is capable of generating all the common reverse and gated effects, but it goes much further than that, wandering into the realms of vocal and percussive ambience and completely new special effects using a repertoire of so-called 'Twist' processes. While traditional gated reverb is triggered by the input signal exceeding a gate threshold, *Nonlin2* doesn't need to be triggered — it's all done by modifying the shape of the reverb burst so it works on any sound regardless of level.

The special effects or Twist side of the program is achieved by applying an assortment of radical processes to the reverb-generation algorithms, where the results range from granular-like effects and odd modulation to strident filtering. The manual doesn't provide much of a clue as to what's going on and the Twist effects are just listed by name, but then hearing the results is better than a thousand descriptive words. The only other processor I've come across that involves a similar approach to weirdness is Native Instruments' *Spektral Delay*.

While the process is undoubtedly complex, operation couldn't be simpler — you pick from 20 preset reverb styles, pick from one of 20 Twist types, then adjust the amount of Twist applied by using the Ratio control. Conventional envelope and hold controls adjust the reverb attack and decay characteristics while Lo and Hi cut can be adjusted along with reverb diffusion and pre-delay. As with other System 6000 based plug-ins, there are so-called Focus Fields that allow you to access the main parameters from any page, though in this case there are only two pages to navigate anyway. You can change which six parameters show up in the Focus field bar, a setting that is saved with your preset.

I have to confess to liking oddball sound processors, especially those that produce musically satisfying results, and this one does. You can use it as



a conventional gated, reverse or ambience reverb, but it really comes into its own when you start dialling in those Twist options. Because the processes are all tangled up in the reverb somehow, the end result is invariably complex and textural, ranging from robotic breathing effects to granular synthesis-style treatments. Furthermore, because *Nonlin2* makes it possible to create reverb patches with very short decays, the effects don't wash out the original sound unless you want them to. There are treatments that work on anything from voice to synth pads or acoustic instruments, and in my view this Powercore plug-in will appeal most to people who enjoy sample libraries such as *Distorted Reality*, *Liquid Grooves*, *Morphology* and *Twisted Textures*. *Paul White*

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Usedtobecool

Kevin Paul (KP): "Can we hear 'Visions of Custard'?"

Joff Gladwell (JG): "'Visions of Custard'?"

KP: "Yeah. The names of the tracks are great, aren't they? 'Classically Trained Groupie'!

"These guys have absolutely no doubts about what they're trying to do. I mean, the title of the demo is *A Demonstration Of How Distortion Is A Good Substitute For Talent*. Brilliant."

Joe Vanags Fleming (JF): "You could never have gotten away with something like this even a few years ago — it's very modern."

JG: "You can see a bit of a Digital Hardcore, Atari Teenage Riot influence. You can imagine poeple who are into that going mental for something like this."

Liz McCudden (LM): "I hate distortion. This sort of thing would drive me out of a room."

KP: "I actually really like this."

JG: "Yeah, me too."

JF: "I think it's alright as well — I really like the drums."

LM: "I think I'm just really sensitive to noise."

KP: "I really like this but it's hard to comment on the production when it's this distorted."

JG: "Well it's just suposed to sound all f**ked up, isn't it?"

KP: "I love the way the CD channel on the desk is so overdriven — this has been mastered really, really loudly."

JG: "It is a bit like having knitting needles stuck in your ears."

KP: "Yeah, but in a good way."

JG: "It's still got a really good groove though, it's not *just* noise."

KP: "The drum programming is really good, there's some really nice ideas in here. This is a bit of sonic terrorism — I like that!"

JG: "You kind of hope that their gigs are really violent and bloody."

LM: "They're probably like the Chemical Brothers or something — you know, a couple of nerds."

JF: "They've obviously got a real problem with guitars — the picture of an acoustic guitar with a bar through it on the inside cover kind of says it all."

LM: "Maybe at their gigs they have kids smashing up guitars at the front of the stage and pissing in pint glasses and throwing it at each other."

KP: "Or lots of people sitting down watching really politely."

JF: "Yeah, and stroking their chins."

LM: "I never listen to this sort of stuff — do you think it's original?"

JG: "Yeah, I think it is."

KP: "I think so too. I tell you what, if you watched this live you'd move to it, even if you moved out of the room. It would definitely get a reaction."

LM: "So, 'Usedtobecool', maybe they're two old geezers who used to be in other bands?"

KP: "I don't know, they look really young in the pictures on the sleeve — the top one looks like he's about 15."

LM: "There's definitely a place for this sort of thing, I'm sure people would buy this.

"I think I quite like it now actually. The noise is quite off-putting to me but there is something about it."

KP: "There's definitely a few people in this building who would like this."

LM: "The feeling when it finishes is great. I can kind of still hear it though. It's like I've been on an aeroplane."

JG: "Does anyone else think that the name Usedtobecool doesn't really go with their music? I think there's something slightly cheesy about the name but the music's really brutal, it's really f**king tough. It doesn't fit."

JF: "They've set out to achieve something here and I think they've achieved it."

JG: "When you compare this to that guy we had earlier who was stuck in the '90s [*see last month's column*] — this is just so inventive and original."

This Month's Panel

Kevin Paul began his career in audio engineering as a tea-boy at Ray Davies' Konk Studios. He joined the Instrument at Mute in '94 and became Head Engineer there in '97. Over the course of his career he has worked with David Bowie, the KLF and, of course, a host of Mute artists, including Goldfrapp and Nick Cave and the Bad Seeds,

Recently Kevin has been concentrating on 5.1 mixing and is about to release the debut album by his band AGK (www.agkmusic.com).

Joff Gladwell is an A&R scout for Mute Records. His daily routine involves listening to demos, going to gigs and talking to people about bands — which is very nice work if you can get it.

He's probably earned it though: Joff started his own record label, Bad Jazz, when he was 16 and spent the next seven years releasing diverse and eclectic music by acts like My Morning Jacket, Lone Pigeon and James Yorkston. He joined Mute in his current position in 2002.

Joe Vanags Fleming is Assistant Publisher at Mute Song, Mute Records' publishing division. After graduating from university Joe worked for the Performing Rights Society (PRS) before going on to join Mute. His job as Assistant Publisher involves liasing with Mute's international sub-publishers, processing royalties and occaisional A&R work with urban and dance music.

Joe is also a DJ and has recently began producing his own music.

Liz McCudden is Product manager at Mute Records, a job which involves organising the scheduling, production and promotion for the many different acts on the label.

Liz's career in music began in the live industry where she worked as Stage Manager at Shepherd's Bush Empire and in some of Londons' other larger live venues.

After a spell working for record label City Slang she went on to join Mute in 2003.

Many thanks to MJ and The Instrument at Mute Records (www.the-instrument.com) for organising and hosting the session.

Michael Kingston

KP: "This is really well put together, very cleverly done. I'll be amazed if he ever gets it released though, with the amount of samples.

"It reminds me of Mylo actually, it's kind of similar to the sound he's got."

JG: "It reminds me of the Avalanches or the Go! Team, something like that."

KP: "Yeah, like the cut-and-paste specialists."

LM: "You can just imagine everybody dancing to this over the summer and it becoming this shock number one."

KP: "It's the most commercial thing we've heard today by about a mile. It's easily the most accessible but that's obviously what he's going for. It's even got a sticker on the cover saying 'now even cheesier!'."

LM: "It's very well presented. I really like the cover and the titles on the back done with a labelling machine."

JF: "Yeah, I like the packaging. I know it's not the most important thing with a demo but it can really help them to stand out when there's a huge pile of them. It kind of shows that a bit more thought has gone into it."

JG: "I always think packaging helps. Generally the best demos come in the most interesting packaging. It doesn't have to be brilliant quality or expensive, just innovative. It's like the Ascoltare demo in the plain envelope we had earlier — it wasn't that interesting in itself but it was different and it seemed to fit the style of the music quite well."

LM: "I think if it comes packaged really well it just shows that you've got a more complete idea about what you're trying to do."

KP: "He's done everything right though — three tracks on the CD, best song first, all that sort of thing.

"The production's pretty good. The mix is good, a couple of slight imbalances here and there but generally I think he's done pretty well to be honest."

JG: "It's all samples basically, isn't it? But I think he's put them together really well."

LM: "It's shockingly catchy. I'll have that first track going round in my head all day."

JG: "You can imagine students really going for this. You know, lagered-up on a Saturday night — they'd love it."

JF: "I think he's got some nice ideas though. There's a lot of people doing this sort of thing and it's hard to make something stand out."

JG: "He's never going to get this released with all those samples on it. It'd take him years to get them cleared."

KP: "I really like the third track, it's got a more minimal sort of feel to it and I like the groove. Number one was obviously just packed full of everything he's ever wanted to put in a record."

JG: "It's pretty big sounding, the first one. It would work really well as, you know, that *sort* of dance track."

KP: "I think all three tracks would work well for that. Like Liz says, this could be the surprise hit of next summer. You can imagine it being really popular in Europe."

JF: "I like the part towards the end of the first track where it sounds like the CD's skipping and then the drum beat comes back in over the top of it."

KP: "Yeah I really like that — we were all looking around trying to figure out if the CD player was broken. Really cool idea." SOS

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cubase notes

Preferences could be the key to more predictable behaviour and smoother operation — for *Cubase*, at any rate!

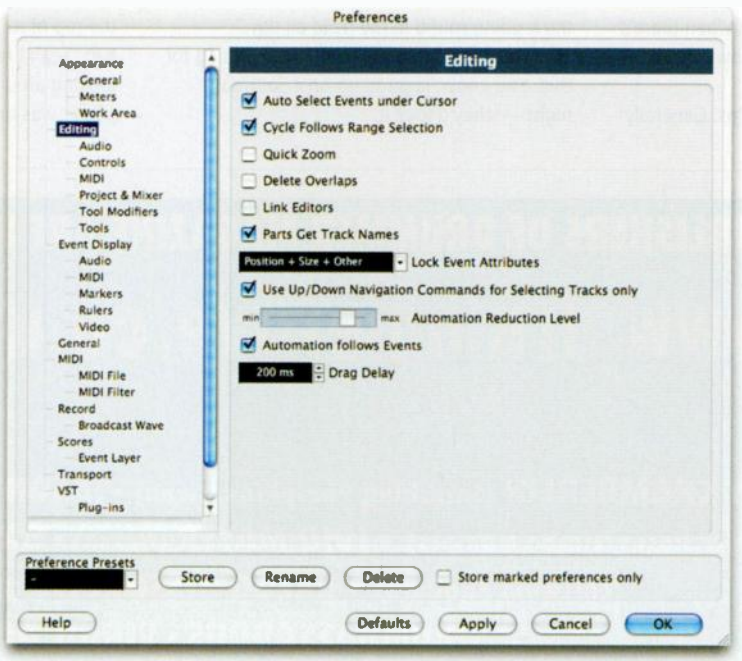
Mark Wherry

Last month's *Cubase* Notes seemed to cause a bit of a stir on Steinberg's Cubase.net forum — how dare *SOS* be allowed to 'review' *Cubase SX* 3.1 before it's available to the users?! After reading the thread, I thought it would be good to mention that since *Sound On Sound* expanded its sequencer coverage to include monthly workshops alongside the already regular Notes columns, the idea of *Cubase* Notes is now to provide news, tips and items of general interest to *Cubase* users. It was in this spirit, therefore, that I wrote about the forthcoming 3.1 update, as an expanded news item with some added opinion, to give *Cubase* users an idea of what they have to look forward to after having worked with the beta. Coverage of updates in *Cubase* Notes does not constitute an official *SOS* review!

A More Desirable *Cubase*

Anyway, getting back to the concept of tips, I thought I'd share a few preferences this month — literally. I was sitting down with a composer friend recently and somehow we got onto the subject of *Cubase*. He was commenting on how great it would be if you could use MIDI Controllers to control basic automation such as volume on MIDI tracks, and I told him about a preference added in version 3 that would allow him to do just that. So this month I want to share a few Preferences you might not have considered, that could really be helpful. (I should mention that the Preferences window has been tidied up and reorganised a little in *Cubase SX/SL* 3.1, and the references in this article refer to this new version rather than earlier releases.)

Taking the above example, should you want to use MIDI Controllers to write automation for MIDI tracks (rather than recording the same automation as MIDI data in a Part), simply enable 'MIDI Controller Input to Automation Tracks' in the MIDI page. Now, for example, when you have a MIDI track selected and you generate Controller 7 data, the volume fader on the corresponding MIDI channel will move.



Cubase SX/SL's newly reorganised Preferences window offers a vast number of options that are easily missed but could make your *Cubase* life much easier, such as the Editing page's options, shown here, described in the main text.

A neat preference that I know quite a few people campaigned for is 'Parts Get Track Names' in the Editing page. Normally, with this option disabled, a Part will keep its original name when moved from one track to another. When the option is enabled, a Part will automatically be renamed to take on the name of the track to which it's being moved or copied. This is useful when you consider that a Part always takes on the name of the track where it was first created, so if you like all of the Parts on your flute track to be called 'flute', even if they came from the violin track original, this is a preference for you.

The Editing page actually has many other useful Preferences too. There's the well-known Link Editors option, which means that an open editor window will always display the contents of the selected parts in the Project window. There's also 'Auto Select Events under Cursor', which, quite literally, automatically selects Events and Parts that fall within the current position of the Project cursor on the selected track. 'Cycle Follows Range Selection' initiates a very *Pro Tools*-like behaviour where the position of the left and right locators can be set automatically to the current selection made with the Range Selection tool, which is rather handy.

Ah, So That's Why!

Paying homage to the great Dennis Norden, our final selection of Preferences is labelled 'Ah, so that's why!' For example, have you ever noticed the following situation: say you have five tracks and the third track is selected, but the last Object you selected on the Project window was in fact a Part on the first track. Pressing the 'down' cursor key selects the second track and any Object on the second track, instead of simply selecting the fourth track, as you expected. Fear not. Enabling the 'Use Up/Down Navigation Commands for Selecting Tracks only' option in the Editing page will give you exactly the behaviour you expect from now on.

A common question from new users is 'why does the horizontal zoom factor change when I drag the Project cursor along the ruler?' The reason is a Preference called 'Zoom while Locating in Time Scale,' which makes dragging vertically up or down from within the ruler zoom the Event display in and out respectively. Dragging horizontally within the ruler does indeed set the time location of the Project cursor, as you'd expect, but since the ruler is rather small it's easy to accidentally drag above or below it and change the horizontal zoom factor by mistake.

Finally, another version 3-related issue. You'll notice that when you move the mouse into a Controller lane in the Key editor, the mouse always defaults to the Pen tool, rather than the Selection tool as before. Some users find this handy, and you can temporarily make a selection as you would normally with the Selection tool instead by holding down Control/Apple. However, to change this behaviour back to the old way (ie. you get a Selection tool and hold down a modifier for the Pen tool), simply disable 'Controller Lane Editing: Select Tool defaults to Pen' in the Editing — MIDI page.

Join us again for more Preferences fun in another *Cubase* Notes column soon, and drop us a line if you have anything personal you'd like to share about your *Cubase* habits... SOS

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Using The Built-In EQ

The Channel Settings window for an audio-based channel offers a full section of controls for the built-in EQ, as seen here between the columns for inserts and sends. Note the Lo and Hi bands are set to High Pass and High Shelving filters respectively, and also notice the EQ button on the Channel Strip is coloured green to show that EQ is active on that channel.

In *Cubase SX*

Although there are many third-party equaliser plug-ins available, the EQ built into *Cubase SX* and *SL* is both functional and convenient, and has the unique advantage of being closely integrated with the Mixer, Inspector and Channel Settings windows.

Mark Wherry

Every audio-based channel in *Cubase* (Audio tracks, Rewire, Group, VST Instrument, Input and Output channels) has a set of four parametric EQ controls that allows you shape the tone of the audio being output from that channel. While you can set the EQ from several different places in *Cubase*, the best place to start is with a channel's Channel Settings window, which you can open by clicking the 'e-in-the-circle' Edit Channel Settings button for the channel you want to investigate. This button can be found in one of three places: on the actual track in the Track List, next to the track's name at the top of the Inspector, or on the corresponding channel on the Mixer, just below the channel's 'W' Write Automation button.

If you want to EQ a VST Instrument, for example, make sure you click the 'e' on the track or channel that represents the audio output of the VST Instrument, rather than the MIDI track/channel that contains the data being fed into said VST Instrument — you can't EQ a MIDI track!

Tour D'EQ

The EQ section in the Channel Settings window is always to right of the inserts column — I'd say in the centre between the inserts and sends columns, but some channels in *Cubase*, such as Input and Output channels, don't have the ability to send audio to another buss. You'll notice that the top half of the EQ section in the Channel Settings window contains a graph, with a bright green line to visually indicate the overall EQ curve created by the four separate bands. The horizontal and vertical axes indicate frequency and level (in decibels) respectively, so you can always see at a casual glance how much a particular frequency range is being cut or boosted. You'll notice the EQ is completely flat by default.

Below the graph, you'll notice four columns of duplicate controls for fine-tuning the EQ settings, with each set containing a power-plug-styled button to enable or disable that EQ, and three rotary controls for adjusting the frequency, gain, and Q of each band of EQ. The frequency control (the outer dial in the top row of rotary controls) sets the frequency you want to manipulate, while the gain control (the inner dial) adjusts how much ▶

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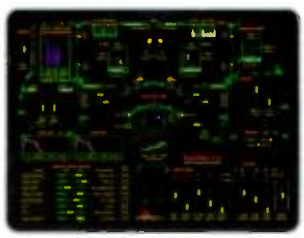

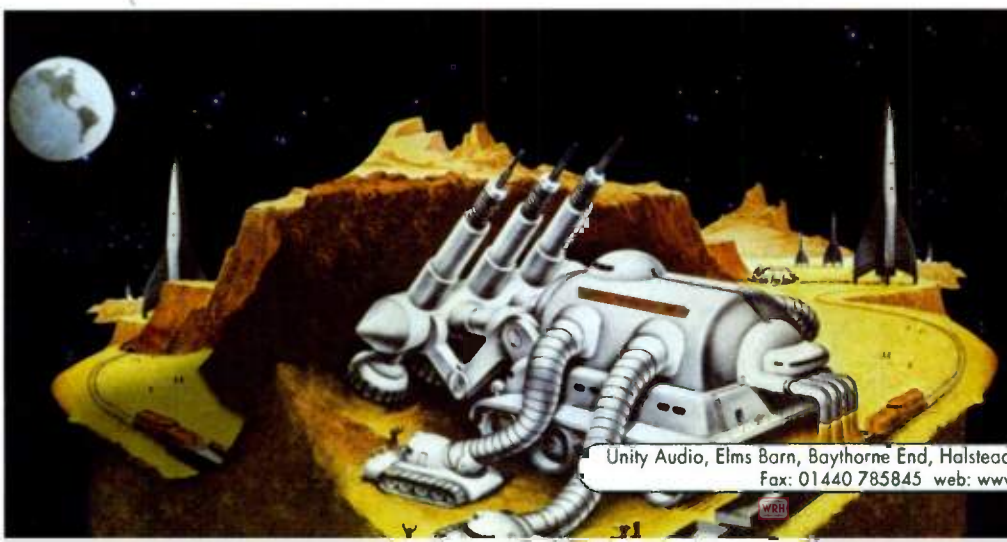

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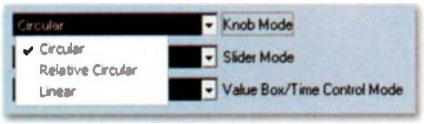
the selected frequency is cut or boosted. Finally, the Q dial (the rotary control at the bottom of each column) sets the range for how many frequencies around the selected frequency should be affected, where a high number indicates a narrow Q and, conversely, a low number indicates a wide Q.

The lowest and highest Q values on the middle two EQ bands, Lo-Mid and Hi-Mid, are 0.0 and 12.0 respectively, whereas setting the Q controls on the Lo and Hi bands to their extreme high and low positions causes those bands to function as high or low shelving/pass filters instead of parametric EQs. See the 'Filters 101' box if you're unsure about these types of filters.

As you would expect, you can double-click the text fields reporting the value of a control to enter a value numerically if you like, but most people will probably find it more intuitive to actually drag the EQ's rotary controls to make adjustments. When dragging the rotary controls, though, it's worth remembering you can Shift-drag them for greater accuracy, and if you have a mouse with a scroll wheel, as with most *Cubase* parameters, you can hover the mouse pointer over a rotary EQ control and use the scroll wheel to adjust the value — and, again, you can hold down Shift while adjusting the scroll wheel for greater accuracy.

An interesting aside here is that if you're not entirely comfortable with the way *Cubase* responds when you drag a rotary controller, it is actually possible to configure how *Cubase's* rotary controllers respond to dragging in the Editing Controls page of the Preferences window.



The Editing Controls page in the Preferences window allows you to set one of three behaviours for how knobs (or, to be more polite, rotary controls), such as those used for the EQ settings, can be adjusted by the user.

The Knob Mode pop-up menu offers three options and is set to Circular by default, which allows you to drag the rotary control in a circular motion as you would a physical knob — clicking around the edge of the rotary controller automatically sets it to that location. Circular Relative is like Circular, except the rotary controller doesn't jump to the current position of the mouse when you begin to drag, and instead, as you might expect, adjusts the control relative to the position of the mouse. However, I think the easiest way to control on-screen knobs by dragging is with the simple Linear option, enabling you to adjust rotary controllers as you would faders by dragging either horizontally or vertically from the position of the knob.

Graphing Functions

Getting back to the issue of adjusting the EQ settings, the graph that illustrates the current EQ curve is actually interactive, so you can drag the points around on the graph to make adjustments instead of the using the rotary controls. Assuming you have no EQ bands enabled, double-clicking in the graph will enable one of the EQ bands depending on where in the graph you double-click: to the far left of the graph enables the first EQ while double-clicking to the far right of the graph enables the fourth EQ. Once an EQ is enabled, you'll notice that the actual frequency and gain values are represented by a dot plotted on the horizontal and vertical axes (alongside the number of the corresponding EQ band from one to four), and the Q is illustrated by the shape of the curve around the point.

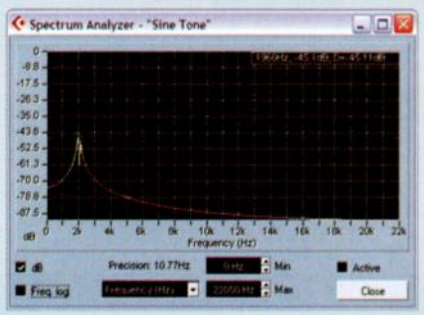
When you drag a point around in the graph, you can move the X and Y position (thus adjusting the gain and frequency of that band) and this can be a really useful way to find the right frequency you need to EQ while the audio is playing through that channel. It can also be fun to automate this action to create some interesting sweeping effects, which you can do by enabling the 'W' Write Automation button for that channel and putting the sequencer into play while you move the appropriate point on the EQ graph. Afterwards, disable Write Automation, enable the 'R' Read Automation button, rewind and press Play to hear what you've done.

If you want to move the point on the graph in only one direction, either to adjust only the frequency (horizontal), or only the gain (vertical), hold down either the Alt/Option or Control/Command keys down respectively while moving the point. To adjust the Q of the EQ band represented by the dot, hold down Shift while dragging the point up or down (or left and right) instead — the point will stay where it is, but notice how the curve around it changes. Finally, if you want to disable a band of EQ, you can double-click the

Finding The Right Frequency

With some instruments, there are basic rules you can follow when setting up EQ to shape the sound. Take drums, for example: add a little gain around 60Hz to the kick drum and some 2k for the snare, boost everything above this for the hi-hats and cymbals and Robert's your mother's live-in lover. All right, so perhaps it's not that easy — unless you want to offend a really good engineer — but what do you do if you're not sure what frequency you need to change in order to make the appropriate tonal adjustment? You can hear a harsh sound in the strings that you'd rather not be there, but you're not sure where it is, for example. One solution is to use your ears and drag the EQ point up and down until you find the frequency, but *SX* users can also use the built-in off-line spectrum analyzer to be a little more precise.

To see a section of audio displayed in the frequency domain, select the appropriate Audio Event on the Project window containing the frequency you want to identify — you could also use the Range Selection tool to highlight the small section of audio you want to analyse, perhaps just an individual note — and choose Audio/Spectrum Analyser. In the Spectrum Analyser window, leave the default options set (Size in Samples = 4096, Size of Overlap = 512, Window used = Hamming, and Normalized Values ticked) and click Process.



