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Nuendo 2

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Apple G5:
Five-page report inside

Preparing your album for pressing

Hyper-editing in *Logic*

Remote-controlling your PC

EMES Black Monitors ■ Marillion Using your fanbase to fund albums ■ London Elektricity Producing drum & bass
■ Samson C Series Monitoring & processing ■ SE Electronics £79 condenser mic! ■ Rinse Recreating samples
Millennium Laptop music PC ■ RME AD18 DS 24/96 converter ■ Sequencer workshops ■ Apple & PC News

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Introducing the 828mkII

24-bit 96kHz resolution. DSP-driven mixing and monitoring.
Front-panel programming. Stand-alone operation.



828mkII feature highlights

- **CueMix DSP™** — the 828mkII delivers DSP-driven digital mixing and monitoring for all 20 inputs. Connect mics, guitars, synths and effects processors, and monitor everything from the 828mkII's main outs, headphone out or any other outputs with no separate mixer needed.
- **Front-panel control** — access your entire mix, or any 828mkII setting, directly from the front panel.
- **Stand-alone operation** — program your mixes at the studio and then bring the 828mkII to your gig — no computer needed. Need to tweak the mix? Do it on site using the back-lit LCD and front-panel controls.
- **Multiple CueMix DSP mixes** — create different monitor mixes for the main outs and headphones. Add send/return loops for outboard gear — with no latency.
- **Front-panel mic inputs** — connect a pair of mics or any TRS input with front-panel convenience.
- **Mic/guitar/instrument sends** — insert your favorite outboard EQ, compressor, amp or effects processor to the two mic/guitar inputs, before the signal goes digital.
- **20 inputs / 22 outputs** — there's no channel sharing in the 828mkII; the mic inputs, SPDIF I/O, headphone out and main outs are all handled as separate channels.
- **Support for 96kHz ADAT optical digital I/O (S/MUX)** — provides 4 channels at 88.2 or 96 kHz.
- **Sample-accurate MIDI** — connect a MIDI controller and/or sound module with no separate interface needed. MIDI I/O is sample-accurate with supporting software.

Basic features

- **Expandable 24-bit 96kHz audio interface** for Macintosh and Windows with 20 channels of input and 22 channels of output (simultaneously).
- **2 mic/guitar inputs** with phantom power and sends.
- **8 TRS analog inputs** with switchable input levels.
- **8 TRS +4dB analog outputs** — perfect for surround.
- **Separate TRS main outs and front-panel headphone jack**, each with independent volume control.
- **8 channels of 24-bit ADAT optical input/output** with sample-accurate ADAT SYNC.
- **MIDI I/O** — no separate MIDI interface needed.
- **24-bit S/PDIF digital input/output** up to 96 kHz.
- **Sync** — word clock in and out; built-in SMPTE (LTC) in and out; sample-accurate ADAT sync input.
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- **Includes AudioDesk®** sample-accurate workstation software for Mac OS with 24-bit recording/editing and 32-bit automated mixing/processing/mastering.



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TSC has Mac audio solutions featuring the entire Mac line up from the portable Titanium G4 PowerBooks through to iMacs, eMacs, iBooks and mega-powerful Dual Processor G4 desktops. Featured here are just two of the packages available. Call TSC now for other solutions.



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- 1) PowerMac G4 1.25GHz 256MB RAM, 80GB Drive, DVD/CD-RW Combo
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 - 3) plus Atto Ultra 3 SCSI card
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tsc pro audio seminar

IN-DEPTH COVERAGE OF EMAGIC LOGIC PLATINUM AND PRO TOOLS LE 6

Seminar presented by Panic Studios' professional music tutor Mark Roberts with credits including Massive Attack, Neneh cherry and DJ Rap.

The 3 hour event will be at:

Venue: TSC Studio, 1 Amalgamated Drive Brentford TW8 9EZ

Date: 23rd September, starting at 11.00am

Refreshments included

To register: Call: 020 8400 1222 or email: info@gotsc.com



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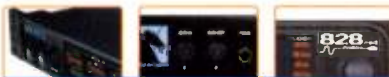


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PORTABLE USB-BASED PRO TOOLS LE MICRO SYSTEM WITH FOCUSRITE MIC PREAMPS

Mbox, Pro Tools LE-based portable micro studio, offers novices and pros alike command of any project and full session compatibility with other Pro Tools systems, from Digi 001 to Pro ToolsHD. In addition, Mbox features a Pro Tools LE-based interface inspired by the same award-winning software used by professionals worldwide. With its spectrum of features, Mbox works hand in hand with your creativity to bring your ideas to life. **£339 ex Vat**

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Emagic Gold production kit	£419	£492.33
Emagic Logic 6	£299	£351.33
Emagic Platinum 6	£450	£528.75
Propellorheads Reason	£215	£252.63
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Cracking Under Pressure?

A couple of times in the past few years, most recently in January 2002, I've written a Leader column on the contentious subject of software piracy and suggested that if it continued in its rampant form, some of the software companies we've come to rely on would go out of business. Fortunately, most of the big names are still with us, but I'm sure that losses in revenue due to piracy are at least partly responsible for some of those big names being bought by multinational software houses or computer manufacturers, often for a fraction of their perceived worth. Hardly a month goes by without news of another takeover or more redundancies at a music-software company, but what's the answer? After all, no dongle or install code is foolproof.

Appealing to the software user's better nature rarely seems to work — the appeal of getting something for nothing would appear to be stronger. Furthermore, some people actually believe they have an intrinsic right to copy any form of data, often excusing their actions by saying that the software isn't that good anyway and that it's overpriced. After all, pretty much any IT student could write a sequencer package in a few weekends — couldn't they? In fact it may surprise many to learn that a major software package such as Emagic's *Logic* or Steinberg's *Cubase* can take up to 20 man-years to write, so being robbed of the returns on this huge investment by piracy has very serious consequences for the software manufacturers.

Finding a solution to this problem may shape the future of the recording market, because if a piece of software can't be copy-protected, the only way forward is to start making hybrid products that have both software and hardware

components. For example, soft synths may be replaced by inexpensive DSP devices that hang on the end of a Firewire cable, but with a user interface that still resembles a plug-in. Roland, TC Electronic and Creamware have already taken steps in this direction, but what I'm envisioning are hardware components no bigger than a games console cartridge, but without which the product can't work. In other words, the hardware functions as both a dongle and as a vital signal-processing component of the system. Whether these devices are strung out on cables like fairy lights or slotted into some kind of expansion box remains to be seen, but I honestly can't envisage any other solution that can guarantee an end to piracy.

Of course these anti-piracy measures could also benefit the user, as adding external processing capacity means less load on the host CPU, and in the case of virtual instruments, specialist chips could be used to provide features that may be completely impractical to implement on even the next generation of host-powered systems. It would also allow the traditional hardware instrument manufacturers to develop products for the sequencer market safe in the knowledge that the performance of their creations will not be limited by the architecture or available power of the host system. They might also be willing to invest time and money to create more sophisticated instruments once the risk of piracy has been eliminated. After all, until piracy is removed from the equation, why should the Rolands and Yamahas of this world risk losing hardware instrument sales by designing plug-in versions of their flagship products that can be copied by any hacker with a weekend to spare? Would you?

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further. The Video Thumbnail Track and video playback via FireWire open new creative possibilities for sound to picture projects. The Marquee Tool, Time Stretching and Sample-Accurate Display make composing music and editing audio directly in the Arrange window more convenient. Not only that, but the Project Manager adds a whole new dimension of efficiency when working with multiple clients. Jump out of your seat and check out Logic Platinum 6 for Mac OS X today.



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Roland unveil sampling workstation in the UK

Roland and Boss had some new products to announce at Birmingham's British Music Fair. Roland's latest offering, the MV8000 Production Studio, is aimed at the dance-oriented studio musician, and looks like an attempt to muscle in on the territory occupied by Akai's well-regarded MPC sampling workstations and Yamaha's RS7000. The MV8000 combines elements of the groovebox, sampler and audio/MIDI sequencer in a self-contained unit with CD-RW and 3.5-inch floppy disk drives and an internal 40GB hard disk. It allows users to sample their own audio or import samples in a variety of formats, including AIFF, WAV, ACID and Akai MPC2000/4000. Indeed, MPC users will notice the MV8000's 16 velocity- and aftertouch-sensitive pads which take pride of place alongside the large green LCD screen and array of sliders, knobs and function buttons. The sequencer can handle up to 128 MIDI tracks and eight stereo audio tracks, which can be used for linear recording as well as sampling. There are four dedicated effects engines and the built-in effects include a 24-bit reverb and other COSM effects such as filters, delays, a vocoder, and a selection of vintage-effects emulations such as Roland's RE201 tape echo. There are balanced analogue inputs and outputs, a dedicated phono input, optical and co-axial S/PDIF outputs, MIDI inputs and outputs, and a USB port, allowing data on the MV8000 internal hard disk to be backed up on a computer. The optional MV8-OP1 expansion board adds a further six analogue outputs, optical and co-axial S/PDIF inputs and an R-BUS port, allowing up to eight channels of digital audio to be transferred to and from Roland's VS-series workstations. A further expansion board, supporting an external VGA monitor and mouse, is planned for next year. The MV8000 should be available from September, priced at £1799.



The GS10 from Boss is a tabletop guitar and bass effects box that also features a USB audio interface. The GS10 features the same COSM guitar effects found in the Boss GT6, plus a range of new guitar and bass amp models. Each effects section (Preamp/Speaker, Compressor, Overdrive/Distortion, Delay, Chorus, Reverb and two special effects) has its own dedicated rotary knobs on the front panel, as well as a value dial for further preset tweaking. The unit also features built-in speakers for musicians on the move, though you'll need a power point to plug in the external AC adaptor. In addition to an output to feed a guitar or bass amp, the GS10 is equipped with stereo RCA line and co-axial digital outputs, MIDI In and Out, XLR and TRS balanced mic inputs and a USB interface which can send and receive MIDI and 24-bit audio. GS10 effect settings can be edited remotely using the bundled editor software for Windows 98, ME, 2000 and XP and Mac OS 8.6 and 9.x. The Boss GS10 costs £399 and will be available later in the year.

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W www.roland.co.jp

Arbiter announce virtual studio tour

Next month, Arbiter Group's Music Technology division will be embarking on a nationwide tour to showcase the latest music production software from Steinberg, Native Instruments, New Sampling Generation, Celemony and Arturia. The 16-date tour begins on the 18th of September at Point Blank Music Production College in London. Each date will involve a presentation lasting approximately two hours, and there will also be the opportunity to put your questions and suggestions to the experts in attendance. Products covered will include the latest versions of Steinberg's *Cubase SX/SL*, *Groove Agent*, *Xphrase* and *Halion 2*, plus their VST System Link, Native Instruments' *Reaktor 4*, *Kompakt* and *Absynth 2* and Arturia's *Moog Modular V*. The new features in Celemony's *Melodyne 2*, which include Rewire, VST and Audio Units support, will also be discussed. The New Sampling Generation range of sample-based virtual instruments from Native Instruments, Eastwest and Zero-G will also be featured. You'll be able to check out Evolution's range of MIDI controllers and keyboards, and audio interfaces from Echo, which will be performing demonstration duties. Tour dates are as follows:

- 18th September — London
- 30th September — London.
- 1st October — Canterbury.
- 2nd October — Bedford.
- 6th October — Southend.
- 8th October — Bristol.
- 9th October — Plymouth.
- 13th October — Derby.
- 14th October — Nottingham.
- 15th October — Birmingham.
- 16th October — Coventry.
- 21st October — Leeds.
- 22nd October — Liverpool.
- 23rd October — Manchester.
- 27th October — Edinburgh.
- 28th October — Glasgow.

Look out for further details next month or visit www.steinberguk.com for more information.

W www.arbitermt.co.uk

Pro Tools courses get underway at Gateway

Gateway School of Recording, who recently became a Digidesign Certified Training Location, have launched their Digidesign Training and Education programme with the Pro Tools 101 course, with more advanced Pro Tools 201 and 210 courses to follow. Each student on the course is provided with their own networked Powerbook G4 and Digi M Box setup running Pro Tools 6 under OS X. The courses are being run in conjunction with Wandsworth City Learning Centre, with the next scheduled for early September.

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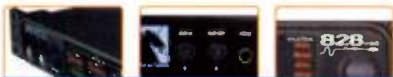


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Appealing to the software user's better nature rarely seems to work — the appeal of getting something for nothing would appear to be stronger. Furthermore, some people actually believe they have an intrinsic right to copy any form of data, often excusing their actions by saying that the software isn't that good anyway and that it's overpriced. After all, pretty much any IT student could write a sequencer package in a few weekends — couldn't they? In fact it may surprise many to learn that a major software package such as Emagic's *Logic* or Steinberg's *Cubase* can take up to 20 man-years to write, so being robbed of the returns on this huge investment by piracy has very serious consequences for the software manufacturers.

Finding a solution to this problem may shape the future of the recording market, because if a piece of software can't be copy-protected, the only way forward is to start making hybrid products that have both software and hardware

components. For example, soft synths may be replaced by inexpensive DSP devices that hang on the end of a Firewire cable, but with a user interface that still resembles a plug-in. Roland, TC Electronic and Creamware have already taken steps in this direction, but what I'm envisioning are hardware components no bigger than a games console cartridge, but without which the product can't work. In other words, the hardware functions as both a dongle and as a vital signal-processing component of the system. Whether these devices are strung out on cables like fairy lights or slotted into some kind of expansion box remains to be seen, but I honestly can't envisage any other solution that can guarantee an end to piracy.

Of course these anti-piracy measures could also benefit the user, as adding external processing capacity means less load on the host CPU, and in the case of virtual instruments, specialist chips could be used to provide features that may be completely impractical to implement on even the next generation of host-powered systems. It would also allow the traditional hardware instrument manufacturers to develop products for the sequencer market safe in the knowledge that the performance of their creations will not be limited by the architecture or available power of the host system. They might also be willing to invest time and money to create more sophisticated instruments once the risk of piracy has been eliminated. After all, until piracy is removed from the equation, why should the Rolands and Yamahas of this world risk losing hardware instrument sales by designing plug-in versions of their flagship products that can be copied by any hacker with a weekend to spare? Would you?

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Your studio problems solved by SOS staff and contributors.

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SOS reviewers often mention their test or reference CDs, which they use to evaluate converters, monitors, and so on. But how do you go about making one yourself? We reveal all...

126 Synth Secrets: Synthesizing Simple Flutes

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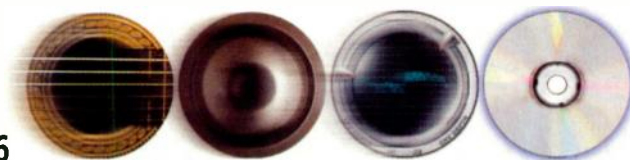
Continuing our examination of *Pro Tools*' Beat Detective tool, we look at extracting and using the tempo and timing of a recording.

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DP v4.1 is available, and it looks like MOTU can provide a viable alternative to *DP3* at last. Plus a look at VST plug-in support in *DP* under OS X...

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When a sample can't be cleared for use, Steve Gibson and Dave Walters of Rinse Productions specialise in recreating it to order.

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SOS reader Robbie Moore has built a studio entirely from salvaged materials.

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Apple surprised everyone with the new G5 Power Macs. In this five-page Apple Notes special, we consider their likely benefits for the Mac-based musician...



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Could your undesirably high MIDI latency in *Cubase SX* be the result of unwittingly using an 'emulated' driver?

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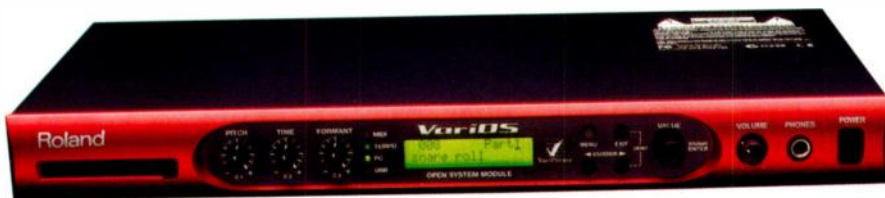
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Roland unveil sampling workstation in the UK

Roland and Boss had some new products to announce at Birmingham's British Music Fair. Roland's latest offering, the MV8000 Production Studio, is aimed at the dance-oriented studio musician, and looks like an attempt to muscle in on the territory occupied by Akai's well-regarded MPC sampling workstations and Yamaha's RS7000. The MV8000 combines elements of the groovebox, sampler and audio/MIDI sequencer in a self-contained unit with CD-RW and 3.5-inch floppy disk drives and an internal 40GB hard disk. It allows users to sample their own audio or import samples in a variety of formats, including AIFF, WAV, ACID and Akai MPC2000/4000. Indeed, MPC users will notice the MV8000's 16 velocity- and aftertouch-sensitive pads which take pride of place alongside the large green LCD screen and array of sliders, knobs and function buttons. The sequencer can handle up to 128 MIDI tracks and eight stereo audio tracks, which can be used for linear recording as well as sampling. There are four dedicated effects engines and the built-in effects include a 24-bit reverb and other COSM effects such as filters, delays, a vocoder, and a selection of vintage-effects emulations such as Roland's RE201 tape echo. There are balanced analogue inputs and outputs, a dedicated phono input, optical and co-axial S/PDIF outputs, MIDI inputs and outputs, and a USB port, allowing data on the MV8000 internal hard disk to be backed up on a computer. The optional MV8-OP1 expansion board adds a further six analogue outputs, optical and co-axial S/PDIF inputs and an R-BUS port, allowing up to eight channels of digital audio to be transferred to and from Roland's VS-series workstations. A further expansion board, supporting an external VGA monitor and mouse, is planned for next year. The MV8000 should be available from September, priced at £1799.



The GS10 from Boss is a tabletop guitar and bass effects box that also features a USB audio interface. The GS10 features the same COSM guitar effects found in the Boss GT6, plus a range of new guitar and bass amp models. Each effects section (Preamp/Speaker, Compressor, Overdrive/Distortion, Delay, Chorus, Reverb and two special effects) has its own dedicated rotary knobs on the front panel, as well as a value dial for further preset tweaking. The unit also features built-in speakers for musicians on the move, though you'll need a power point to plug in the external AC adaptor. In addition to an output to feed a guitar or bass amp, the GS10 is equipped with stereo RCA line and co-axial digital outputs, MIDI In and Out, XLR and TRS balanced mic inputs and a USB interface which can send and receive MIDI and 24-bit audio. GS10 effect settings can be edited remotely using the bundled editor software for Windows 98, ME, 2000 and XP and Mac OS 8.6 and 9.x. The Boss GS10 costs £399 and will be available later in the year.

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W www.roland.co.jp

Arbiter announce virtual studio tour

Next month, Arbiter Group's Music Technology division will be embarking on a nationwide tour to showcase the latest music production software from Steinberg, Native Instruments, New Sampling Generation, Celemony and Arturia. The 16-date tour begins on the 18th of September at Point Blank Music Production College in London. Each date will involve a presentation lasting approximately two hours, and there will also be the opportunity to put your questions and suggestions to the experts in attendance. Products covered will include the latest versions of Steinberg's *Cubase SX/SL*, *Groove Agent*, *Xphrase* and *Halion 2*, plus their VST System Link, Native Instruments' *Reaktor 4*, *Kompakt* and *Absynth 2* and Arturia's *Moog Modular V*. The new features in Celemony's *Melodyne 2*, which include Rewire, VST and Audio Units support, will also be discussed. The New Sampling Generation range of sample-based virtual instruments from Native Instruments, Eastwest and Zero-G will also be featured. You'll be able to check out Evolution's range of MIDI controllers and keyboards, and audio interfaces from Echo, which will be performing demonstration duties. Tour dates are as follows:

- 18th September — London
- 30th September — London.
- 1st October — Canterbury.
- 2nd October — Bedford.
- 6th October — Southend.
- 8th October — Bristol.
- 9th October — Plymouth.
- 13th October — Derby.
- 14th October — Nottingham.
- 15th October — Birmingham.
- 16th October — Coventry.
- 21st October — Leeds.
- 22nd October — Liverpool.
- 23rd October — Manchester.
- 27th October — Edinburgh.
- 28th October — Glasgow.

Look out for further details next month or visit www.steinberguk.com for more information.

W www.arbitertm.co.uk

Pro Tools courses get underway at Gateway

Gateway School of Recording, who recently became a Digidesign Certified Training Location, have launched their Digidesign Training and Education programme with the Pro Tools 101 course, with more advanced Pro Tools 201 and 210 courses to follow. Each student on the course is provided with their own networked Powerbook G4 and Digi M Box setup running Pro Tools 6 under OS X. The courses are being run in conjunction with Wandsworth City Learning Centre, with the next scheduled for early September.