Cubase SX features an off-line spectrum analysis function, as shown here, which plots the curve of the selected audio in the frequency domain. Notice the information text in the top-right area of the graph that details the point representing by the circle (shown here at the top of the peak) on the graph.

A second Spectrum Analyser window will appear that plots a graph with frequency on the horizontal plotted against amplitude on the vertical. If the graph doesn't appear to show anything, you can make the display slightly clearer by enabling both the dB option (to display the amplitude in decibels on the vertical axis) and the Freq. Log option (to display the frequencies on a logarithmic scale, as opposed to a linear scale).

As you hover the mouse horizontally over the graph, notice how a circle appears along the curve: you'll also see a text display in the top right to explain the frequency and amplitude at the point the circle is plotted. One neat feature here if you've selected a single note to analyse is that the highest peak on the graph will usually indicate the pitch of that note. If you click the Frequency (Hz) label along the bottom of the window and choose Note (C) from the pop-up menu, you'll notice that the horizontal scale changes to show pitch instead, and by hovering the mouse over the graph you can figure out the note's pitch.

Once you've identified the appropriate frequency, you can now close the Spectrum Analyzer window and adjust the EQ controls accordingly.

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corresponding point on the graph to disable that band.

Bypass, Reset & Preset

Once you've started tweaking with the inbuilt EQ, it's useful to be able to hear comparisons with and without the EQ adjustments; and while you could simply enable and disable the individual EQs, this can be a real pain if you're using all four. To temporarily disable all four EQs simultaneously, simply click that channel's Bypass EQs button, which you'll find in no fewer than five places! Firstly, in the Channel Settings window, there's a Bypass EQs button at the top-right of the EQ section and on the Channel Strip (the diamond-shaped button with a line through the middle), where it glows green when EQs are active and yellow when they're bypassed. This latter button is also duplicated on the Channel Strips found on the Mixer window, and on the appropriate track in the Track List if the Track Height is sufficient. Finally, there's also a Bypass EQ button on the EQ Section title in the Inspector: the thin, blank rectangle to the right of the title of that Inspector Section. Phew!

However, if you realise that the EQ settings you came up with really aren't working, you can reset all four EQs to their default and disabled state on a particular channel by clicking the Reset EQs button, which you'll only find in Channel Settings window to the left of the Bypass button at the top-right of the EQ section. While the icons in *Cubase* can sometimes be a little confusing, it's worth remembering that hovering the mouse over a button for a brief time will display a handy hint box to tell you the function of that particular button.

If you come up with some EQ settings that you'd like to keep and use on other channels in the current Project — or any other Project for that matter — *Cubase* lets you store EQ presets within the Channel Settings window that can easily be recalled when you want them. EQ presets are stored within *Cubase* and aren't saved with specific Projects.

To store a channel's EQ settings as new EQ preset, click the Store EQs button in the Channel Settings window (the '+' button at the top of the EQ section) and a new preset will be added. Double-click the current EQ preset label to the right of the Store EQs button and in the Type In Preset Name window, enter a name for the EQ preset and press Return or click OK. The currently selected EQ preset can always be renamed in this way.

To recall an existing EQ preset, click the current EQ preset label and select a different preset from the pop-up menu. To delete the currently selected EQ preset, simply click the Remove EQs button (the '-' button next to the Store EQs button), although it's worth noting that you won't get a warning before the preset is removed, and this operation cannot be undone.

The Inspector offers two Sections to adjust the EQ controls if an audio-based track is selected on the Project window's Track List.

Other Places To Set The EQ

You might have noticed throughout this article that are many different places to carry out options such as bypassing the built-in EQ. Similarly, there are in fact a couple other places you can adjust the EQ settings in addition to the Channel Settings window we've been looking at. To adjust the EQ settings for an audio-based track on the Project window without opening the Channel Settings window, select the appropriate track, make sure the Inspector is visible, and click the title of the Equalisers Section in the Inspector. Although the presentation of the controls is slightly different, with the controls being shown as sliders instead of knobs, the actual workings and results are exactly the same. Alternatively, there's also an Equaliser Curve Section in the Inspector, which displays a duplicate version of the EQ graph from the Channels Settings window and behaves in exactly the same way.

If you want to have multiple Inspector Sections open simultaneously, such as the Equalisers and the Equaliser Curve, or maybe the Curve and the General Settings Section, you can Control/Command-click to open a new Section in the Inspector without the Section that's currently open closing. Alt/Option-clicking and Inspector Section opens and closes all Inspector Sections.

If you find yourself working in mostly the Mixer window when mixing, *Cubase SX* users can also access the controls for the built-in EQ via the Extended View on the Mixer, which isn't available to *Cubase SL* users. Switch to the Extended Mixer View by activating the Show Extended Mixer button on the Common Panel of the Mixer, and you can set an individual channel's Extended strip to show the EQ controls by clicking the small, downward pointing arrow just above the pan control and selecting either EQs, EQs +, or EQs Curve from the pop-up menu. EQs shows the EQ controls as faders, EQs + shows the controls as knobs, while EQs Curve shows the EQ graph at the top of the Extended strip and rows of text to describe the EQ values below. You can click these and then drag the fader that appears while the mouse is held down to adjust the values. You can set all audio-based channels to show EQ controls by clicking the third, fourth or fifth buttons from the top of the Common Panel in the Extended Section in the Mixer. SOS

The Extended Mixer in *Cubase SX 3* offers three different ways of configuring EQ settings, as illustrated here — each channel is assigned identical EQ settings.

Filters 101

The following types of filters are available to you in the lowest and uppermost bands of *Cubase*'s built-in EQ section.

Low Shelving

A low-shelving filter allows you to cut or boost all the frequencies below a corner frequency you can set.

High-pass

A high-pass filter allows only frequencies above the user-defined cutoff point to pass through the filter.

High Shelving

A high shelving filter is the opposite to a low shelving filter, allowing you to cut or boost all the frequencies above the corner frequency.

Low-pass

The low-pass filter is the opposite to a high-pass filter, allowing only frequencies below the cutoff point to pass through the filter.

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WRH

logic notes

If you need to run multiple Firewire audio interfaces, you'll want to upgrade to the latest Tiger version of *Logic*.

Stephen Bennett

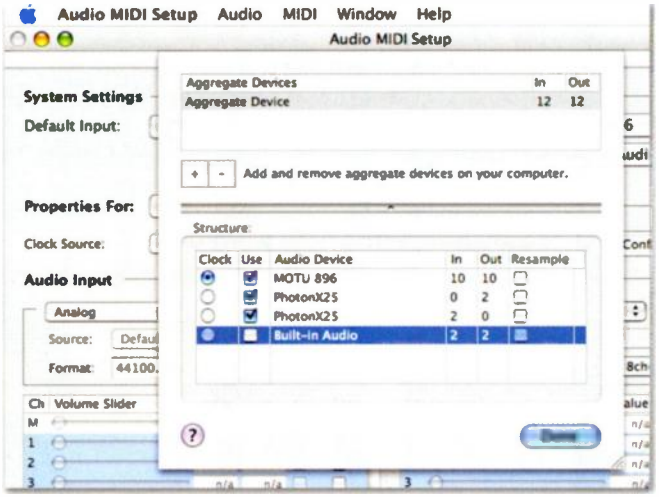
Universal Audio have just released version 3.9 of the driver for their rather excellent UAD1 DSP card. "So what's that got to do with *Logic*?", I hear you cry. Well, the UAD1 frees up its onboard CPU when you Freeze tracks containing UAD1 plug-ins. I've not used *Logic*'s Freeze feature on my G5 at all yet, but now I'll start freezing again in earnest so I can get the most out of my UAD1. The other reason I've mentioned the new UAD1 driver is that it's now fully compatible with Tiger, so I can finally upgrade my studio system's Dual 1.8GHz G5. Incidentally, if you are running a UAD1 under Panther, Universal Audio still recommend that you upgrade the driver anyhow, as there are other performance enhancements.

Have Your Say!

If you want to suggest changes or improvements to *Logic*, then here's your chance! The Apple development team are inviting *SOS* readers to send in their suggestions of what they'd most like added or changed in *Logic*. Email your top five suggestions (in order of preference) to logicnotes@soundonsound.com, and we'll forward your lists on to the *Logic* team. We'll be asking them for feedback on which changes users deem most important and how these might be addressed.

Current Versions

Mac OS X: Apple *Logic Pro* v7.1
Mac OS 9L Emagic *Logic Pro* v6.4.2
PC: Emagic *Logic Audio Platinum* 5.5.1



Updating To Tiger

I've been running Tiger on my laptop since its release, and I've now used it on a couple of major recording sessions. I'd been eagerly waiting for Mac OS 10.4 as I was keen to try its ability to use more than one Firewire interface in tandem for recording a whole band in one go. Using *Logic* v7.1, I'd already been recording 16 input tracks at once at 24-bit/44.1kHz with no problems at all using my MOTU 896 and a borrowed 828, so I was keen to upgrade my G5 to Tiger.

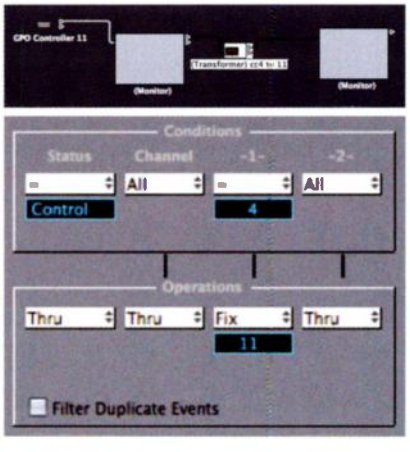
Unlike *SOS* Apple Notes columnist Mark Wherry, I always do a System Update rather than an 'archive and install'. I've never had any problems with this method and it's quick; I had the system up and running with Tiger in just under two hours, and that's including a Carbon Copy clone of the system disk to a spare Firewire drive (which also repairs permissions). After the basic Tiger install, I used System Update to check for any recent OS updates. Next it was the MOTU Firewire and some Tiger-ready plug-in patches, such as Synthogy's *Ivory*, Garritan's *Personal Orchestra*, and the UAD1.

After the final reboot, I launched *Logic* — and it crashed! It seemed to be falling over as soon as Core Audio attempted to load. After a cup of coffee and a bit of head scratching, I realised what the problem was: System Update hadn't picked up that the Apple Pro Application package hadn't been installed. A quick visit to Apple's web site (www.apple.com/support/downloads) solved the problem. How the hell did we manage before the Internet?

Apart from this 'minor' glitch, everything went swimmingly. *Logic* v7.1 seems to run in pretty much the same fashion as it did under Panther. So is it worth upgrading a music-only system to Tiger? Well, if you need to use more than one audio interface, it definitely is. I'm still to see the results of any other possible benefits though. It's often recommended that you don't upgrade during a 'mission critical' period. However, I'm continuously in such a situation myself, so if I listened to that advice I'd still be on Mac OS 7! These days, cloning your entire system drive onto a bootable backup should be enough to get you back to where you were before any upgrade if you have problems. SOS

Logic Tips

A lot of software these days makes use of MIDI controller data in an attempt to improve the realism of a performance. For example, the new *Synful Strings* library uses MIDI controllers to adjust vital aspects of volume and timbre. If you are using an expression pedal into a master keyboard, you can set up the keyboard to determine which MIDI controller is transmitted when you move the pedal, but if you're running several different plug-ins it can quickly become very inconvenient to keep switching controller numbers. However, you can use the Environment to make this easier to manage. On a new Layer, create two Monitor objects, an Instrument object, and a Transformer object. Cable the objects together as in the screenshot below and also set up the Transformer as shown — this converts my footpedal's MIDI CC4 output to CC11. Now Alt-click the little arrow on the second Monitor object to cable it to your plug-in. Finally, select the new Instrument object as the Track Instrument in the Arrange window and move the footpedal — the required MIDI controller will now be sent to the plug-in.



When saving *Logic* Songs as a Project I've noticed that if you set the Audio Files Not Used In The Arrange Page parameter to Leave it can cause a problem. *Logic* does in fact leave the files behind, but it doesn't always remove them from the Audio window. What this means in practice is that if you physically delete these files from the disk, Logic will ask you for them every time it boots the Song. You can delete these references by opening the Audio window and choosing Select Unused from the Edit menu. You'll see these 'orphan' audio-file references selected (just check that they are blank boxes and don't have waveforms displayed), allowing you to delete them.

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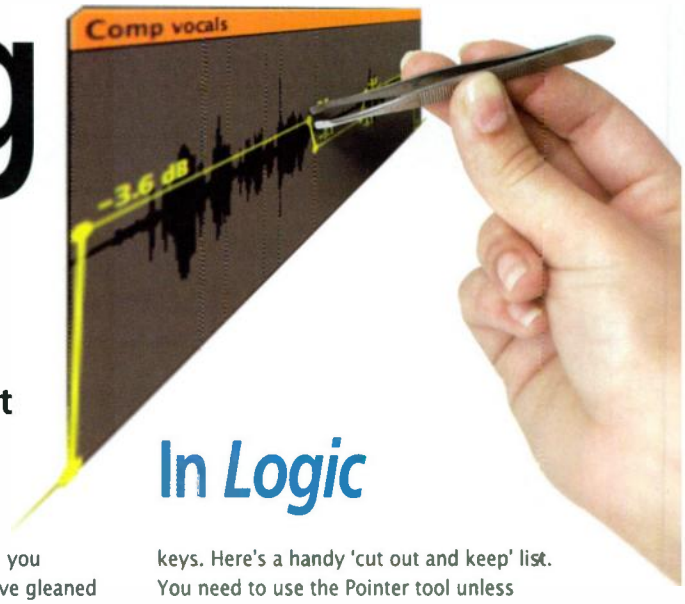


In Logic

Comprehensive automation is one of *Logic*'s most powerful facets, allowing micro-management of all the settings in your mix.

Stephen Bennett

One of the most powerful features of a modern Digital Audio Workstation (DAW) is the ability to automate almost every parameter. As a song plays, you can automatically adjust volume, pan, sends, mutes, and nearly all the controls of your plug-in effects and virtual instruments. *Logic*, as you would expect, has a powerful and comprehensive automation system. However its implementation is often obtuse and complex, with many features poorly documented or, in some cases, not documented at all!

I'm currently mixing an album completely in *Logic* for the first time. (Thank you, plug-in delay compensation!) In the past I've either mixed totally within *Pro Tools* or used a combination of *Logic*'s automation and an external mixing board and effects. For this album, everything is being done in the box — including bringing in a couple of external synthesizers via my MOTU 896 Firewire interface. It's been a roller-coaster ride, with some laughs and some tears, some annoyances and some surprises. The purpose of this article is to bring you practical tips and advice which I've gleaned from my mixing sessions to help you make the best use of *Logic*'s automation.

There are two ways to write automation data in *Logic*. One is to record the movement of on-screen or hardware controller knobs and faders, the other is to write automation data directly with the mouse. In practice, it's probably best to use a mix of these techniques. What I generally do is use the mouse technique to get rid of extraneous noises, especially in a vocal track, and fader automation for more general automation and virtual instruments. I then fine-tune this automation again with the mouse.

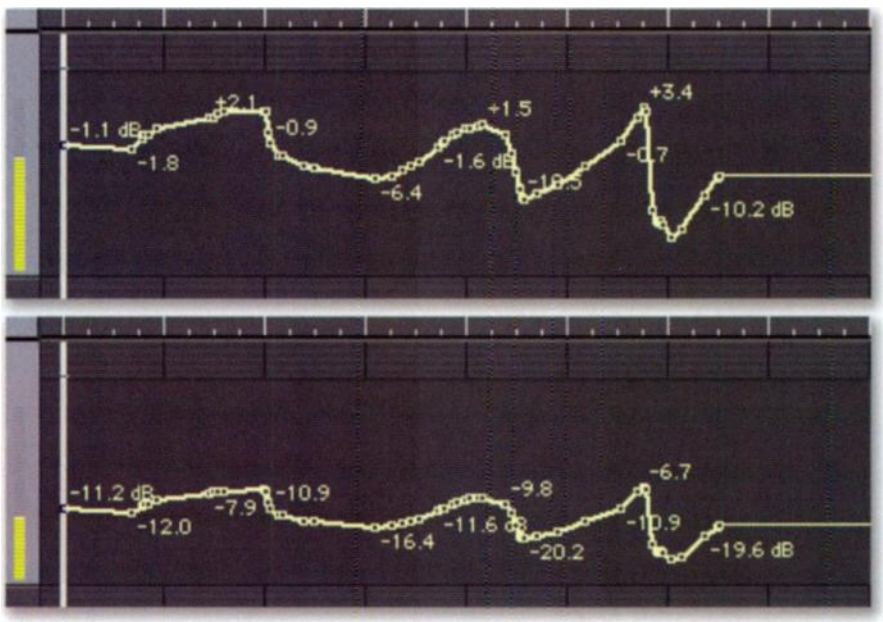
Editing Automation Data With The Mouse

The way nodes and lines are created and edited in *Logic* is affected by the modifier keys. Here's a handy 'cut out and keep' list. You need to use the Pointer tool unless stated otherwise to perform these operations.

• CREATING DATA WITH THE POINTER TOOL
You can add a new node by a short click anywhere on the track, or add a new node on an existing line with a short click on the automation line. To create four nodes around a part of a region, hold down the Shift, Control, and Alt keys and drag over the area around which you wish to create nodes. However, beware that there is a bug with this in *Logic* v7.1, whereby if you try to create a four-node cluster like this, only three nodes are actually inserted — so you'll have to click on the automation curve to the right of the nodes and create another. To create two nodes around a part of a region, hold down the Shift and Alt keys while dragging over the area.

Track-based Automation

Logic uses a track-based automation system. In older versions, automation was only available as Hyper Draw information on individual regions, so if you moved or deleted these regions you lost your automation data. *Logic* now keeps its automation data independent from its regions, though it can still be copied with regions if need be. If you want, you can even have automation data even where there are no regions at all. Another thing to mention is that the new track-based automation isn't restricted to Hyper Draw's eight-bit MIDI data resolution; it's internal to the program and allows for high-resolution fades.



Holding down the Apple key and dragging the volume automation slider scales the entire track's volume data proportionally.

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The Automation tool can operate in two different modes: Curve or Select. You can select the mode from the pull-down menu below the Arrange window's Toolbox.

▶ • SELECTING DATA USING THE POINTER TOOL

To select a node, click and hold on it — a little info window will appear giving you details about the node. Select a line by clicking and holding on the line. To select a group of nodes, hold down the Shift key and drag around them. You must do this within the boundary of a region, otherwise you'll select the region itself. You can then move the whole selection by dragging the lines or the nodes within the selection. If you'd like to select all automation from the nearest node to the Song's end, hold down the Alt key and click on the node. Double-clicking a node while holding down Alt selects all automation on a track.

• SELECTING DATA WITH THE AUTOMATION TOOL IN SELECT MODE

Selecting all the nodes within a given region is as simple as clicking on the region itself. Non-contiguous selections can be made by holding down the Shift key and dragging over each area.

• MOVING DATA WITH THE POINTER TOOL

Just click and drag single nodes to move them, and the same goes for single automation lines. To move a selection of nodes either horizontally (in other words forwards or backwards in time) or vertically (in other words incrementing or decrementing the data values), click-hold and drag a line or node.

• MOVING DATA WITH THE AUTOMATION TOOL IN CURVE MODE

In this mode, dragging a line will result in a curve. Depending on where you drag the line, the curve will be either 'smile' shapes or 'S' shaped. You can do this with the Pointer tool by holding down the Alt and Control keys while dragging.

• SCALING DATA WITH THE POINTER TOOL

To scale selected automation data up and down (increment or decrement) proportionally, drag somewhere other than on a line or node. To do this to a whole track's visible data, hold down the Apple key and drag the level slider to the right of the track list up or down.

• COPYING AND DELETING DATA WITH THE POINTER TOOL

With some automation data selected, drag the selection while holding the Alt key to create a copy. You can delete a single node with a short click, or a selection of nodes using the backspace key — but check no objects are selected as well! To delete all the automation data in a track, hold down the Shift and Alt keys and double-click the track.

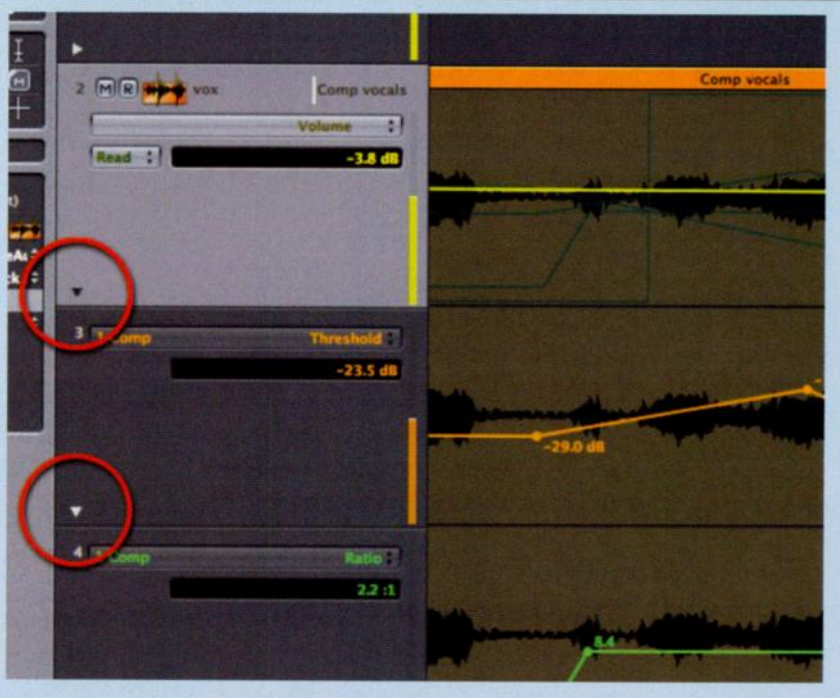
Dealing With Noises & Breaths In Vocal Takes

With a vocal track I start by removing any extraneous noises in between the actual singing lines. (Things like 'I really f***ing messed that up!') Usually I'll do this with the mouse. First make the vocal track's automation visible in the Arrange window — see 'Displaying Track Automation' box for details, and bring up the Volume automation, checking that the automation mode is set to Read. You'll see the volume automation line appear. The easiest way to draw automation curves around the vocal phrases is to drag a box around each of them while holding down the Shift, Control, and Alt keys simultaneously — on releasing the mouse, four automation nodes will be created.

Repeat this for all the vocal phrases and then drag the lines between the phrases down to create volume curves around each of them. Now you zoom in on the track so that you can edit the automation data in more detail with the mouse. You can change the feel of a vocal recording by lowering or completely removing the vocalist's breathing — especially if you're using a compressor plug-in on the voice. Breaths at the starts of phrases can be dealt with while removing other noises as described above — just move the start curves of the automation 'islands' until the breath's gone.

If you have a breath within a phrase, you'll probably want to work in a slightly different way. Use the Shift-Control-Alt-drag technique as described above to generate ▶

Displaying Automation Data.



By clicking the little triangles to the left of the track list, you can display different types of automation data simultaneously.

If you look at a track with automation data at high zoom, you may see many layers of automation faintly appearing against the currently displayed automation data. There are two ways to access these:

- Select another parameter from the track's pull-down automation menu — this includes all the current parameters that have automation data associated with them. Whatever type of data you decide to select will then appear on top, allowing you to edit it.
- Click on the little arrow at the left-hand side of the track list. This opens another track lane specifically for displaying automation data. Further clicking on this tracks' arrow will open up another automation track lane. All these lanes are then available for editing simultaneously.

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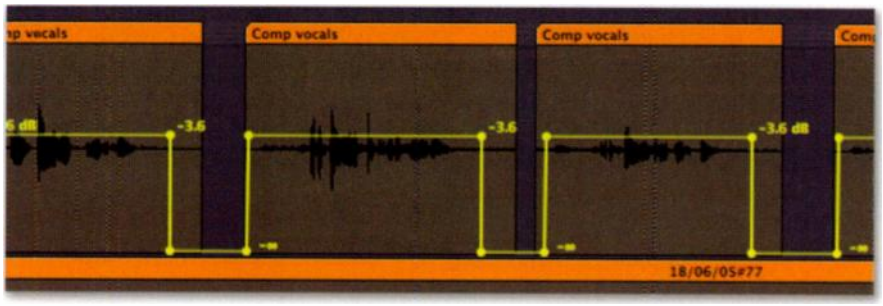


The first thing to do with compiled vocal takes is to remove any extraneous rubbish between takes (above), after which breath noises can be lowered (below) to counteract the effects of any compression used.

nodes. Now drag down the line between the nodes. You'll probably find that removing the breath within a phrase completely will sound unnatural, so you may just want to reduce the level a little, as in Screen 4. Once you've decided on the level drop, you can drag nodes around to fine-tune where and how fast it happens.

Reducing Vocal Plosives & Sibilance

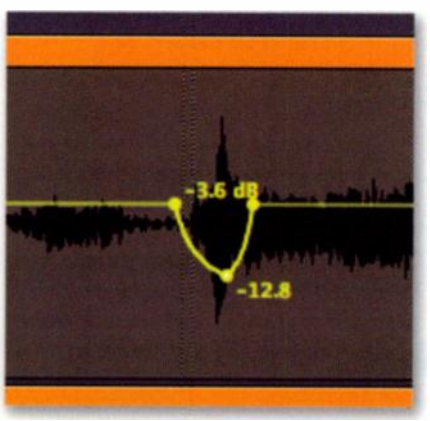
Excessive plosives (bangs or pops on 'B' and 'P' sounds) and sibilance (harsh 'S' sounds) are the bane of vocal recordings. You can always use a de-esser to try and remove sibilance, but I always find the sound of de-essers unnatural. With total automation available, I prefer to deal with each case by reducing the volume for a small period of time at the point of the offending sibilance or plosive. Listen through to the vocal track in solo mode and at a high on-screen zoom magnification. When you reach a sibilant 'S' or a popping 'P', stop the sequencer. Create two nodes by clicking just before and after the area, and then create a third between them, dragging it down to create the volume drop as shown in the screenshot on this page.

You need to listen to the automation to make sure you haven't gone too far. You'll probably need to do some fine editing of the automation nodes to get it sounding right. I find that using 'S'-shaped curves is also useful in this situation, as they seem to help in getting a more natural effect. The duration of the drop in volume only needs to be of the order of milliseconds to reduce the effect of sibilance or pops — any more and you'll hear it as a definite volume drop. Using this method on sibilance keeps the track sounding bright and doesn't produce that 'toothless' effect that de-essers can sometimes cause — it's hard work, but rewarding! Of course, you may have to modify this automation further later in the mix process, as automation can rarely be done in isolation.

More Fine-tuning Tricks

There are other fine automation edits that can be worth doing, and not just as regards volume. If you look at the track automation pull-down menu you'll see the automatable parameters of all the plug-ins on a track, along with volume, pan, solo, mute, sends, and effects bypass. The last of these is particularly useful if you want a plug-in only to affect part of a track. I often add echo just to the ends of vocal phrases by activating it only at those points in the track. Some plug-ins can cause pops, though, when you do this. If this is the case, insert the plug-in on a buss and automate the send to that buss instead.

It's easy to see how powerful this technique is. Something I often do is adjust the output level, ratio, and threshold of a compressor during a song to help the vocal sit in the mix. It's also easy to increase sends to delays or reverbs when a mix gets busy and reduce the levels for a drier sound during sparser sections. While it may seem more natural to use *Logic*'s automation system with a hardware controller or on-screen knobs, the mouse-based editing features are essential for fine-tuning and so shouldn't be overlooked.



A very brief dip in level is all it takes to reduce excess sibilance, and curved automation lines can be particularly useful for fine-tuning the results.

Stem Mixing

One of the annoying limitations of *Logic*'s automation system is that there is no way to increase or reduce all automation data in one go. Consider a typical mixing scenario: you've adjusted all your backing tracks until you're happy with the mix, but you need a few extra decibels on vocals and bass drum. However, just raising the levels of these tracks takes the master over 0dB. What you really want to do is lower all the other tracks proportionally instead. To do this, you'll have to lower the volume and, perhaps, other automation data on each track! Imagine how long this would take if you had 48 tracks with complex automation of multiple parameters!

"Using automation on sibilance keeps the track sounding bright and doesn't produce that 'toothless' effect that de-essers can sometimes cause."

Although there are various automation-editing commands that can help to make this easier, you may also want to think of mixing using the stem technique. What this means in practice is sending several similar tracks to busses as 'stems'. For example, you might send all the drums to one buss, backing vocals to another, guitars to another, and so on. Balancing then becomes just a matter of adjusting the levels of the stem busses rather than those of all the individual tracks — and you can automate these busses too. Stems can also be compressed individually, which can help in getting things to 'sit in the mix'. Of course, you will still have to edit other automation data, such as a synthesizers' filter cutoff, individually for each track — but you're unlikely to want to do this simultaneously on many instruments.

That's all for this month, but look out for more automation tips coming soon. SOS

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We investigate a newcomer to the orchestral sample-player scene and provide a quick round-up of the 'powered processing' options available to *DP* users.

Robin Bigwood

Digital Performer users are well served by sample-based orchestral Virtual Instruments — highly developed packages such as the snappily titled *East West Quantum Leap Symphony Orchestra* and Garritan's *Personal Orchestra* exist alongside more generic solutions such as NI's *Kontakt 2* (which is bundled with a good bit of the excellent *Vienna Symphonic Library*) and MOTU's own *Mach Five*. Just recently, though, the choice expanded still further, with the arrival of *Synful* in Audio Unit format.

Synful takes a different approach to most other orchestral simulations, in that it does away with the multi-Gigabyte library of individual samples and instead occupies a mere 75MB or so. Instead, it apparently uses a sophisticated additive synthesis system combined with an 'interpretive' element that looks at ways of making your orchestral parts sound more natural and idiomatic. It seems that those who work in the orchestral scoring field either love or hate *Synful*, but it certainly has some impressive aspects. It might also be valuable when used in addition to a conventional orchestral sound library, adding a much-needed sense of realism to many phrases.

For *DP* users, the great news is that *Synful* works fine as an Audio Unit plug-in, and its developers were quick to fix some incompatibilities with *DP*'s AU inspection process. That bodes well for the future. Using *Synful* in *DP* is also extremely easy — you set up your instruments in its main window slots and then drive them from individual MIDI tracks. You can also have multiple *Synful* instances if you need to treat certain instrumental groupings with different plug-in effects, for example. *Synful* costs around £280 (depending on exchange rate), and is available from www.synful.com.

Powered Processing Options

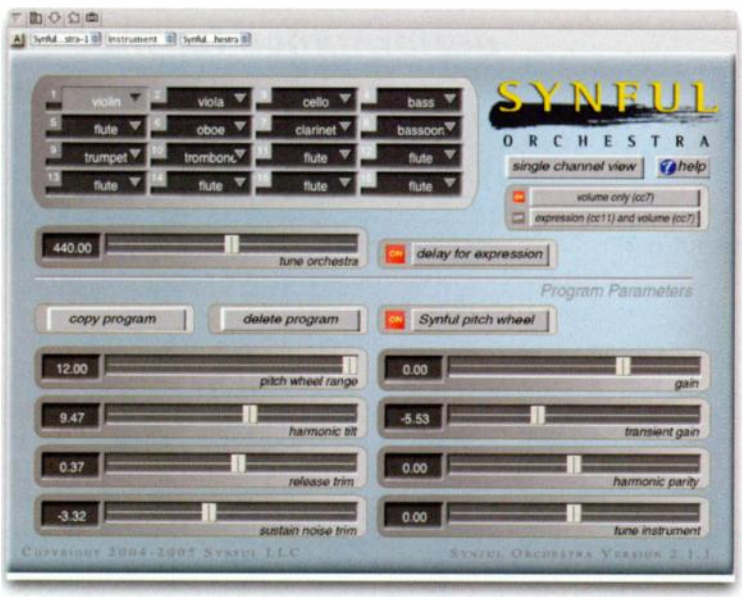
Universal Audio recently released version 3.9 of their UAD1 software, which is now compatible with Mac OS 10.4. The UAD1, as you may already know, is a PCI card that carries out audio processing without taxing your computer's processor, but only when you use its bundled plug-ins. These are in the Audio Unit format if you're using OS X, although OS 9 users are still supported by UAD1 MAS plug-ins.

Aside from offering obvious processor-use benefits, UAD1 plug-ins are of very high quality, offering emulations of legendary studio gear such as the 1176, LA-2A and Fairchild compressors, Pultec EQ and EMT plate reverb. Prices range from approximately £300 for the 'Project Pak', which comes with a cut-down set of plug-ins, to £900 for the 'Ultra Pak', which comes with the kitchen sink.

The UAD1 isn't the only powered processing card on the market. Its main rival is TC Electronic's Powercore system, which ships as either a PCI card or an external Firewire unit. Again, Powercore processors appear in *DP* as Audio Unit plug-ins, and while there isn't the same emphasis on emulation of analogue gear as with the UAD1, Powercore plug-ins arguably span a broader range of applications. As well as compressors and EQ (including Sony's *Oxford EQ* as an extra-cost option) there are de-noising and restoration tools, synths (including the Access *Virus* and Novation *V-Station*), amp modelling and mastering processors. A mere £279 gets you the Powercore Element PCI card with a useful selection of bundled plug-ins and the option to purchase the more heavyweight ones, while £800-900 buys you either the rackmount Powercore Firewire or the Powercore PCI MkII card, both of which deliver the greatest performance currently offered by the Powercore system. For details visit www.tcelectronic.com

Finally, the most recent newcomers to the *DP*-compatible powered-processing card ranks are Waves' Audio Processing Accelerators (APAs). These external boxes use high-speed Ethernet to connect to your Mac and allow you to run most of Waves' most demanding plug-ins (the *IR* convolution reverbs, the *Linear Phase* processors and the *Renaissance Reverberator* and *Renaissance Channel*).

If you're in love with your Waves processors, the APA processors might be the way to go, although their stated performance capabilities don't seem terribly impressive compared to their cost. The most powerful, mobile APA44M has a list price of $2,400, while the rackmount APA32, which is apparently 30 percent less powerful, comes in at $1600. The implication, too, is that the APA32 may be saddled with fan noise, as Waves state it's 'designed for machine rooms'. More information from www.waves.com. SOS

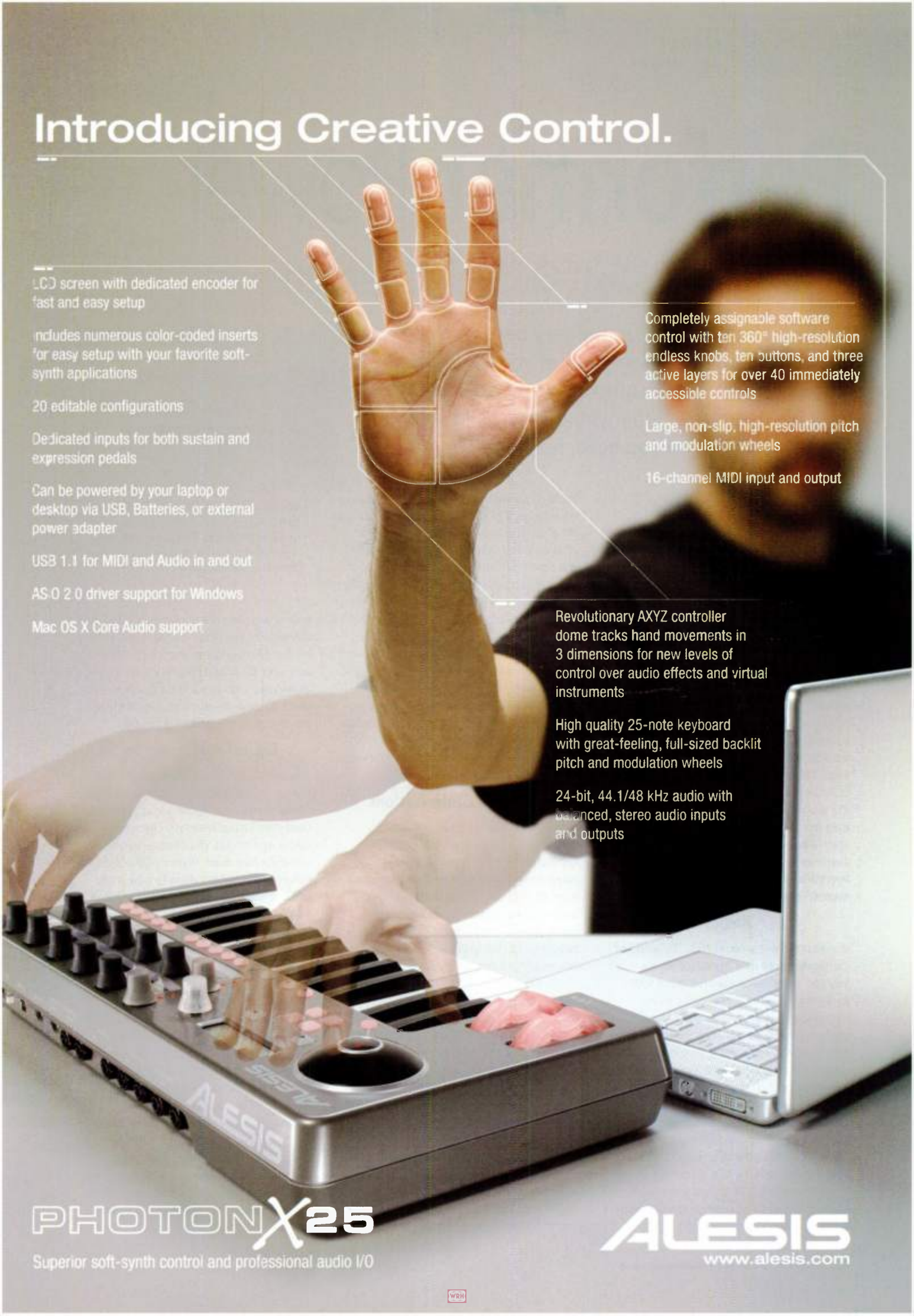


The *Synful* orchestra, running as an Audio Unit plug-in in *DP* 4.52. Like it or hate it, you're probably looking at the future of orchestral emulations.

DP 4.6 Stop Press

Just as I was finishing off this edition of *Performer* Notes, MOTU made available *DP* 4.6, which includes all the enhancements to previous versions that were shown at this year's winter NAMM show and at Sounds Expo in London. The major new feature is undoubtedly pitch automation, which incorporates *Autotune*-like pitch manipulation capabilities into the Sequence Editor. But there's also V-Racks (a special kind of project chunk that can host virtual instruments and other plug-ins so they're accessible from all other chunks), a new Pattern Gate plug-in, a better metronome and countless other improvements. See next month's *Performer* workshop article for more on pitch automation, and rest assured that there will be plenty about the other new goodies in *SOS* over the coming months.

Introducing Creative Control.



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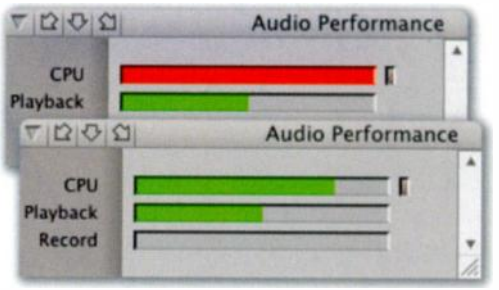
Making The Most Of *Digital Performer*

Knowing how to squeeze the very best performance and efficiency out of your *DP* setup can let you work more quickly and increase your creative options, whether you own a G3 iMac or the latest G5. For all you need, read on...



What separates success from disaster when you're developing complex projects can be how efficiently you work. Knowing the ways to keep your *DP* setup as streamlined as possible can make your Mac seem much more powerful than it is.

Robin Bigwood

A major part of the appeal of sequencing software like *Digital Performer*, that relies on the Mac's processor for all of its MIDI and audio processing, is that it can perform amazing feats of performance under the right conditions — feats that can make hardware-based systems look severely limited. But with the flexibility of the software approach comes a variety of pitfalls: conflicts with drivers, operating systems and other software, confusion caused by the sheer open-endedness of what's on offer, and poor performance that comes from simply not using your software to its best advantage and not establishing the working practices that help you get the best from your system. It's this last issue that I'll be looking at in this month's *Digital Performer* Technique article, covering everything from basic configuration to sophisticated mixing solutions.

Basics

If ever there was a certainty in the world of computer-based music production, it's that you can never really have too much RAM. Everything you run on your Mac needs memory, and if the total amount required at any one time is greater than the total you've got, your Mac starts using your hard drive to make up the shortfall. This 'virtual' memory can be a life-saver, but because it's essentially mechanical it's slow. Add into the equation the fact that you may already be taxing your hard drive with audio-track playback and sample streaming, and clearly you're going to run into difficulties.

So how much RAM should you have if you're running *DP* as your main music app? From personal experience, I think that between 768MB and 1GB should be regarded as a minimum. This amount should allow you to run many projects in recent versions of *DP* under OS 10.3 or 10.4 with few problems, although 2GB or more is better, especially if you're adding a software sampler or Rewired applications.

RAM is so important that you *must* get enough: it's as simple as that. Try online suppliers such as Crucial (www.crucial.com) if you're unsure as to which type you should get for an existing Mac. If you're buying a new Mac and you're on a budget, you're better off getting a slightly slower processor but maxing out your RAM than getting a marginally faster chip but crippling it with insufficient memory.

More Mac Optimisations

Prior to OS X, Mac users would optimise their systems by carefully allocating application memory and maintaining pared-down extension sets. It was almost a point of principle to know what every extension did, so that one could keep as lean a system as possible. OS X has taken away a lot of that hassle, but it's surprising how much you can still do to ensure that it's running at its best.

First of all, check your Energy Saver settings in System Preferences and make sure that Processor Performance is set to 'Highest'. This isn't configurable on some versions of OS X with certain Macs, but if you have the option to change it, do so, or you'll be running your processor at reduced speed.

Then consider whether you have any additional elements in your system that could impair performance. Quit any applications and background processes you don't need. Turn off Appletalk, Bluetooth, Airport and any other network connections, unless you need them, unmount iDisks and any servers you're not planning to use, and disable Sharing. Some users even disable text smoothing and graphics features such as window shadows and transparency, but that's beyond the scope of this article, and maybe taking things a little too far...

Digital Performer Setup

The one truly tweakable area of *DP* itself is the Configure Studio Settings dialogue box (Setup menu / Configure Audio System / Configure Studio Settings). The numbers of voices and busses you choose here mostly influence how much memory *DP* uses, so it makes sense to limit them to how many you'll actually use in a project. A value of 150 for the Disk read/write size is suitable for most typical voice and buss counts, but that should be increased to anywhere between 200 and 500 if you're actually working with hundreds of tracks. Small buffer-size-per-voice values (such as 150) are useful if you're trying to increase your track counts when you don't have much RAM, but they steal processor power. If you're well endowed with RAM, or don't need all that many voices, try raising this to between 300 and 600.

The other key dialogue box is Configure Hardware Driver, again accessible from the Setup menu, or from the Audio pane of *DP*'s Control Panel transport window. The most important setting here is Buffer Size. This determines the size of the audio 'chunks' that *DP* works with. While larger buffers

entail a much lower processor hit, they cause unworkable latency when you try to monitor audio or virtual instruments in real time via *DP*. It's not an uncommon approach to keep buffer size low (128 or 256 samples) during the tracking stage of your projects, then increase it as much as possible during mixing, which is generally when you need your plug-ins. However, if you have facilities for zero-latency monitoring (using a hardware mixer or suitably-equipped audio interface, for example) you may well choose to use the maximum buffer size at all times and keep *DP* running as efficiently as possible.

The Work Priority setting in *DP* 4.5 changes the way in which *DP* integrates with OS X's multi-threading processing. Setting it to High is recommended for users of dual-processor Macs, but the Medium setting can work best on single-processor G4s, allowing much better performance and eliminating processor spiking. If you have an older Mac, try all three settings and see which one works best for you.

Managing Processor Use

Having done all you can to optimise your system, it's time to actually use it for something! When you're actually running *DP* ▶

Freeze Tracks: An Essential Technique For Saving Power

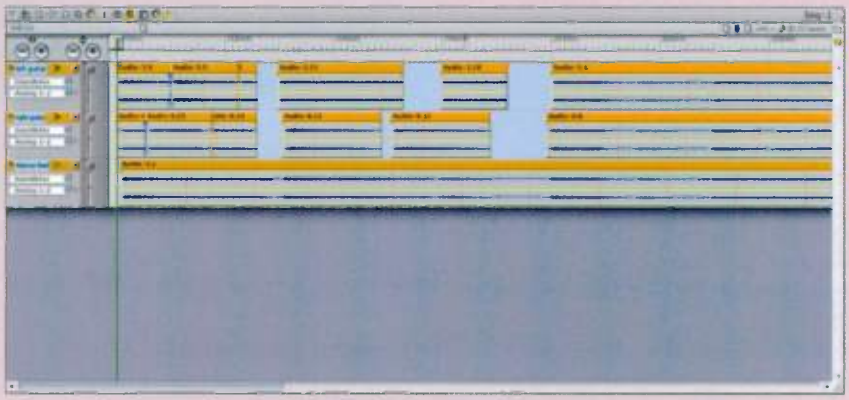
In the fight against the evil sentinels of rampant processor usage, this is your secret weapon: it might not be all that elegant, but it's devastatingly effective.

Freeze Tracks is actually a sophisticated shortcut. It takes plug-in-laden audio tracks or virtual instruments and records their output to new audio tracks. The original tracks are then disabled, along with the plug-ins or instruments that they hosted, and consequently you get to claw back huge amounts of processor power while leaving your sequence sounding just the same.

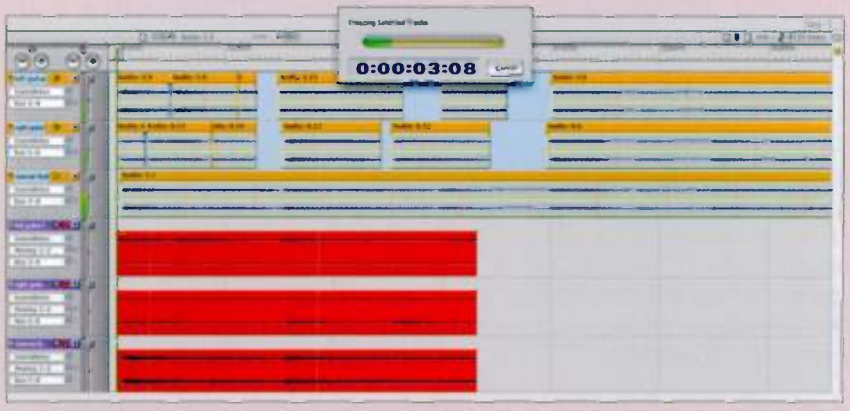
The disadvantage, of course, is that you can no longer tweak settings for the new, 'frozen' tracks, although MOTU make unfreezing very easy, should you ever need to revisit the originals. Freeze Tracks is also potentially time-consuming — it doesn't work faster than real time, so that it can accommodate virtual instrument and even Rewired or external audio tracks, and that can sometimes make the process a drag. Get to know Freeze Tracks, though, and you can pull off results with low-powered G4s that would embarrass the latest G5s. Here's how to freeze audio tracks:

1. Start by selecting what you want to freeze. This can be one or more soundbites, a time-range selection across one or multiple tracks, or entire tracks. Remember that since the track or tracks on which you've made your selection will be disabled after the freeze, it really only makes sense to select *all* their contents. To select an entire track, hit Apple-A and then click the track name in the Tracks Overview.
2. From the Audio menu, choose Freeze Selected Tracks (or hit Ctrl-Apple-F). *DP* creates as many new tracks as you selected and names them '[track name] freeze', then carries out the real-time bounce. When it's finished, original audio tracks have their voice allocation set to None, so that they can no longer be heard, and their plug-ins are disabled. You might consider assigning them a specific colour at this point so that their disabled status is easy to spot.
3. You can now continue to develop your project, and may never need to touch the original or frozen tracks again. However, if you do need to revisit your originals, select any part of them and go to the Audio menu while holding down the Shift key, to choose Unfreeze Selected Tracks (or just hit shift-ctrl-Apple-F). The frozen track remains in place but it 'gives back' its voice allocation.
4. At this point you can repeatedly toggle the playback status of the original frozen track by selecting any part of the original and choosing Unfreeze Selected Tracks again. If you need to 'refreeze' a track after tweaking it, first delete its existing freeze track, then repeat steps one and two above.