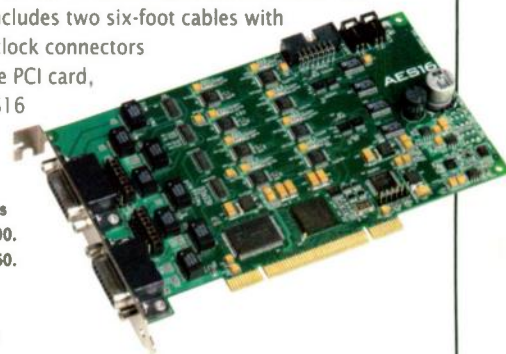
T Gateway +44 (0)20 8549 0014.
W www.gsr.org.uk

Lynx produce 16-channel, 24/192 digital audio card

The AES16 is a new 16-channel AES-EBU PCI card from Lynx Studio Technology. It provides eight stereo inputs and eight stereo outputs of 24-bit digital audio at sample rates up to 192kHz in both single-wire and dual-wire AES modes. With 32-channel onboard mixing, controlled by Mac and PC software included with the card, it's designed to let you use digital consoles, DAWs, or multi-channel A-D/D-A converters with your computer. Up to four AES16 cards can be installed on a single computer, and when combined with Lynx's LS-ADAT 16-channel ADAT LStream card, the pair can act as an AES-ADAT digital format converter. The AES16 incorporates Lynx's new proprietary Synchro Lock technology, allowing it to extract a clean clock signal from degraded signals affected by long cable runs, thus negating the

effects of jitter. The card is available now, in two forms. The AES16 XLR, which includes two six-foot cables with XLR and BNC word-clock connectors which connect to the PCI card, costs £722. The AES16 card alone costs £640.

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W www.lynxstudio.com



Novation's BassStation goes soft

Launched in 1993, the Novation BassStation introduced a new generation to the joys of modelled analogue synthesis and hands-on control. Now, following the release of *V-Station*, a virtual version of Novation's K-Station, the BassStation is getting the same treatment. *BassStation* is a software synth plug-in for Mac and PC in VST and Audio Units formats, featuring two oscillators with sawtooth and square waveforms and a low-pass filter that can be switched between 24 and 12dB virtual topologies to recreate the character of the original BassStation and the Roland TB303 respectively. There are 100 factory presets and 100 user program memories, and programs can be freely transferred between the hardware BassStation keyboard and rack and the *BassStation* plug-in. All the dedicated controls from the BassStation have been preserved in the graphical interface and some additional controls have been added, such as dedicated ADSR controls for the filter envelope as well as the amp envelope and individual pitch modulation and PWM controls for each oscillator. All of the on-screen knobs and switches can be controlled via MIDI. Each instance of *BassStation* is monophonic and the number of simultaneous instances is limited only by host processing power. Novation quote figures of over 50 instances on a 2.5GHz PC and 40 on a 1GHz G4 Mac. *BassStation* costs £99 and should be available from next month.

Novation have also announced the

Remote 25 Audio, which expands on the feature set of their Remote 25 USB MIDI controller keyboard reviewed in last month's SOS. The Remote Audio has more knobs, sliders and buttons, as well as the obvious difference — audio-interfacing capabilities. The two-octave, semi-weighted keyboard, X-Y touchpad and joystick are the same as on the Remote 25, but the Remote 25 Audio's controls total 56, with 28 buttons, 16 knobs, three rotary encoders and nine sliders, all laid out and labelled according to the features common to almost all software synths. With amp-envelope, modulation-envelope, oscillator and filter control sections, the idea is that you'll always know where to find specific controls for specific tasks, avoiding the need for front-panel overlays. The Remote 25 Audio ships with preset programs for controlling numerous popular software applications, including Steinberg *Cubase*, Emagic *Logic*, Propellerhead *Reason* and Native Instruments' range of plug-ins. It can store over 50 programs and its two-line LCD screen displays program names and

parameter values of the relevant controls. The keyboard controller's audio section features a pair of low-noise preamps with phantom power, boasting over 70dB of headroom, and 24-bit A-D converters. Audio input is via a pair of XLR and quarter-inch combi jacks and there's also a co-axial S/PDIF digital input. There are quarter-inch jack audio outputs plus a headphone output with independent volume control. Incoming audio can be monitored directly via headphones. Two onboard multi-effects processors can be applied to incoming audio following the preamp stage, with a choice of reverb, chorus/phaser, delay, compression, distortion and three-band EQ. Effects can be applied to the headphone mix while the incoming audio is recorded dry. The Remote 25 Audio also features two MIDI Out ports and one MIDI In, allowing it to act as a USB audio interface. Like the original Remote 25, it can be powered via the USB connection, by six AA batteries or via the included mains adaptor. Low-latency audio and MIDI ASIO drivers for Mac OS X and Windows XP are also included. The Novation Remote 25 Audio will be in the shops this Autumn, costing £549.

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CEDAR processors half price for the Summer

CEDAR Audio, market leaders in pro-audio restoration tools, have announced a special Summer promotion of their Series X and Series X+ rackmount processors. Until Thursday the 9th of October, the DCX Declicker, CRX Decrackler, DHX Dehisser, BRX+ Debuzzer and AZX+ Azimuth corrector are all available for half their normal price. Based on algorithms originally developed for CEDAR for Windows, the three Series X and two Series X+ units feature exceptionally simple controls for processing digital audio in real time with the minimum of effort. The 1U rackmount units feature 24-bit stereo inputs and outputs via AES-EBU and S/PDIF connectors, and internal 40-bit floating point technology throughout. Contact CEDAR for details.

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HHB goes up to Oxford

HHB Communications have recently been appointed exclusive UK distributors of Sony Oxford plug-ins. The plug-ins, which are based on the technology found in Sony's OXF R3 digital console, include *Oxford EQ*, *Dynamics* and *Infiator* and are available for Pro Tools MIX and HD systems and the TC Powercore card (though currently only *EQ* and *Infiator* are available for the latter).

HHB have also launched a new range of audio-optimised CD-Rs, developed and tested specifically for use with stand-alone CD recorders and duplicators. The range includes 74-minute, 80 minute, printable and bulk-packaged silver discs, rated 1x-24x, and gold discs, rated 1x-8x. HHB have highlighted the fact that high-speed CD-Rs designed for data may not operate correctly in some audio CD recorders and warn against using any CD-R with a specified speed rating greater than 24x for audio.

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Soundscape look to the future

Back in June, we brought you the news that Mackie were to cease distribution of the Soundscape product line, placing the DAW platform's long-term future in doubt. Since then, a consortium within the Belgian company Sydec, who originally developed the technology, have effected a management buyout, purchasing the Soundscape name and accompanying intellectual property, their premises and all existing stock. They have formed a new company, Sydec Audio Engineering, to continue development and production of the system's software and hardware. This looks like good news for Soundscape users everywhere, who continue to show strong support for the platform, particularly in the post-production and broadcast industries.

W www.soundscape-digital.com

New mic attempts a Luna landing

MAudio (formerly Midiman) have been present in the field of MIDI (and latterly audio) computer peripherals for nigh-on 15 years, but theirs is not the first name to spring to mind when you think of microphone manufacturers. But all that could change with the launch of the M Audio Luna large-diaphragm condenser mic. While the Luna's modest price (£169.99) puts it alongside the current glut of identikit Chinese-made condenser mics, its styling certainly sets it apart. The Luna, which is equipped with Class A FET electronics, a solid brass capsule and 1.1-inch gold-evaporated diaphragm, is available now.

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W www.m-audio.com



Three, two, won!

Another month goes by and another lucky *SOS* reader wakes to find a large, expensive-looking package on their doorstep. This month, we can announce that April's competition prize of a fully-loaded Zoom MRS1266CD digital multitracker, worth over £900 and kindly donated by Exclusive Distribution (+44 (0)1462 481148/www.exclusivedistribution.ltd.uk), was won by Spencer Ayres from Sheffield, pictured here with his prize. Spencer runs a mobile recording studio in his spare time and plans to use the Zoom to record live gigs. Turn to page 276 for the chance to win the complete *Symphonic Orchestra* sample collection from Eastwest/Quantum Leap in this month's competition.



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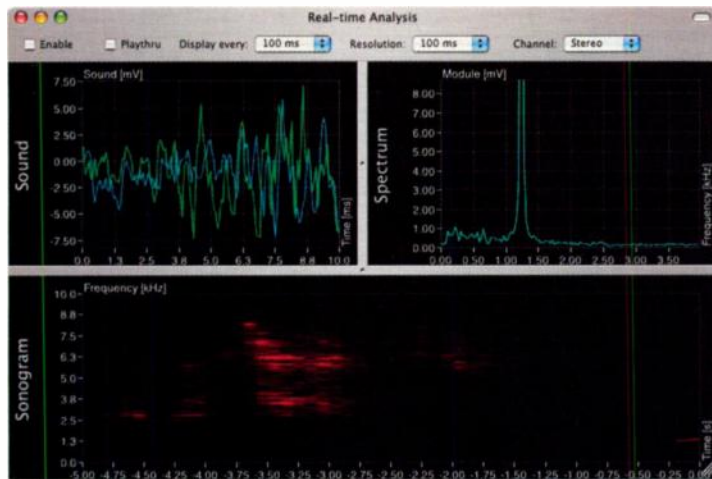
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Cost-effective audio analysis for OS X

Swiss software manufacturers Arizona have released version 1.0 of their new audio analyser for OS X, *AudioXplorer*. The stereo analyser software, which supports Audio Units plug-ins, features oscilloscope, spectrum analysis and sonogram windows, available simultaneously and in real time. *AudioXplorer* is free to download and will function unregistered with some features disabled. However, registration only costs a very reasonable \$15. Surf to the Arizona web site for more information.

W www.curvuspro.ch/audioxplorer



Shuttle Pro v2 cleared for takeoff

Contour Design's Shuttle Pro jog-wheel controller has been given a makeover. The Shuttle Pro has found favour with many audio and video editors, providing a freely programmable array of buttons and a jog/shuttle wheel for scrolling and timeline editing, in a compact, ergonomic package. The Shuttle Pro v2 features the same essential functionality and design but swaps the original's white for a black and silver colour scheme. It features 15 assignable buttons, and its jog wheel is constructed from a new alloy material. In addition, the Shuttle Pro's software interface has been rewritten from the ground up to offer enhanced functionality, including control of multiple devices and support of macros, via a simpler interface. While it can be programmed to control almost any application, the Shuttle Pro v2 ships with numerous presets for applications such as Emagic *Logic*, MOTU *Digital Performer* and Sonic Foundry *Acid*, as well as several leading video applications. The controller, which connects via USB, is compatible with Mac OS X and Windows 98 onwards. The Shuttle Pro v2 is available now, priced at £99.



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Kenton to develop wireless MIDI system

MIDI specialists Kenton Electronics have announced that they are currently working on a wireless MIDI transmission system. The system, as yet un-named, will consist of a small battery-powered transmitter which can be worn on a belt, with a MIDI input for connecting a keyboard or MIDI guitar, and a receiver unit with a MIDI Out. The system is mainly intended for players who use MIDI equipment for live performances, as it will offer greater freedom of movement than previously possible. The system will be able to transmit all MIDI data, including SysEx, MIDI Clock and MIDI timecode. Although the exact details of the system have yet to be finalised, Kenton say that they will probably produce two versions — one based on the Bluetooth wireless standard and another, cheaper version operating at a lower frequency.



Kenton also have two more new products on the way. The LD2 is a MIDI volume level display. It is primarily intended for synth and keyboard players who use a volume pedal and want an accurate level readout. The small unit, which connects via a single MIDI input, displays MIDI volume both numerically (0-127) and by means of a 20-segment, multi-coloured LED strip. Kenton are also developing a 'hands-free' MIDI control hub, designed to extend the player's control over his or her performance. The XC5 has two inputs for footswitches, two inputs for expression pedals and an input for a breath controller. Check the Kenton web site for further information.

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Digital Performer v4.1 adds Audio Units support

The latest update to MOTU's *Digital Performer 4* includes support for Audio Units plug-ins and virtual instruments and for the Digidesign Audio Engine (DAE), allowing *DP* to act as a complete software front-end for Pro Tools HD and MIX systems, with full access to the Pro Tools automated mixing environment and TDM plug-ins. In addition to enhanced MAS and AU plug-in and virtual instrument support, the new Virtual Instrument Tracks feature streamlines the procedure for adding virtual instruments to a mix and promises timing accuracy to within a single sample. Check out this month's Performer Notes on page 264 for more details of the new features in *DP4.1*.

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W www.motu.com

Alchemea College gets Digidesign seal of approval

Alchemea College of Audio Engineering in Central London is now a Digidesign Approved Training Location. Alchemea have also been building a new studio (their sixth), featuring 5.1 surround sound, a full Pro Tools HD rig and a Digidesign Control 24 desk. From now on, the Pro Tools 101 course will be incorporated in the College's Studio Assistant Course and Diploma courses, and will also be available as a stand-alone three-day course, taking place every two weeks from August onwards. The two- and three-day Pro Tools 201 and 210 courses are also available, and will be offered to Alchemea Diploma students at a reduced cost.

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Vienna Symphonic Library believe biggest is best

The Vienna Symphonic Library have released Pro Editions of their *Orchestral Cube* and *Performance Set* orchestral sample libraries. The Pro Editions build on the ground-breaking First Editions, adding new instruments and articulations and more than doubling the size of the library. In fact, with almost 360,000 samples weighing in at over 240GB, the Vienna Symphonic Library Pro Edition is the largest sample library ever created. New instruments include solo contrabass trombone, solo Wagner tuba, a second solo flute (to complete a full flute quartet) and a number of new percussion ensembles. Perhaps the most eagerly awaited single addition to the library is the solo violin, comprised of 18,000 samples covering the full range of different articulations (legato, pizzicato, détaché, spiccato and so on). The *Performance Set* also features a range of solo violin glissandos, runs and repeated notes. The range of string ensemble articulations has been also extended, with new col legno, sul ponticello,

flautando and finger tremolo performances, and the full range of articulations are presented con sordino (muted). There are flutter-tongued performances for the entire woodwind section and the percussion library of the *Orchestral Cube* has increased in size to 22GB, with repeated notes, rolls and other authentic performances. Understandably, this level of detail and realism doesn't come cheap. The complete Vienna Symphonic Library Pro Edition (*Orchestral Cube* and *Performance Set*) costs £3600, while an upgrade from the complete First Edition costs £1393. Similar discounts are available when you upgrade from an individual part of the First Edition to the equivalent Pro Edition, for example, from *Strings* First Edition to *Strings* Pro Edition.

Due to the sheer size of the library, the Pro Edition has been released in 16-bit resolution only. However, VSL have hinted that a complete Pro Edition of the library featuring both 16-bit and

24-bit samples will be released in early 2004, titled *Symphonic Cube*. It has also been suggested that this library, which will surely require RAM and processing power of truly mammoth proportions, will be released on an external hard disk, another first. And the scope of VSL's ambition doesn't stop there. The coming year should also see the release of the *MIR* (Multi-Impulse Response) 'True Space' reverb system, a combined sampling reverb and mixing engine designed to accompany the library, which will allow the user to place the output from the VSL library in acoustic environments sampled from real locations and concert halls. Where VSL's new system differs from existing sampling reverbs like Audio Ease's *Altiverb* plug-in is that, instead of sampling a concert hall's reverb from one spot with a single impulse, they sub-divide the stage into a number of sectors and release a special impulse from each one in up to seven directions. This means that individual instruments or instrument groups can be positioned on a virtual stage via

a drag-and-drop graphic user interface. Since the reverb engine is designed exclusively for use with the library, the directional characteristics of each instrument have been taken into account. For example, the fact that French horns, unlike the rest of the brass section, point backwards can be factored into the reverb engine's calculations. *MIR*'s mixing engine allows access to a further range of options such as volume and the positioning of the 'virtual microphone', bringing together the full range of spatial parameters in one environment. There's a real-time preview mode for instant feedback, although the calculations for high-definition reverb convolution will, for now, be performed off-line. Eight-channel output allows *MIR* to operate in a variety of surround sound formats up to 7.1. Like *Symphonic Cube*, don't expect to see *MIR* before the new year.

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New web site offers free gig listings

A new UK web site, www.entertainmentdiary.com, lets live acts register their forthcoming gigs in a nationwide gig and event diary free of charge. The web site covers every size of venue, from small local pubs and clubs to national concert halls and stadiums, and every style of music. Once registered, performers and promoters have access to a personal control panel where they can update their details and enter forthcoming dates. Visitors to the site can browse the listings and view artist profiles, including photos and demo songs. Flyers and posters can also be printed out from the data entered. Basic registration is free, though a fee of £10 is required to unlock some of the more advanced features.

W www.entertainmentdiary.com

Midify your vocals with Midifier

Midifier is a new PC VST and Direct X plug-in from KNZ Audio which converts the pitch of monophonic audio tracks into MIDI note data, thus allowing the user to control MIDI devices using any audio source, including vocals. A simple user interface allows you to set the threshold (in dB) for Note On and Note Off messages and to enable/disable the interpretation of pitch-bends. All you have to do is set up *Midifier* on an audio track in your sequencer, select a destination for MIDI output, and the plug-in does the rest. You can download a demo version, which mutes every 10 seconds, from the KNZ Audio web site. Registration costs £35. An Audio Units version for Mac OS X should be available soon, and an RTAS version is also planned.

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Korg unveil Summer catalogue at the British Music Fair

Korg chose the British Music Fair in July to launch a whole range of new products. To start with, there are two new digital multitrack recorders, the D16XD and D32XD, which offer 16 and 32 recording tracks respectively. Both models share the same basic design and a mouth-watering array of features, including 24-bit/96kHz



The moving-fader, 32-track D32XD recorder.

recording capabilities, a 320 x 240-pixel touchscreen, four-band EQ on every channel, eight channels of analogue compression on input, a 64-bit digital mixer, and a built-in hard disk and CD-RW drive as standard. Both recorders also offer eight quarter-inch jack inputs and eight XLR inputs with individually selectable phantom power and individual trim knobs and pads, and the optional AIB8 expansion board adds a further eight inputs, allowing 16-track simultaneous recording. There are also dedicated guitar and expression pedal inputs and two headphone outputs. Each track has eight virtual tracks and the built-in 40GB hard drive provides up to 188 track hours of recording time. Audio files can be imported from and exported to a computer via the USB port. The D32XD's mixer has a 56-channel, 14-buss structure with an eight-band parametric master EQ. It is also equipped with 16 motorised 100mm faders. The 16-channel D16XD features 16 60mm non-motorised faders, but both models support full automation of fader and



The 16-track D16XD.

effect settings, panning and EQ. Four rotary knobs below the tilting, backlit TouchView display control the parameters shown on the screen, which provides a graphical representation of EQ and effects settings, metering and audio waveforms. There are also dedicated aux send and EQ controls. A full suite of digital editing functions is included, such as normalise, reverse, fade and time-stretch tools, plus all the copy, erase, and undo functions you might expect. Both recorders include three 56-bit digital effects processors, with the D32XD offering up to 24 insert effects and the D16XD offering up to eight. Both also have two master effects slots. Finished tracks can be mastered and burnt to CD using the built-in CD-RW drive. Further expansion options are provided by the ACB8

analogue compression board, offering a further eight channels of compression for the AIB8 board, and the DIB8 digital interface board, which offers eight channels of ADAT digital input plus word-clock interfacing. The D16XD will be available in August and the D32XD in October.

Also on show was the Microkontrol, a MIDI controller keyboard with 37 mini-keys, eight rotary encoders, eight knobs, and some seriously stylish looks. The compact controller — it measures just 52 x 23 x 7 cm (WDH) — also features a four-way assignable joystick and 16 velocity-sensitive pads, which can be used for everything from drum programming to sequencer transport control. A variety of templates for controlling a number of popular software applications are included, along with Korg's *Microkontrol* template editor software for Mac OS X and Windows XP. Up to 12 templates can be stored on the keyboard itself. Backlit, coloured LCD screens above each of the eight rotary encoders and the template selector knob display parameter and template names respectively. With these LCDs and the pink lighting behind the 16 pads, the Microkontrol should be easily visible on stage — or in gloomy studios! The keyboard can be powered via its USB connection, six AA batteries or the included AC adaptor, and also features five-pin MIDI In and Out ports, allowing it to act as a USB MIDI

interface for other MIDI gear. It should be available in October.

Korg's Electribe MX groovebox turned a few heads at this year's Frankfurt Musikmesse with its unlikely marriage of cutting-edge modelled synthesis and a dual-valve output stage, and now it has a sister — the Electribe SX. This new groovebox also features Korg's Valve Force circuitry, which employs a pair of 12AX7 vacuum tubes, but while the MX concentrated on synthesis, the SX focuses on sampling. In classic Groovebox fashion, Patterns are constructed from Parts, nine of which are available on the SX for building beats and rhythm parts using 'one-shot' samples. Two more Keyboard parts allow samples to be played melodically using the built-in step sequencer or an external MIDI controller, and a further two Stretch parts allow you to independently adjust tempo and pitch of the material loaded into them. There's also a Stereo slicer for chopping up rhythm loops. There are 285 seconds of memory at



The new Microkontrol.