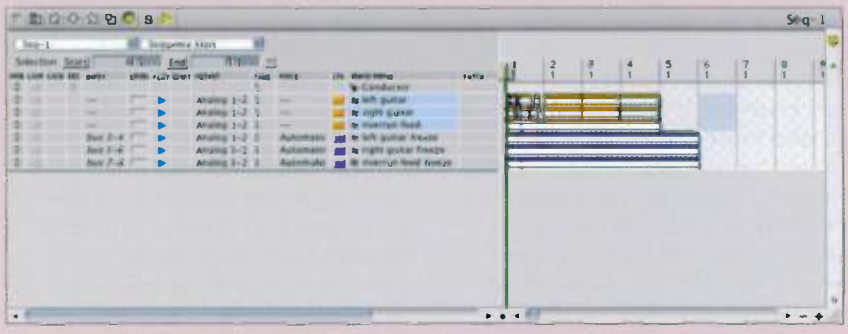
Working with aux and Instrument tracks is very similar, except that *DP* won't automatically disable the original tracks. To do this, you should set their outputs to None. Also, to freeze an Instrument track you need to first select both the Instrument track and its corresponding MIDI track (or tracks).



The first step in reclaiming precious processor power using Freeze Tracks: select the tracks you want to freeze.



Hit Control-Apple-F or choose Freeze Selected Tracks from the Audio menu. *DP* makes a real-time bounce of your tracks, complete with effects, and then disables the original tracks



After the freeze, your original tracks remain in place. If you need to revisit them to make an edit or tweak their plug-in settings, just select any part of them and hit shift-control-Apple-F to 'unfreeze' them.

there are plenty of things that will start to use up the power you have available — plug-ins, software instruments, background and real-time processing, automation, and general project size and complexity. Here are some things to try which can help to keep it all manageable.

• Audio Plug-ins

Audio plug-ins do maths so complicated it makes your eyes water. In terms of processor hit, the big offenders are reverbs, multi-effects (ie. plug-ins that incorporate multiple modules, such as delays, filters and distortion), phase-accurate EQs and granular synths. Multi-band processors and distortion effects can also be rather 'heavyweight', but in truth every plug-in, whether EQ, compressor or delay, needs its slice of processor time.

It seems obvious, but it's worth making sure that you're always using the most efficient and suitable plug-ins for the job. Why, for example, use a multi-band compressor on a vocal track? Or a convolving reverb just for a touch of ambience? And make sure you're not using plug-ins for the sake of it — I've seen compressors set to a 1:1 ratio being used as glorified volume controls, when pushing up the fader would have done just as well. Some plug-ins are more efficient than others too, so 'slimline' choices are obviously much better if you don't have processor power going spare.

In the case of complex plug-ins that allow parts of their processing chains to be bypassed, make sure you've turned off what you can. The shareware *Reverbit*, for instance, has a damping section that uses a huge amount of processor power but can be disabled if not needed. Smartelectronix's *Ambience* also has an overall 'Quality' parameter. Keeping this low sometimes makes little difference to the overall sound, but can massively cut CPU use.

• Getting Wet

In some instances you may consider recording 'wet' — that is, using plug-ins during tracking and recording their effects directly with your audio. You lose the flexibility to remove or change the effect once it's recorded, but for some applications it's a much better way of working. Some guitar and synth sounds, for example, seem intrinsically bound up with the effects you put on them, so it can make sense to just capture the whole shebang from the start. Then, after recording, you can disable the effects and reclaim some processor power for other tasks. For anyone who's not used to working in this way, let's just run through the steps:

If you know the effect you want, you can apply plug-ins off-line by selecting the audio you want to treat, then choosing a plug-in from the Audio Plug-Ins sub-menu of the Audio menu. With this method, heavyweight plug-ins like iZotope's *Trash*, shown here, effectively use no processor power at all in your mix.

1. You'll have to be set to monitor your recording through *DP*. You may first need to choose a low buffer size from Setup / Configure Audio System / Configure Hardware Driver.
2. From the same sub-menu, choose Input Monitoring Mode. Select 'Monitor record-enabled tracks through effects' and 'Only during recording (and punched in)'. Click OK.
3. Make sure you enable Audio Patch Thru by clicking the Consolidated Window's little headphones icon, or by choosing Audio Patch Thru from the Studio menu.
4. Create an aux track and configure it with the input(s) you're using for recording and an unused buss or buss pair (as appropriate) for the output. Create an audio track and choose this same buss or buss pair as an input. You've just created a virtual 'channel strip' between your hardware input and audio track, and now you can load up the aux track with any plug-ins you require. Your audio will be processed by these before being recorded to the audio track.
5. All that remains is for you to record-enable your audio track and away you go. After you've finished, just disable the effects you chose on the aux track, which can stay in your sequence in case you need it again later.

If recording wet doesn't appeal to you, or you just need to work with plug-ins in a more conventional way, there are still many techniques you can use to keep things efficient.

• Off-line Effects

If you have tracks being treated by one or two plug-ins throughout their length, and you're happy with the sound, you might try applying those plug-ins 'offline', rather than making *DP* continue to process them in real time. I often do this with EQ and dynamics plug-ins, but it can work with anything, really, and may be particularly useful if you need several simultaneous unusual reverb treatments on separate tracks, for example. Applied in real time, these might bring a computer to its knees, but after you've applied the effect off-line there's zero processor-hit.

Using off-line effects is very simple:

1. Select the audio that you want to apply an effect to. You could choose part of a track by selecting individual soundbites or making a time-range selection, or select an entire track by hitting Apple-A and then clicking the track name in the Tracks Overview.
2. From the Audio menu, choose Audio Plug-ins, and then the plug-in you need from the sub-menu that appears.
3. Dial in your settings, or choose a preset, and click Preview to hear how it will sound. In *DP* 4.5 the audio you selected is

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Routing the output of several tracks via a buss or buss pair to an aux track allows them all to share the plug-ins on the aux track. Here several drum tracks are being treated by an EQ and limiter on the Aux (the track at far right)

Traditional 'send and return' effects architectures, whereby a single effects processor treat several tracks simultaneously, are easy to set up in *DP*, and are very processor-efficient. Here the aux track (at far right) is being fed audio via the sends of the audio tracks to the left.

automatically looped so that you don't keep having to click Preview.

4. Enter values for Pre-roll and Post-roll, if necessary. *DP* will be creating a new soundbite as part of the off-line process and you may need it to be longer than the audio you originally selected. Why? Well, for example, when you're applying a long reverb to a short section of audio, unless you specify at least enough Post-roll to cover the new reverb tail, it will be truncated.

5. Finally, hit Apply. *DP* does its stuff and your new 'wet' soundbite replaces the audio you originally selected.

Applying plug-ins off-line is a great technique to learn, but it has a disadvantage in that it can only deal with one plug-in at a time. If you want to capture the effect of several plug-ins, it's better to set them up as normal real-time effects and then use *DP*'s Freeze Tracks feature to bounce them to a new track. See the 'Freeze Tracks' box for more on this powerful feature.

Other *DP* Considerations

Multitrack playback inevitably takes its toll on your processor, especially when it involves lots of soundbites on each track, or lots of fades and crossfades. You can't always lower your track count, but merging soundbites or freezing complex tracks can help a great deal.

Various real-time processes also contribute to processing demands, first and foremost mix and plug-in automation. Yet again, track merging can come to the rescue here, but you can also decide not to enable automation for plug-in data types you don't need. The Automation Setup dialogue window, accessed from the Setup menu, can help with this.

If you suspect that real-time MIDI plug-ins are contributing to your CPU overhead, try applying their equivalents 'off-line' from the Region menu. If you need to keep your original data, drag it to a Clippings window before applying the Region command.

Finally, remember that having many editing and plug-in windows open will slow down *DP* unnecessarily, especially when they have animated elements such as level meters or other displays. Window Sets can be used to restore order, and hitting F10 to invoke OS X's Exposé feature will quickly show you how many windows you have open.

• Sharing Plug-ins Using Auxes

The one remaining 'power user' technique involves using busses and aux tracks to share single plug-ins amongst multiple tracks, and there are two basic approaches you can take to it. This is a technique that can not only save you precious processor cycles but can also make mixing easier and quicker.

The first approach involves routing multiple individual tracks to a single aux track. Any plug-ins you place on the aux track then affect all the audio tracks that feed it. I find this very useful for applying general EQ to a mix of individual drum or guitar tracks, for example. Here's how you set it up:

1. Create an Aux track. Set its output as your normal monitoring stereo pair and its input as a buss pair that you haven't used

elsewhere in your sequence
2. Make the output of any tracks you want to process through the aux track plug-ins the same buss pair you chose for the aux track's input.
3. Now you can play your sequence and start placing plug-ins on the aux track. You can, of course, still utilise the audio tracks' faders and pans to control the basic mix of this 'group'.

The second approach to sharing plug-ins utilises *DP*'s send architecture and is particularly good for adding delay and reverb effects to a mix.

1. As before, create an aux track and make its output your main output pair, but this time choose an unused buss (not buss pair) for its input. Set up your desired delay or reverb plug-in on the aux track and set its wet/dry mix 100 percent wet.
2. When you want to add this effect to an audio track in your sequence, call up the Mixing Board (shift-M), click on one of the track's send slots and choose the same buss as in step one (perhaps via the 'New Mono Bundle' sub-menu).

Virtual Instruments

If audio plug-ins can eat your processor alive, some virtual instruments can chew it up, spit it out and then come back for more. It's perhaps true to say that there are no really easy ways to massively reduce the processing impact of virtual instruments, except by freezing them (see 'Freeze Tracks' box), but here are a few other things to consider:

- If you're pushed for power, try to use the most efficient synth or sampler designs. A 'hardwired' synth such as NI's *Pro 53* or the *Subtractor* synth in Propellerheads' *Reason* is likely to be much more efficient than a modular or semi-modular design such as NI's *Reaktor* or *Absynth*, or complex emulations such as Arturia's *Moog Modular V*.
- In the case of samplers, working with a single instance used multitimbrally may well be more efficient than using multiple instances.
- Try limiting synth and sampler polyphony to the minimum you need, and watch that synth patches don't have ridiculously long amplifier release times that cause processing to continue ages after notes have stopped sounding.
- On samplers, especially, don't enable filters or modulators unless you actually need them.
- Be suspicious of integrated effects. These are often poorly optimised compared to *DP*-hosted plug-in equivalents
- Keep *DP*'s buffer size as large as possible during playback and mixing
- If you're not using a synth or sampler for a while, set its track output to None. This useful technique keeps the synth accessible in your sequence and preserves all its settings, but completely removes its processor hit.

3. Now turn up the send level to begin to feed audio through your aux track. You can, of course, repeat steps two and three for as many audio tracks as you need.

In this example, your reverb or delay is set up as a mono-in, stereo-out effect, which means that sends from stereo audio tracks are summed to mono before being processed by it. However, you might choose to set up a true stereo aux, in case you want to process stereo audio tracks and preserve their separate channel information. *DP*'s very flexible sends make all this easily possible. SOS

pro tools notes

It's update frenzy this month, as Digidesign deal with the move to Tiger and iron out more of the bugs in *Pro Tools* 6.9.

Mike Thornton

This month, Digidesign have been very busy releasing updates, the first set of which are for *Pro Tools* v6.9 on Mac OS 10.3.8 or Windows XP. First, the update to version 6.9cs1 for Pro Tools TDM fixed the following bugs:

- While writing automation, a Pro Control fader could lose communication with *Pro Tools*, resulting in no automation written for the time the lapse occurred.
- When using Machine Control with an external timecode offset (in the fields labelled 'Session Start Offsets' located in the Session Setup window), *Pro Tools* did not take the offset into account when performing an auto-edit on the nine-pin device.
- Scrubbing or shuttling a nine-pin device did not smoothly update the nine-pin device when using either the control-surface jog wheel or the 'Shuttle' Numeric Keypad Mode.
- If a selection had been made on a Playlist at a timeline position after the incoming timecode, the screen would not properly scroll to the timecode location.

Digidesign then announced a further update up to version 6.9cs2 for *Pro Tools* TDM, which fixed a bug with input gain on legacy peripherals attached to a 192 or 96 I/O. If you have a 192 I/O or 96 I/O, and the interface firmware version is 4.3, you need to run the Digitest firmware updater. If your 192 I/O or 96 I/O has firmware version 3.0, incorrect input gain on legacy peripherals will not occur, and you will not be able to update the firmware. This does not apply to the 96i, which does not have a legacy port.

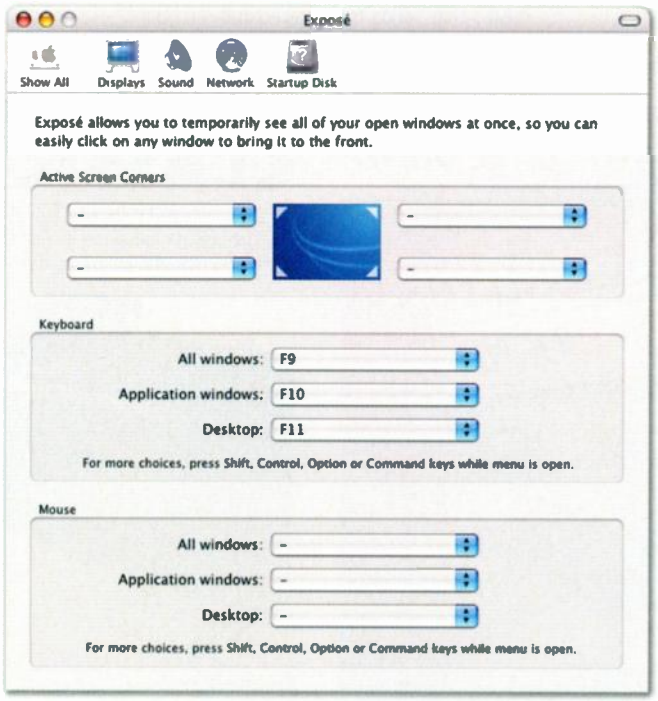
Finally, Digidesign have released another update, which takes *Pro Tools* TDM to version 6.9.1 for all HD and HD Accel owners. The *Pro Tools* TDM 6.9.1 updates replace the previous 6.9 TDM updates and is required for Avid Mojo users with the Media Station PT 1.6.1 option on Mac OS 10.3.8, and for AVoption V10 and Mojo users with Media Station PT 1.6.1 on Windows XP. *Pro Tools* TDM 6.9.1 also includes the *Pro Tools* TDM 6.9cs1 fixes for users of D-Command, D-Control, Pro Control and Control 24, and the Machine Control option.

Tiger Tools

There are also updates for *Pro Tools* 6.9.2 running with Mac OS 10.4.x (Tiger) only. The 6.9.2cs1 update is for TDM users of Tools LE system on a Macintosh computer running Mac OS X 10.4.1. Note that there was no 6.9.1 software release for Pro Tools LE systems. *Pro Tools LE* 6.7 or 6.9 must be installed in order to use the *Pro Tools LE* 6.9.2 updater, and you will need your *Pro Tools LE* 6.7 or 6.9 authorisation information. An update for *Pro Tools M-Powered* systems to run on Mac OS 10.4.1 will be forthcoming.

There are a number of 'known issues' with v6.9.2. They are:

- Macintosh Journalled File System is now recommended for all Pro Tools systems (LE and TDM) running v6.9 or above. See this month's Pro Tools Workshop article for more details on this.
- *Pro Tools* does not support sleep mode on Macs, so make sure it's off by going into your System Preferences, launching Energy Saver, clicking the Sleep tab, and disabling all Sleep features. Set 'Put the computer to sleep when it is inactive' to Never. Also, do not manually put your computer to sleep when running *Pro Tools*.
- Because of the default F-key settings in Mac OS X and Expose, the F9, F10, and F11 keys will not initially work in *Pro Tools*. To change the Expose settings in order to use these keys in *Pro Tools* go into your System Preferences, launch Expose, and in the middle section turn off the F9 to F11 settings. This will enable you to use the F9 (Scrub tool), F10 (Pencil Tool) and F11 (Wait for MIDI Note) shortcuts.
- After copying a Session from a CD-ROM to a local drive it is necessary to change the permissions of the data. From the Finder, choose the File Menu and Get Info, open the Ownership & Permissions pane, and change the permissions from 'Read only' to 'Read & Write'.
- It is possible that *Pro Tools* will crash when you are simultaneously burning a CD with iTunes and working in *Pro Tools*, so the advice is to quit *Pro Tools* before burning CDs with iTunes.
- When opening Sessions which have been renamed in the Finder with names longer than 31 characters, *Pro Tools* will truncate the name with an added unique identifier tag when the session is open. *Pro Tools* does not rename the Session, but just visually represents the name differently, so don't worry — there's no need to rename the Session again.
- With the Core Audio driver installed, Digidesign recommend that you wait 5-10 seconds before launching another sound/multimedia application after *Pro Tools* has quit to ensure smooth playback with other applications using Core Audio.
- Renaming a mounted drive ▶



Some of the keyboard shortcuts in *Pro Tools* clash with the default controls for Mac OS 10.4's Expose features. The latter can be reassigned in the System Preferences window.

v6.9.2, and fixes the problems found in the 6.9cs1 & cs2 updates to the Tiger-compatible version of *Pro Tools* (v6.9.2). Digidesign have also released *Pro Tools LE* v6.9.2, for M Box, Digi 002 and Digi 002 Rack users. Update to *Pro Tools LE* 6.9.2 if you want to use your Pro

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while *Pro Tools* is launched will cause *Pro Tools* to quit automatically. You have been warned!

Also updated this month is the *EQ III* Digirack plug-In. The update fixes the problems with settings being incorrectly recalled which was mentioned last month. As usual, all the updates I've mentioned here are available from the Support/Downloads section of the Digidesign web site (enter www.digidesign.com/download/ to go straight there).

Core Audio Problems

With Mac OS 10.3.9 (which isn't approved for use with *Pro Tools*) and 10.4, Apple report that some of their own applications might not open fully or at all if the Digidesign Core Audio driver has been installed. Instead of opening, an application's icon just bounces in the dock indefinitely, or a black triangle appears below the icon in the dock, but the application's windows and menus don't appear. The applications that may be affected are Quicktime Player, iTunes, iDVD, iMovie, *Garage Band* and *Final Cut Express*.

If this happens to you, Audio MIDI Setup can usually be used to work around the issue. Apple's recommended solution is to change the default audio device used by Core Audio as follows:

- Open Audio MIDI Setup (which lives in the folder Applications/Utilities on your hard drive).
- Click the Audio Devices tab.
- From the Default Output pop-up menu, choose Built-in Audio.

You should now be able to open all affected applications as expected.

The Pro Tools Plug-in Preset Co-op allows *Pro Tools* users to share settings both for Digidesign's own plug-ins and third-party ones.

Digidesign's *EQ III* plug-in has been updated to fix a bug with settings being incorrectly recalled.

Meanwhile, Digidesign are reporting problems with Core Audio 6.9 and Roxio's *Jam*, whereby *Jam* won't play through Digidesign hardware using Core Audio v6.9. They advise the following:

- Make sure the Digidesign hardware is selected in your Sound Control Panel.
- Launch *Jam* and, in its preferences, select 'Mac OS X Audio HAL' for the audio driver.
- Quit *Jam*, launch the Core Audio Manager and check that it's showing it's 'connected' in the status field.
- Launch *Jam*. It should now play through your Digi hardware. If it's not, try trashing the preferences for *Jam* and the Core Audio driver (trash DAE Preferences, Digisetup and either com.digidesign.coreaudiosetup .plist or Digidesign Core Audio Setup.plist), then empty the Trash and restart the computer before trying the above steps again.

Some folk are still having problems, but they seem to be those who upgraded to Mac OS 10.3.9 and/or Quicktime v7. The official line is that for 10.3.x ('Panther') you shouldn't go beyond 10.3.8 and Quicktime 6.5.2.

Finally, Digidesign have pointed out an Audiosuite bug which affects *Pro Tools* v4 and above. When you try to use an Audiosuite plug-in on a region, you can you get a error message that reads 'This plug-in only processes 48 channels at a time. The current selection is not a multiple of that.' It was first thought to be a Waves plug-in issue, but then there have been reports that the Digirack *EQ III* causes a similar problem which Digidesign have confirmed. It can be avoided by closing the Audiosuite window after processing. It seems to only happen if you keep an Audiosuite window open between processes. They have added a further workaround, which is to change a parameter in the Audiosuite window before processing. They are continuing to look into this but, in the mean time, the safe advice is not to have more than one Audiosuite plug-in window open at any one time.

Very Useful Site

Finally I would like to draw your attention to a useful web site. It is The Pro Tools Plug-in Preset Co-op, which has been set up to allow *Pro Tools* users to share plug-in settings in the form of plug-in preset files which can be uploaded and downloaded. Preset files are categorised by plug-in, and can have a searchable description including what they are and how they can be used. It has been designed with extensive searching and selecting capabilities making it easy to find the sort of preset you're been looking for.

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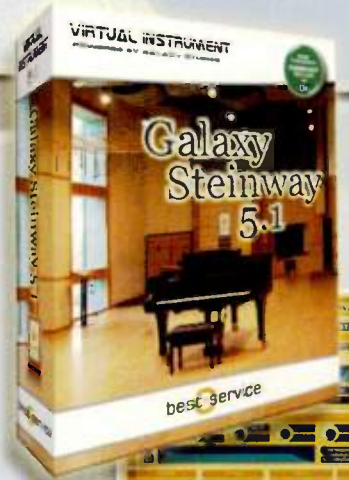

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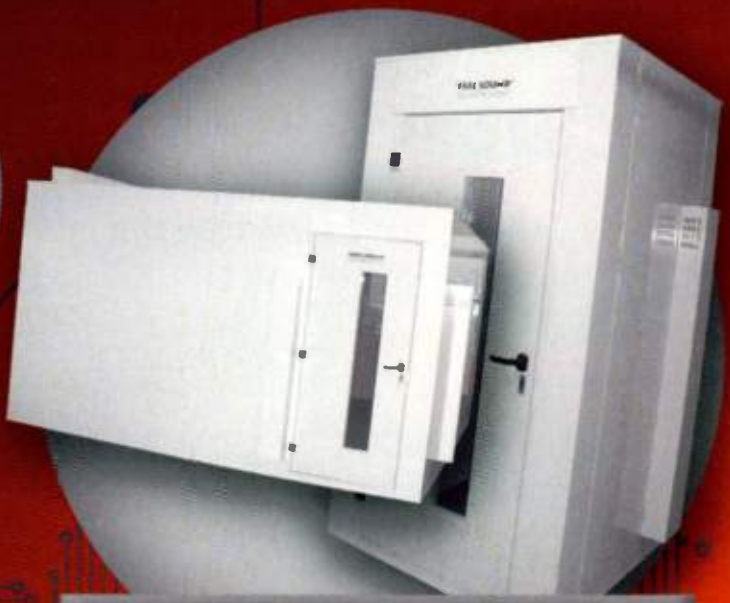

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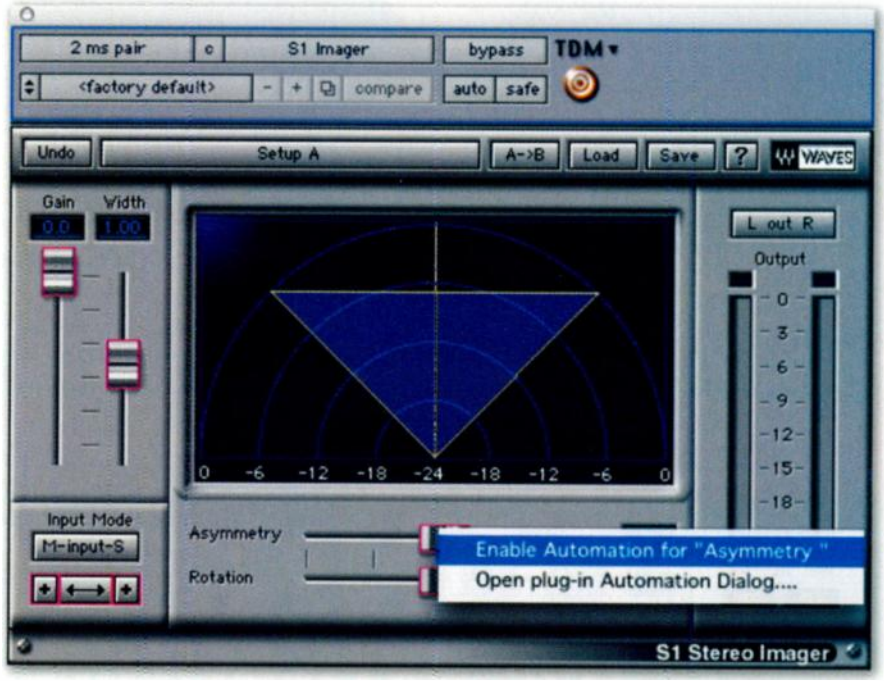
Key Points

Hidden Keyboard Shortcuts In *Pro Tools*

You'd be surprised at the things that you can do without opening a menu in *Pro Tools*. And if there's no shortcut for the command you need, why not create your own?