16-bit/44.1 kHz resolution which can be divided into up to 384 individual samples. 128 pre-loaded patterns cover a variety of dance styles and up to 256 patterns can be stored in the internal memory, or data can be backed up on Smart Media cards. Like the Electribe MX, the SX is equipped with three digital multi-effects processors which can be used simultaneously. There are 16 effects to choose from, including reverb, delay, flanger and chorus, as well as more extreme effects, such as a bit-depth reducing decimator. Both grooveboxes also feature a performance arpeggiator with a ribbon controller, which controls note length, and a slider, which controls pitch. The Motion Sequence function allows up to 24 parameter automation events to be recorded per pattern. The Electribe SX should be available this Autumn.

Not forgetting their guitarist customers, Korg also launched the Ampworks and Ampworks Bass amp modelling processors. Both Ampworks units feature a range of amp

and cabinet models and effects in a compact package with a simple, knob-based user interface. Three large dials select amp model, cabinet model and effect, while five smaller knobs constitute the conventional amp channel strip (gain, treble, middle, bass, volume). There's also a tap-tempo button and a knob to control effect depth. The Ampworks processor features 11 amp models, 11 cabinet models and nine independent effects as well as noise reduction. The Ampworks Bass processor features 11 amp models, 10 cabinet models, 11 effects and noise reduction. Both have 11 preset amp, cabinet and effect combinations and a further two user programs can be stored. Attaching a footswitch allows the user to remotely switch between the two user programs and manual settings, or between one user program and the bypass circuit. The processors can run off two AA batteries or the included mains adaptor. The Ampworks will be available in September, with the Ampworks Bass following in October.



The Electribe SX sampling groovebox.

well-specified synth engine, and the 350 Styles are fully reprogrammable too. What's more, the PA1X Pro contains some technology that is easily the equal of the feature-set in Korg's top synths. There's a built-in sampler capable of reading WAV, AIFF and Akai-format samples like the Triton's, for example, with 16MB of user RAM (expandable to 32MB), and an amazingly effective new time-slicing algorithm which allows loops to be run at around half their original speed with very few artifacts. The keyboard is 62-note polyphonic and boasts a touchscreen-driven user interface, a set of user-assignable faders, an S/PDIF digital out, two audio inputs, a built-in hard drive and a TC-Helicon vocal harmony processor. There's also a dual performance sequencer with a crossfader.



The amp-modelling Ampworks (front) and Ampworks Bass (rear).

Using this, two completely separate songs can be created in the sequencer, each comprising eight accompaniment parts and four user parts, and you can then crossfade between them using the fader — which is great for live work. All in all, the PA1X Pro is definitely worth a closer look!

T Korg UK Brochure Line +44 (0)1908 857130.
W www.korg.co.uk

Korg's final Summer launch might not initially appear to be of interest to *SOS* readers, but it has hidden depths. To deal with the less appealing aspects first, the sample-based PA1X Pro is a 76-note arranger keyboard featuring preset accompaniment Styles and an option for displaying karaoke lyrics on its screen. But the 760 onboard factory sounds are fully editable via the



Malcolm Toft launches new range of audio gear

The latest product from Toft Audio Designs is the ATC2, a dual-channel FET compressor, four-band equaliser and mic preamp. Designed by Malcolm Toft, whose pedigree as an engineer and designer of audio products stretches back to the 1960s, the ATC2 provides two complete recording channels which can be linked for stereo operation. The compressor has controls for attack, release, ratio and make-up gain, and a VU meter that can be set to display either gain reduction or output level. The well-specified EQ section features a 50Hz low-pass filter, high- and low-shelving EQs with selectable turnover points (60 or 120Hz low shelf and eight or 12kHz high shelf), and two individual swept-mid bands, with the low mid ranging from 100Hz to 1.5kHz and the high mid ranging from 1kHz to 15kHz. The compressor and EQ

can be switched out of the signal path if you wish. Both channels are equipped with an XLR mic input with switchable phantom power, a quarter-inch jack instrument input, and XLR and TRS jack outputs. The sturdy 2U rackmounting unit features a quarter-inch-thick anodised aluminium front panel. The ATC2 is available now, priced at £799 including VAT.

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Multi-pattern valve mic joins TL Audio Ivory Series

Considering the recent flurry of interest in valve microphones, it seems only logical that TL Audio, who were among the first to make high-quality valve processing affordable with their Fat Man and Ivory Series recording channels, should enter the fray with a valve mic of their own. And that's just what they've done. The latest addition to the Ivory 2 series is the 5000 valve condenser mic and preamp set. The microphone features a one-inch diaphragm and is equipped with low-cut filter and pad switches. It offers nine variable response patterns, with omni, cardioid and figure-of-eight patterns, plus six intermediate stages. The response pattern is selected using a dial on the 5000's matched power supply and preamp, a 2U rackmount unit, styled in the familiar Ivory 2 colour scheme. The power supply sends a full 200V to the microphone's internal 12AT7 triode valve, while the discrete preamp stage controls input and output gain and is equipped with a phase-reverse switch, VU level meter and input peak LED. There's a balanced line-level XLR output which can be switched to bypass the preamp stage and output a mic-level signal to be fed to an external mic preamp instead. There's also a separate quarter-inch jack monitor output. As an optional extra, the DO2 card provides a 24-bit S/PDIF output at 44.1 or 48kHz and a word-clock input. Two 5000's can be linked to output a stereo signal from one DO2 card. The TL Audio 5000 valve mic and preamp costs £746 including VAT.

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GEM Club returns

Generalmusic have announced the return of the GEM owners club with the launch of a new web site at www.gem-club.com. The site offers members direct access to over 3GB of online resources, including OS updates, software utilities, technical support and data, and current and archived information on all GEM products. Members also receive a bi-monthly electronic magazine featuring articles, tutorials, tips and FAQs. Membership costs £35 per year.

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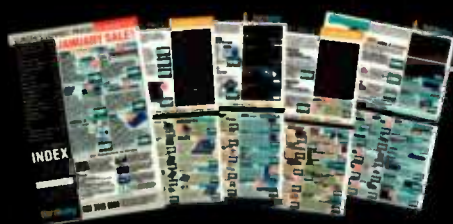
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EGOS-WAVE192L

STUDIO 24 INLINE MIXER



A flexible 16 channel mixer, with an additional 8 inline inputs bringing the total to 24, hence the name. This means that you can use the mixer in the conventional way for your sources, but also monitor the 8 tape return channels at the push of a button, without having to reach the mixer. The three band EQ has a sweepable midrange, and four aux sends (2 pre, 2 post), with 8 mix preamps, and insert points. Each channel has an LED clip indicator. Now with Turnkey's incredible discount, you'll be INLINE for another top bargain!

RRP £436
£269
ALES-STUDIO24

top deals!

computer mixers outboard monitoring integrated studios

DIGIDESIGN M-BOX

- USB audio interface for Pro Tools 3.2 LE
- 24 bit converters, mic preamps by Focusrite
- In-line analogue in and out
- Mini S/PDIF digital I/O
- Headphone socket with 8 ohm control
- Insert points via TRS jacks

RRP £400
£374
DIGES-MBOX

DIGIDESIGN 002 RACK

- 2U rack, features installation with Pro Tools LE 6.2 recording software
- 8 in 16 out analogue, 4 XLR mic preamps and 24bit S/PDIF converter and ADAT optical I/O, 1 in 2 out MIDI interface

RRP £1050
£999
DIGES-002R

FRONTIER DAKOTA

- Professional multi-channel PCI soundcard for digital I/O
- Four ADAT optical ports for 16 in 16 out up to 24 bit 48kHz
- ADAT sync via 15 pin D-Sub and 32 channel MIDI interface via breakout cable
- SMPTE timecode sync and chase for video mic
- Buy Dakota + Monitor as exp for only £229.99

RRP £229.99
£229
FRON-DAKOTA

PRODIGY 192 SOUND CARD

- 2 in 8 out full duplex PCI format soundcard
- 24 bit, 96kHz AD, 192kHz DA
- 8 analogue outputs, 2 digital out
- S/PDIF optical and coaxial mic preamp, headphones
- Jack
- Daughtboard for MIDI and S/PDIF input

FACTORY DIRECT
£99
ATRA-PRODIGY

STEINBERG VSL2020

- 32 channel ADAT soundcard
- Ultra-low latency support for VST instruments
- Less than 3ms ASIO 2.0 compliant
- Included V-STACK software supports up to 16 VST's and 8 send effects

RRP £250
£209
STEI-VSL2020

CM AUTOMATION MOTORMIX

- Hardware control surface for Pro Tools and other software mix applications
- 8 motorised faders, 8 pots
- Cascade 4 units for 32 ch
- Solo mute FX buttons

FACTORY DIRECT
£869
CMAD-MOTORMIX

SAC-2.2 CONTROLLER

- Hardware controller interface and USB hub
- 8 motor faders, 12 assignable pots
- 87 illuminated buttons, LED scribble pads
- User templates for Pro Tools, Logic, Cubase, Sonar 2.0 etc.
- Optional 8 ch expander

FACTORY DIRECT
£1099
PRAI-SAC2K

CAKEWALK HOME STUDIO 2002

- Record and edit unfiltered audio and MIDI tracks
- Mix live audio with playback via breakout cable
- Direct plug-in and soft synths
- Includes Pyro MP3 & CDR Virtual 50-mid Camme synth & Acid format wav library

RRP £40
£29
TWEL-CARHMP

SOUNDQUEST INFINITY V2

- Software synth editor - libraries for detailed patch editing via full computer interface with graphic user interface
- Supports over 400 popular MIDI instruments
- Also works within Cubase

FACTORY DIRECT
£99
SDUL-INFINITY

AKAI MFC42

- IU rack MIDI synthesizer with effects with one mono plus one separate stereo channel
- LFO, HPF, BPF, notch, up to 8th order slope
- MIDI Mounting Kit only £25.99

RRP £400
£159
AKAI-MFC42

TC M2000

- Price crash on the 24 bit M2000!!!
- 24 bit multi-effects unit with AES EBU + coaxial digital I/O, MIDI control
- 2 simultaneous effects
- 500 patches, Wizard help

RRP £1099
£499
TC-M2000

AKG K240DF

- Open-vented bak padded circumaural dynamics
- 200mW at 80dB SPL/mW
- Professional 600Ω load
- Response -10dB, 15-20,000Hz

RRP £110
£49
AKG-K240DF

EGOSYSTEMS NEAR 05

- 2 way bi-amped active nearfield monitor
- 5 inch rear ported woofer, 1 inch silk dome tweeter
- 42 watt LF & 32 watt HF amps, crossover 2.7 kHz
- Balanced XLR & TRS jack inputs, 30kΩ load
- Thermal overload, RF interference protection

FACTORY DIRECT
£129
EGOS-NEAR05

SPIRIT ABSOLUTE ZERO

- Small two way nearfields
- Rear ported 6 inch woofer, soft dome tweeter
- 8Ω nominal load
- 95 Watts RMS, 80dB SPL per Watt
- Last few units at this amazing price

RRP £206
£119
SCRA-AB0

KORG PXR4

- Pocket size handheld 4 track digital mix-studio
- Built in drum machine for rhythm backing
- 4 audio tracks with 8 virtual tracks
- File transfer to computer via USB interface
- 8 in 16 out, ready-to-go!

RRP £350
£225
KORG-PXR4

KORG D1600 & CDRW2 HD

- Integrated multitrack studio with FX and 2508 HD
- 18 tracks of 16 bit 44.1kHz audio or 8 tracks 24 bit
- 24 channel 8 bus digital mixer, 3 band EQ with sweep, mtr
- Optional onboard CDRW2 drive only £189.99

RRP £1199
£849
KORG-D1600CD

ADK SC1

- Small diaphragm condenser mic
- Fixed cardioid pattern
- 10mV/Pa sensitivity
- 180dB inherent noise
- 134dB SPL peak handling
- Nominally flat response

FACTORY DIRECT
£55
ADK-SC1

ADK A51DLX

- Large diaphragm condenser mic
- 10mV/Pa sensitivity
- Vocal/instrument applications
- Fixed pattern
- Includes shockmount

FACTORY DIRECT
£95
ADK-A51DLX

ADK A51SL

- Large diaphragm condenser mic
- Cardioid pattern, FET electronics
- 1 inch diaphragm
- 10mV/Pa sensitivity
- 16dB inherent noise
- 175dB SPL peak handling
- Price includes shockmount and case

FACTORY DIRECT
£189.99
ADK-SL

AKG D660S

- Handheld dynamic mic with on/off switch
- Hypercardioid response, 2mV/Pa sensitivity
- Bright 6dB presence lift, & bass roll-off below 80Hz
- Includes soft case and wind clip

RRP £98
£19
AKG-D660S

M8 and M12 ANALOGUE MIXERS

- Incredible savings on these M series mixers! The M8 is a 16 channel with 8 mono and 4 stereo channels, while the M12 is 20 channel with 12 mono and 4 stereo channels. Both offer 4 aux sends, 3 band EQ with sweep mid, channel direct outs, 100mm long throw faders, signal and peak LEDs, and even a built in stereo AD converter with S/PDIF digital output.

RRP £499
£269
SCRA-M8

SPIRIT 328 DIGITAL MIXER

- Scrutinised 32.8 format 24 bit automated digital mixer with 16 mic inputs, 3 band EQ, 4 auxes, 8 buses, motorised faders and 16 digital channels via ADAT or TDIF, as well as AES/EBU stereo I/O. Two effects buses feature L1000 multi-effects DSP onboard and features include global dynamics blocks for compressor/limit, transport controls, snapshot recall, dynamic automation, PFL, AFL, MIDI and wordclock. A very versatile deck.

RRP £3819
£1199
SCRA-SPIR328

266XL DUAL COMPRESSOR GATE

- Two channels of dual side compression via new Auto-Dynamics™ Attack and Release controls, program-dependent expansion, gates, balanced inputs, precision LED metering and switches insert. Front panel selection of stereo or dual mono operation, all in a standard 1U rack design and at an unbeatable price. Now with two auto-stop modes!

RRP £160
£99
DBX-266XL

MA5A/D DESKTOP MICRO MONITORS

- Compact active desktop speakers available in two versions - MA-5A with analogue phono inputs, and MA-5D with additional front panel optical S/PDIF digital input and internal D/A converter. Both front panel speaker cabinets has a full range 2.5 inch driver unit with 5 watt amplifier and protective grille. Includes bass traps and rubber feet. Speakers are each 19 x 14 x 12 cm in blue finish. Analogue version £39.99 Digital version £49.99

RRP £180
£39
EDIR-MA5A

LSR25 BI-AMPED

- JBL are one of the few companies to make significant advances in drive technology with their modified aluminium, composite and aluminium baffles created to the woofer ballistics to aid heat dissipation. The entry level LSR25 benefits from some of these innovations with its rigid aluminium enclosure and integral twin-woofer. The front ported 2 way bi-amped nearfield monitor offers a 2.5 inch woofer and 1.0 inch tweeter with a 100Watt (100W) amplifier and 40 watt amp. It has a variable 80Hz-10KHz (100Hz) crossover and 40 watt amp. It has a variable 80Hz-10KHz (100Hz) crossover and 40 watt amp. It has a variable 80Hz-10KHz (100Hz) crossover and 40 watt amp.

RRP £799
£319
JBL-LSR25P



KARMA SYNTHESIZER



BUY 2 PCM BOARDS FOR ONLY £199 EXTRA!

Choose any two from the 9 different titles of EXB-PCM boards available and get them for only £199 extra when you buy this synth. Drawing from the Triton synth engine and the powerful manipulation of the Electribe grooveboxes this dance workstation is another bestseller from the Korg synth range!

Take advantage of our offer - get two sound expansion boards for only £199 extra when you buy this synth! Karma puts the power of complex arpeggiators, phrases and patterns at your fingertips in a flame red 5 octave synth, using Korg's well established Hyper Integrated sample-based synthesis to channel the 32MB sound bank of 825 multisamples and 813 drum elements into 640 firey presets, including a complete GM2 bank, and 64 drumkits, all of which are fully user programmable along with 768 multitimbral combi patches. This keyboard is 62 voice polyphonic and has 5 stereo insert effects, 2 global effects and a global equaliser, plus 102 discrete effect algorithms and 4 pole assignable filters. The onboard 16 track sequencer holds 200,000 notes at 192ppqn resolution, with 200 songs and convenient SMF backup to floppy disk drive. It features a performance driven user interface for rapid setup and control during live gigs, with 8 realtime parameter knobs for on-the-fly edits, softkeys under the large LCD screen and a joystick pitchbend / modulation control. Karma uses the same synth engine and effects processor as the Triton, in a more streamlined package, and can also accept the optional MOSS expansion board. A great synth for the stage or the studio!

RRP £1499
£999⁹⁹
KORG-KARMA

YST-MS30 SUBWOOFER SPEAKER SET

Turnkey's great cost saving offer brings you these Yamaha active multimedia speakers with two satellites and a separate subwoofer, with Yamaha's YST bass enhancing technology. Satellites are 6 watt each with 2 inch full range drivers, while the subwoofer is a single 5 inch cone with 18 watt onboard amplification. The whole system is magnetically shielded. Don't miss out on this deal!



50% OFF!
RRP £99
£49⁹⁹
YAMA-YSTMS30B

SU200 PHRASE SAMPLER

Sitting between the SU10 and the SU700 this new sampler provides up to 83 seconds of phrases with loop returning and real-time effects control. The 8 rubber pads (which light up) are chosen from 3 banks of different samples, and are 6 per bank and 6 per pad. There is a touch sensitive ribbon controller to use for scratching samples or real-time effects / filter sweep. The SU200 can reverse the effects instantly, loop (with tap tempo) and reverb, and offers distortion, delay, pitch mod LFO, slice gating FX and 17 filter types. It has mic in, line in, SmartMedia card slot, battery / PSU operation and includes a sample CD.



50% OFF!
RRP £285
£179⁹⁹
YAMA-SU200

QS6.2 SYNTHESIZER

The QS6.2 is a new revision of Alesis' 5 octave performance synthesizer with a new silver grey finish and improved control interface. It uses a 4 layer composite synthesis based on a 16MB ROM library with 540 presets and a powerful 4 bus multi-effects section derived from the Q20 engine. The modulation matrix and parameter editing is extremely detailed, and the Qcard slot allows for expansion to 24MB. It has 4 data sliders, 3 LFOs, 3 envelope generators and is 64 note poly with 64 part multi-timbral mix mode.