Mike Thornton



Clicking on a plug-in parameter with the Ctrl+Command keys held enables automation for that parameter.

It's another keyboard shortcut-fest this month in our regular guide to getting more from *Pro Tools*. Following our look at the Keyboard Focus, I think it's time to introduce some of the more obscure shortcuts. Most of these are available on both Mac and Windows versions of *Pro Tools*, but some aren't documented at all, so they might be new to many readers.

Automation

I am sure many of us automate plug-in settings by clicking on the Auto button in the plug-in window, selecting the parameter, adding it to the list and clicking OK, then selecting the correct parameter on the audio track, missing it in the list by mistake and having to try again! For us, there is a really useful shortcut. It turns automation on for your chosen plug-in parameter and switches to the automation data display on the track in two very quick and easy steps...

- To turn automation on, **Ctrl+Option+Command-click** (PC: **Ctrl+Start+Alt-click**) on the plug-in parameter.
- To switch that track to display automation data for a given parameter, **Ctrl+Command-click** (**Ctrl+Start-click**) on the plug-in parameter.

That's it! Now you are ready to edit the automation graphically.

To add breakpoints (or anchors) in any graphical automation you can click with with the Grabber tool, but there are alternatives. On the Mac, you can use Option+'/', which is really nice, as there is a '/' key above the right-hand Option key on most keyboards. On the PC, you simply right-click.

To access graphical automation data more easily, you can use **Ctrl+Command-click** (PC: **Ctrl+Start-click**) in the Edit or Mix window to change the display as follows:

- **Ctrl+Command-click** on the track name changes display to waveform.
- **Ctrl+Command-click** on the text 'vol' in the I/O view changes display to volume automation.
- **Ctrl+Command-click** on the text 'pan' changes display to pan automation.
- **Ctrl+Command-click** on the mute button changes display to mute automation.

On the Mac, adding the Option key to any of the above will make the change to all tracks. These shortcuts work on both the Mix Window and the I/O section of the Edit window.

Navigation & Zooming

Here's a handy shortcut which allows you to navigate quickly without having to dive down to the bottom of the Edit window to click on the scroll bars. Using **Option+Page Down** (PC: **Alt+Page Down**) will scroll the Edit or Mix window one 'screen' to the right, while **Option+Page Up** will scroll the Edit or Mix window one 'screen' to the left.

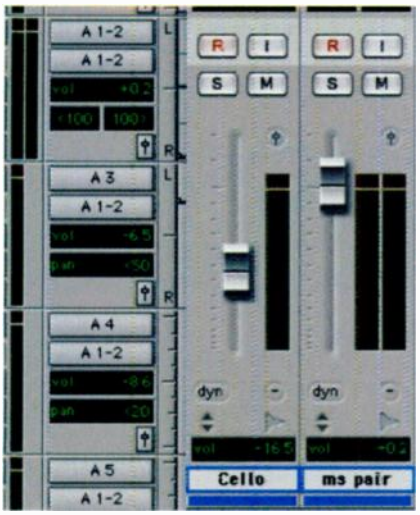
To make the selected track larger or smaller you can use Ctrl plus the up or down arrow keys (this seems to be a Mac-only shortcut). Adding the Option key into this shortcut does it to all tracks — on the PC, you can use Start+Alt plus the up or down arrow keys.

You can also adjust the nudge and grid values from the keyboard. To adjust the nudge size, hold down Command+Option (PC: Ctrl+Alt) and use the '+' or '–' keys on the numeric keypad to adjust the nudge size up or down. Similarly, holding down Ctrl+Alt (PC: Start+Alt) and using the '+' or '–' keys will adjust the grid size up or down.

Another handy navigation shortcut is to Ctrl-click (PC: Start-click) on any track in the Edit window, which will force the Mix window to scroll along so that that track appears as first visible track on the far left of the Mix window (or as far left as possible). This also works the other way, so Ctrl-clicking on a track name in the Mix

Using The Trim Tool To Fill

Have you ever wanted to trim out a region precisely to a preceding one? Well you can: by holding down the Ctrl (PC: Start) key whilst trimming, *Pro Tools* will stop at the preceding region's edge. This works with the Trim tool in TC/E mode, too, thus enabling you to precisely fill or stretch to fit a gap. Neat!

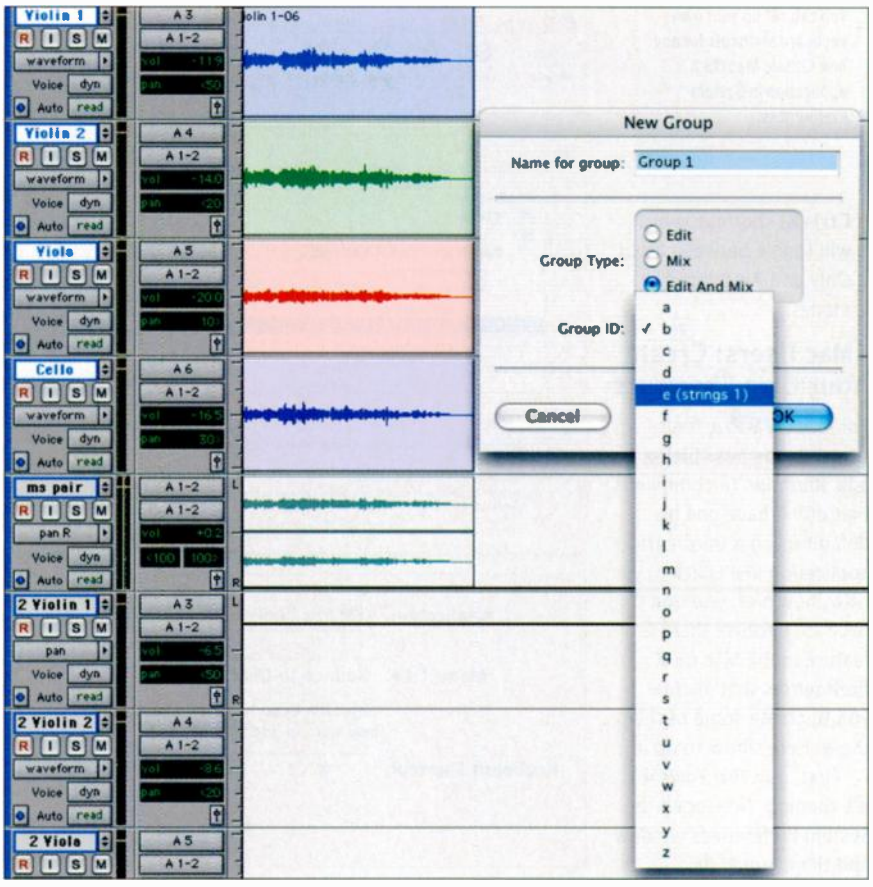


Clicking on the meters with all three modifiers held switches them to 'fat' mode.

window will put the selected track at the top of the Edit window (or as high as possible). This is great for large sessions on two-screen systems where you have the Edit window on one screen and the Mix window on the other.

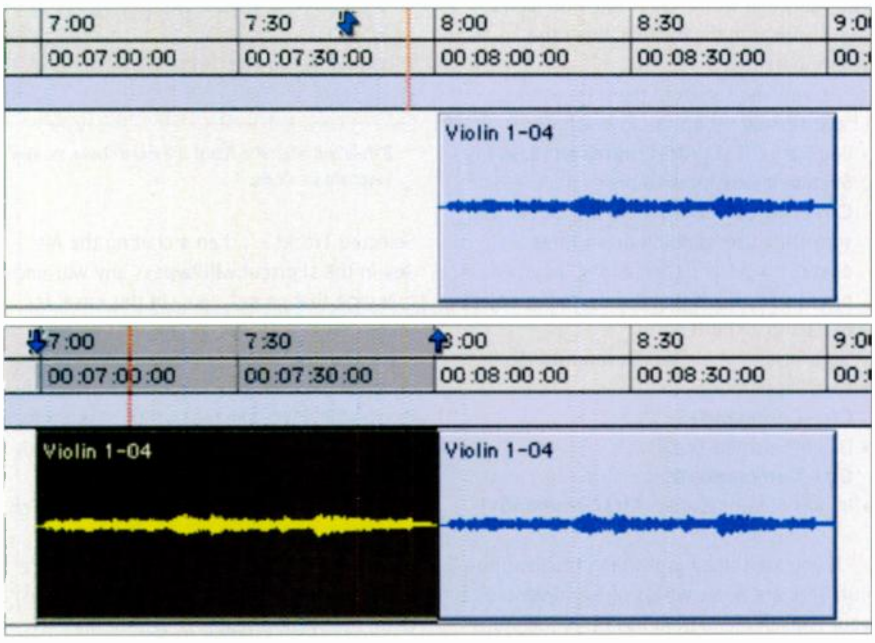
Miscellaneous But Useful Shortcuts

- **Command+Alt+Ctrl-click** (PC: **Ctrl+Start+Alt-click**) on a meter in the Edit or Mix window to toggle between 'fat' and normal meters on all tracks.
- We all know how to duplicate a region so it repeats after itself, but here is a way of getting it to repeat a region before itself. To copy backwards, **Ctrl+Alt+Command-click** (PC: **Ctrl+Start+Alt-click**) the region: hey presto, a duplicate will appear butted up before the original.
- When you're in the Name Tracks dialogue, you can use **Command+right arrow** (**Ctrl+right arrow**) to select additional tracks to be named without leaving the window. Alternatively, having named the first track, instead of hitting the Enter key, which is the natural thing to do, use **Command+Enter** (**Ctrl+Enter**) and you get the next track ready to rename. This one falls very nicely under the fingers.



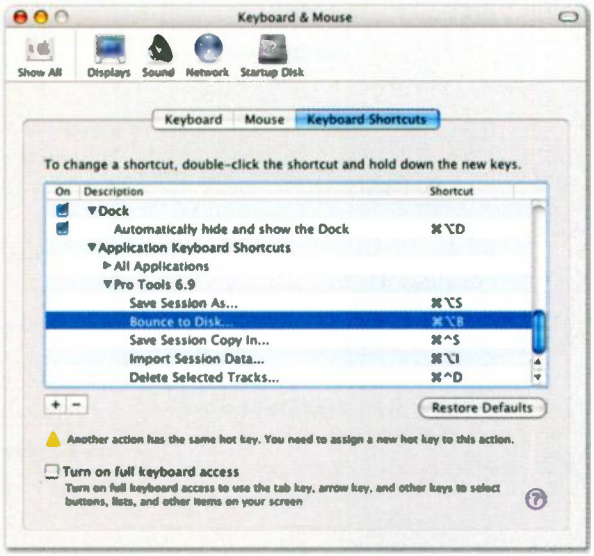
You can replace an existing group by setting a new group to have the same ID letter.

- When you create a new track using **Shift+Command+N** (PC: **Shift+Ctrl+N**), the New Track window will open. In that window, you can use Command (PC: Ctrl) plus left or right arrow to choose Stereo or Mono, and Command+up or down arrow to select from Audio, Aux, Master or MIDI tracks. Finally use Command+Option (PC: Ctrl+Alt) plus up or down arrow keys to select Samples or Ticks.
- Have you ever wanted add or remove a track from a group, and ended up creating a new group and then deleting the old one in order to do so? What a pain! Well, it is possible to edit a group. To do this, select all the tracks you now want to be in that group in the normal way (which is so much easier with the new multiple selection options in *Pro Tools* 6.9!) and use **Command+G** (PC: **Ctrl+G**) as if to create a new group. Now change the group ID to match the group you want to edit. Finally, click OK and that group will contain the new selection of tracks.
- TDM users now have a separate Input Monitor button on each track, but *Pro Tools LE* now incorporates the **Alt+K** (PC:



Regions can be duplicated ahead of, as well as behind, the source region.

HIDDEN KEYBOARD SHORTCUTS



You can set up your own keyboard shortcuts for any non-Classic Mac OS X application in System Preferences.

Before and after: *Pro Tools*' File menu shows my new keyboard shortcuts.

▶ **Ctrl+K**) shortcut, which will toggle between Input Only and Auto Input modes.

Mac Users: Create Your Own Shortcuts

For Mac OS 9 *Pro Tools* users, it was possible to add shortcuts to commands that didn't have one by default using a third-party application like Quick Keys. Now, however, you don't have to, because there is a feature in the Mac OS X preferences that enables you to create some of them there. Here's how to do it.

First, quit *Pro Tools* if it's running. Now open the System Preferences window and then launch the Keyboard & Mouse preference pane. Select Keyboard Shortcuts and click the little '+' sign in the bottom left corner of the window. From the pull-down menu, choose *Pro Tools* from the 'other' item. (It won't come up in the main list, so you will need to navigate to the *Pro Tools* application in your Digidesign folder, which should be in the Applications folder on your hard drive.)

Now type in the exact menu option that you want to add a shortcut for. In this example, I wanted to have a shortcut for the Bounce to Disk command. I found it helpful to make a screenshot of the menu so I got the exact spelling and punctuation correct, as you must type it exactly how it appears in the drop-down menu. Make sure your upper and lower-case characters are right as well as any full stops. Now press the key combination you want to use (in this case Alt+Command+B) and you will see it appear in the field. You should make sure that you are not using a shortcut already assigned from the standard menus, remembering the not-so-obvious ones too.

Quit System Preferences and launch *Pro Tools* again, and all being well, you should see your newly added shortcut in the menu. If a particular shortcut has already been allocated for that particular application, your new one won't 'take', and you won't see it appear in the menu against the appropriate item.

As you will see from the screenshots, I have already set up the following...

- Bounce To Disk: **Alt+Command+B**. In my opinion it's easier than the **Ctrl+Option+Command+B** shortcut that some folk use. Holding down three operator keys and then adding another one is so difficult that it defeats the object of having a shortcut!
- Save Session As... **Alt+Command+S**.
- Save Session Copy In... **Ctrl+Command+S**.
- Delete Selected Tracks... **Ctrl+Command+D**.
- Import Session Data... **Alt+Command+I**.

If you are thinking of trying this feature out, here are a few words of warning! If your chosen menu item has three full stops at the end, as is the case with 'Delete Selected Tracks...', then including the Alt key in the shortcut will bypass any warning message that comes up — in this case, for instance, where there are regions on the track you are trying to delete. This is a Mac OS X convention — for example, Alt+Empty Trash will empty the bin without asking if you are sure. This is why my Delete Tracks shortcut doesn't have Alt in it.

Some shortcuts also do other things. For example, my Delete Selected Tracks.. shortcut will do a Region Duplicate if there is a region or regions highlighted — in this case, the system seems to ignore the Ctrl key and responds to Command+D! SOS

To Journal Or Not To Journal

There has been some confusion as whether you should use Journalling when formatting audio drives with Mac OS X and Disk Utility. Hopefully I can clear up this simply: Digidesign recommend the use of Journalling for *Pro Tools* versions from v6.9 and above, whether you are running Panther (10.3.x) or Tiger (10.4.x). However, if you are still running v6.7 or lower, you should leave Journalling off.

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sonar notes

More screen space without having to buy a second monitor — just one of the *Sonar* nuggets we've got for you this month...

Craig Anderton

With any modern sequencing host, not just *Sonar*, it seems there's never enough screen space. Although *Sonar* lets you save screen layouts and recall them, it's not as useful as a dual-monitor system. If you've found yourself wanting a way to organise your desktop differently, visit www.fatfreesoft.com/2desk.php and download *Double Desktop*. This efficient system-tray utility doubles the width of your desktop, then lets you switch between the two halves using an arrow button in the system tray (or a hot key). Best of all, it's free for non-commercial use.

You might set up the console view in the 'extended' desktop while the main desktop shows the track view, which you would do by 'pushing' the console into the other desktop, switching, then dragging it the rest of the way. It stays there until you exit the program. Or you could drag all your soft-synth interfaces to one desktop and switch between working with *Sonar* itself and editing synth sounds. What's more, if you're already running a dual-monitor system, each desktop becomes a dual-monitor desktop, so essentially you have two pairs of two screens.

To make it easy to know which desktop you're on, you can choose different wallpaper for the second desktop and change icon label colours separately for both desktops. To return to normal, just exit the program. Over the couple of months that I've been using *Double Desktop* I've experienced no stability problems or other glitches.

Checked Your Utilities Lately?

When you clicked on the Install option of the *Sonar 4* installation disk, there's a good chance you clicked 'Install *Sonar 4*' and left it at that... in which case you may have missed the options to install some MFX (MIDI FX) and utilities.

To install these, close any open programs, then insert the *Sonar* installation CD (you won't need the serial number for this aspect of installation). Click on 'Install', then on 'Install Utilities'. Each of the utilities, as follows, needs to be installed separately:

- *Discwelder Bronze:* Trial version for burning DVD-Audio discs.
- *Plug-in Manager*, which provides a way to rename and organise plug-ins.
- *Audio Finder*, which deals with the problem of knowing you have an audio track on your hard drive but not knowing where. It displays relationships between *Cakewalk* Project files and associated WAV files, so that you can locate missing files, determine which WRK files use which audio files, and audition or delete files. And if you have an 'un-delete' utility for your PC, you may even be able to recover deleted files.
- *MP3 Upgrader* is the downloadable file we mentioned last issue that allows you to validate an MP3 encoder purchased with another Cakewalk program so that it will work with *Sonar 4*.

The 'Install MFX' option on the installation disc lets you install several MIDI effects: JMT Orchestrator, Music Lab MFX, and Ntonyx MFX. Each of these must be installed separately. In a future column, we'll cover these under the broader topic of MIDI plug-ins and *Sonar*.

New Emu Drivers

Emu make some fine interfaces (1820M, 1820, 1212m and 0404) that not only run the *Proteus X* and *Emulator X* soft synths but also provide audio interfacing. Quite a few people run *Sonar* with these interfaces, but some have reported inconsistent operation. The good news is that you can now go to www.emu.com/support and download the Digital Audio System/Emulator X Driver patch V1.8 (if you're using the Emulator X or Proteus X, you should also download their version 1.5.1 update).

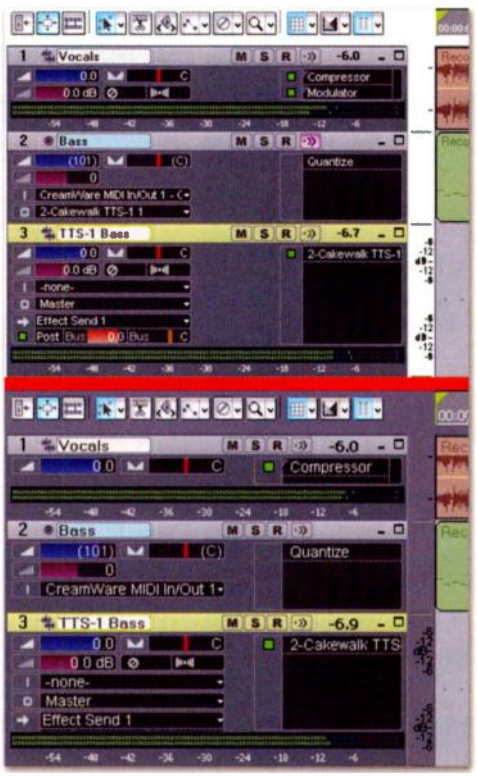
Version 1.8 has several enhancements, including better ASIO behaviour when used with *Sonar*, as well as improved ASIO/WDM recording performance during bursts in PCI-buss activity (this helps to minimise recording drop-outs). The new version also fixes a bug that caused *Sonar* to crash when using ASIO at a sample rate that differed from *Patchmix DSP*'s rate. There's improved PCI performance and greater PCI-buss utilisation efficiency, and the ASIO driver now recovers fully after an ASIO application crashes or terminates prematurely.

Sometimes Bigger Is Better

The normal font size in *Sonar*'s Track View is usually fine — unless you're overdubbing on an instrument located several feet away from the computer screen. Fortunately, it's easy to up the font size a bit by altering Windows' default DPI (dots-per-inch) setting.

To increase the font size, right-click on the desktop and select Properties. Don't go to the Appearance tab and attempt to adjust the font size there; doing that will affect Windows, but not *Sonar*. Instead, click on Settings, then the Advanced button, then the General tab. Under display, change the DPI settings drop-down menu value from 96 DPI to 120 DPI. You'll be informed you need to restart the computer before this setting takes effect. Click on Apply.

You'll then be told whether you need to install the font files from your Windows CD-ROM or network, or already have them on your system. Choose the appropriate answer (usually Yes), then click on Close to close the Display Properties window. Restart and enjoy your easy-to-read fonts! SOS



The upper half of this picture shows the 96 DPI font size, while the lower half shows the same tracks at 120 DPI.

Multiple MIDI Pages

Here's a documented but not commonly known tip presented by *Sonar* aficionado Jeff Noel in Cakewalk's user forum. If you Ctrl-double-click on individual MIDI Clips, each will open in a separate Piano Roll View window, instead of the standard Multiple Track view in a single window. Jeff points out that this is especially helpful when you're building multi-voiced bass lines with multiple instances of a program such as Spectrasonics' *Trilogy*.

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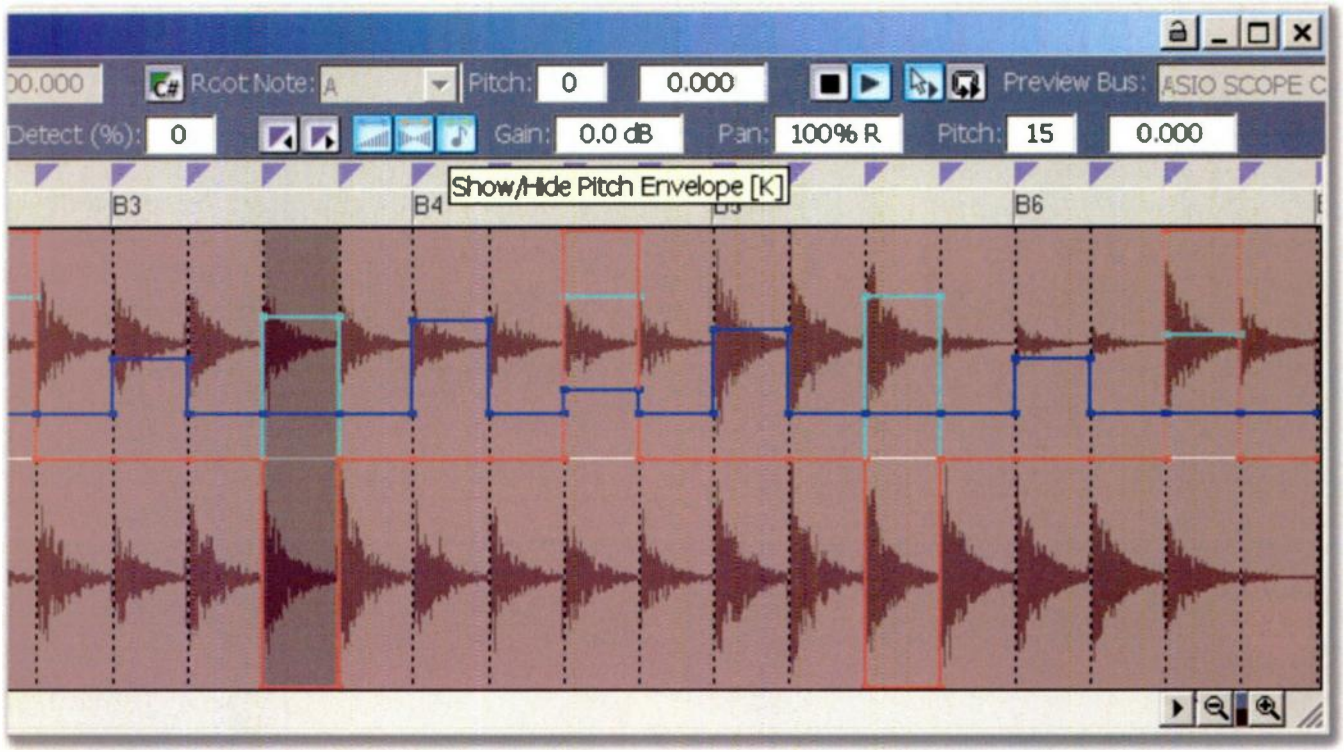

Loop Construction

In *Sonar 4*

Sonar 4 has excellent loop editing facilities, and this month we're going to show you how to use them.

Craig Anderton

When *Sonar* first appeared, one of its strengths was the ability to create, edit and save WAV files that could stretch automatically with the project tempo and pitch. Previously, this type of convenience was pretty much the domain of Sony's *Acid* software (originally introduced by Sonic Foundry). Although DJs and groove-orientated musicians took to this concept initially, over time loops have worked their way into a variety of musical genres, including rock and soundtracks, and while many musicians are content to get their loops from sample libraries, quite a few are creating loops from their own recorded material. For example, if a guitarist plays a great lick, sometimes it's worth repeating as a motif in different parts of the song. Even if you only ever use commercial loops, it's important to know how to edit them because, sadly, a lot of sample CDs are carelessly 'prepped' and do not stretch well over a range of tempos.

Sonar's Loop Construction window is the centre of activity for editing, creating and saving stretchable loops, which Cakewalk call 'groove clips'. We've covered some aspects of looping before in *Sonar* Notes, but *Sonar 4* added several new capabilities (facilitating some rather nice special effects) to the Loop Construction window, so there's still plenty left to talk about.

To make this article as hands-on as possible, I'd recommend that you download my example loop from the *SOS* web site (www.soundonsound.com/sos/sep05/audio/sonarloop.wav). This is a file from my *AdrenaLinn Guitars* sample CD (but with the groove clip characteristics removed). We'll use it to illustrate the various points in this article.

Groove Clip Background

A *Sonar* groove clip embeds pitch and tempo information into a standard WAV file's header. This information instructs a compatible host how to play back the file in the face of varying tempo or pitch changes. The more accurate and detailed the pitch/tempo information embedded in the file, the better the stretching quality during playback. *Sonar*'s groove clips are compatible with the '*Acid*ised' file format that was introduced in the *Acid* loop-based composition program; in fact, you can load '*Acid*ised' files into *Sonar* and *Sonar* groove clips into *Acid*.

The underlying technology that allows such advanced loop manipulation is DSP-based. The basic idea is to create 'slices' of audio at transients, add or remove samples to lengthen or shorten the loop respectively, then crossfade these segments to smooth any transitions within the loop. Some wonder how this differs from REX files. Well, in the case of the latter, minimal DSP is applied to the slices, so audio quality is virtually unaltered. However, REX files are best suited to percussive material, as putting slices in the middle of a sustained tone produces an audible discontinuity. With DSP, crossfading within a sustained tone hides these kinds of problems.

There are limits to the stretching abilities of groove clips. If you slow down the loop too much, you'll hear artifacts as the ▶

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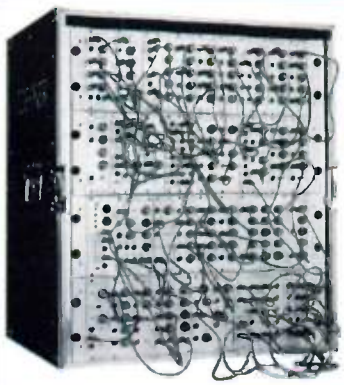

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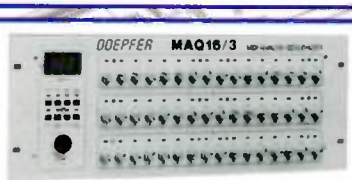

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algorithms struggle to insert samples that extend the material. Speeding up is less problematic, as it's easier to remove existing material than create new material that never existed previously. This is why pro loop-library designers often record their loops at slower tempos, if possible.

OK: enough theory. Download the file, and let's create the perfect loop.

Bringing Loops Into *Sonar*

There are several ways to bring a file or loop into *Sonar*:

- Drag and drop from the desktop into an audio track. The file starts at the point where you release the mouse button, consistent with any Snap value you've set.
- Drag and drop from the desktop into a blank space in the Tracks pane (Track View). This automatically creates a track, with the file starting at the beginning of the sequence.
- Go File / Import / Audio, then navigate to where the file resides. Double-click on the file and it will be placed in the active track, starting at the Now time.
- Use the Loop Explorer. This is such a useful option that we'll cover it in detail.

The Loop Explorer

The Loop Explorer (View / Loop Explorer, or type Alt+1) provides a way to locate and audition loops, as well as see their properties. If the loop is a groove clip or *Acid*ised file, it will play back at the Project tempo as you audition it (see screen below).

The Loop Explorer is laid out like Windows Explorer, with a tree structure to the left for navigation. Files are displayed in the right pane, and when you click on a file its properties (sample rate, bit resolution, number of samples, length in samples, original tempo and original key) appear in a line at the bottom of the window.

The toolbar in the upper left has two distinct sections. The three buttons to the left relate to navigation. From left to right, these are:

- Go up one level in the tree.
- Refresh.
- Call up Windows Explorer.

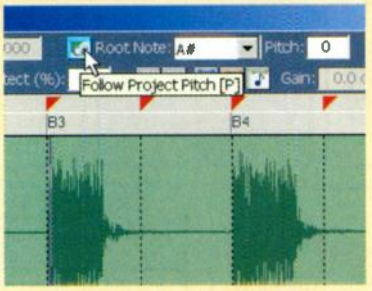
The next three buttons to the right control auditioning. Again from left to right, we have:

- Play: click this to play the selected file.
- Stop: click to stop the selected file from playing.
- Auto: when this is enabled, clicking on a file will cause it to play automatically.

Once playing starts, unless Auto is enabled a file will continue to loop until you select another file or click on Stop. Either of these actions stops the file from playing. If Auto is enabled, the only way to get the Loop Explorer to shut up is to click on Stop. If you double-click on a file in the Loop Explorer, the file will be inserted into the active track, starting at the Now time.

The rightmost toolbar button has a drop-down menu that chooses the display mode for the right pane: you can choose a list format, details, small icons or large icons. Another item, Folders, shows or hides the left pane. To the right of this button is the Preview Buss drop-down menu, which provides a list of available outputs over which you can monitor the loops. Finally, note that there's a splitter bar between the left and right panes, so that you can change the proportion of the window taken up by each pane.

Establishing Root Pitch



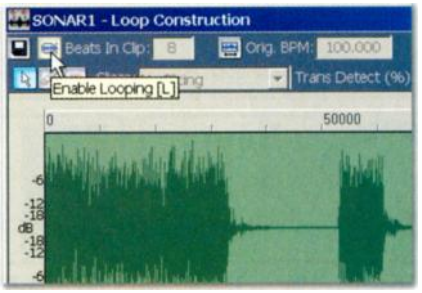
Here's the way to make a loop follow any key changes in the Project, as set by the Project pitch value.

For melodic loops, enter the original key (the one the loop was recorded at) in the Root Note field. If you want the loop to follow the Project pitch, click on the 'Follow Project Pitch' button. In the case of an unpitched sound (such as a drum loop), you probably want the pitch to stay constant regardless of what's happening in the song, so make sure this option is not enabled.

Loop Construction Preparation

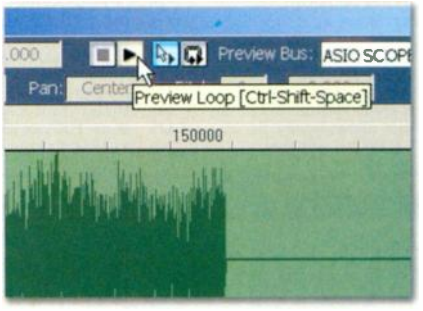
Bring the example file W_FUNK04_Bb.WAV into *Sonar*, and we'll turn it into a groove clip.

- Double-click on the clip and the Loop Construction window opens up.

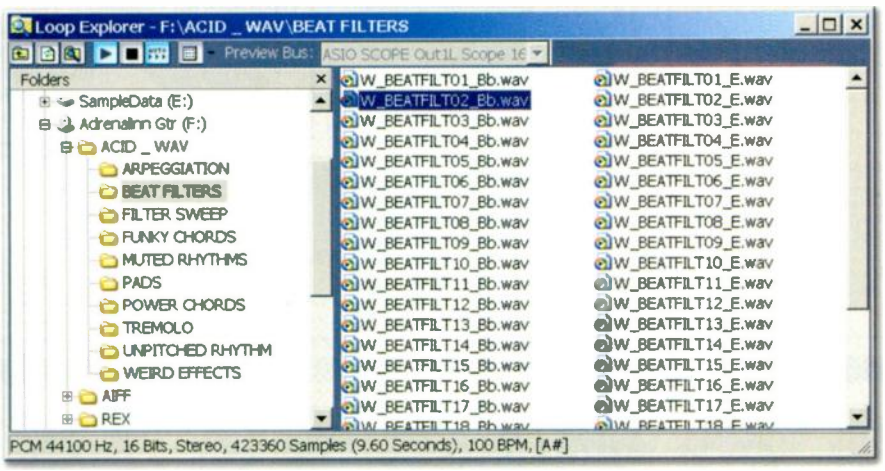


Clicking on Enable Looping turns the clip from a standard WAV file into a Groove Clip.

- We need to tell *Sonar* how long the clip is. Click on the Enable Looping button (see screen above), and two main things happen: the number of beats is displayed in the 'Beats In Clip' field (eight, in this case), and a set of markers appears that represents *Sonar*'s guess as to where the transients should fall. Usually *Sonar* gets the number of beats right, but you can enter a number in the 'Beats In Clip' field if you need to change the default.
- Set the Project tempo in the main program



Click this button at any time to hear the loop play.



A loop has been selected for auditioning. Double-clicking on the loop inserts it into the Clips pane.

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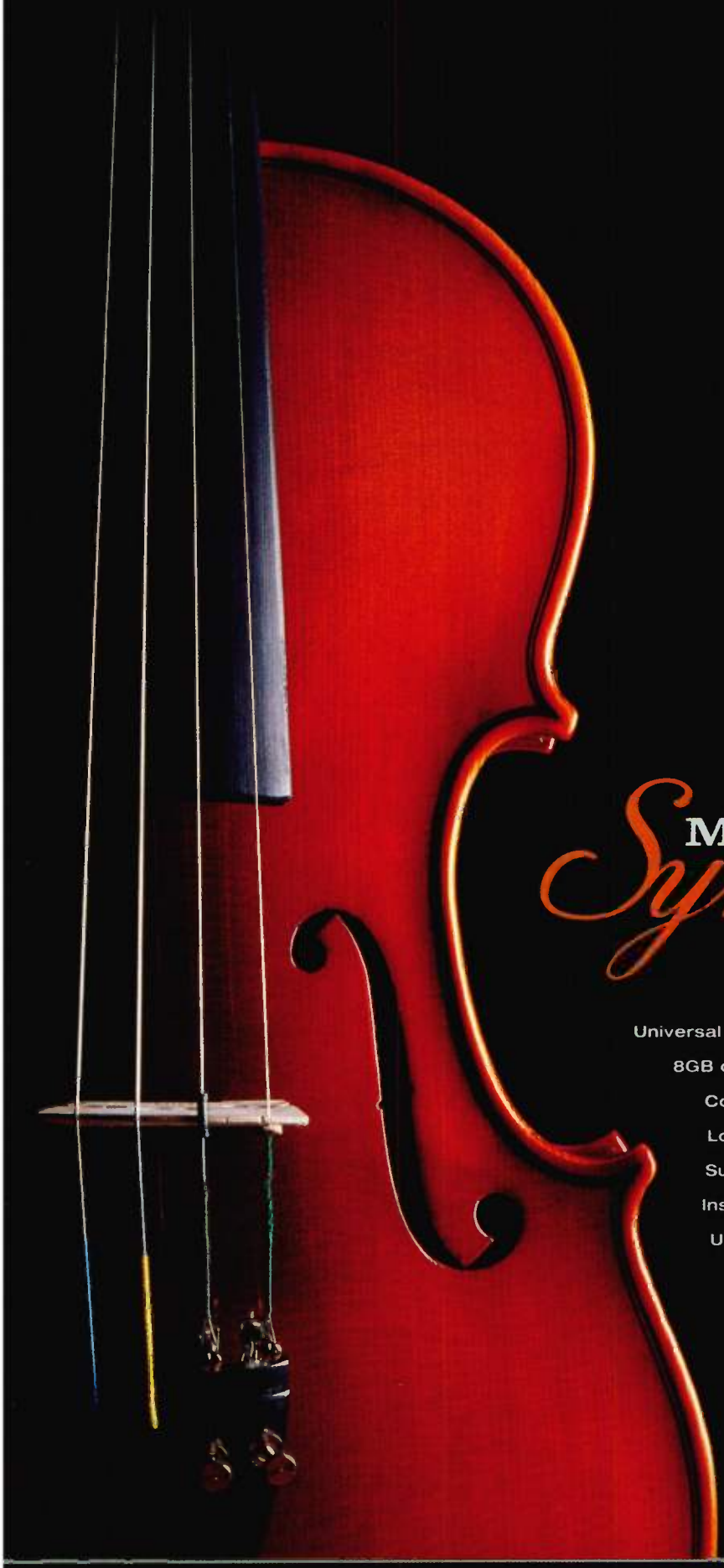

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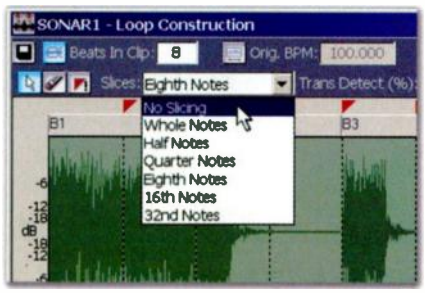
to 100bpm (the same as the original loop tempo) and click on the Preview Loop button to hear what we have so far. As with the Loop Explorer, there's a drop-down menu for choosing the Preview Buss.

- While you're at it, click on the button to the immediate right of the Preview Loop button to enable Slice Auto-Preview. This is a new feature in *Sonar 4* that lets you hear a slice if you click on it in the main waveform view. The next button to the right, if enabled, causes the selected slice to loop; leave it off for now.

Tweaking The Slices

When you play the clip, you'll hear that it contains several guitar chords. What we'll do is put a slice at the start of each chord's attack, so each chord lives in its own slice.

A drop-down 'Slices' menu puts slice markers at specific intervals. This can save time if you're slicing something like a drum-machine pattern with a regular 16th-note hi-hat pattern; set the slices to 16th notes and you're probably done. In fact, if you set the Trans Detect percentage value to '0', slices show up only at the interval you specified. I'm not going to make things *that* simple, because this is a guitar part played by a human! So we're going to add slices manually.



There are several semi-automatic options for placing slices within a file, but we'll do some of it by hand.

- Select 'No Slicing' from the drop-down menu (see screen above). Note that *Sonar* has detected three transients — the most obvious transients in the file. These are at beats three, four and five.
- Highlight the Trans Detect (%) parameter, enter 100, then hit Return. This makes *Sonar* more sensitive to transients, and several more slice markers show up at these transients (see top-right screen).
- Now click in each slice in the waveform. *Sonar* has done a pretty good job of isolating the chords, except for the slice that falls around beat six. We need to add more markers for these chords.
- Use the horizontal zoom-in button (+) so that this slice fills most of the Loop Construction window. Look closely at the waveform. You can pick out what appears to be a fairly significant 'blob' of audio just before beat six. To add a slice at this transient, double-click in the row that has the other marker triangles, right above where you want the slice. A blue triangle appears (blue indicates a marker that's manually created, as opposed to the red, automatically-generated markers — see middle screen above).
- Play the slice to the right of the marker you just added. We still need two more markers to mark the two chords that occur in this slice. Another slice is needed almost exactly on beat two; zooming right in often makes it easier to see the blob of audio where a transient occurs. To fine-tune a marker's placement, click on its triangle and drag to the desired position.
- Continue listening to slices and tweaking markers until each chord has its own slice. Set each marker as close as possible to any attack transient. For example, if you zoom right in on the marker that was

Sonar detects more transients when you increase the Transient Detection sensitivity.

Double-click in the markers row to add another slice marker.

The transient at beat two is difficult to see unless you zoom right in. When you locate it, add another slice marker.

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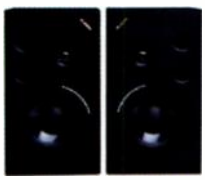

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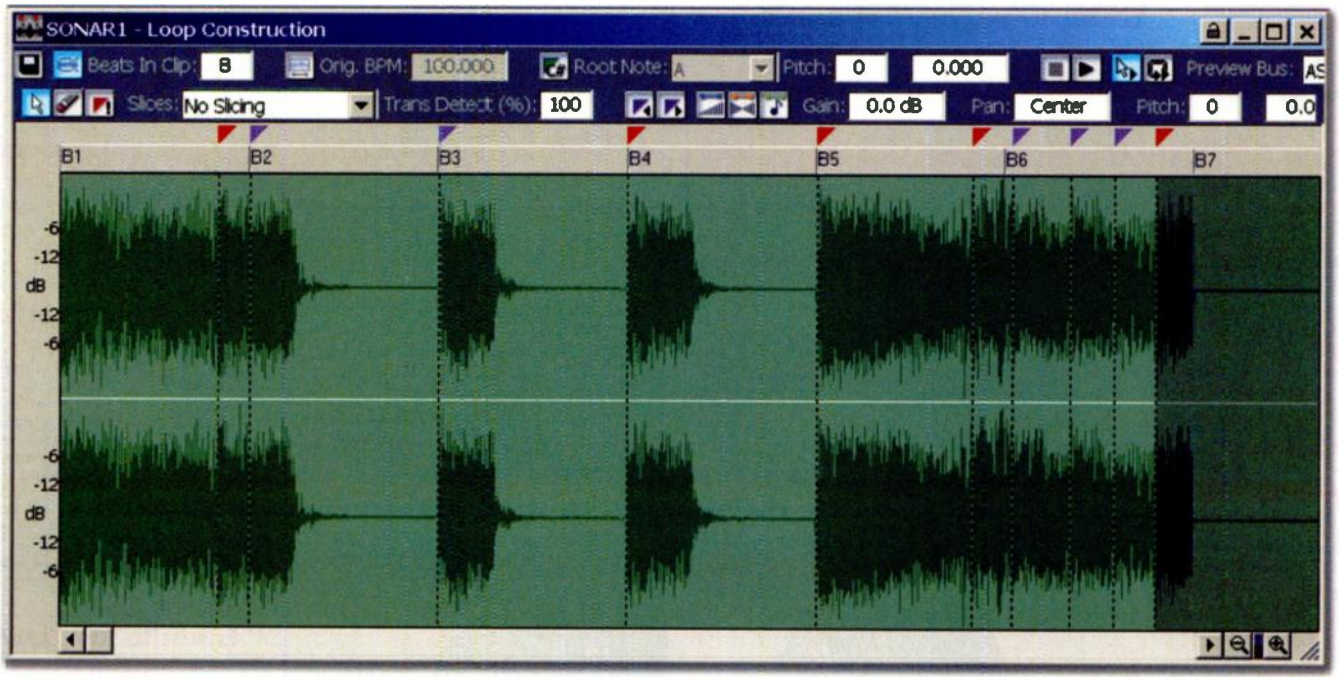


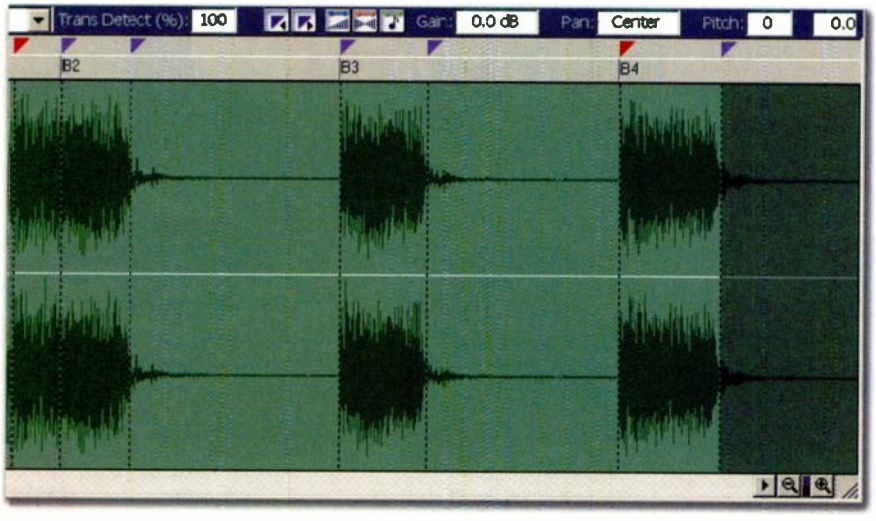
Note the three slice markers added just before each chord's final decay. These help create a more realistic sound when you slow down the tempo.

around beat three, it hits a bit early. Drag this marker to the right so that it sits right at the beginning of the transient that hits on beat three. The triangle turns blue to show that it has been manually adjusted.

- Now you should have something that looks like the screen above. Change the Project tempo to 150bpm and preview the loop. It should have the same rhythm as the original, only faster. Now change the Project tempo to 70bpm, then preview the loop. This makes the DSP work a lot harder, and also reveals a problem: The little decays at the ends of the chords that start at beats two, three and four are being stretched so that they last longer, and they therefore sound unnatural. To solve this problem, add another slice marker just before each of the little decays (see screen below). Now play the file at 70bpm. It should sound much better.

Another problem with slowing down tempo is that sustained sections can sound uneven, because a fairly long section is being stretched. We can remedy this problem by adding another slice marker in the middle of long sections. For example, when you preview the file at 70bpm, note that the first slice suffers from a little 'wavering' Add a marker in the middle of this slice and the wavering goes away. Try the same technique with the slice that begins at beat five as well.

You can tweak groove clips forever, but this one works pretty well from about 80bpm to 180bpm. More tweaking won't improve it that much.



The file now has slice markers in all the right places — at the beginning of each attack transient.

Let's Go Nuts

Sonar 4 added the option to change pitch, pan and gain for each slice. This works in a very similay way to standard envelopes, although changes are quantised to each slice, and you can't change values within a slice. In other words, an individual slice can't fade out or pan from left to right — it will be set at a constant level or constant pan position.

Edits can be done graphically or by entering numbers in fields. For graphic editing there are three toolbar buttons, each of which shows/hides an envelope (orange for pan, light blue for pitch and dark blue for gain). Drag the envelope within the slice to edit it (see the screen on the first page of this article). The only significant difference between graphic and numerical editing is that when you're working graphically you can change pitch only in semitone steps. When you're doing so numerically there's a field for semitones and another field for fine-tuning. There are some limitations — gain changes might produce pops if there are significant level shifts, for example — but being able to change these parameters offers tremendous creative latitude.

Save It!

I'm sure you don't want to do all this tweaking again, so now you should save the file. Either of these options will save it as an *Acid*ised WAV file: either drag the loop from the Clips pane to your desktop (or to a folder on your desktop), or click on the floppy disk ('Save Loop to WAV File') button. Happy looping! SOS

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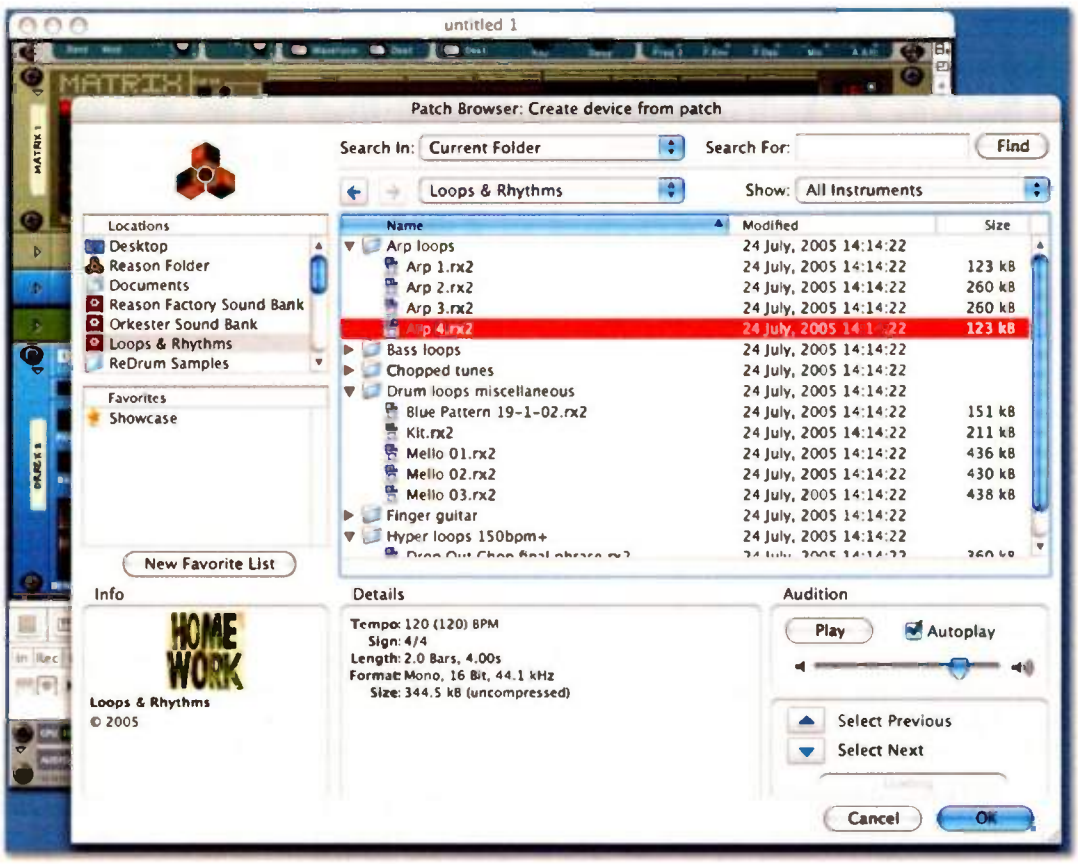

Once completed, your Refill will be recognised by *Reason*. Here, a dedicated REX-loop Refill is being browsed via *Reason*'s 'Create device from patch' option.