NEW
50% OFF!
RRP £689
£359⁹⁹
ALESIS-QS6.2

VOYAGER SYNTHESIZER

This monophonic analogue synth is based on the original Model D from the 70s and is a truly authentic modern equivalent of its classic ancestor. Featuring a velocity sensitive 64 note keyboard with aftertouch, an XY touch pad pressure controller, 3 oscillators, a noise generator, two LFF resonant filter stages and an LFO with selectable waveforms including two sample and hold types. The Voyager B model (shown) features illuminated blue pitchbend wheels, while the top of the range Limited Edition Signature model features the blue white keys, name plate, a certificate of authenticity and the signature of Bob Moog himself. Voyager B Model: £2249.99 Limited Edition Signature Model: £2999.99



FACTORY DIRECT
£2199⁹⁹
BIGB-VOYAGER

mic sampling keyboards modules recording

AKG C900

- BARGAIN!!! Handheld 48V cardioid condenser mic
- Includes case, stand clip & PB1000 presence boost adaptor (brightens treble response on acts only)
- 17.5dBa self noise at 1mW/Pa sensitivity
- 130dB SPL, peak handling
- Gentle 3dBa bass roll-off



RRP £130
£79⁹⁹
AKG-C900

SHURE SM58 LCE

- The world's most famous industry standard vocal mic
- Dynamic cardioid, with upper mid presence extender (brightens treble response on acts only)
- Beta 58 improved spec hypercardioid version available only £118.99



RRP £125
£70⁹⁹
SHUR-

ACCESS VIRUS INDIGO

- 3 octave synthesizer
- 32 note poly 4 oscillator analogue modelling
- 1024 programs (256 user patches 768 factory)
- 98 simultaneous DSP effects
- 32 note poly, 1024 programs, 4 oscillators
- 88 simultaneous FX, 8 outputs
- 6 pole filters, aftertouch, pitch mod, effects



FACTORY DIRECT
£1269⁹⁹
ACCE-INDIG02

ACCESS INDIGO REDBACK

- Limited Edition signature model
- 3 octave analogue modelling synth keyboard
- 32 note poly, 1024 programs, 4 oscillators
- 88 simultaneous FX, 8 outputs
- 6 pole filters, aftertouch, pitch mod, effects



FACTORY DIRECT
£1329⁹⁹
ACCE-REDBK

ACCESS VIRUS C KEYBOARD

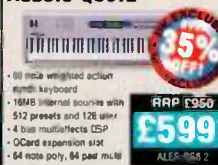
- 6 outputs, 2 inputs
- 16 part multitimbral
- 61 note velocity and aftertouch sensitive keyboard
- 98 Simultaneous DSP FX
- Surround sound
- 1024 programs



FACTORY DIRECT
£1429⁹⁹
ACCE-VIRUSKC

ALESIS QS8.2

- 88 note weighted action synth keyboard
- 16MB internal sounds with 512 presets and 126 multi
- 4 bus multi-effects DSP
- Q-card expansion slot
- 64 note poly, 64 part multi



RRP £950
£599⁹⁹
ALESIS-QS8.2

EVOLUTION MK149

- 48 keys (4 octaves)
- Velocity sensitive
- Pitch bend mod wheels
- Octave shift, pedal input



RRP £119
£59⁹⁹
EVO-MK149

OVERHEIM MC1000

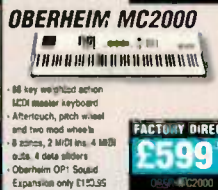
- 76 note weighted MIDI controller keyboard
- 2 zones, 2 MIDI outs, 1 auxiliary MIDI input
- Aftertouch, pitch, mod and two mod wheels
- 8 zones, 2 MIDI ins, 4 MIDI outs, 4 data sliders
- Overheim OP1 Sound Expansion only £125.35



FACTORY DIRECT
£399⁹⁹
OBER-MC1000/076

OVERHEIM MC2000

- 88 key weighted action MIDI master keyboard
- Aftertouch, pitch wheel and two mod wheels
- 8 zones, 2 MIDI ins, 2 MIDI outs, 4 data sliders
- Overheim OP1 Sound Expansion only £125.35



FACTORY DIRECT
£599⁹⁹
OBER-MC2000

OVERHEIM MC3000

- 88 key hammer-weighted MIDI master keyboard
- Aftertouch, pitch wheel and two mod wheels
- 8 zones, 2 MIDI ins, 2 MIDI outs, 4 data sliders
- Overheim OP1 Sound Expansion only £125.35



FACTORY DIRECT
£849⁹⁹
OBER-MC3000

VISCONTI VIVA 76

- 76 note synth action keyboard with GM bank
- 363 sounds, 10 drum kits
- Remix, chorus, MIDI
- 42 note poly, 2 pedal ins
- Spillover, layers, 98 multi
- 88 note version also available only £519.99



FACTORY DIRECT
£449⁹⁹
VIVC-VIVA76

ACCESS VIRUS RACK

- Analogue modelling rack synthesizer
- 16 note poly, 4 outputs
- New Version 6.0 firmware
- 12 buttons and 5 assignable rotary encoders
- 2 audio inputs
- 8 pole sweeping reverb filters



FACTORY DIRECT
£499⁹⁹
ACCE-VIRUSRK

ACCESS VIRUS RACK XL

- 1U rack virtual analogue modelling sound module
- 32 note polyphonic
- 3 oscillators, 6 outputs
- 88 simultaneous effects
- Wide red LCD screen
- Included Emagic Sound Driver software for PC/Mac



FACTORY DIRECT
£799⁹⁹
ACCE-VIRUSXRL

CLAVIA NORD MICRO MODULAR

- A complete synth engine with PC editor software
- 100 patches, compatible with Nord Modular
- 4 note poly, 2 audio in & outs, phone, PC/MIDI
- Patch libraries available from www.clavia.se
- Unbelievable deal at this price. Don't miss out!



RRP £799
£269⁹⁹
CLAVIA-NORDMICRO

REDSOUND DARKSTAR XP2

- Hot new version of the acclaimed Darkstar synth
- 6-voice polyphonic
- 5-part multi-timbral
- 2 external audio inputs
- New features: 4 outputs, sine waveform, jog dial, headphone output



RRP £299
£149⁹⁹
REDSOUND-DARKSTAR-XP2

SOUNDART CHAMELEON

- 1U rack 24 bit mainframe DSP processor for MIDI and audio
- 16 bit sounds over 2 octaves per percussion set
- Depending on downloaded firmware
- Users can write their own software too!



FACTORY DIRECT
£599⁹⁹
SART-CHAMELEON

WALDORF ATTACK RACK

- VST soft synth now as hardware version
- 16 bit sounds over 2 octaves per percussion set
- 4 in/2 in
- MIDI in/out thru
- 2 oscillators, waves, FM
- 4 effects, 2 envelopes



FACTORY DIRECT
£449⁹⁹
WALD-ATTACKR

WALDORF MICRO Q RACK

- 3U rack virtual analogue synth
- 25 voice poly, 8 outputs
- 5 osc, 3 LFOs, 4 pole filters
- Voices, prog arpeggiator
- ring mod, 16 mod routings
- 11 simultaneous effects
- Change variables only £549.99



FACTORY DIRECT
£499⁹⁹
WALD-MICROQR

MARANTZ CDR631

- CDRW recorder with added AES/EBU input
- 5-PDF with oop out
- CD-TEXT data compatible
- 4-in/4-out control
- Units are 'B' Stock based as new with full guarantee



RRP £399
£289⁹⁹
MARA-CDR631B

MARANTZ CDR500

- Professional hi-res tray CD player & CDRW recorder
- S/PDIF with oop out
- Supports CD-TEXT, SCMS mastering mode
- Units are 'B' Stock based as new with full guarantee



RRP £299
£329⁹⁹
MARA-CDR500

OB12 SYNTHESIZER

- 12 note poly analogue modelling synth with 4 analogue outputs and 3/PDF digital
- Oscillators in 1/2, 3/4 waveforms including pulse width modulation and noise, and even have a ring modulator, dual envelope filters can be found in a variety of different ways for maximum flexibility, multi waveform LFO's can be synced to MIDI. Features 49 keys, aftertouch, ribbon controller, knobs which transmit MIDI plus a 32,000 note sequencer and arpeggiator. Effects include sound morphing, EQ reverb and that legendary B. Oberheim sound. An incredible synth even at the old price, now it's unbelievable, with a saving of £200!



ALMOST 40% OFF!
FACTORY DIRECT
£499⁹⁹
OBER-OB12

VIRUS C SYNTHESIZER

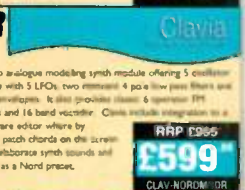
- Heavily upgraded and enhanced, the fifth generation of the Virus analogue modelling desktop synth brings along those classic rich analog textures with the replicability and creative potential that only come with the art of good gear. With its stylish red light window set in a floating black head, the Virus C is more than just a software version. Six outputs with unlimited capabilities, 32 note polyphony, 4 oscillators, 98 simultaneous arpeggiators, 16 layer arpeggio mode, 16 independent arpeggiators and 6 pole sweeping filters put name into the most comprehensive, flexible, and its will perform with 34 MB DIA converters and 32 simultaneous real time arpeggio followers deliver the effortless smooth sound of vintage gear!



FACTORY DIRECT
£1079⁹⁹
ACCE-VIRUSC

NORD MODULAR MODELLING SYNTH

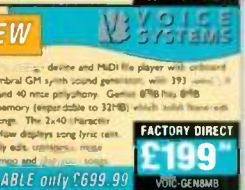
- Colourful desktop analogue modelling synth module offering 5 oscillator wave architecture with 5 LFOs, two resonant 4 pole low pass filters and powerful ADIR envelopes. It also provides classic 6 operation TRF for synths modules and 16 band vocoder. Clavia include integration to computer software editor where by arranging virtual patch cards on the screen you can develop elaborate synth sounds and upload the results as a Nord preset.



RRP £985
£599⁹⁹
CLAVIA-NORDMODR

GENIUS 8MB MIDI FILE PLAYER

- Desktop MIDI data file "CD" drive and MIDI file player with onboard 16 part multitimbral GM2 synth sound generation with 392 samples, 3 arpeggiators and 40 note polyphony. Genius 8MB 8MB internal memory (expandable to 32MB) which holds thousands of SMF songs. The 2.40 character LCD window displays song lyrics, main menu, song names and patch names.

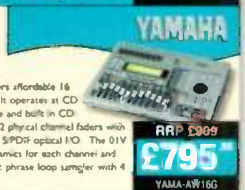


FACTORY DIRECT
£199⁹⁹
VOIC-GEN8MB

GENIUS 120 VERSION ALSO AVAILABLE ONLY £699.99

AW16G 16 TRACK HD RECORDER

- Yamaha's newest AWY series hard disk recorder offers affordable 16 track playback and 8 track simultaneous recording. It operates at CD quality 16 bit 44.1kHz and includes a 20GB IDE drive and built in CD-RW burner as standard. The mixer section packs 12 physical channel faders with a 36/82 configuration offering 2 XLR mic inputs and S/PDIF optical I/O. The 01V style interface offers 4 band parametric EQ and dynamics for each channel and 13 effect algorithms. Yamaha have included a 47 sec phrase loop sampler with 4 pads and 20 preset phrase samples. Great value!



RRP £989
£795⁹⁹
YAMA-AW16G

The Virus C Desktop synth is the new center of the Access universe. Equally comfortable in professional studios or beside a home computer, as well suited to clubs and concerts as it is to film soundtracks, this is the heir to a legendary line of predecessors, and it inherits their tradition with more flair than ever before. The stunning red display will captivate you, and we haven't even got to the best parts yet...

The quintessential modern-vintage synthesizer, the new incarnation Virus C offers an unfathomably vast array of sonic possibilities: 32 note polyphony, 4 oscillators, 2 filters, 3 LFOs, 9 mod matrix destinations, 98 effects...more than just a simulation of circuits, it paints a true replica of the very big picture that makes analog and acoustic instruments sound so alive. The synth is as user-friendly as you want it to be. No artist wants a tool to demand more attention than the art itself, so we rebuilt the Virus to keep inspiration at your fingertips. Unlock creative freedom with improved access to the features you need. Let your imagination run wild with powerful undo/redo. It's as if the Virus reads your musical thoughts to replicate your wildest electronic dreams.

With unprecedented synthesis power behind it, and the evolution of Access Music in front of it, the Virus C will long shine in your musical universe as brightly as it does in ours. Other virtual analog synths can't touch it - we proved that with the 'a' and the 'b'. So what could be better than a Virus but more Virus?

VIRUS C



URL: WWW.VIRUS.INFO

CODE: 

INFO: **VIRUS**



Experts regard the Virus as the quintessential modern synthesizer with the best sounding virtual analog sound and the most powerful features available in the world today. In addition to its unique sound characteristics, the Virus C's architecture offers a substantial amount of built-in software, including 1024 programs, the Virus C's own sequencer.

With its 100% software-based architecture, the Virus C's unique integration of the power of modern digital technology with its capability to emulate legendary analog synthesizers and filters and a truly remarkable sound that has effected an entire industry.

23

DRIVEN BY THE SHEER POWER OF THE VIRUS ENGINE

NEW OS6!

- FRESH ARPEGGIATOR PATTERNS
- PURETUNE ADAPTIVE TUNING
- PARAMETER CONTROL SHORTCUTS



VIRUS KC
6 outputs, 2 inputs
32 note polyphonic
16 part multitimbral
61 note velocity and aftertouch sensitive keyboard
98 simultaneous DSP effects
Surround Sound
1024 programs

VIRUS INDIGO REDBACK
Limited Edition signature model
6 outputs, 2 inputs
32 note polyphonic
16 part multitimbral
3 octave analogue modelling synth keyboard
98 simultaneous DSP effects
1024 programs

VIRUS INDIGO 2
6 outputs, 2 inputs
32 note polyphonic
16 part multitimbral
37 note velocity sensitive keyboard
98 simultaneous DSP effects
Surround Sound
1024 programs

VIRUS RACK XL
6 outputs, 2 inputs
32 note polyphonic
16 part multitimbral
Includes Sound Diver
98 simultaneous DSP effects
Surround Sound
1024 programs

VIRUS RACK
4 outputs, 2 inputs
16 note polyphonic
16 part multitimbral
Includes Sound Diver
1024 programs

VIRUS

THE HARDEST SOFTWARE SYNTH EVER



HIGH QUALITY KNOBS
100% TACTILE CONTROL



69 LEDs
SEE WHAT YOU HEAR



RED HOT DISPLAY
DEDICATED UNDO
AND RANDOM

- Raw power from up to 4 oscillators with 16-Voice layered unison mode
- Richly resonant sweeps from two independent multimode filters (36 dB / 6-poles per voice)
- Ultra fast envelopes (0 to 144 dB in under 22 microseconds)
- Dedicated undo/redo/random to correct programming mistakes and defeat 'writer's block'
- 32-voice polyphony and 16-part multitimbrality
- 1024 programs (256 User / 768 ROM / 128 Multi)
- 98 simultaneous DSP effects
- Surround sound capabilities
- 6 Outputs (24-bit D/A) / 2 Inputs (18-bit A/D)
- Modulation matrix with 6 source and 9 destination slots - every feasible parameter can be controlled
- 16 independent arpeggiators with patterns and abundant real-time controls
- 2 Soft Knobs, individually assignable per program
- MIDI clock sync capabilities for virtually every time-based parameter



turnkey

020 7419 9999

114-116 Charing Cross Road London WC2H 0JR

sales@turnkey.co.uk

www.access-music.de

www.turnkey.co.uk



cubase
solutions from **£1099**



nuendo
solutions from **£1999**



protools 002
solutions from **£1169**



gigastudio
solutions from **£1699**

Hardware and software for illustrative purposes only.



Carillon is run by computer music evangelists and fanatics. We take the same approach to every aspect of our product from ultra low noise hardware design to the painstaking configuration, test and support of every system.



QUIETEST
performance

FINEST
support

TOUGHEST
hardware

EASIEST
to use

FITTEST
for the purpose

CHEAPEST
price pledge



core computers
partner for Carillon's proprietary 002

AC-1 LE STANDARD Core 1

Intel 845 Chipset Motherboard, P4 2.4GHz Processor, 512MB DDR RAM, 80GB ATA 100 7200rpm Seagate Hard Drive, Black 48/12/48 CDRW, 32MB ATI Graphics Card, LAN, 56k Modem, USB2.0, Black Keyboard and Mouse, Windows XP, Low Noise CPU Fan, Carillon Ultramate LE Power Supply.

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AC-1 LE PLUS Core 2

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Q&A

Your technical questions
and queries answered

Q How do I compress my orchestral recordings?

I regularly make stereo location recordings of orchestras, using *Cool Edit Pro* for editing and mastering. If I simply normalise my raw recording, when it is played back in a typical domestic environment with average background noise, it's necessary to turn up the volume for the quiet bits and then turn it down for the loudest sections.

So, for each movement of a piece I will look at the level of all the sections and boost the quieter passages by a fixed small amount, and reduce the level of any extreme peaks in the loudest parts. Then, by checking what headroom there is at the loudest part, I can amplify across the whole performance to achieve maximum volume whilst maintaining dynamic integrity between movements. I don't believe a stand-alone stereo compressor can achieve this effect.

Are there any rules of thumb that can be used in the adjustments in level that can be applied to passages with extreme dynamics? How do the producers for Deutsche Grammophon, Sony, and so on do it? I am not aware of having to adjust the volume in regular listening conditions when playing back commercial classical recordings.

Chris Overton

Technical Editor Hugh Robjohns replies:

In days of old you would ride the faders as the piece was being recorded, following the score to anticipate when you need to start pulling the fader down (to control the level of a loud section) or push it up (to lift a quiet section). These days, with 24-bit recording, this kind of adjustment tends to be made at the editing/mastering stage rather than during recording. It sounds like you're doing the same thing in Cool Edit Pro.

As far as compression is concerned, I would suggest some very gentle overall compression, typically with a ratio of 1.1:1 and a threshold around -30dBfs, but you'll need to adjust this to suit the amount of squash you require. This will reduce the

For more hints, tips and problem-solving visit the SOS Discussion Forum
www.soundonsound.com/sosforum.htm

overall dynamic range but maintain some dynamic variation. Be careful choosing your attack and release times to prevent any pumping effects. A multi-band compressor will make this easier.

Another popular technique exclusive to classical music is the parallel compressor. For this you need a compressor with a huge headroom margin and the ability to apply a lot of gain reduction (well over 20dB). The idea is to split the signal in two, with one path going to the mixing desk, and the other going to the compressor. The output of the compressor is then routed to the desk and mixed with the direct signal. Set the compressor to provide around 20dB of gain reduction when the music is at its loudest,



Orchestral recording at Angel Studios, London — some compression techniques are unique to classical recording.

and set the return level so that this compressed signal is about 20dB below the direct signal's peak level. Set attack and release times to prevent pumping. The idea is that loud passages won't be altered significantly because the compressed signal is so quiet in comparison. However, as the input signal falls in level, the compressor applies less gain reduction and so its contribution becomes more significant, raising the low level signal. With input signals of -20dB, the compressor won't be compressing at all, and so will combine at the same level as the direct signal, providing a 6dB overall lift. Obviously, you can play around with the compression ratio and threshold to vary the amount of lift you require. It is a very subtle and effective technique, but is a bit fiddly to set up.

Finally, if you're using a digital compressor, don't forget to offset the direct signal to correspond to the delay caused by the compressor's A-D/D-A conversion process, otherwise you will encounter phase problems.

Q What does diatonic mean?

I know that the white keys on a keyboard form a diatonic scale, but what does diatonic really mean?

Rob Fowler

SOS Contributor Len Sasso replies:

To understand the meaning of diatonic, it helps to think of a scale not as a collection of notes, but rather as a series of intervals. The definition of a diatonic scale is that there are five whole-tone and two semitone intervals in the series and that the semitones must always be separated by at least two whole-tones. Using '2' to symbolize the whole-tone steps and '1' for the semitone steps, the major diatonic scale corresponds to the interval series 221221. No matter what note you start on, following this prescription yields a major diatonic scale — the white keys starting on C is one example. It turns out that all possible diatonic scales are constructed by starting somewhere in the major diatonic scale and continuing until you reach the same note you started on. Those are generally referred to as the church modes: Dorian for 212212, Phrygian for 122122, Lydian for 222121, and so on.

While the preceding definition is correct and functionally useful, it might leave you a little cold, as it does nothing to explain why those intervals are used or why the seven notes in a diatonic scale are chosen over the other notes in the 12-tone equal-tempered scale. For reasons deriving from the physics and maths of sound, the strongest harmonic relationship aside from the octave is the perfect fifth, which makes G the closest relative of C, for example. Since C stands in the same relationship to F as G does to C, it makes sense that a scale centered around C should contain both G (called the dominant) and F (called the subdominant). The next closest harmonic interval is the major third. Together, the root, major third, and perfect fifth constitute a major triad, and it's not too big a stretch to imagine that you might want to construct a major triad on the three notes C, F, and G. Do that and you have the seven notes in the C diatonic scale.

There's still the question of why there are five other notes in the 12-tone

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Q&A

► equal-tempered scale, and the answer contains a hidden but important compromise. You can make music, which is naturally called diatonic music, with just the seven notes of the diatonic scale. And if you did that, they would in fact be slightly different notes from the ones you find in the equal tempered scale. If you want to expand the system to accommodate diatonic scales in other keys, one natural way is to iterate the process of adding perfect fifths. This produces what is commonly called the cycle of fifths, but is actually a spiral of fifths that never really comes full circle. But if you make the perfect fifths just slightly flat, they do come full circle after 12 steps. Miraculously, you also wind up with notes that are close to the major thirds — they're a little sharp and a little more out of tune than the fifths, but still useable. This compromise gives us the 12-tone equal-tempered scale (equal tempered meaning all the intervals are the same). Relative to C, the extra five notes turn out to be where you find the black keys on the piano keyboard, and that's why the intervalic definition we started with works.

Q What is optical compression?

Lately, there seem to be numerous affordable hardware compressors on the market, and I've noticed that many of them (the Platinum Focusrites and the Joemeeks, for example) are described as optical compressors. What's the difference between optical compressors and other types of compressor, such as VCA, FET and valve compressors? Are there any relative merits to these different types of compressor and are they suited to any particular applications?

Luke Ritchie

Editor In Chief Paul White replies: After microphones, nothing stirs up a group of music professionals so much as a discussion about compressors. Essentially, compressors are gain-riding devices that monitor the level of the incoming signal and then apply gain reduction in accordance with the user's control settings. Given this simplistic explanation, shouldn't all compressors sound exactly the same, in the same way that faders tend to?

Clearly compressors don't all sound the same, and there are a few good technical reasons why. Perhaps of less importance than some people might imagine is the gain control element itself, which can be a tube, a FET (field effect transistor), a VCA (voltage-controlled amplifier), an optical photocell arrangement (a light source and a light detector) or even a digital processor. Certainly all these devices add their own colorations and distortions to a greater or lesser extent, but what influences the sound most is the way the ratio and envelope characteristics deviate from theoretically perfect behaviour.

In an imaginary, perfect compressor, nothing happens to the signal until it reaches a threshold set by the user, after which a fixed compression ratio is applied. For example, if the compression ratio is set at 4:1, for every 4dB the signal rises above the threshold, the output rises by only 1dB. A modification to this is the soft-knee compressor where the ratio increases progressively as the signal approaches the threshold, the end result being a less assertive, less obtrusive form of compression.

Many classic designs don't in practice act like this perfect compressor however, as their compression ratio may vary with the input signal level. For example, some compressors work like a perfect soft-knee device until the signal has risen some way

above the threshold, then the compression ratio reduces so that those higher level signals are compressed to a lesser degree than signals just above the threshold. The reason for this change in ratio is simply that many early gain-reduction circuits don't behave linearly, especially those using optical circuitry as the variable gain element. The components themselves are non-linear so when, for example, you combine a non-linear light source with a non-linear light detector, the composite behaviour can be quite complex and unpredictable — however, history has buried those optical circuits that didn't sound good, so we're now left with those that happened to sound musical.

The other very important factor governing the sound of a compressor is the shape of the attack and release curves. While a modern VCA compressor can be made to behave in an almost theoretically perfect way with a constant ratio and predictable attack/release curves, many of the older designs had very strange attack and release characteristics, and, in the case of optical compressors, this was originally due to the relatively slow response of a light and photocell compared with a VCA.

For example, the now legendary Universal Audio 1176 combined a fairly fast attack time with a multi-stage release envelope. Conversely, the Teletronix's LA2A's rather primitive optical components resulted in a slower and quite non-linear attack combined with a release characteristic that slowed as the release progressed. Indeed, perhaps the reason the traditional optical compressor has so much character is that there are so many places in the circuitry that non-linearities can creep in.

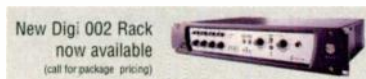
Having said that, some modern optical compressors use specialised integrated circuits that incorporate the necessary LED light source (which has largely taken over from the filament lamps and



The Focusrite Trak Master and Behringer Composer Pro are two affordable compressors which use optical gain control elements. The Samson S•Com, however, uses a VCA.

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Q&A

► electroluminescent devices used in early designs) and detector element in a single package that incorporates feedback circuitry to speed up the response time and to linearise the gain control performance. Indeed, some of these are so well behaved that they can sound almost like VCAs, but using clever design, it should be possible to recreate the old sounds as well as the new using contemporary electronic devices, or imaginative software design come to that.

It's harder when it comes to saying what type of compressor is best for which job, but in very general terms, a well-designed VCA compressor will provide the most transparent gain reduction, which is ideal for controlling levels without changing the character too much. However, a compressor that allows high-level transients to sneak through with less compression can also sound kinder to material than one that controls transients too assertively, which is why some of the older, less linear designs

sound good. That's not to say modern designs can't sound good too though — Drawmer pioneered the trick of leaking high frequencies past the compressor to maintain transient clarity while other manufacturers, such as Behringer, use built-in transient enhancers or resort to equally ingenious design tricks.

Optical compressors, especially those that don't use super-well-behaved integrated optical circuits (or those that use them imaginatively) usually impose more of their own character on the material being treated, making it sound larger than life. In this context, the compressor is as much an effect as a gain-control device, and such compressors are popular for treating vocals, drums and basses. The Joemeek and TFPro compressors fit this 'compression as an effect' category as they use discrete LEDs and photocells in a deliberately non-linear topography that's really a refinement of that used in some vintage designs.

Digital compressors and plug-ins can reproduce the characteristics of vintage classics, but only if the designers successfully

identify those technical aspects of the original design that make it sound unique. If they don't, you end up with an approximation or caricature rather than a true emulation.

Q Is it wise to buy a second-hand microphone?

With so many brand-new budget-priced microphones out there these days, I'm wondering if it might be better to get a high-quality mic second-hand instead. I don't think I'd trust second-hand monitors, but does the same apply to mics? For the £150 or £200 I'd spend on a new mic, I could get a far better model second-hand.

SOS Forum Post

Technical Editor Hugh Robjohns replies:

I would certainly support the idea of buying second-hand pro audio gear, but I would be very wary of buying gear in the price range you're talking about second-hand. My

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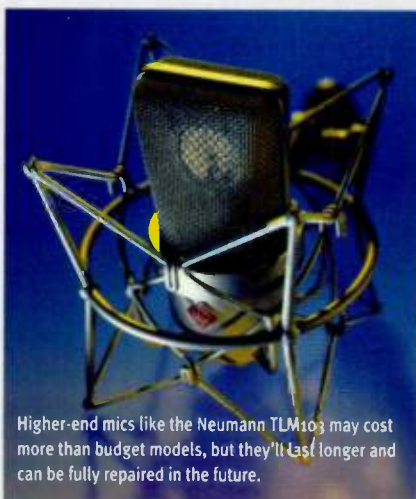
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Higher-end mics like the Neumann TLM103 may cost more than budget models, but they'll last longer and can be fully repaired in the future.

reasoning is as follows. Firstly, users of high-end professional equipment generally know what they are doing and so their equipment tends (with the inevitable exceptions) to have been reasonably well maintained. It's not always the case, but you can usually tell in an instant by looking at a piece of equipment whether or not it has

been well looked-after, and if it looks OK it usually is.

Secondly, bona fide pro gear can be serviced and repaired. All the reputable speaker manufacturers will happily supply replacement drivers, and all the reputable mic manufacturers will be able to repair and recondition their microphones. So even if the gear has had a hard life, it will remain perfectly serviceable. You can still get spares for 30-year-old Studer tape machines, for example.

Conversely, budget audio equipment is made as cheaply as possible, and while you can get remarkable quality for your money, most of it is not cost-effective to service — in other words, it is disposable. The current glut of Chinese-made mics offer exceptional value, but you certainly won't be able to get them repaired in the factory after 20 years like you can a Neumann, AKG or Sennheiser. Likewise, getting spare parts for a Fostex multitrack tape recorder is a lot harder than for an old Studer or Otari.

So, if the second-hand budget gear in question is in good condition and very cheap,

then it may be worth the risk, but go into it with your eyes open — it may well prove impossible or prohibitively expensive to have this kind of gear repaired should it fail a week after you bought it. On the other hand, a second-hand truly professional product should remain serviceable for decades. I bought four Sennheiser MKH20 mics second-hand a few years ago, and one turned out to be faulty, but it was serviced by Sennheiser and came back like new, and, even adding the cost of the service, it was still a very good deal compared to the cost of the mics brand-new.

Q Do I need balanced patchbays?

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Q&A

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Steven Lewis-Monto

Reviews Editor Mike

Senior replies: *It sounds like you've already invested a good deal of money in the gear, and there's certainly enough there to produce high quality audio. However, if you're going to retain audio fidelity with so many pieces of equipment working together, I would try to balance as many of your analogue audio cables as possible. Even in my more modest home setup mains hum and induced noise are problems (which have taken upgrading to balanced connections to sort out), so if you're ever hoping to use your studio professionally you don't really have a choice. Even in commercial studios a lot of time can be spent dealing with hum, so it's worth planning for it now, in my opinion. Unbalanced connections are fine for a smaller setup than yours, but, at the stage you're at, I reckon it's a recipe for disaster.*

The great thing about balanced connections is that lifting the earth connections between equipment to break earth loops is comparatively easy — just disconnect the earth wire at one end of the signal cable — but with unbalanced gear the same trick very rarely works in practice and will often make things worse. If you're wondering how to decide where to make this disconnection in your system, Mallory Nicholls suggested that his preferred method was "to connect cable shields at equipment outputs and not at equipment inputs" in his Studio Installation Workshops in SOS September and November 2002 (www.soundonsound.com/sos/sep02/articles/studioinstallation0902.asp)



Installing balanced patchbays (as opposed to unbalanced ones) makes dealing with hum much, much easier.

and www.soundonsound.com/sos/nov02/articles/studioinstallation1102.asp). So, disconnect the shield just before it reaches the equipment inputs. If you're using any moulded cables, then you might have to perform some modification on the patchbay, but this is not usually too difficult to work out — it's what I did, and it's worked very well so far!

To incorporate any unbalanced devices within the balanced system, you have two main choices: unbalance at the input to the unbalanced device — connect one of the balanced signal wires to the jack sleeve, along with the earth wire, and don't disconnect the earth wire elsewhere — or use a balancing transformer to do the interfacing. The second solution is more costly, but may be the only way to solve any hum problems which the first solution may create.

Maybe you'll be lucky and not get any appreciable hum using the first system, but if you do get hum then have a look at the Ebtech Hum Eliminators we reviewed in SOS March 2003 (www.soundonsound.com/sos/mar03/articles/studioessentials.asp) — there's an eight-channel one for £295 which would probably isolate enough connections to sort remaining hum problems out. I've only needed to use a two-channel one to sort out a persistent hum in my system, but yours is much more complex, and all of it will be connecting to the central desk, which multiplies the potential for hum.

Q Why is my vocal clipping?

I've been recording vocals using a Neumann TLM103 mic going through a Dbx 386 tube preamp, and using the Dbx's converters to send a digital signal into a Roland VS1680 multitracker. I understood the Dbx was virtually impossible to clip, but experience

proves otherwise! Firstly, it's impossible to use the Dbx's 'Drive' tube emulation above its lowest setting without getting obvious red light peaking and distortion for any louder transients during a vocal take (I like to sing fairly close to the mic). Does this mean I'm not getting any tube warmth from the unit? Generally, due to this problem, I always use the 20dB pad which enables me to crank up the Drive dial a little, but not much. What is the purpose of its higher incremental notches if you can't really use them? Even with Drive set all the way down, and the digital metering on the output stage peaking between 12 and 16dBu but avoiding the red light district, there are still obvious frequencies in my voice which cut through the supposed soft limiting facilities of the Dbx type IV converters to produce distortion. Sometimes I have to do drop-ins of single vowels, vainly trying to grab a clean one at a comparable level to its neighbouring words. What am I doing wrong?

Phil Godfrey

Reviews Editor Mike Senior replies:

I own a Dbx 376 and use it for all my vocal recording, and I'd suggest that you definitely don't want to be lighting that input Peak LED — that lights when the input is clipping, and clipping is quite a different thing to valve warmth. Given that your TLM103 has a fairly high output level of 21 mV/Pa, if you're giving your performance a bit of welly close up to the mic then you may well find that you have to have the input gain all the way down.

I also work very close to the mic — like you, I have the Drive control all the way down for most of my louder numbers. This isn't a problem, though — you're still driving the valve, simply by dint of the raw level coming from the mic, it's just that you don't have to add any gain on the Drive control to do it. The valve 'sound' for recording purposes is very understated in quality equipment, and you don't need to try too hard to get the benefits of the valve — you'll get all the warmth on offer just by running the valve comfortably within its normal working range. You don't need to overdrive the valve, as you would in a guitar amp.

You also asked what use the upper notches of the control were if you always



The Dbx 386 hybrid valve/solid-state preamp features the Dbx Type IV A-D converter, supposedly impossible to clip...

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Bob Moog's famous filter design gives his instruments their unique character. Whereas the original used a single low-pass filter, Voyager incorporates his audio filter which can operate in either of 2 modes: *Dual Low-Pass Mode* arranges 2 Low-Pass Resonant Filters in parallel, panned to L & R outputs and *Low-Pass /High-pass (Band Pass) Mode* connects Low-Pass and High-Pass filters in series. In either mode a new *Spacing* control can



Bob Moog has always favoured the warmth and rawness of voltage control over the predictable uniformity of digital but his VCOs now boasts the best of both worlds with ultra-stable tuning thanks to a new temperature regulation circuit. Sonically, the Voyager's oscillator waveforms are continuously variable so you can morph between waveforms for a huge range of timbres, and in practice, the addition of a dedicated LFO frees an extra VCO for even fatter tones. New Oscillator Sync and Linear FM deliver characteristic metallic & acoustic tones with intuitive tactile control.



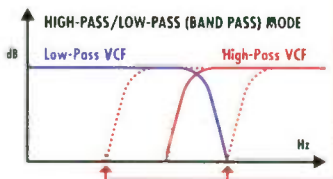
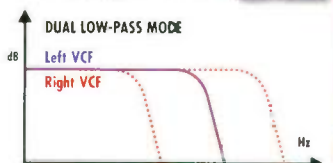
All sections of the Voyager are equally comprehensive and well thought out. Both filter and amplifier envelopes are four stage ADSR and a five channel mixer includes level control for an external input.

Obvious advances include memories & performance control. The MIDI keyboard is both velocity and pressure sensitive and an all new 3D Touch Surface provides 3 continuous control



signals (x and y coordinates and touch area amount). Control routing and patching possibilities are endless - try using the pad to simultaneously control the level & rate of modulation morphing between waveforms!

This short description can't do justice to a machine that Bob Moog has had in the gestation phase for over a quarter of a century. Call for a brochure or better still, check Voyager out in store or as a free trial in your own studio.



offset the cut-off frequency of the two filters over a +/- 3 octave range for an infinite palette of sweeping harmonics, spatial phasing, multiple resonance & variable band-pass effects.

The Voyager's two Modulation Buses are many times more flexible than those on the original. Each bus (1 shown) patches from six modulation sources, through four shapers to six destinations via the modulation wheel or pedal controller. The LFO can also be controlled from a variety of external sources including MIDI clock, and Voyager also includes dedicated Sample & Hold.

VOYAGER™ by Bob Moog

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Q&A

▶ sang too loud for them. The reason for having them is so that low-output mics, such as dynamics and ribbons, can also be boosted into the optimum operating range for the valve. Think of the Drive control more like an input gain control, and that should clarify things a bit. I'd also be tempted to leave the Pad out unless it's absolutely necessary — it'll just be adding extra components into the signal path, and that's not necessarily desirable.

So, if you're setting up your Drive control right, there remains the question of the gain management in the rest of the chain. The first thing to realise is that it is possible to get nasty distortion out of the Dbx Type IV compression if you push it too hard, even if you don't theoretically get digital clipping. The best tactic, in my opinion, is to treat the converter just as you would any other and leave plenty of headroom. In this case, without compression, the majority of the signal will probably be hitting the -16dBFS mark, although this depends on your own performance dynamics. The most important thing is that you try to avoid making the -4dBFS light come on at all. Set the channel up while rehearsing so that only the -8dBFS light ever comes on. Because of the way in which the Type IV conversion process works, the moment the -4dBFS light comes on, the converter is effectively limiting the signal, so if (once you've set things up) you cook things a little hot in the middle of a take and the -4dBFS light comes on, you'll only be limiting the spikiest peaks. Type IV is great at peak limiting, but that's all it should be used for — use a compressor to reduce the dynamic range if necessary. Your description of your metering levels ("the digital metering on the output stage peaking between 12 and 16dBu but avoiding the red light district") shows me that you're running the output too hot: the 12dBu and 16dBu lights correspond to the -8dBFS and -4dBFS lights when the meter is switched to read the digital level, so if these are coming on most of the time then you've strayed too far into the danger zone. Also, bear in mind that even the digital output metering in the Dbx 386 is analogue, so the real peaks in your audio signal will probably extend beyond the meter reading. And because of the Type IV process, the output meter will only hit the 0dBFS light if it's seriously abused, so just avoiding the red light does not necessarily guarantee clean audio.

If you're getting distortion through the Roland VS1680 even on unclipped material,

double-check that Dbx's sample rate is set correctly and that you're clocking the VS1680 from it — if the Roland is set to run from its own internal master clock then you may encounter a variety of strange spits and pops.

When digital and analogue gear is used in the same system, setting up the gain sensibly throughout the recording chain can be a bit of a minefield. However, it's worth taking the time to get it right, because otherwise all your recordings will suffer. You certainly shouldn't have to be dropping in words to avoid clipping — that's something you should be doing for artistic reasons to get the best possible performance.

Q What do Solo, PFL and AFL do?

Please can you explain the difference between 'soloing' a channel and using the other buttons marked 'PFL' and 'AFL' to listen to it. They seem to do very similar but different things. Enlighten me!

Will Robinson

Technical Editor Hugh Robjohns replies:

The PFL, AFL and Solo buttons found on the channel strips of professional mixing desks can be confusing if you're unfamiliar with their uses, not least because different manufacturers have different names for, and different ways of arranging these functions.

PFL stands for Pre-Fade Listen. It allows you to monitor the channel in question's signal level at a point immediately prior to the channel fader, and will therefore include any EQ or dynamics that might have been applied on that channel. Thus when setting up a channel's input gain using PFL, it's important to bypass any EQ and dynamics processing, otherwise you won't know what the actual headroom is at the front end. On mono channels, PFL is mono. On Stereo channels PFL should be stereo, but some cheap desks derive a mono PFL signal for



The Solo, PFL and AFL options on well-specified mixers allow the engineer to hear what's happening at different points in the channel's signal path.

both mono and stereo channels.

AFL, which stands for After-Fade Listen, is similar to PFL in function, but takes its signal from a point immediately after the channel fader, showing the level of the channel's contribution to the mix. AFL is also mono on mono channels.

Solo, more correctly known as Solo-in-Place (SIP), is an after-fade listen taken from after the pan control as well as the channel fader. It is therefore a stereo signal even on mono channels. The idea is to allow the monitoring of a channel signal when panned to its appropriate position in the stereo image. SIP is usually achieved by monitoring the main mix buss and muting all the channels other than the one you pressed the SIP button on. However, this means that you can't use SIP while mixing because it destroys the mix on the mix buss, muting aux channels as well as main channels. (PFL and AFL only affect the signal routed to the monitor outputs.) That's why SIP is often described as 'destructive solo monitoring'. Usually, you'll want to solo a channel and hear it with any associated effects returns, so selected channels can usually be made 'safe' from the SIP function, so that they continue to contribute to the mix when all the other channels are muted. A lot of desks have a single 'solo' button somewhere near the fader which can be configured to provide any or all of these functions.

Q What's the difference between morphing and crossfading?

Is there any real difference between morphing from one sound to another and crossfading? In many cases, the two sound very similar.

Anna Silman

SOS Contributor Len Sasso replies:

Morphing and crossfading are really two entirely different processes and apply to different situations. Crossfading takes place between two audio files, typically non-destructively in a sequencing environment or destructively in a sample editor. The effect, of course, is that one sound fades out as the other fades in. Morphing takes place between two groups of settings for an audio device, either hardware or software. In that case, one sound also dissolves into another, but the intermediate sounds are not simply a mix of the starting and ending sounds.

If you have sequencing software and a synth plug-in that can be automated, here's

an experiment to quickly convince yourself that there really is a difference. Set up a basic oscillator and lowpass-filter patch without any envelope applied to the filter cutoff. Record rather long clips with the filter wide open, then with it relatively closed (but with the oscillator still audible). Now crossfade between the clips over a fairly long period. Next use animation to slowly sweep the filter cutoff across the same range. Compare the crossfade with the animated filter, which amounts to morphing between the open and closed states. Of course, morphing usually involves many more parameters, and the results are correspondingly more complex and interesting.

Q What's the difference between the Detect Silence and Hitpoints functions in Cubase?

Cubase SX has a Detect Silence feature and a Hitpoints feature that seem to me like they do pretty much the same thing. Are they different, and when should I use them?

Ben Flanagan

SOS Contributor Len Sasso replies:

Yes, those features are really quite different. Silence-detection software, of which SX's Detect Silence is an example, works by searching for areas in an audio file where the level drops below a given threshold for a specified minimum amount of time. For more detail about its uses, see the Q&A on extracting loops in SOS June 2003 (www.soundonsound.com/sos/jun03/articles/qa0603.asp). Beat-slicing software, of which Hitpoints is an example, works by searching for abrupt changes in an audio file, presumably signalling individual events such as drum hits in a percussion file.

As the names imply, one of the main differences between Detect Silence and Hitpoints is that Detect Silence marks and optionally removes whole sections that it interprets as 'silence' (threshold, duration and other criteria are typically user-definable), while Hitpoints marks individual points in the audio file, the theory being that the region between two points represents a single event. In a simple audio file, say a kick-drum part, Detect Silence could be used to separate the individual kicks, but in a busy percussion part, it's unlikely that individual events are separated by silence. Detect Silence would be no help in that case. On the other hand, Hitpoints



The Hitpoints mode in Cubase SX is designed to detect and mark individual hits, making beat-slicing easier.

would be little help picking out regions separated by silence in an audio file (such as a track from an audio sampling CD) because each region would most likely contain a large number of hitpoint markers, but none at the boundaries of the silent portions. In short, use Hitpoints for slicing up audio files into individual events and use Detect Silence for identifying (and possibly removing) low-level regions in an audio file.

Q What disk utilities should I use with Windows XP?

I've heard that with Windows XP, old versions of Norton Speed Disk do not work and that the latest version of Speed Disk included in Norton Utilities has a number of features removed and is no better, if not worse, than the defrag utility that Windows XP comes with. I'm about to move up to Windows XP to take advantage of Cubase SL, and have used Speed Disk in the past in favour of the defragger that came with Windows 98 because of the huge speed difference.