▶ The info.txt file and a splash.jpg image you'll find in here are used by the software to customise how your Refill will appear in the *Reason* browser. Copy the Template Folder and then edit the info.txt doc with a text editor. The basic shape of this file shouldn't be changed, but by putting the right bits in the right place you'll give your Refill its name and provide a copyright date, your URL and whatever comments you'd like to share with the recipient of the Refill.

- You can also replace the splash image with the JPEG of your choice, though it has to be 64x64 pixels in size and called 'splash.jpg'. Whatever you do, you'll need both these files: *Refill Packer* will present an error report if they're missing.
- At this point, drop all the files to be included in the Refill into the copy of the Template Folder. Alternatively, drag the text file and JPEG to your *Reason* data folder. Now open *Refill Packer*.
- Choose your Input Folder, from the menu or by clicking on the folder next to the 'Input Folder' entry in the window. Navigate to the location of the Template Folder copy you've just created (or the folder that you've just added the text and splash image to). This will cause the text and image to fill up most of the rest of the window.
- Now choose the Output File. Specify the location on your hard drive where you'd like the Refill to be saved and a name pops up in the window. It'll be the name you added to the info.txt file, with a '.rfl' extender (rather than the name of the folder where your original data is stored).
- Click the 'Create Refill' button.

With any luck, a progress bar will chug away, files in the putative Refill will be counted, then the Refill will be created. It could take some time if there are lots of samples and REX files involved or just a few seconds or minutes with a set of *Subtractor* patches. If there are any problems, this is when you'll discover them. I found that my main problems were bad links between Songs or patches and samples — not all the samples I used were in my *Reason* folder! (A secondary problem related to incompatible sample formats left over from editing sessions.) Luckily, *RP* generates a report file that describes the problems encountered (see the screen below). Move the samples to the folder being packed and the next run will be fine.

If anything goes wrong, *Refill Packer* gives you the opportunity to save a text file that lists the problem — in this case, missing sample files.

Another issue might arise if the Refill you're trying to create makes reference to material found in other Refills. *Refill Packer* has an option to warn you of references to such material, and can also add a list of external Refills to the new Refill's descriptive text. If the reference is to one of the factory Refills, there's no problem, since anyone accessing *your* Refill will have the same set. There will also be no problem if the new Refill is just for your use or aimed at a collaborator who has the same collection of third-party *Reason* material as you. But if the new Refill is to be distributed more widely, you can't count on every user having all your Refills, so it's probably best to winnow out any patches or devices that refer to these external Refills.

There is one potential problem that won't be flagged: REX loops that have too many slices for *Dr:Rex* to load. The device only handles loops of up to 92 slices, so it's a waste of time and space including such loops in your Refill. Even if you've been organised, your REX folder might have the odd file meant for a different application, or stragglers and working versions. Part of your preparation, then, might be a quick scrolling audition session via the *Reason* browser: files with too many slices pop up an error message. You can log them and fix or delete them before creating your Refill. SOS

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This library features single-note samples of a mouth-watering collection of vintage synths, including models by ARP, Emu, EMS, Oberheim, Moog, Roland, and Sequential. The idea is that you create a playable patch by transposing each sample across the keyboard in your choice of sampler — if you have *EXS24*, *Halion*, or *Reason*, patches have been included to do this for you. The documentation cheerfully informs you that synth sounds 'nearly always transpose well when sampled', so only one note is included for many of the sounds, and never more than one note per octave.

The flaw with this approach, though, is that it can't recreate the way most of these synths work: for instance, pitching a sample up an octave will effectively halve the envelope and/or modulation times of the sound's filter and amplifier, but it would be a rare analogue synth patch where these tracked the keyboard in this way.

Despite such conceptual problems, however, all is not lost. Although one note per octave doesn't build a particularly satisfying instrument in most cases, some of the unfiltered files present opportunities to create more usable patches which rely on your sampler's envelopes and filters — you lose the characteristic sound of the original filters, but at least your oscillator comes from a vintage analogue synth. Also, if you avoid transposing any of the samples too far you'll find you can coax out some useful bass and lead lines in practice. On the downside, though, the organic and evolving nature of many of the sounds sampled makes finding a smooth loop a challenge in most cases — as demonstrated by the rather lumpy loops in the bundled *EXS24* patches.

To Sample Lab's credit, the audio has been well recorded, and covers a lot of ground sonically. The booklet also nicely categorises the hundreds of different samples both in terms of the synth that produced each and in terms of the attributes of the sound — there are categories for short and long notes, without and without attack, modulation, and filtering, as well as separate effects and percussion sections. If you're the kind of person who's willing to spend time creating custom synth sounds using a sampler, then there is no question that this library will present an excellent resource. Many potential customers may also be swayed into purchasing by the complete set of Roland TR808, TR909, and TR606 percussion samples, which of course are unlikely to present any transposition problems.

That said, I'm not sure that most creative electronic musicians work from these kinds of single-note samples these days, and 606/808/909 samples have been padding out libraries for ages. If *Analog Archive* had been released ten years ago, maybe I'd have got more excited about it. These days, though, I expect something a bit more usable for my money. *Mike Senior*

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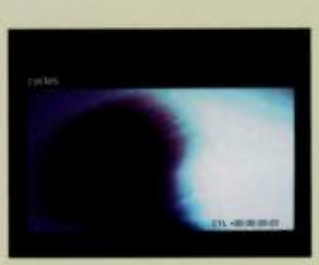

Cycles Volume Three: Incidental Gesture

AUDIO+WAV

The title of this library doesn't necessarily give much of a clue as to its contents. However, it is from the same team as *Unnatural Rhythm*, reviewed in *SOS* February 2005, and the content is in a similar ball park — abstract, weird, and unsettling in equal measure. However, while *Unnatural Rhythm* is dominated by short (two- to eight-bar) rhythmic and pulsating loops, *Incidental Gesture* is more about textures and abstract melodies. As before, the collection is provided with an audio CD (for easy auditioning) and a DVD-ROM of 24-bit WAV files. As these samples are not really loops (many of them are over one minute in length), no REX 2 files are supplied. For the WAV files, both 44.1kHz and 48kHz versions are included, the latter giving compatibility for film/video work. For the purposes of review, I explored the 24-bit/44.1kHz WAV versions using Sony's *Acid Pro*, and this consisted of 1.6GB of data spread over some 130 samples.

The material is divided into five folders. The content of the Rhythmic Beds folder is perhaps the closest to *Unnatural Rhythm*, containing 21 examples of rhythmic weirdness with lengths between eight seconds and two minutes. While the files are not *Acid*ised, the file names usefully include tempo and bar-length information, so it is very easy to make them loop if required. Sample names such as ArpegSuspense, MamboSqueel and TinDrumChase give a feel for what is on offer — these are intended to create a dark or dramatic feel and, as elsewhere within the collection, the sounds move from hi-tech through to ethnic in flavour.

The Narrative Expressions and Moody Essentials folders contain a variety of quirky soundscapes, bleeping or buzzing noises, and metallic bashings. These are more for sound beds or sound-design applications to create a particular atmosphere rather than to be used in a strictly musical context. The majority are over 30 seconds in length and some run to over three minutes — so not only could you score that scary scene, you could also make it scary for a looooooooong time! The final two folders — Melodic Meanderings and Horn Based Gestures — are more melody based, although even here things are pretty abstract and, on the whole, ambient. The Horn Based Gestures group is based on various sax, whistle, and clarinet phrases, and the mood is generally very lazy and relaxed. Some of these are straight recordings, while others have been suitably processed to the point of almost being unrecognisable. The breathy nature of some of these adds a definite ethnic feel to a composition.

In use, *Incidental Gesture* made an excellent complement to *Unnatural Rhythm*. Rhythmic soundscapes created with the latter can have a little detail and further atmosphere added via these samples and there is a consistency in the content that makes combining them very straightforward. While these samples may not have mass appeal, for those creating more experimental music or atmospheres for use with moving images, Incidental Gesture has plenty to inspire. *John Walden*

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MULTI-FORMAT

This library is split into three main elements: approximately 150 drum breaks, some 50 percussion loops, and 350 instruments. Given the 'Drum & Bass Producer Pack' subtitle, the drum and percussion loops are suitably speedy — original tempos are mostly in the 160-175bpm range — and nice and busy. The breaks are split into a number of helpfully named folders. For example, the Classics folder features a small number of 'bread and butter' drum breaks, while the names of the Rough Enough and Slightly More Polite folders speak for themselves. My particular favourites were within the Heavy category — lots of squashy kick drum and some suitably crunchy processing really did get my monitor cones moving! Throughout, the processing is nicely done, with plenty of variety from clean, 'in your face' loops through to those with a good dose of added ambience. While the quality was excellent, the only downside was that I was left wanting more! The same applies to the smaller number of percussion loops. These mainly consist of hi-hat, shaker, ride, bongo, and a small number of fills, and they can be useful to add a layer of sizzle to one of the breaks as required.

As might be expected in a library aimed at drum & bass producers, the instruments collection is pretty much devoid of any conventional instruments. Instead what we get is a varied collection of weird and wonderful bleeps, bloops, and buzzes — with a smattering of drum hits, stabs, and heavily processed vocal snaps thrown in for good measure. In the Refill, these are all available as *NNXT* patches and are organised into a large number of categories. As well as the more usual basses, pads, and drum hits, they include FX, Cosmic Pads, and Tek Sounds. There are plenty of choices within the bass sounds, from big and fat through to thin and fizzy. The contents of the Vox FX and Stabs categories were also good, although it would have been even better if there had been more of them!

Drum & bass is a pretty specialised musical genre and tracks are generally built upon a foundation of (often very busy) drum loops and a fairly minimal arrangement of other sounds. This library contains all the essential elements required to build complete instrumental tracks in this style. Some of the loops and sounds here do follow a fairly well-trodden path, but there would be more than enough to appeal to budding drum & bass producers. I've no criticisms of the quality of the material here but, at this UK price point, I think the quantity of material has suffered from the provision of so many different formats. That said, it's totally understandable from the perspective of the manufacturers — multiple formats cost more to produce — and those who want maximum flexibility may well consider this a sensible compromise. *John Walden*

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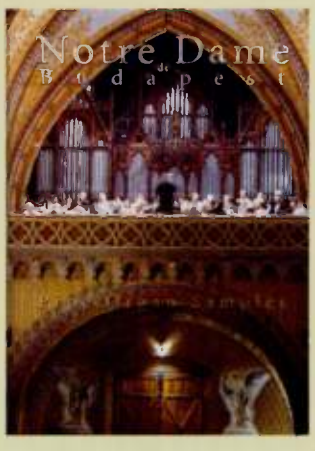
Notre Dame De Budapest

GIGASTUDIO

Here you have not one, but two cathedral organs from Budapest, Hungary, the larger of which resides in the splendid Notre Dame de Budapest (also known as the Matthias Church). The second instrument hangs out in another part of town, in Notre Dame de Kispest. These are old buildings (the Matthias Church dates from the 13th century), but the organs are relatively modern and benefit from a mixture of traditional design and current technology.

The makers have picked a selection of the most useful single and combination stops from both instruments, sampling 45 presets from the first organ and 21 from the second. To avoid looping, the manual notes were sampled for thirty seconds and the pedals for a whole minute — definitely long enough for most musical purposes! Although the booklet (a fascinating read for pipe-organ fans) makes suggestions about choosing one or other of the instruments for different musical styles, there's no big difference in their sound; you can switch between them or layer their presets to your heart's content.

The samples cover a very broad tonal spectrum, ranging from soft flute stops like Flute Harmonique and Gedackt, both simple, plain, and lovely, to Anches 16' 8' 4' Sub + Super, a towering, steely gothic racket fit to usher in the apocalypse. Between these extremes, there's a large menu of accompaniment-friendly stops of various colours and strengths, as well as declamatory solo voices like Clairon and Krummhorn. My favourite preset, suitable for both solo and backing work, is Flute Traversiére, an absolutely beautiful, rich, floaty timbre. The composer Stravinsky slated the organ as 'the monster that never breathes', but this breathy woodwind-like sound might have given him second thoughts!



Sampled church organs need reverb like fish need water — the organ samples include a fair amount of the stuff, and to avoid the reverb suddenly 'drying up' at the ends of notes, the makers provide release-trigger versions for all the presets. *NDB*'s Csaba Huszty has also created some excellent convolution cathedral reverbs for *Gigastudio 3* users, one of which is included in Tascam's *Gigapulse* factory presets. Swellbox, crescendo, and tremolo effects are faithfully replicated, while cathedral sound effects (bells, footsteps, whoopee cushions) further increase the audio realism. (I lied about the whoopee cushions.)

This large library (22GB in the *Gigastudio 3* version) is an ideal tool for anyone who composes for pipe organ. Keyboardists and producers looking for a high-quality church-organ sound to add to a mix will also find it useful, though finding the right preset might take a few minutes! The creators are to be applauded for their serious-minded approach and unstinting effort in capturing every sonic nuance of these magnificent instruments. Anyone tempted to shell out some of their hard-earned cash for these glorious samples can take comfort from the fact that half the revenue is donated to the churches for restoration of the organs — however, from what I've heard here, they're already in pretty good nick! *Dave Stewart*

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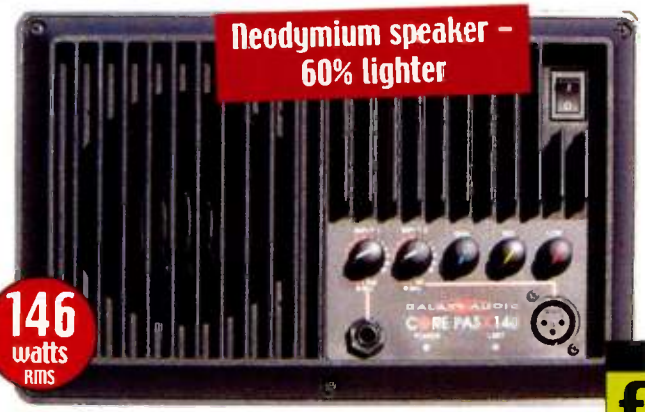

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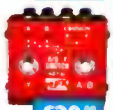

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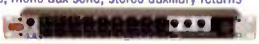

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apple notes

As the Mac community looks to Pentium M-based Powerbooks to deliver high-performance, low-power mobile solutions, what if you can't wait until next year and need to purchase a Powerbook right now?

Mark Wherry

I have to confess to suffering something of a love-hate relationship with Powerbooks. I always regretted not buying a 15-inch Titanium model during its fashionable lifespan, and was eager to see what a successor would be. But at around the same time Apple offered the original 12- and 15-inch Aluminium models, Intel were introducing the Pentium M processor as part of their Centrino trio of mobile and wireless technologies for notebook computers, and it became clear that the 'Power' tag didn't mean quite so much as it had previously.

It was, therefore, a little disappointing when the 15-inch Aluminium model finally appeared: from an aesthetic point of view it was fatter, which also translated to slightly heavier; and the battery life also seemed a step down from the previously desirable Titanium models. With no Powerbook model that appealed to me, I found mobile bliss in IBM Thinkpads with Pentium M processors: great battery life, great performance — what's not to like? Well, ultimately, while it's an obvious conclusion, if you want to run Mac software, the Thinkpad isn't particularly practical; and if you need to have a laptop Mac right now and you can't wait for Pentium M-based Powerbooks, how desirable are the current Powerbook models?

This month I got the opportunity to find out, as I was away from my usual day-to-day regime, didn't have access to my Powermac G5 and ended up using a 12-inch Powerbook for Mac-specific tasks.

Have I Got Specs For You

The last revision to the Powerbook line-up came on 31st January this year. When discussing these then-new Powerbooks in May's Apple Notes, I concluded that Apple had compensated for offering relative few technical advances in power (either in processing or energy consumption) by instead providing more feature-rich Powerbooks that came loaded with almost all previously optional extras as standard. Indeed, for £1199 you can get a 12-inch Powerbook with a 1.5GHz G4 processor, 512MB 333MHz DDR memory, an 8x Superdrive, NVIDIA GeForce FX Go5200 graphics with 64MB of video memory, an 80GB 5400RPM hard drive, and Airport Extreme and Bluetooth 2 wireless connectivity.

iPods & *iTunes*

It's been another successful month for the *iTunes* Music Store, which celebrated the download of the half-billionth song in the middle of July. And to give some idea just how quickly songs are leaping off the digital shelf, when Apple released *iTunes* 4.9 at the end of June, the press release cited "over 430 million songs purchased and downloaded worldwide." Aside from fuelling even more downloads, *iTunes* 4.9 added a Podcast directory to make it easy to find and subscribe to Podcasts, audio broadcasts that are published on the Internet by companies and individuals alike (Podcasting has been likened to radio in this respect) and can be downloaded to your portable music player — which is to say, your iPod.

Speaking of the iPod, according to Apple's third-quarter results the company shipped 6,155,000 iPods in the quarter (compared to 1,182,000 Macs) – a 616 percent growth over the same quarter last year. And to ensure continued growth towards the all-important Chirstmas season, Apple 'simplified' (the company's word, not mine) the iPod line-up this month, by merging the iPod and iPod Photo models. What this means is that the previous iPod model with greyscale screen is no longer available and iPod Photo is effectively now just iPod — even the U2-branded iPod is now an iPod Photo underneath. The new iPod is available in 20GB or 60GB configurations for £209 and £299 respectively.

Of these specifications, the 5400RPM hard drive in a 12-inch form-factor is a particular highlight, especially for those who want to record and play back a few tracks of audio, or maybe some samples, without always carrying around an external Firewire drive. The speedier drive also makes the system generally faster in areas such as boot time and virtual memory management. Anyone who's ever used a laptop with a 4200RPM drive (as in previous 12-inch Powerbook incarnations or iBooks) will attest that it can be a little frustrating.

The 8x Superdrive is capable of writing single-layer DVD-R and DVD+R discs at 8x, DVD-RW and DVD+RW discs at 4x, CD-Rs at 24x and CD-RWs at 10x. The supplied memory means that you can work quite happily without needing to purchase additional memory straight away in most cases (although the 12-inch PowerBook can be expanded to 1.25GB, and I'd definitely recommend the upgrade, given how cheap memory is these days). The 15- and 17-inch Powerbooks can be upgraded to 2GB RAM, so this may need to be factored into your Powerbook purchasing decision if you think even 1.25GB won't be enough.

Spec-wise, the only thing I think I really miss with the 12-inch is the Gigabit Ethernet port found on the 15- and 17-inch models, especially since Powerbooks are meant to be targeted towards professional applications. I can't say I honestly miss a Firewire 800 port on the 12-inch, which is the only Powerbook model to feature solely Firewire 400, instead of both 400 and 800 as offered in the 15- and 17-inch. The extra bandwidth might be useful if you use your Powerbook as a desktop replacement — but then you'd be unlikely to choose a 12-inch Powerbook in the first place.

As it is, I tend to use my 400 port for either an iPod or a Wiebetech Combo GB portable hard drive (www.wiebetech.com) that powers itself over the Firewire port and has an HGST 60GB 7200RPM 2.5-inch ATA drive. This is the perfect mobile companion, as it's ▶

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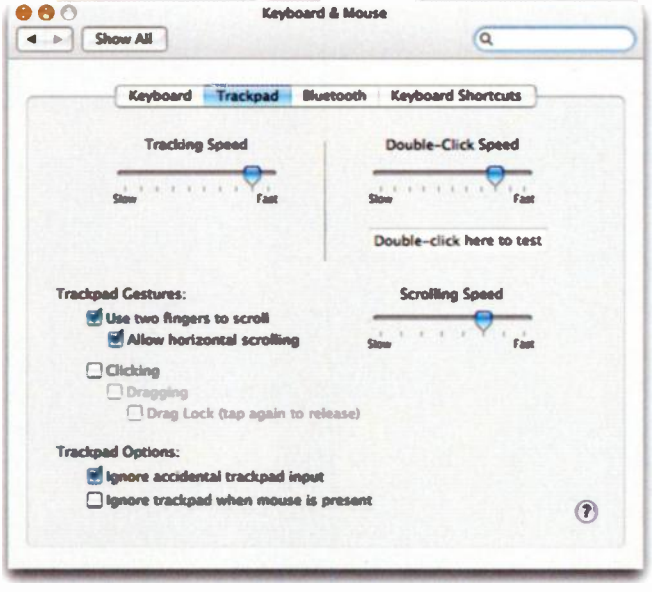
amazingly light, and while it's not quite as fast as a 7200RPM desktop drive it's fast enough for streaming audio files. Another plus for the Wiebetech drive is that it features Firewire 400, 800 and USB connectivity and is supplied with a variety of cables to suit all situations. No Powerbook musician should be without one!

No Sudden Movements

In terms of new hardware features, the current Powerbooks feature two additional 'patent-pending' technologies: a scrolling trackpad and a Sudden Motion Sensor. The scrolling trackpad enables you to scroll the current window by using two fingers on the trackpad simultaneously, instead of one, which turns out to be pretty handy, as it lets you scroll windows using far less finger movement than before, without having to move the pointer away from where you're working to access the scrollbar and back again. This behaviour can be adjusted in the Keyboard and Mouse System Preferences pane, where you can set the speed of scrolling, disable scrolling altogether, or disable only horizontal scrolling. While gesture-based trackpads are nothing new — Sony and IBM have had similar ideas — Apple's two-finger gestures are neat compared to the way in which the edges of a trackpad are assigned other behaviours in competitors' laptops.

The Sudden Motion Sensor (SMS, but sometimes referred to as AMS, for Apple Motion Sensor, or MMM, for Mobile Motion Module) is designed to detect strong vibrations, sudden changes in position or accelerated movement, such as when you move your Powerbook during normal operation, or if you were to drop it. Once the SMS has detected an anomaly in vibration, position or movement, it tells the Mac to park the heads of the hard drive to prevent damage, then resumes normal operation once everything has settled down again. This is obviously quite useful for day-to-day operations (a similar technology is featured in IBM's Thinkpad range), but the SMS can cause problems if you need to read and write large streams of data from your Powerbook's internal drive. Apple have a helpful knowledgebase article if you want to temporarily disable the SMS (http://docs.info.apple.com/article.html?artnum=300724) and Amit Singh offers an interesting page at www.kernelthread.com/software/ams/ describing the SMS and offering some applications to help illustrate how it works.

In use, the 12-inch Powerbook is a handy beast. I really appreciated the large internal hard drive when I started installing *Logic Pro* 7.1 and *Final Cut Studio*, and the built-in Superdrive is also neat. In terms of performance, it's pretty much identical to the 1.5GHz 15-inch G4 Powerbook I looked at in November 2004's Apple Notes (www.soundonsound.com/sos/nov04/articles/applenotes.htm). The 15-inch is a little bulky, and the 12-inch is marginally fatter, but there's still something seductive about the combination of the latter's feature-set and form factor.



The scrolling trackpad gestures in new iBooks and Powerbooks can be configured in the Trackpad page of the Keyboard and Mouse System Preferences Pane.

Amit Singh's *AMS Visualiser* is a cool, interesting, but ultimately pointless application (in the nicest possible way) that reads data from the Sudden Motion Sensor now featured in Apple's Powerbook and iBook laptops and displays the position and rotation of your computer in a 3D space.