Ross Copping

SOS Contributor Martin Walker replies:

It's not just a case of older versions not working — when moving to another operating system it always pays to be careful with utilities such as Speed Disk that work at a low level, since they have the potential to do some serious damage to what is, after all, unknown territory for them. If you're intending to update an existing Windows installation to XP, you should first investigate when XP-compatible updates or upgrades have been released for all such utilities, and, if so, you should install these before XP; otherwise you should uninstall them altogether.

As for the speed difference, there are two

issues — the time it takes to defragment a drive, and how much faster it operates afterwards. I discussed the various approaches to defragmentation most recently in SOS April 2003, and although using the Disk Defragmenter bundled with Windows 98 was like watching paint dry, personally I've found the bundled Win XP defragmenter to be very effective. It has a handy Analyse function that lets you view how fragmented the drive contents are before committing yourself, and once you do, it's far quicker to use.

It can also optimise disk layout for both boot and application launches, laying out data in contiguous chunks to eliminate excessive head seeks. If you have Task Scheduler enabled it will start optimising after the first boot, so your second boot should be faster. However, while Windows XP is constantly fine-tuning file positions on each boot, Microsoft estimate that 90 percent of the optimisation is done in the first couple. Even with Task Scheduler disabled you can run the new Defragmenter by hand to achieve the same improvements.

The only other advantage of Speed Disk in the past was its ability to place the swap file (or page file) outermost on a partition to provide the fastest performance, but with many musicians now routinely using 512MB or more of RAM, this becomes less important, especially as some people are routinely disabling the swap file altogether.

Although I was an enthusiastic user of Norton Utilities 2000 running on Windows 98SE, I've not personally upgraded to the latest 2002 version compatible with XP, largely because XP's own utilities all seem so much more effective than in previous versions of Windows, and because XP itself seems to need far less tweaking for audio purposes than its predecessors. Why not install Windows XP and see how you get on before deciding whether or not to invest in a suite of utilities? **SOS**

THE FUTURE OF MUSIC TECHNOLOGY

In these days of multi-GHz CPUs, the silent music PC is but a memory, drowned out by cooling fan noise. But we can have the speed without all that racket, according to a German PC manufacturer...

Dave Shapton

Moore's law is all very well. For about the last 20 years, it has observed that the power of microprocessors doubles every 18 months, which is all the more remarkable when you note that almost every year, someone tells us that Moore's law is about to be made redundant. Usually the argument is something along the lines of 'we've reached the limit of electron lithography' or whatever. I've lost track of the number of times I've heard this in the last decade, and yet, here we are, with processors faster than ever, and with no real sign of the speeding up slowing down.

But the rate of progress of technology as a whole (as opposed to just processors) is by no means as predictable. That it goes forward in leaps and bounds is a given; but quite when the next big jump is due is difficult to

predict from any sort of distance. It's the fact that you often can't see these big advances coming that makes them all the more surprising in one sense, and exciting in another.

Well, we're close enough to the next big leap to be able to talk about it with some confidence. It's the result of the convergence of predictable technical advances and somewhat less predictable commercial decisions. And it's going to have a very big effect on the way we create music and how we distribute it around our homes. In fact, over the next three years the PC architecture is going to change more than it's changed in its history. In three years' time, we may even have to redefine what we mean by a 'PC'.

I'm going to cover all these radical changes in detail, but not this month. There's too much to cover in one column, and some of the information is decidedly sketchy at the moment, so what



The new Hush PC: it has no cooling fans (hence all the fins) and is virtually silent. A recording musician's dream?

I'd like to do is give you an overview, and focus on the specifics as and when it becomes available. The first change will be, visually, the most obvious. PCs will stop looking like PCs. Instead, they'll mutate into something that looks nice beside the aspidistra.

Now, I don't want to trivialise this. In fact, I doubt if it's possible to overstate the importance the appearance of a computer is going to have in the next year or so. We've reached the point where using a computer as

a home media server is going mainstream. But I very much doubt if we'll actually reach domestic ubiquity for PCs if they don't smarten up their act. The fact is that most PCs look awful, no matter how many knobs and LEDs you put on them. So the search is on for a computer that not only looks OK in the living room, but which doesn't broadcast its presence with a noise only a few dB down from a vacuum cleaner.

Silence, Please!

There's no doubt in my mind that the best-looking PC on the planet at the moment is the one made by the German company Hush Technologies, shown above. It's the most understated piece of design I've seen for a very long time. And it single-handedly defines the form factor for the Home Media Server.

I've been saving the best bit until last: it's almost completely silent. Cooled by an external heatsink that is an integral part of the design, the only noise is from the hard disk, and you have to practically put your ear against the machine to hear that. The noise that PCs make is not deafening, but it is intrusive, both in a recording and a listening

Cleaner, More Transparent Windows

Tying the new PC architecture together is the next big iteration of Windows, currently rejoicing in the development name of 'Longhorn', which I suppose is marginally better than Intel's unfortunately named next-generation Pentium: 'Prescott'.

The release of Longhorn is probably at least two years away, but I have seen video of an early alpha version, which at this stage, of course, looks pretty similar to Windows XP. But that's just the user interface. Underneath there are some pretty big developments.

But let's stay with the User Interface for a minute. It's going to be 3D. In fact, it's going to be 3D with the resolution and responsiveness of high-definition video. For example, if you have a video picture (lets say

you've got a camera on the studio floor so that you can watch from the control room), you can see this in real time on the Windows desktop, and can even rotate it in 3D space so that it looks like it's on a billboard, viewed from an angle. When a window moves from the foreground to the background, you'll be able to arrange for it to flap, just like a curtain.

Gimmicky, perhaps, but it might just help you to navigate your way around today's ever-more complex desktops. Now, of course, most of today's computers won't be able to handle this. The ones that can have a graphics card that is compatible with DirectX 9: basically a pretty powerful graphics accelerator with advanced 3D capabilities. At last, after an incredible 17 years, Windows

is going to abandon compatibility with the old VGA graphics standard, and is going to go straight for DirectX 9.

What this will mean for most of us is that real-time video and audio will be handled with ease by every new computer. Special video effects will be part of the operating system. Pretty exciting stuff; but the best news of all is that with all the graphics processing being carried out in hardware (the graphics co-processor, or GPU), the central processor will have even more time available for audio processing. We'll be looking at 4 or 5GHz CPUs, Hyperthreading enabled, with nothing much to do apart from generate, let's say, a perfect physically modelled orchestra.

I can't wait!

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EMES Black TV & Amber

German manufacturer EMES return with the Black TV Actives, a set of full-range nearfield speakers that can be used with or without the optional Amber subwoofer.

Paul White

EMES is a company that is not afraid to look in new directions if existing solutions don't meet their needs, and the system under review is a good example of that approach as the nearfield speakers use dual-concentric drivers rather than the more common separate tweeter configuration. Unlike the Tannoy dual-concentric system, which uses a pressure driver at the centre, the EMES tweeter element looks much like a conventional soft-dome direct radiating device.

The review system comprised the EMES Black TV HR active nearfield speakers plus the EMES Amber HR active subwoofer, though other combinations of EMES components are possible. The sub handles the active crossover filtering for the connected nearfields and also includes inputs and outputs for a centre speaker for use in 3.1 or 5.1 systems. This combination provides full-range monitoring for the project studio and smaller commercial facility at a system cost of under £2000. Perhaps the best way to approach this system is by looking at the individual units first, then considering their performance as a system.

The Black TV Actives

Based around a single 17cm polypropylene cone driver with a time-aligned one-inch neodymium tweeter mounted at its centre, the Black TV HR Active is an active, bass reflex design measuring 380 x 210 x 250mm. The driver motor is based on a neodymium magnet and is powered by two 100W RMS amplifiers fed from a fast-response switched-mode power

Active Monitors & Subwoofer

supply. One feeds the tweeter coil, the other the bass/mid. The driver is screened for use close to CRT monitors, and a number of DIP switches are provided on the rear panel for adjusting the level, low EQ and high EQ. The reason for choosing a co-axial design is that the monitors operate more nearly as a perfect point source of sound, which in theory delivers better stereo imaging and a much wider sweet spot than conventional designs. The downside is that good dual-concentric drivers are difficult to design and expensive to build. Having both drivers mounted on a common axis means the dispersion is the same in both the horizontal and vertical planes, so they will work just as well on their sides as in 'portrait' mode. The crossover frequency is 1400Hz and the frequency response without the sub is specified as 43Hz to 20kHz \pm 2.5dB, which means the Black TV is a very respectable full-range nearfield monitor in its own right.

The cabinet is constructed from MDF with an attractive grey laminated finish augmented by rubber corner mouldings that also double as anti-slip feet. All the sockets and DIP switches are mounted on the rear panel heat sink along with the IEC mains inlet and power switch, the connection protocol throughout being balanced XLRs only. Three sets of four DIP switches allow the input level sensitivity to be set in steps from +15dB down to -13dB (balanced) or from 0dB to -28dB unbalanced, so virtually any balanced or unbalanced source can be accommodated. A green front-panel LED indicates that the speakers are powered up and this doubles as a warning LED, flashing red in the event that the amplifiers become overheated due to extended very high-level listening.

Bass-end adjustment is provided in 16 stages via the second row of DIP switches offering the usual more, less or flat options. These will be more useful when the monitor is used on its own as the bass end is rolled off anyway when used with a subwoofer.

The high end is adjusted via the last set of DIP switches between 4dB of high-end cut and 5dB of boost. The reflectivity of the room surfaces may require this setting to be tweaked, but it's equally valid to make small adjustments to account for listening preferences. I carried out all my tests with everything set flat and found no need to make any changes.

Amber HR Subwoofer

The Amber HR sub is built around a 10-inch, dual-coil driver that uses a paper/glass fibre cone where each coil is fed from a pair of 80W amplifiers (presumably in bridge mode) making the total power 320 Watts. A conventional 'analogue' power supply is used. The long-throw driver is mounted in a substantial MDF bass reflex enclosure styled to match the Black nearfields and has a free field response of 38Hz to 2kHz, though the internal active filtering means that the high limit is only ever 80Hz or 150Hz depending on the crossover setting chosen by the user. A further permanent

SOUND ON SOUND

EMES Black TV Actives/Amber Sub £999/£899

pros

- Well-integrated, full-range sound.
- Comprehensive sensitivity and frequency adjustment via DIP switches.
- Good overall performance and stereo imaging.

cons

- A little expensive for the typical project-studio owner.

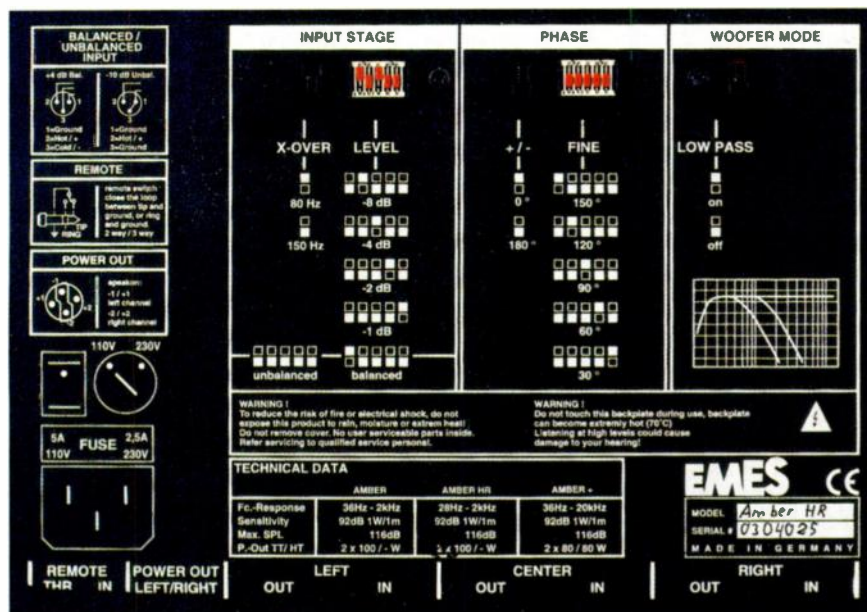
summary

The EMES system performed very well, and though it comes towards the top end of the price range for project studios, it is worth checking out, especially if your music requires that depth of bass.

“At sensible listening levels, the sound is both huge and clear with all the depth you could wish for, but at the same time, the contribution of the sub is never overstated.”



EMES BLACK TV ACTIVES



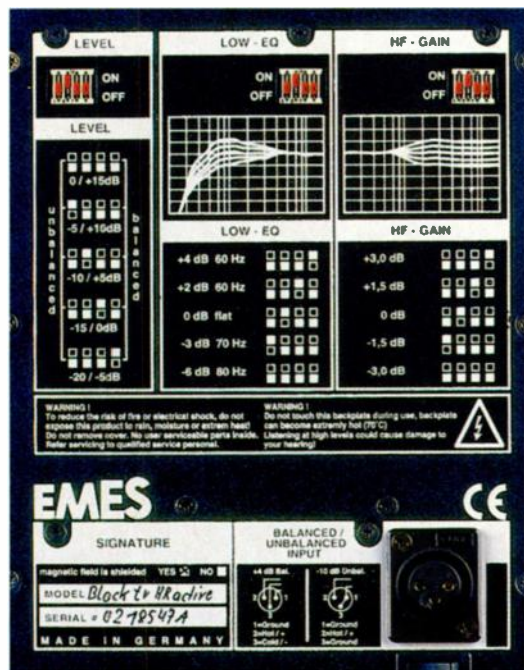
The switches on the back of the Amber subwoofer allow a great deal of user customisation; you can adjust input sensitivity, crossover frequency, and phase to tailor the sub to different monitoring environments. But you need to know what you're doing!

to integrate perfectly with the rest of the spectrum, it didn't seem to muddy or obscure the mid-range, which is a common problem with many full-range systems I've heard. The speakers also go adequately loud, though you can make the warning lights nervous if you're the type who likes to monitor at punishing levels for long periods. At sensible listening levels, the sound is both huge and clear with all the depth you could wish for, but at the same time, the contribution of the sub is never overstated. If you hear a system with a sub and it actually sounds as though it has a sub, then it's either a badly designed system or it is not set up correctly.

Conclusions

An effective studio monitor has to convey the information that you need to make sensible mix decisions; it has to spotlight shortcomings such as distortion, and it should be pleasant to listen to for long periods. The EMES system meets all of those needs as well as could be expected from a full-range system within its price range, and I have to admit that I really enjoyed listening to music on them. The stereo imaging is also good with no radical changes if you move listening position.

While the system represents good value given its performance, there must be some cost penalty in using what is ostensibly a full-range speaker (the Black TV Active) as a satellite as it is engineered to produce adequate bass end when working without a sub. When used with a sub, its input is filtered below 80Hz or 150Hz, so its low-frequency potential is unused. This contrasts with systems such as those produced by Blue Sky, where the satellite speakers are designed specifically to work with a sub and so don't need to have such an extended low-end response. This also allows the satellites to be made physically smaller. That comment aside, I liked the EMES system very much and the cost, given the quality of performance, is still very reasonable. Selling monitors is a tough game at the moment, because there are so many good models to choose from in the low to mid price range, but this system certainly deserves closer attention, especially if you need depth from a compact system.



The DIP switches at the rear of the Black TV Actives allow user adjustment of the input sensitivity, low- and high-frequency response.

frequency of either 80Hz or 150Hz. This is useful, not only because music and video producers tend to work with different crossover frequencies, but also because the placement of the sub relative to the nearfields may affect the subjective performance differently depending on the crossover setting. The DIP switches also allow for polarity inversion and incremental phase adjustment from 30 to 150 degrees, which may be necessary if the sub is substantially in front of or behind the nearfields. However, this needs specialised measuring equipment and expertise to set up accurately, so it's probably best to leave the phase switches alone and

try to keep the sub in more or less the same place as the nearfields.

Testing

I compared the system against my Mackie HR824s as well as some other monitors I had at the time, and my initial impression was very positive. I like speakers that let you almost listen 'through' them into the performance so that you can separate the different instruments in a complex mix. The system was very much like my Mackies in that respect with lots of depth and detail but not compromised by harshness. Furthermore, although the bass end seemed

- ▶ 'sub-audio' low pass filter set at 15Hz prevents the sub from wasting effort reproducing very low frequency information below the range of human hearing and, more importantly, below the frequency at which its port can provide proper driver loading.

The overall size of the Amber sub is a not-unreasonable 380 x 480 x 400 mm, including the 'pod' on the rear panel that houses the XLR ins and outs for the left, centre and right speakers as well as the DIP switches and IEC power inlet.

The switches allow the input sensitivity to be set in steps from 0.45 to 4.5V and it's also possible to choose a crossover

information

- £ Black TV Active monitors, £999 per pair; Amber subwoofer £899. Prices include VAT.
- T Audio Inspirations +44 (0)1664 483111.
- F +44 (0)1664 410999.
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Samson C•Control, C•Que 8 & C•Com 16

Monitor Controller, Headphone Amplifier & Stereo Compressor



Paul White

Many SOS readers are as short on space as they are on money, so Samson, already well-known for their cost-effective mics, monitors and processors, have stepped into the breach with their new series of half-rack processors. The steel construction of the units is robust and attractive, and

These three compact units offer a great deal of functionality in a remarkably small footprint.

profiled plastic 'bumpers' allow several of these units to be stacked for easy desktop use. The kit also includes screw-in feet that can be used to support the lowest unit in a stack and these also tilt the units to a suitable angle. All the units run from included AC

power supplies.

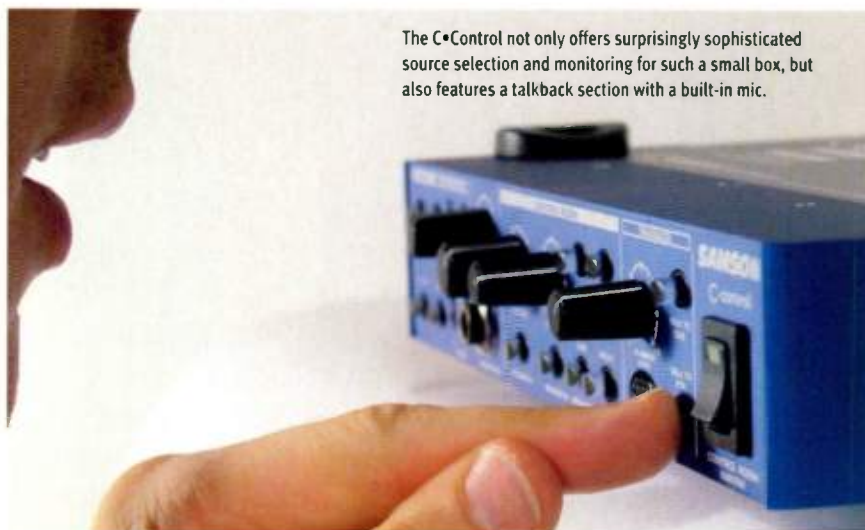
The three units under review here comprise a four-channel headphone amplifier, a fully-featured stereo compressor with presets, and an ingenious stereo monitor controller, but these are only the beginning of

the range — apparently there's at least a tube mic preamp and an optical compressor in the pipeline, and possibly more useful little units to follow.

C•Control Stereo Monitor Controller

With so many powerful virtual instruments and effects available within music software, it's perfectly possible to set up a computer-based recording system without a mixer, but there are elements of the traditional mixer that it's difficult to manage without, especially if you're using active monitors. For example, you need an easily accessible physical volume control, perhaps a monitor Dim button for when the phone rings, and a mono button to see if your mixes collapse into a lifeless heap when played over a mono system. Then there's talkback, the ability to select different two-track machines for playback, and a headphone out. Samson's C•Control provides all this and more.

Essentially, the C•Control duplicates the master section of a mixer and, in addition to its main stereo mix input, it can also switch to three further stereo sources. Stereo input level monitoring is implemented using a pair of



The C•Control not only offers surprisingly sophisticated source selection and monitoring for such a small box, but also features a talkback section with a built-in mic.

six-segment LED meters. What's more, it can even mix these inputs, which is useful if you simply want to use your guitar preamp to play along with a CD or one of your songs in progress. There's no input level control though so levels must be controlled at source. As well as being monitored via speakers, the stereo mix can be sent to three stereo recorders at the same time (any one of which

can be used as a monitor source via the input selectors), and there's switching for up to three sets of studio monitors. The third monitor output may be on at the same time as either of the first two making it suitable for feeding a subwoofer or for driving separate playback speakers in the studio area. Clearly much thought has gone into the monitor switching system, not least because, if the

WHAT PRICE CONTROL?

TASCAM FW-1884.

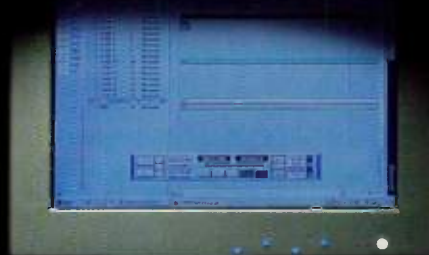
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Two IEEE 1394 FireWire ports provide connection to host computers and drives. Expansion is simple, with the addition of FE-8 sidecars, each providing a further 8 fully spec'd channel strips.

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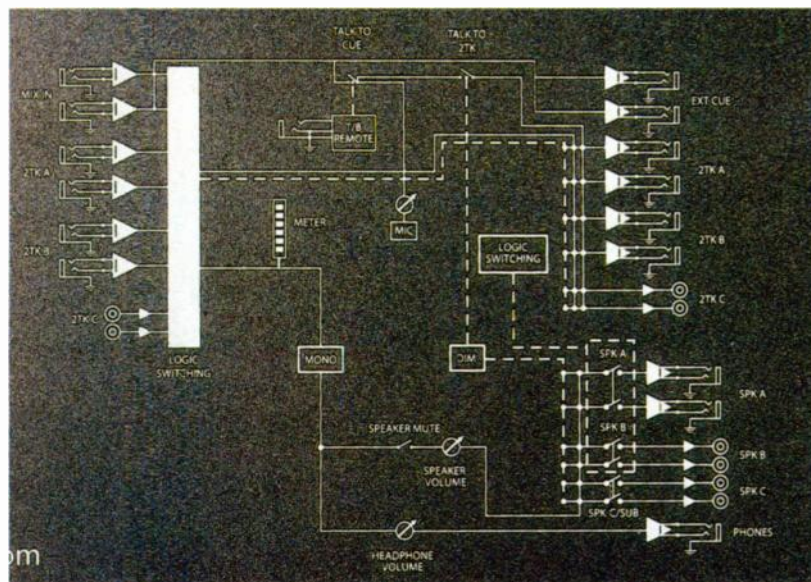
* TASCAM FW-1884 pictured with two FE-8 additional channel control strips. Monitor not supplied.
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SAMSON C•CONTROL, C•QUE 8 & C•COM16



C•Control offers much of the functionality of a conventional mixer's master control section.

► Speaker B button is pressed down, the Speaker A button toggles between Speakers A and Speaker B, whereas if the Speaker B button isn't down it simply turns Speaker A on or off. The routing also makes it virtually impossible to feed an output back into an input, which would produce electrical feedback.

C•Control includes an integral electret talkback mic (mounted in the front panel) that can send into the cue mix or into the two-track outputs, where a rear-panel jack allows remote talkback switching using an optional 'normally open' switch. The speaker outputs dim whenever talkback is operated. A headphone amp with its own level control is built in, and a stereo cue output feeds the selected stereo input to an external headphone amp or other cue system. Using talkback momentarily overrides the source in the cue output but does not affect the headphone output.

Inputs & Outputs

The first three inputs are on balanced jacks operating at a nominal +4dB level, while the fourth is on phonos and operates at -10dBV. A single stereo level meter monitors the overall input level. All three two-track outputs, plus the stereo mix input, are active when selected, so to prevent a two-track machine in record mode from feeding back into its own input, the correspondingly numbered two-track output is muted when a two-track input is switched on. This is a wise precaution, but because of this you also have to remember to deselect all three two-track inputs if you want to use the talkback to record a verbal cue to tape, otherwise nothing will happen. Two of the two-track outputs are balanced on TRS

jacks at a +4dB level, while the third again uses unbalanced phonos at -10dBV.

To the immediate right of the meters is a headphone jack and its associated level control. This always monitors the input and is not interrupted by the talkback facility — talkback only routes to the Cue outs (balanced jacks) or to the two-track outputs, depending which of the two non-latching Talkback switches is depressed. A talkback level control is fitted.

The speaker-system outputs are at line level (the first is on balanced jacks while the other two are on phonos), so are suitable for feeding both active monitors and passive monitors driven from a power amplifier. A master level control affects all the speaker outputs, while Speaker B has a further volume control (which you could think of as a trim control) allowing it to be balanced with Speaker A. If a subwoofer is

SOUND ON SOUND

Samson C•Control £119

pros

- Affordable.
- Provides everything you need from a mixer master section without having to have a mixer.
- Compact and stylish.

cons

- External PSU.

summary

The C•Control provides all the facilities you need for multi-speaker monitoring, stereo source selection and two-track management, and also provides a phones output and talkback.

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MICROPHONES

SAMSON C•CONTROL, C•QUE 8 & C•COM16



C•Control offers comprehensive, sensibly chosen connection options.

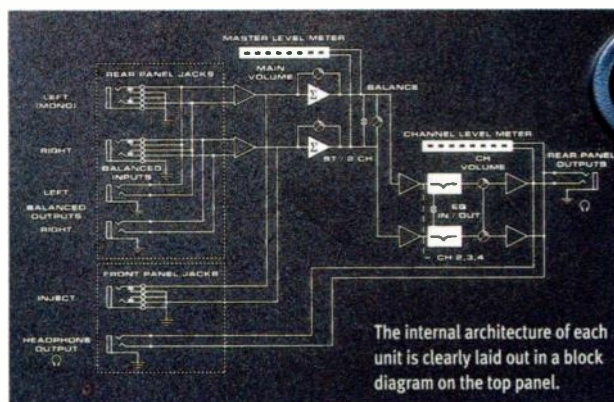
► fed from the Speaker C outputs, its level must be calibrated on the unit itself, after which it tracks the main volume control setting along with Speakers A and B. The Dim switch knocks down the speaker output levels by 20dB to allow talking or answering the phone without disturbing the volume control setting and there's also a Mute button for when only complete silence will suffice. Mono sums the left and right channels for compatibility checking.

C•Que 8 Headphone Amplifier

Headphone amplifiers are one of those unglamorous, but nevertheless essential components of any studio where it is necessary to provide headphone feeds for two or more musicians. Samson's C•Que 8 provides four independent channels of headphone amplification designed to work into virtually any impedance of headphone. Each channel has two outputs (one on the front panel, one on the rear) enabling a total of eight sets of headphones to be driven at one time. The stereo inputs are on balanced TRS jacks on the rear panel, but there's also a further Inject

input (stereo TRS) on the front panel that allows a mixer send or other source to be added to the phones mix, so that a vocalist can have a mix with more vocals in it, for example. A pair of Link outputs enable further headphone amplifiers or other devices to monitor the headphone feed.

In situations where stereo use is not needed, the unit can be switched into dual-channel mono mode. The Balance control is used to adjust the stereo balance of the line input in normal stereo operation, but this changes to adjusting the mix of the two inputs in two-channel mono mode. A single button switches between the two possible



The internal architecture of each unit is clearly laid out in a block diagram on the top panel.

modes of operation. In stereo mode, the main stereo input is mixed with the stereo Inject input, where the level of the Inject signal needs to be set at source. In dual-mono mode, the line and Inject inputs are mixed to a mono signal and fed to all channels. If one input is a mix and the other is from, say, a vocal send, the Balance control can be used to set the level of vocals in the monitor mix. The input Volume control affects both the

main stereo input and the Inject input.

Unusually for such a modestly-priced headphone amp, the C•Que 8 also has a switchable EQ contour circuit built in to impose a 'smile curve' on each of the four headphone feeds, much like the loudness button on a hi-fi. There's also a level meter (for signal presence confirmation) and a rotary volume control on each of the four channels, with a separate meter to monitor the input line level. Threaded mounting holes are located in the bottom of the case, presumably to facilitate stand mounting, and a block diagram of the unit is screened on the top panel to clarify the functionality when the manual is not to hand.

C•Com 16 Stereo Compressor

The C•Com 16 offers dedicated stereo compression based on a choice of 15 presets or fully manual operation. Its balanced jack I/O can be switched to +4dbu or -10dBV operating levels using a rear-panel switch, and there's also a side-chain insert point for adding equalisers or other processors — if, for example, you were setting up full-band de-essing. Because the side-chains of the two compressor are permanently linked, it isn't of course possible to treat two separate mono signals.

Conceptually, the C•Com 16 is pretty straightforward and is controlled via a 16-way rotary switch that selects one of 15 compression presets or the fully manual adjustment mode. Red and green LED indicators show which preset is currently selected and there's a six-segment gain reduction meter that is used in conjunction with the Sensitivity (essentially threshold) control to set the desired amount of compression. Curiously, the Sensitivity control only has a -10 to +20dB range, so if the incoming signal is quite hot, as it could be coming from a soundcard, it might be difficult to set the compression threshold low enough. The remaining Ratio, Attack and Release controls work only in manual mode and there's a further Output control that works in all modes to provide make-up gain when the peak level has been pulled down by compression. A further meter can be switched to monitor the input or output, and the

SOUND ON SOUND

Samson C•Que 8 £109

pros

- Nicely styled and ruggedly engineered.
- Loud, clean output.
- Inject input adds welcome extra flexibility.

cons

- The front panel is a little congested, especially when headphones are connected to the front-panel jacks.

summary

The C•Que 8 meets its design brief as an inexpensive and reasonably versatile headphone amplifier with more than enough output power to keep any musician happy.



Outputs are duplicated front and rear, allowing connection of up to eight pairs of headphones.

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New PowerMac G5 Audio Production Performance

Logic (Mac) versus Cubase (PC)

To quantify the performance advantages of the Power Mac G5 for audio production, Apple tested eMagic's Logic Platinum for the Macintosh and Steinberg's Cubase SX 1.051 for the PC. Apple created a processor-intensive workload of projects containing multiple unique audio tracks; assigned five default reverb plug-ins to each of the audio tracks; and tested each platform to see which could play more plug-ins.

For Logic, Apple used the default settings for the Fat EQ, AutoFilter, Chorus, and Silver Compressor plug-ins. For Cubase, Apple used an equalizer and the default settings for the StepFilter, Chorus, and Compressor plug-ins.

Simultaneous audio tracks with five plug-ins

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59	Power Mac G5 1.8GHz PowerPC G5	NEW! PowerMac 1.8GHz PowerPC G5 £1849
52	Power Mac G5 1.6GHz PowerPC G5	NEW! PowerMac Dual 2GHz PowerPC G5 £2299
81	Dell Precision 650 Dual 3.06GHz Xeon	
35	Dell Dimension 8300 3GHz Pentium 4	

The dual 2GHz Power Mac G5 can play 115 tracks, compared with a maximum of 35 tracks on the Dell Dimension 8300 and 81 tracks on the Dell Precision 650. More impressively, the 1.6GHz single-processor Power Mac G5 played 50 percent more tracks than the 3GHz Pentium 4-based system.



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NEW! Mach 5	£346



SAMSON C•CONTROL, C•QUE 8 & C•COM16

► compressor has a bypass button, but there are also some additional features worth mentioning.

Because heavy compression can pull down the level of high frequencies within a mix, the C•Com 16 includes an Enhance button that uses a dynamic filter to restore the high end

chosen, it is only necessary to adjust the Sensitivity control to get the required amount of gain reduction, but, as stated earlier, this isn't always easy, even on the +4dBu setting, because of the limited range of the Sensitivity control. Once the right degree of compression has been established, the Output control can

many users feel nervous about setting up manual compressors, so for them the C•Com 16 provides an affordable way to dip a toe into the water using presets before wading in with the fully manual mode.

Setting up the C•Control proved to be extremely simple, and the illuminated buttons make it clear what mode the switches are in, although it did take me a while to work out why the talkback to two-track didn't seem to work at first. Everything worked as proclaimed on the tin and, though I found the talkback mic a little noisy, it didn't affect intelligibility and didn't get onto the recordings (other than when slating the two-track feed), so it's not a problem. The signal path through the C•Control was very clean and having the ability to mix inputs is a true luxury. I found it useful to patch the input from my audio interface into the stereo mix input and then to bring the output from my keyboard line submixer into the next input, as this allows me to isolate either source and check for quality problems. The mixed output can then be recorded to a two-track machine or, alternatively, one of the two-track outputs could be fed back into the computer's audio interface to allow the MIDI parts to be recorded as audio. As you can mute the mix input without muting the feed from the line mixer, this is extremely easy.

A product like the C•Control is long overdue and I hope it won't be too long before Samson build something similar for surround monitoring, ideally for no more than twice the price. The C•Control covers all the obvious 'master section' functions including talkback, and in making the four stereo inputs usable at the same time it solves one of my own problems, which is how to feed an additional small mixer into the monitoring system along with the computer's stereo output so that I can plug in instruments when rehearsing. Combined with the C•Que 8 headphone amplifier, which would stack above or below it, the C•Control neatly meets the entire monitoring needs of a typical computer-based studio. In my view this is a seriously useful piece of kit that anyone with a workstation or music computer system should not overlook, and for coming up with such a practical niche product Samson deserve to sell C•Controls by the container-load. I've a feeling this one is not going to go back! **ES**

information

£ C•Control, £119; C•Que 8, £109; C•Com 16, £119. Prices include VAT.

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during periods of heavy processing. Furthermore, the compressor side-chain provides a soft-knee characteristic up until the signal has exceeded the threshold by around 10dB, after which it stiffens up to apply a more assertive hard-knee compression at the ratio set by the user (or the preset parameters). Samson call this SKD — Smart Knee Detection. The manual also talks about programme-dependent attack and release time modification (AEG) but it isn't clear whether this applies only to the presets or to the manual mode as well. Such a feature is especially useful on mixes where the dynamics of the piece are constantly changing, as the compressor is able to adapt its behaviour accordingly.

The presets available cover most eventualities, from smooth and aggressive vocals, through bass guitars, guitars and percussion to stereo mix compression. Dedicated presets are included for limiting and enhancement, with a particularly useful Stereo Master preset that manages to be reasonably transparent while still adding weight and density. Once a preset has been

be used to match the subjective level of the signal to that with the compressor bypassed, which makes assessing the effect of the compression much easier.

Conclusions

The C•Que 8 provided a clean, loud headphone feed when tested with a number of different types of headphone, and all the controls worked exactly as they should. The knobs are a little small and fiddly and the legending a little too easy to hide with your fingers when you're making adjustments, but there's nothing serious to complain about. Between the two modes of operation, most small studio monitoring requirements can be met with reasonable flexibility and, overall, the C•Que 8 delivers an impressively solid performance at a very affordable UK price. There are more versatile systems around, but none which can compete with the C•Que 8 in terms of ease of use or UK price, and I think Samson have struck a good balance here between complexity and cost.

The C•Com 16 offers nothing particularly new, as we've already seen preset compressors from the likes of TL Audio and Focusrite, but that doesn't detract from the fact that it is a good-sounding, easy-to-operate compressor that can be used on mono or stereo signals. In manual mode, it works conventionally and sounds 'right' on most sources. It has enough range to make things sound very obviously compressed, but the sound stays focused and musical all the way. I also liked the Enhance button, as this adds a subtle but welcome high-end lift to the sound, and helps maintain a sense of transparency during heavy compression. In fact I think a lot of users would probably switch it in when mastering, just because it sounds good. As with the other boxes, the C•Com 16 also looks smart, it seems well engineered, and its performance exceeds what you'd expect for the cost. I know that

SOUND ON SOUND

Samson C•Com 16 £119

pros

- Good selection of presets suitable for mono and stereo sources.
- Presets are ideal for newcomers to compression.
- Enhancer adds a nice gloss to the sounds being processed, without being unsubtle.

cons

- External PSU.
- Sensitivity control may not have enough range for those feeding in really hot input levels.

summary

The C•Com 16 is a cost-effective and easy-to-manage compressor with the benefit of both preset and manual modes.

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Studio SOS



The SOS rescue team set off for Bristol to help out readers Alistair Vickery and Jon Midwinter, who wanted help with their mixes — not only getting the bass sounding right, but also stopping it getting out of the house and annoying the neighbours!

Using the spectrum analyser within the channel equaliser in Emagic's *Logic v6*, the overemphasised low end of Alistair's mixes, and his bass sounds in particular, became very apparent.

Paul White

Alistair Vickery and Jon Midwinter both started out as DJs, something they still find time to do, but they work together most of the time as a production duo in Bristol, specialising in drum & bass and recording under various guises, Distorted Minds being their primary tag. Alistair set up the studio six years ago and their first release 'Eventual', was rewarded with extensive club and radio play. Since then they have released material on various labels including New Identity Recordings, Formation, 5HQ Recordings, Renegade Hardware, Trouble On Vinyl and Breakbeat

Culture. Today they run their own record label, D-Style Recordings.

The duo work from a large, single-room studio above a double garage at Alistair's parents' home. They called *SOS* because they felt their mixes were lacking clarity, and also to see if Technical Editor Hugh Robjohns and I could help with noise leakage problems. Like so many studios, their setup is a mix of hardware and software, with Emagic's *Logic Audio v6* providing the main recording environment. Monitoring is via a pair of Dynaudio BM15s fed from a Hafler power amplifier, and most of the mixing is done manually using a Mackie analogue eight-buss console. John told us he wasn't convinced by most

software instruments, as he found them too clean-sounding for drum & bass work, so many of the sounds come from a hardware Emu sampler and an Access Virus synth. There's also a rackmount Novation Bass Station and a couple of more conventional keyboard synths including a Roland JP8000 and XP50.

Drum & Bass Mixing

The mixer tends to get used as a sound-design tool for reshaping sounds before use, often by applying radical EQ to individual sounds and then resampling them. We listened as Alistair played us some of his mixes and then some commercial recordings in a similar genre for comparison. Both Hugh and I felt that the sound from the BM15s was a bit bass-light, mainly because the dry-wall structure of the room was acting as a bass trap. A significant

amount of bass was also escaping to annoy the neighbours, but other than an overall bass lightness there were no obvious hot or dead frequency spots.

Given that drum & bass isn't the cleanest of musical art forms, some lack of clarity is to be expected, but Alistair told us that when their material was mastered, it usually had to be brightened up quite a lot. The listening tests revealed that the bass end on their mixes was very deep and powerful, but it seemed to lack focus when compared with the commercial mixes, so rather than try to use EQ to correct the problem I asked Alistair and John to show us how they normally recorded and mixed their bass parts. The desk was already set up for the mix they were currently working on and, sure enough, on the bass parts the Low control on the Mackie EQ was turned up full to give +15dB of boost. Because this is a simple shelving equaliser, the boost continues all the way down the audio spectrum, so as well as beefing up the part

of the bass spectrum that needed it, it was also pushing up the level of subsonic frequencies that simply eat into the available headroom without contributing to the mix in any useful way. This was almost certainly the main culprit in producing the muddy LF that Alistair and John had noticed when their tracks were played on big club PAs. However, because of the limited LF reach of the BM15s in their room, this subsonic energy was not apparent at all in the studio!

To see what effect this was having, I suggested we use the frequency analyser facility in the new *Logic v6* Channel EQ to compare the frequency spectrum of their mix with that of a commercial mix they liked the sound of. The analyser needs to be set to its highest resolution to produce anything meaningful, and even then it can only provide a rough guide at the lower end of the spectrum, but straight away it was evident that Alistair and John's mix contained way more subsonic energy for more of the time than the reference mix.

Hugh and I suggested that to improve this situation, they use a parametric rather than a shelving EQ to add any required bass boost, as that would avoid adding too much boost below the area of interest. Because only the largest professional monitoring systems cover the entire audio frequency range accurately (and then only in a well-designed room), there will inevitably be things going on within a mix that you can't hear over a typical project-studio monitoring system. Furthermore, we pointed out that it's invariably better to create the right type of sound at source than to try to batter it into submission later using large amounts of EQ.

Solving Low-end Problems

Alistair asked whether we thought adding a subwoofer would solve the problem, but we both felt that it would be inappropriate in this case. Firstly, to deliver very low frequencies with any pretensions of accuracy you need to have a very well-designed (and

Sorting Out A Rattling Speaker

When we started listening to the monitoring system to try to form an impression of the room acoustics, it quickly became apparent that something was amiss. There was a buzzy rattle that seemed to be triggered by certain bass frequencies. Tracking this kind of thing down can be difficult, as sometimes it's just as likely to be noises generated by other objects in the room, or even within the walls, as it is the speakers — especially if it only appears at high listening levels. So I had Paul play a few bass notes on a Roland JP8000 as test material to make finding the problem easier.

In this case we were able to establish that it was definitely a problem with one of the loudspeakers. Sometimes buzzy noises of this kind

are caused by loose fixing screws, or even air leaks around the gaskets of the loudspeaker drivers, particularly if the speakers are routinely used at high levels and with bass/drum-heavy music. So the first and easiest thing to try is simply tightening up all the accessible fixing screws. In the case of the driver fixings, it is best to adopt a similar tightening procedure to a car wheel — tighten in small stages working around opposite pairs of screws. It's worth checking the fixings of the terminal connector panel on the back as well in the case of passive speakers, and the entire amplifier chassis in active ones.