Go Anywhere, Do Anything

No sooner had I finished looking at the 12-inch Powerbook than the web's modern equivalent to jungle drums started beating about an imminent iBook revision. While the rumours of a widescreen iBook proved to be incorrect at this time, Apple did release new iBooks, following the same strategy used for the current Powerbook line-up (ie. provide them with a rich feature-set). All the iBooks now feature 512MB PC2700 DDR memory as standard (which can be upgraded to 1.5GB), ATI Mobility Radeon 9550 graphics with 32MB of dedicated DDR memory, and built-in Airport Express and Bluetooth 2.0 wireless connectivity. The new iBooks also feature the scrolling trackpad and Sudden Motion Sensor.

There are now two standard iBook configurations available, starting with a 12-inch screen model for £699 that features a 1.33GHz G4 processor with a 133MHz system buss, a 40GB 4200RPM ATA hard drive, a Combo drive and the usual iBook interfaces: a 56k modem, 10/100 Ethernet, Firewire 400, two USB 2.0 ports, a video output and a headphone jack. The 14.1-inch model for £899 offers a 1.42GHz G4 processor, a 60GB 4200RPM ATA hard drive and an 8x Superdrive. In terms of pricing, these new iBooks are pretty good value for money, especially when you think back to the cost of iBooks a couple of years ago in the G3 era. Then again, Apple do now have to compete against aggressive pricing in the consumer and education markets from PC companies such as HP and Dell.

Those seeking a portable Mac for music and audio might be better off saving the pennies (or cents) for a 12-inch Powerbook. While the price difference between the 12-inch iBook and Powerbook is significant (over £300) for a few improvements that may seem minor, they are actually important improvements: a 167MHz system buss instead of 133MHz, a 1.5GHz processor over a 1.33GHz one, and a 5400RPM internal hard drive instead of a 4200RPM model. As I've mentioned before in Apple Notes, for me the 14.1-inch iBook doesn't really appeal because the screen offers the same resolution as the 12-inch (1024x768).

In addition to updating the iBook, Apple also revised the Mac Mini line-up on the same day, and there are now three models, all featuring 512MB memory as standard (the lack of this was a criticism when *SOS* reviewed the original Mac Mini in the May 2005 issue). They cost £359, £429 and £499 respectively. The upper two models feature built-in Airport Express and Bluetooth 2.0 as standard, and the top-end model offers a Superdrive instead of the Combo model included in the rest of the range. SOS

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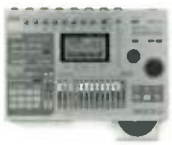

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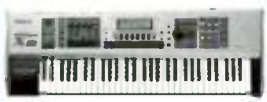

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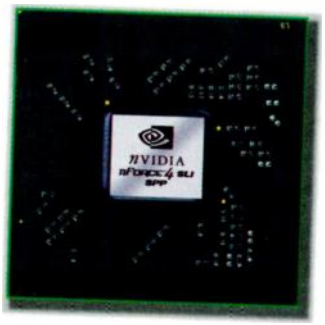
pc notes

The PCI Express peripheral standard is generally good news for musicians, but some audio problems related to this faster interface and certain motherboard chip sets are emerging. We examine the issues.

Martin Walker



Until recently the flagship chip set for AMD owners, Nvidia's nForce4 is now available in the Intel version shown here, but has unfortunately been at the centre of some problems for musicians owning PCI soundcards.

When I first started using PCs in 1991, most motherboards featured ISA (Industry Standard Architecture) expansion slots. Later on, when the industry introduced the more advanced PCI (Peripheral Component Interconnect) variety, there was a transition period of several years, during which new motherboards provided several of each type of slot, so that users could continue to use their existing ISA peripherals. Eventually, nearly all motherboards abandoned ISA slots altogether, in favour of new models featuring anything up to six PCI slots. This was excellent news for musicians, who could install multiple soundcards and audio DSP cards to provide them with all the facilities they needed.

The new one-inch-long PCI Express x1 expansion slots found in many of the latest motherboards use a high-speed serial buss and provide double the bandwidth of the current PCI slots, while multiple 'lanes' are used to further boost performance of the PCI Express x16 graphics slot, giving it a 4GB/second bandwidth. The vast majority of motherboards that feature this new technology also provide a couple of standard PCI slots for the user's existing devices. The transition period before PCI slots die out on new motherboards could be several years, although this time around it might be shorter, as there are already so many USB and Firewire alternatives to most PCI peripherals.

PCI Express Audio Issues

The transition I've just referred to, however, is being made a lot more troublesome for many musicians because of problems they've encountered with running their PCI soundcards in the 'legacy' slots of some of the first-generation PCI Express motherboards. Although no-one seems entirely sure yet, the audio problems seem to be connected with the x16 high-power graphics capability of PCI Express-equipped motherboards, and are particularly prevalent with Nvidia's nForce4 (NF4) chip sets.

Unveiled in October 2004, the nForce4 chip set initially supported AMD's Athlon 64, 64 FX and Sempron processors and gave them PCI Express features like those of Intel's 915/925 chip set for the Pentium range, as well as the SLI (Scalable Link Interface) feature that allows those with heavy graphic requirements to share the load between two graphics cards. Nvidia subsequently released versions of this NF4 chip set to support AMD's Opteron processor and, most recently, Intel's processor ranges. It is now being widely used, by many motherboard manufacturers; indeed, the nForce4 SLI is currently seen as the flagship chip set for Socket 393 Athlon 64 processors.

However, tests on various PCs featuring this chip set have shown processor overhead that was larger than expected when the PC was running lots of plug-ins, as well as audio glitches unless the interface buffer size (and hence latency) is increased. Some users have reported having to increase buffer size as high as 2048 samples with an NF4 chip set, compared with 128 or 256 samples on a roughly equivalent PC featuring Nvidia's previous NF3 chipset. Although the vast majority of the problems reported by musicians relate to PCI soundcards plugged into the legacy PCI slots on PCI Express-equipped motherboards, RME have reported similar issues with their Fireface 800 interface, so other Firewire interfaces may be affected as well.

The problem isn't confined to a single application, either, but has been reported by musicians running *Cubase SX*, *Nuendo* and *Sonar*, amongst others, and it doesn't seem to be inherent in the NF4 chip set itself, since some motherboards featuring it (such as Tyan's expensive dual-processor S2895 model) seem to be immune, and PCI Express motherboards featuring Via chip sets also seem to be causing similar problems.

Many users suspect that the high-performance 16x graphics card often associated with such systems are somehow hogging the buss, and this hypothesis seems to be confirmed by the

Apple Intel Macs

This month, I'd like to officially welcome Mac owners to the PC Notes column, since they will now have even more reason to be interested in its contents. By this time next year, Apple will be selling Macs built around an Intel Pentium processor rather than the Power PC processors of the past. This is partly because they still haven't been able to launch the 3GHz G5 Mac promised two years ago, and also because cooling problems have prevented them from releasing a G5 laptop whose performance rivals that of Intel's popular and powerful Centrino models.

Apple have revealed that every release of Mac OS X over the last five years has been secretly compiled for Intel processors as well as for Power PC (see the Apple Notes column in the last issue of *SOS*), and that these new Intel-based models will be able to run Windows as well as Mac OS X, although they don't plan to let anyone run their operating system on other Intel-based computers. A Developer Transition Kit consisting of an Intel 3.6GHz Pentium 4 660 computer running OS 10.4.1 for Intel is already available, so that Mac-based developers can get up to speed in re-compiling their code to run on the new machines, and this doesn't seem to be causing them many problems.

For years there have been Mac evangelists who have poured scorn on all PC hardware, so (perhaps unsurprisingly) there's been an outcry from some Mac users about this corporate move, as well as much merriment from some PC users. I've personally worked on so many different personal computing platforms over the years (ZX81, Commodore 64, Atari 400/800 and ST, Amiga, PC) that it doesn't really matter to me what I use, as long as it's reliable when I want to make music (and my PCs nearly always are). I know Mark Wherry owns both Macs and PCs, so his views are likely to be balanced as well, but I'm sure he'll have plenty more to say about this move in the Apple Notes column. However, once the fuss has died down on both sides I sincerely hope that all musicians will forget their previous Mac/PC arguments and just get on with making music.

fact that replacing such a card with a less powerful model such as Nvidia's 6200 or ATI's Radeon X300 will reduce the problem. In truth, most musicians rarely need such high levels of video performance, and the slower cards also tend not to require noisy cooling fans.

Motherboard Advice

My advice is to be extremely cautious if you're about to buy a new PC that features PCI Express slots, particularly if it uses Nvidia's nForce4 chip set, and especially if you have several PCI cards that you want to use in its legacy expansion slots. Those who already push the limits of PCI bandwidth, such as musicians with multiple Powercore or UAD1 DSP cards should be particularly wary.

The general consensus of opinion at the moment seems to be that musicians thinking of buying an AMD-based motherboard should probably forego PCI Express altogether and stick with the tried and tested nForce3 chip set and a Socket 939 processor. You needn't be unduly concerned about buying into an evolutionary dead-end, as many of these motherboards should accept more powerful dual-core versions of their processors in due course.

Judging by reports so far, musicians intending to buy or build an Intel-based PC with PCI Express slots may experience fewer problems, but should still specify the lowest-powered graphics card they can find to go with it. Such problems aren't confined to desktop PCs, either — even the latest Centrino laptops feature a PCI Express graphics interface, although the dedicated graphics interface fitted to most of them tends to be less powerful and therefore less likely to cause audio problems. For what it's worth, I didn't come across this issue with the Philip Rees PC I reviewed in *SOS* January 2005, which used an Asus P5GD2 Premium motherboard, Nvidia's 5300 graphics card and an Emu 1212M PCI soundcard.

The current issues might turn out to be curable via individual graphics-card driver updates — we just don't know yet. If, on the other hand, they're confirmed as a hardware design issue on certain motherboards, there's little musicians can do except take the drastic step of replacing them. Some musicians are hoping that it's a 'first generation' PCI Express design glitch that will disappear as motherboard manufacturers release new models, and are therefore biding their time before buying a new PC. Other musicians are expecting the situation with PCI Express to get worse before it gets better, and some who were about to upgrade anyway are buying or building new PCs featuring PCI slots only, before motherboards featuring them become scarce. Others have already abandoned PCI audio interfaces in favour of Firewire-based alternatives (although, as mentioned earlier, this still may not guarantee perfect results with PCI Express-equipped motherboards). Others are patiently waiting for PCI Express soundcards to appear and (we hope) bypass the problems.

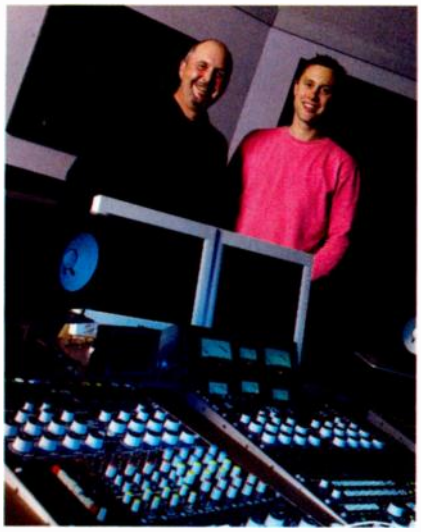
Current PCI Express motherboards, such as the Asus P5GD2 shown here, provide three PCI Express x1 slots, one PCI Express x16 and two legacy PCI slots, but in a year's time PCI support might be dropped altogether from new designs.

PC Snippets

- Rightmark's *Audio Analyser* is now up to version 5.5 and adds a spectrum analyser function to its suite of tests, so users can load in any WAV file for closer study. There's also an intriguing new radio button, marked ASIO, in the Test Options, alongside the existing ones for MME and Direct Sound, but unfortunately it's permanently greyed-out and non-functional. However, Maxim Liadov of Rightmark says that ASIO support will be in the next release of the software, expected this summer. The *Audio Analyser* is still a free download, from http://audio.rightmark.org.
- There are new driver and *Patchmix DSP* mixer versions out for the Emu (www.emu.com) soundcard range. Top of the list of enhancements for the version 1.8 drivers is improved ASIO/WDM performance during bursts of activity on the PCI buss. PCI latency values are now set automatically for improved performance, and Emu cards now use the PCI buss more efficiently, all of which should please anyone who has previously had audio drop-out problems when trying to run Powercore or UAD1 DSP cards alongside, or with certain graphics cards. The ASIO drivers now recover if an ASIO application crashes (previously you had to reboot your PC), and various bugs have also been fixed, but there's still no multi-channel WDM driver. The version 1.71 *Patchmix DSP* update simply adds 192kHz support to the 0404 soundcard.
- Tascam have released a free *Gigastudio* version 3.10 update for their users (www.tascamgiga.com), offering lots of new features, including MIDI templates for controlling tremolo, mono staccato and legato playing styles. The legato mode also incorporates clever formant pitch-shifting for its portamento, and the new Dynamic Expression Filter allows you to morph between different velocity layers in real time. You can now switch between Stack Instruments in real time, name them, and remap samples to different notes. Presets can be loaded/saved for the EQ and Dynamics sections, and *Gigapulse* has a new Import Wave option, to allow custom presets to be created more easily.

PCI Express Soundcards?

Unfortunately, audio interface manufacturers seem to have, so far, collectively ignored PCI Express, in favour of Firewire and USB 1.1 and 2.0, with some still releasing new PCI-based cards, particularly at the budget end of the market. This is, perhaps, understandable: PCI is now a very mature and well understood technology, and there's also no denying the attractiveness of Firewire and USB interfaces that don't require you to open up your PC to install them. In addition, the number of musicians with PCI Express slots in their PCs (at the moment) must be relatively small. However, unlike PCI, PCI Express specifically supports time-dependent data transfers that are designed to guarantee that data arrives at its intended destination on time, which is ideal for real-time processes such as video and audio streaming. With this in mind, audio interface manufacturers ought to be falling over themselves to support PCI Express. I also suspect that some manufacturers must be secretly working on new PCI Express products, and if I can persuade some of them to reveal more I'll let you know. SOS



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At this point a small voice in the back of your head will probably tell you it's time to have your album mastered. This can be an unsettling prospect — you know it's probably not something to do yourself, but you're not sure about letting somebody else loose on your tracks, and it's really expensive, right? This is where Emasters can help you.

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questions

Which of these artists is not listed above as having been a client of Kevin and Streaky?
- a. Groove Armada ☐
- b. Duran Duran ☐
- c. Pink Floyd ☐
- d. Fatboy Slim ☐

How much shared mastering experience do Kevin and Streaky have between them?
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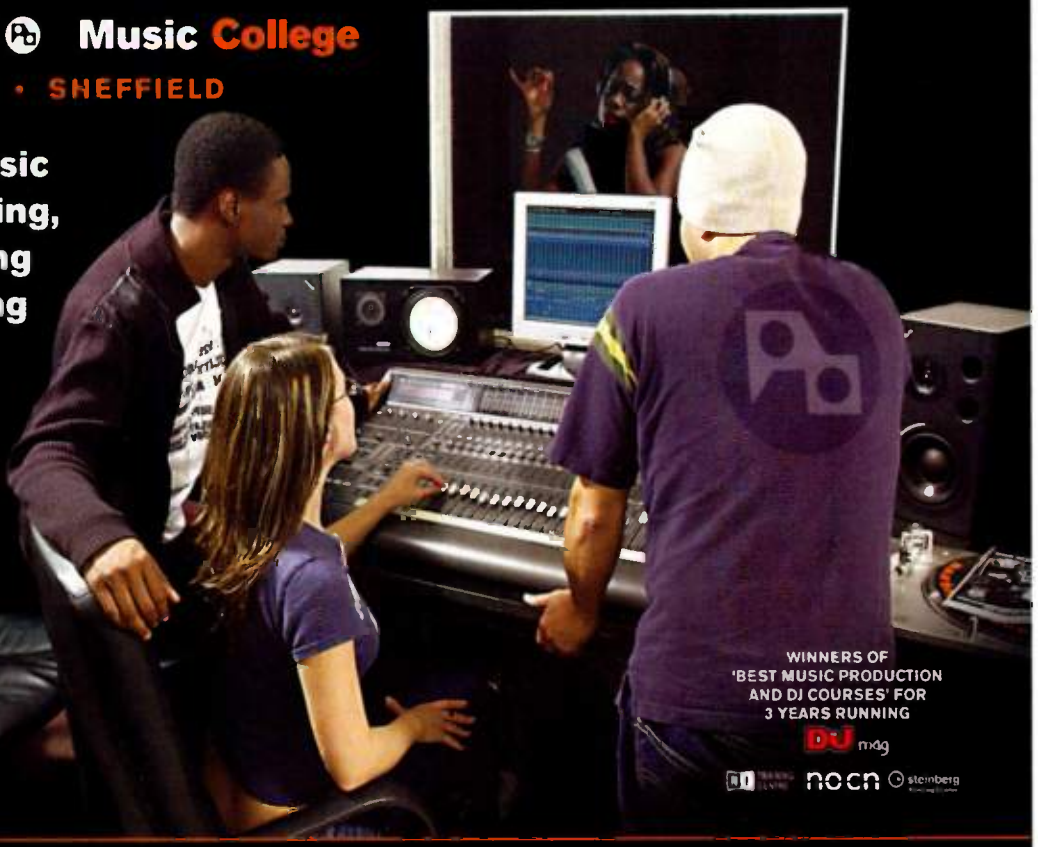

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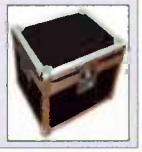

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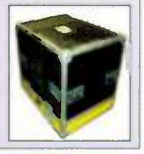

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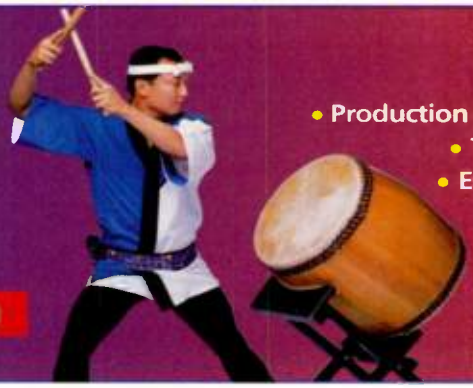

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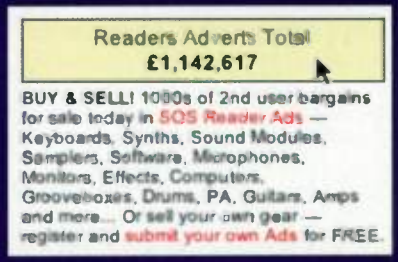

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YAMAHA RM50 drum module, eight outputs, eight triggers, RAM memory card, 808 and 909 samples, resonant filters, good condition, manual, offers. ☎ 020 7350 2642 (London).

samplers

AKAI MPC2000, good condition, includes manual, will arrange delivery, £350. ☎ Ben 07773 358664 (Preston, Lancashire).

AKAI S2000 32MB RAM, 10 outs, 32 note polyphony, 16 bit sampler, in A1 condition, £120. ☎ Scott 07793 038043 (Northampton).

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KORG ELECTRIBE MX, the blue one, still in box with everything it came with, a super bit of kit, buyer collects, no mailing, £325 ☎ 01621 817907 (Colchester, Essex).

ROLAND CSQ600 CV/gate sequencer, in excellent condition, four memories, DIN sync, £50. ☎ Rob 01403 272098 (Horsham, West Sussex).

computers/software

APPLE 21-INCH STUDIO DISPLAY (Blue), excellent condition, studio use only, it comes with four port USB hub, too big for me, £190. ☎ 07973 633348 (London).

APPLE G4 Powermac Quicksilver 800MHz, two 40GB HDs, 512MB RAM, OSX 10.3.7, original discs with Pro keyboard and mouse, £300. ☎ 07940 084885 (London).

CARILLON AC1 P4 2.4GHz, 512MB RAM, 80GB HD, Windows XP, 19-inch monitor, loads of software, ultra quiet, used in a smoke-free home set-up, original box, contact for full spec, £475 ☎ 01702 719419 (Leigh-on-Sea, Essex).

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miscellaneous

BEN DUNCAN Power Conditioner, 500VA, transformer based, professional spec, protect your gear and clarify your sound, £480 in the shops, will accept £350. ☎ Nik 01522 526419 (Lincoln).

B-TECH BT26 phono/microphone pre-amplifier with power supply, £15 including UK postage. Philips CDR870 CD recorder, boxed with manual, £85 including UK postage. ☎ 01422 833508 (Sowerby Bridge).

COMPLETE DIGITAL STUDIO for sale, includes Carillion computer, Yamaha AW4416, Emu Proteus, Alesis Midverb, Behringer PX2000, and much more, must be seen. ☎ 01252 870203 (Camberly, Surrey).

wanted

IOMEGA 1GB JAZ DRIVE, looking for an external Jaz Drive (SCSI, 1GB). ☎ 07792 033571 konradko@postmaster.co.uk (London).

ROLAND VS8F3, please call with details, ta. ☎ 01202 624053 (Poole, Dorset).

ROLAND XP50 KEYBOARD in good condition, will pay up to £350. ☎ Mrk 0118 9477644 (Caversham).

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Errors & omissions excepted

Have sample-library makers completely lost the plot?

Hilgrove Kenrick

I remember, way back in the mists of time, being horrified to find I'd filled the 2MB hard drive on my Amstrad 1640. That was it — I had to upgrade, and my new beige doorstop had a whole 10MB of hard disk space! Now I find myself surrounded by black boxes (black is the new beige, you know), each with two 500GB RAID arrays. All well and good, but now, instead of feeding in a stack of 5.25-inch floppies, I'm stuffing the things with DVDs.

Welcome to the wonderful world of software sampling! Friends who survive on their mundane nine-to-five jobs and go home via the pub every night can't understand the attraction of slaving away into the early hours, endlessly inserting these infernal discs without at least taking out shares in a hard drive manufacturer — after all, I seem to be buying them like they're going out of fashion. The prize for the lengthiest cyclical injection is the Vienna Symphonic Library's *Pro Edition* — 360 Gigabytes of data, all compressed onto no less than 16 DVDs! And don't forget that once you've copied the data on to the hard drive, it then has to chunter along forever as it uncompresses the individual files from their archives. The final straw is when you go all the way through an installation only to find the library doesn't quite meet your expectations. Cue profanity and much gnashing of teeth.

But even assuming you like the library, what happens when you want to use it on more than one machine? You have to go through the palaver of installation all over again: eject, insert DVD, close, wait for PC to notice anything has happened, walk away, and maybe, just for kicks, paint something so you can watch it dry.

Some libraries, Native Instruments' for example, allow you to just re-install the front end, not the sounds — a brilliant solution when, if you're paranoid like me, you have the entire library backed up elsewhere. All you have to do is fly it across a network, and then point the plug-in to the relevant folder. Others won't let you, and worse, don't even come on a DVD, so you're stuffing in CDs until kingdom come. Vienna Symphonic Library seem to have come up with a good solution with their *Symphonic Cube* — the whole lot is shipped *pre-installed* on hard drives. Hooray! At least until one of the hard drives falls over...

But all of this is just the tip of the iceberg if you're a user of modern sample libraries. The real problem is licensing. Once you've bought the library, decided you like it, and installed it, you may not be able to use it. At least, not for what you had in mind.

Even back in the days when you could only sample a couple of seconds, you had to watch out for copyright — as dear old Vanilla Ice discovered when he blatantly sampled one of the biggest bands on the planet and hoped no one would notice! With sample libraries, you have to go through the licence, an impenetrable document informing you what you can and can't do with the sounds, and where. This is especially critical when your intended use is music for picture. One of my favourite libraries states (somewhere amongst all the licensing Wafflespeak) that I may not use it for 'Motion Picture Advertising in the USA', or library music for the same purpose — unless I happen to use it for scoring the whole film, and my music is then used in the trailers. Apparently, that's different, although helpfully, it neglects to explain exactly how.

To summarise; firstly we have to wait until our (remaining) hair goes grey while feeding our beige (or black) boxes with these libraries, then we may or may not find that they're not quite what we thought. Finally, after wading through the rainforest's worth of legal mumbo-jumbo that accompanies the discs, you may discover that you have to be very careful when and where you use them, unless you had them down as shiny (but curiously expensive) coffee coasters. It would seem that when I'm deep in the middle of a commission, I'm supposed to stop and think, 'now, am I allowed to use this sound or not?' It's not exactly conducive to a swift and uninterrupted workflow.

So, come on, library-makers — sort it out, will you? We can't live without you, and you can't live without us — surely there has to be an easier way? SOS

About The Author

At various times of day, Hilgrove Kenrick is a media composer, pro-audio writer, fast-car thrill-seeker, wife's dogsbody and *bon vivante*. The rest of the time he just changes nappies.

If you would like to air your views in this column, please send your submissions to soundingoff@soundonsound.com or to the postal address listed in the front of the magazine.

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