In this case the driver fixing screws were, indeed, quite loose, but tightening them still failed to cure the problem. The next most likely scenario

is that the internal connection wires, or even the lead wires running to the voice coil of the bass driver, are rubbing on something inside — other wires, sound absorption material, cabinet panels, or whatever. To solve this problem you usually have to carefully remove the bass driver and rearrange the internal wires as necessary — but if it is a lead-wire problem the bass driver will have to be replaced.

As we investigated, it turned out that the bass driver of the other speaker had already been replaced after exhibiting this very problem, and as it seemed likely that it was a similar lead-wire problem with this speaker, we didn't investigate any further, leaving it up to our hosts to organise a replacement as soon as possible. *Hugh Robjohns*



Hugh's first step when attempting to eliminate a rattle in one of the BM5 speakers was to secure some loose fixing screws on the bass driver. When this didn't solve the problem, Paul used a Roland JP8000 to provide a consistent signal, allowing Hugh to troubleshoot further.



Alistair had been using fairly extreme EQ settings for his bass sounds on his Mackie console — the low-frequency shelf was cranked all the way up, giving 15dB of boost! Paul flattened the bass channel's EQ and resolved to optimise the sound in other ways.

▶ usually large) listening room, and a misleading and inaccurate low end would be likely to cause more problems, not less. Also, more extreme LF energy would pass through walls very easily, exacerbating the problem of escaping noise annoying the neighbours! The safest option in this situation is only to EQ those elements of the bass end you can actually hear and leave everything below 60Hz or so as it is. At least this will give the mastering engineer a fair chance of adjusting the bass end adequately before the record or CD is pressed.

We also ran a separate frequency analysis on the bass synth sound used in the track currently being worked on, as we all felt it lacked power and definition, even when extreme bass boost was being used. I suspected that the main reason was a lack of energy in the upper bass region where bass is heard rather than felt. This occupies roughly the 80Hz to 200Hz range, and it's mainly this part of a bass sound that you hear when a record is played on a small domestic hi-fi or on a portable radio. Sure enough, there was plenty of bass energy below 80Hz but a serious lack of activity for an octave or so above that, so trying to put the punch back with EQ wouldn't have helped the situation.

One of the production tricks used by the pair was to dirty up sounds using the SPL Charisma valve processor, and in some situations they would split a signal into two mixer channels, EQ one channel to be very

bassy and the other to be bass-light and bright, then add different amounts of distortion to the two parts (or distort just one of the parts) before mixing them back together. This can be a useful trick, but in this instance distortion didn't help, because although it added harmonics right across the spectrum, it did little to fill the 'hole' in the frequency plot. The only real solution when faced with this kind of challenge is either to modify the synth sound at source or, alternatively, to layer in another sound

that contributes in the frequency region where the original sound is lacking. One further recommendation we made was that Alistair and John should install a pair of small, domestic hi-fi speakers on which to try their mixes, as what sounds big on the Dynaudios can sound quite lacking in bass and punch on smaller speakers. Ideally, dance mixes of any type should be checked on studio monitors, small nearfields and a large club sound system to confirm that the bass end translates adequately.

Using Distortion On Bass Sounds

The conversation turned to methods of distorting sounds, and I asked if they had ever tried using plug-ins. They said they had and that they didn't like the results, which didn't surprise me as I've never really liked them either, other than some of the better guitar amp simulators. I explained that raw distortion usually sounds bad, because it needs to be filtered by something like a guitar speaker or emulation of a guitar speaker to round off the rough edges. As the studio Mac wasn't a particularly fast model, I didn't suggest using a guitar preamp plug-in, but instead felt that a hardware unit (such as the Digitech Genesis 3 or the Line 6 Pod XT) might be a good solution for warming/dirtying up synths and samples, and it would also make guitar recording easier on the occasions they needed it. John told us that they have a good relationship with their local music store, and that it might be possible to try one out before deciding, and they definitely felt the idea had promise.

Purely out of interest, I set up some bass synth sounds when I returned home and



A few experiments with some heavy towels confirmed that the noise of Alistair's Mac G4 computer could be significantly reduced with very little effort.

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In an attempt to reduce the levels of bass leakage from the studio, Paul spent some time tapping various flat surfaces, such as underneath the stairs, to ascertain which ones were most likely to be resonating with the low frequencies.

► tried using *Logic's* little-understood *Phase Distortion* plug-in to give them more attitude. Providing you spend a while experimenting with the controls (not all of which do what you'd expect), this can yield some very worthwhile results. The sound is hard to describe, but it's not unlike increasing the modulation depth on an FM synth, where the harmonics become richer and more intense. Although there's little in-depth detail on what goes on inside this plug-in, it seems to work by changing the waveform shape in a similar way to the phase distortion synthesis used in the old Casio CZ synth range (which was itself a form of FM) and can save the day when other forms of distortion fail. It seems to work best on monophonic synth lines and drum loops.

Noise Reduction Measures

Before moving on to the noise leakage issue, Alistair told us that he had problems with the fan and drive noise from his Mac being picked up when recording vocals. It turned out that vocals were usually recorded to one side of the studio, but a few minutes of impromptu experimentation showed that a better place was towards the rear of the room, where the sloping ceiling/wall was covered in foam tiles. Working there only entailed buying a headphone extension cable, but setting up the mic facing the absorbent wall made the subjective level of the background noise at typical recording levels insignificant. The sound of the vocals was also more natural and uncoloured when recorded from this position. A further

improvement could be made by improvising an absorbent screen (the ubiquitous duvet?) between the vocalist and the mixing desk.

We also tried a trick I'd developed at home for making my own G4 quieter, which simply entails draping a heavy rug over it to form a tunnel, where the front and back of the computer 'look' out of either end of the tunnel. Keeping the back of the computer clear is essential, as this is where a G4 is ventilated. Providing the rug goes all the way to the floor on both sides of the machine, the drop in noise is significant, and can be further improved by having the back of the computer facing something absorbent, such as acoustic foam. We used a couple of heavy towels just to confirm the principle and everyone agreed the drop in noise levels was worthwhile.

Prior to us finding this way to record vocals, the pair were planning to build a vocal booth, but in my experience homemade vocal booths are responsible for

some of the worst vocal recordings I've heard. Typically they are treated to absorb well in the upper frequencies and mid-ranges, but not at the low end, so what you end up with is a middly, honky room, with a woolly, dominant bass end. If you have built such a booth and are having these problems, try introducing some reflective surfaces back into the room, for example wooden slats or diffusor/reflectors made from plastic guttering with the convex side facing into the room.

Dealing With LF Leakage

As expected, a lot of sound leakage was due to an ill-fitting outer door at the bottom of the stairwell leading up to the studio, and the single-glazed windows in the studio were leaking quite badly too, even though Alistair had made some Rockwool-filled shutters, which also excluded all daylight. In order to preserve the look of the building, we suggested fitting conventional double-glazed window units to the inside of the window spaces and leaving the existing leaded windows on the outside. One of the windows was right in front of the mixing desk, and would be reflective when the shutter was removed, but we felt the acoustics of the monitoring area could be maintained or even improved by fixing around one square metre of thick foam tiles to each side of the window opening, directly behind the monitors. As the side walls were quite a long way from the mixing position, there were no noticeable flutter echoes so it was decided not to treat these.

The outside door was showing light around its edges, and this gap was allowing a lot of sound to escape around it — it was also not particularly heavy. We explained that, to make it an effective sound isolator, it should be made more massive by adding a layer of 3/4-inch chipboard to the inside,

Thoughts From Alistair & Jon

"The day Paul and Hugh spent with us certainly helped, and we're hoping we can try some of the sound isolation measures they described. I'm making more use of the EQ inside *Logic* now, especially with the analyser set to high resolution so that I can see the spectrum of the sound. I've also started to notice more about what we can actually hear on the BM15s (specifically at the low end) and I've tried out lots of different types of EQs to see what the differences are.

We're definitely looking at trying out a Pod XT, as some of our friends use one, and in general

I think we had forgotten to experiment as much as we used to before the computer age really hit us. We bought the computer, got rid of almost everything else and then bought a lot of it back again! I think it's good to have both hardware and software tools and, although you can have a lot of fun messing around with either, at the end of the day you actually have to get on and write music. It also takes longer to realise what you can actually do with an application such as *Logic*, because there's an awful lot of stuff in there to explore."



"Can I borrow a cup of acoustic foam?"

ideally with a layer of barrier mat (heavy, flexible, mineral-loaded material) sandwiched in between to add more mass and to increase the damping. The frame should then be extended to include a threshold strip at the bottom, and proper neoprene sealing strip should be fitted all the way round (not domestic draught excluder). These specialist items are available from any studio acoustics materials supplier. Modifying the door in this way may not be enough, but there was space to build a small entrance lobby with a second door, which would be much more effective should the need arise. Although it would be possible to make the outer door even more massive, a special frame and hinges would have to be fitted to support the weight, so our DIY solution felt like a good compromise.

Another major source of leakage was a lightweight studding partition wall at the side of the stairwell, which adjoined the garage. This allowed sound to pass out through and around the garage doors. Building an internal brick or block wall would be the ideal solution, but as there might not be space for this, we came up with a compromise plan which involved uprating the existing wall by adding a series of multi-material layers comprising barrier matt, 3/4-inch chipboard, soft fibreboard and then one or two layers of thick plasterboard. Just applying this to the garage side of the wall should be adequate, but the same could also be applied inside the stairwell if needed. This is a relatively inexpensive solution, and within the scope of most people's DIY skills. The final plasterboard layer could then be skimmed with plaster to produce a professional finish. The reason for using this layered construction is to improve the damping of the wall, which in turn helps absorb sound energy rather than transmit it. The existing plasterboard wall could be felt to vibrate quite strongly when the monitors were playing at a moderate level.

Significant noise was also leaking from the underside of the stairs themselves and, again, a similar layered system could be used to damp this. As the stairs were close to a garage window overlooking a neighbour, fitting internal double glazing to this window might also be of benefit. Some leakage through the studio floor into the garage was also evident, but curing this would be much more complicated, and could involve fitting a floating floor to the studio. As the other areas of leakage seemed the most significant, it was felt that tackling these would probably bring about an adequate improvement. SOS

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Eventide's first foray into the world of plug-in effects sees them recreating five of their classic '70s processors. But is there still a place for them in today's studios?

Sam Inglis

The big names in hardware processing have reacted to the rise of plug-in effects in very different ways. Some, like TC, have enthusiastically embraced software, while others have been more reluctant to make their designs available in virtual form. Until now, Eventide have been firmly in the latter camp. You could find their Harmonizers and other effects in every pro studio in the land, but you'd look in vain in your plug-ins folder for them.

Eventide's *Clockworks Legacy* bundle is thus being heralded with more of a fanfare than your average set of plug-ins. Don't buy it expecting to get an Orville or an Eclipse in software, though: the five plug-ins in this package are all modelled on classic Eventide processors from the 1970s — the company's full name was originally Eventide Clockworks. On offer here are recreations of their very first Harmonizer, the H910, along with its more sophisticated successor the H949, the Omnipressor dynamics unit and the Instant Phaser and Instant Flanger. They are available only for Mac-based TDM and HD systems; on HD systems, all plug-ins

Eventide Clockworks Legacy

Plug-ins For Pro Tools TDM & HD Systems

support sampling rates of up to 96kHz, and *Instant Phaser* and *Omnipressor* also work at 192kHz.

Getting Started

The *Clockworks Legacy* box would be large enough to ship a small car, and is weighty enough to suggest that there's a printed manual inside. Instead, the space is filled with a mass of black fabric. I thought this might be some fiendish new copy-protection scheme, but it turned out to be nothing more than an elephantine *Clockworks Legacy* T-shirt. It's a nice idea, but I suspect most people would have preferred a manual — and now that Barry White has gone to his reward, I'm not sure who will actually be able to wear the thing.

The plug-ins are installed from CD-ROM, and you have to manually copy the documentation to your hard drive if you want it. A nice touch is the inclusion of PDF copies of the original manuals for all the processors. A quick browse through the section on setting up an external signal to control Harmonizer pitch is recommended for anyone who feels nostalgic about the immediacy and simplicity of studio

equipment in the '70s...

Authorising the *Clockworks Legacy* bundle gave me my first brush with the iLok protection system that is becoming standard for Pro Tools plug-ins — unlike some plug-ins, the *Clockworks Legacy* bundle does not give you the option of using challenge-and-response authorisation instead. With the CD, you get a credit-card sized piece of plastic. From this, you punch out a smaller piece of plastic with metallic traces on it, and at the prompt, you insert this into your USB iLok key. The system has the obvious advantage that your authorisation is transferable between machines, because it's the iLok key that is authorised, not the hard drive. It also has the obvious disadvantage that your authorisation could quite literally go down the drain if the key falls out of your pocket at the wrong moment. On balance, it probably is an improvement over the old floppy disk key system, but it's a bit disconcerting to think that a two-inch-long piece of green plastic can end up holding thousands of pounds' worth of investment in software. The process of twisting out the

Test Spec

- Beige 300MHz Apple Mac G3 with 256MB RAM, running Mac OS 9.1, with third-party PCI USB card.
- Digidesign Mix Plus system running *Pro Tools* 5.1.3.

plastic card and inserting it into the iLok can also be a bit nerve-racking, though on the plus side, the discarded plastic tab makes a serviceable guitar pick.

Sweet Harmony

When the H910 first appeared in 1975, it was one of the first commercially available digital processors. It was certainly the first device that could take an incoming audio signal and repitch it at will. Pitch-shifting was controlled either manually, using the unit's front-panel knob, or using the optional HK940 keyboard controller, which allowed you to 'play' the pitch-shifted sound. The H949, which was launched in 1977, eliminated much of the glitching that was characteristic of the original, offered a wider range of pitch-shifting, and added a number of new features including reverse delays and flanging. Eventide claim, plausibly enough, that it "may even have been the world's first multi-effect audio product".

Pitch-shifting technology has come a long way in a quarter of a century, and it's fair to say that for many of their intended functions, the original Harmonizers have been superseded by newer products. When it comes to fixing up an off-key vocal performance, software such as *Auto-Tune* and *Melodyne* offers much more transparent pitch-shifting and can detect pitch deviations and compensate automatically, without requiring skilful manual control.

Similarly, there are now easier and more natural-sounding ways of creating artificial harmonies than using multiple Harmonizers, while other functions of the hardware units, such as the H910's feedback suppression, will be irrelevant to most Pro Tools users.

So what's the point of recreating these digital dinosaurs in software? In a word: character. They may be of limited use for transparent pitch correction, but the H910 and H949 are effects machines to be reckoned with. The H910's combination of

Thanks to *Pro Tools'* automation facilities, the plug-in *Harmonizers* offer a level of controllability that would be hard to achieve with the hardware units. Every control can be automated, and the pitch-shift control itself can be linked to a MIDI input, so that you can either 'play' harmonies from the keyboard or use the pitch-bend wheel for dynamic control over the amount of pitch-shift applied. Option-clicking usually returns any control to its Off or neutral position, which is



decidedly coloured, low-bandwidth pitch-shifting and multi-tap delay with feedback can produce results ranging from subtle flanging and ADT to weird and wonderful robot voices. The H949 adds random and micro-interval pitch-shifting, a built-in flanger, a 400ms loop sampler, a feedback loop EQ and a Reverse mode, opening up whole new areas to the intrepid knob-twiddler. You can create nasty metallic reverbs, rich flanging and chorusing, moving delays where each repeat is progressively shifted up or down, and strange stuttering percussive noises. You could turn Kate Bush into a snarling wolf or Johnny Cash into a chipmunk.

I wasn't able to A/B the plug-ins against the hardware units, but it's a measure of the accuracy with which Eventide have recreated them that you constantly find yourself thinking "Ah. So that's how they got that sound on that record." Any self-respecting Stranglers fans who try out the manual pitch-shifting, for instance, should be prepared to find themselves chanting "We are the men in black / We don't approve of artificial food...", while you could probably recreate every silly voice in the entire *Hitchhiker's Guide To The Galaxy* TV series with H910 alone. When you get bored of alien voices, you can try dirtying up your drum tracks, or using the Harmonizers in series with *Amp Farm* to recreate classic techniques for thickening a guitar sound. Whatever you do, the results are very individual: no other Pro Tools pitch-shifting algorithm I know of sounds similar, and you won't get these distinctive chorus or flange effects from any of the *Mod Delay* plug-ins.

particularly useful in the case of the pitch-shift control, as this would otherwise be a fiddly operation.

In other areas, the faithfulness of Eventide's recreation limits the *Harmonizers'* flexibility when compared to plug-ins that don't seek to recreate vintage units. Each one offers the same fixed delay times as the original, for instance, with no facility to sync delay time to *Pro Tools'* tempo. Nor have Eventide added the ability to pan individual repeats within the stereo field: both H910 and H949 are resolutely mono. You can use them as multi-mono plug-ins on a stereo track, but since each mono instance uses an entire Mix card chip, you'd better have plenty of DSP spare. Given that the original Harmonizers must have had less processing power than today's toasters, it's a bit ironic that it takes so much Pro Tools DSP to recreate them!

Instant Access

Eventide pioneered the idea of the multi-effects unit, but they also made processors devoted to a single sound. The company claim that they inadvertently invented the phasing effect in the design of their Instant Phaser, which was designed to recreate the sound of tape flanging, while the Instant Flanger was a later and more sophisticated attempt at the same goal. Both are recreated here.

The Instant Flanger might not be as well known as the Harmonizers, but its plug-in recreation is easily the best-sounding implementation of this effect I've ever heard in software. All too often, digital flanging effects sound thin and metallic, and rob the

SOUND ON SOUND

Eventide Clockworks Legacy Bundle £586

pros

- The plug-ins sound great, and they don't sound quite like anything else.
- *Instant Flanger* could well be the best plug-in around for classic modulation/delay-based effects.
- MIDI control and automation add to the possibilities of the originals.

cons

- *Omnipressor* can be awkward to set up and control.
- *Harmonizers* use an entire Mix card DSP chip.

summary

The originals may be museum pieces, but the plug-ins definitely have a place in the digital studio.

EVENTIDE CLOCKWORKS LEGACY

► source of body rather than adding depth and thickness. Eventide's *Instant Flanger* has a refinement and subtlety that puts the rest to shame. At one end of the scale, it can add a real sense of stereo width to a mono source without noticeably changing the sound itself, while at the other, it approaches the kind of jet-plane effect beloved of '60s producers, although it might

to *Instant Flanger's* subtlety is that you can use any or all of these control elements at once by clicking their front-panel In buttons.

Instant Phaser also offers multiple control sources — in this case Remote, Oscillator, Manual and Envelope — but only allows one of them to be active at once. Although it's simpler than *Instant Flanger*, it offers similar dollops of warmth and

analogue dynamics unit of the same name. *Omnipressor* has an unusual and initially rather baffling interface. There are orthodox Threshold, Attack and Release time controls, plus a virtual VU meter which can be set to display input level, gain reduction or output level. So far, so straightforward, but it's to the right of the VU meter where things begin to get weird. In place of a conventional Ratio



not go quite far enough in this respect for some tastes. Between these extremes lies a fertile land of shimmering guitars, impossibly rich strings and watery backing vocals which could take months to explore fully.

One of *Instant Flanger's* most impressive attributes is the ability to create movement in a sound without introducing too much obvious periodicity, as simple flanger plug-ins based around a single LFO inevitably do. *Instant Flanger* does include a built-in oscillator for those kind of effects, but adds other control elements and modifiers too. A Bounce control is designed to mimic the characteristic behaviour of the motors in a tape deck when changing speed, there's a manual control which allows you to sweep the flanging effect by hand, and there's an independent Remote control which allows you to sweep the effect using the mod wheel on a MIDI controller. There's also a Depth control which allows you to introduce the unaffected signal back into the mix, creating additional phase-related artifacts, and an envelope follower. The key

richness, without becoming nasal or robbing the sound of its guts. Again, low settings can add stereo interest and depth without making a sound obviously effected, while thick, whooshing frequency sweeps are firmly on the agenda at high settings, and it's probably better at recreating extreme 'Itchycoo Park'-style drum sounds than *Instant Flanger*. Fewer controls mean that the middle ground is less versatile, but there's enough here to bring a smile to the face of guitarists and keyboard players who remember the '70s. The DSP load is also a little lower: one-third of a Mix card DSP chip, compared with the 50 percent taken by *Instant Flanger*.

Like the real things, the *Instant Flanger* and *Instant Phaser* plug-ins are available only in mono-to-stereo versions. I realise that stereo-to-stereo versions wouldn't be authentic, but I would have found plenty of use for them.

A Pressing Engagement

The final plug-in in the *Clockworks Legacy* bundle is *Omnipressor*, based on the

control, there is a knob labelled Function, plus two more marked Atten Limit and Gain Limit.

The Function knob does, in fact, control the compression ratio, but it goes much further than you might expect. Between its leftmost point and the centre, it causes *Omnipressor* to act as an expander/gate rather than a compressor, varying the expansion ratio from 1:10 to 1:1. As you turn it further to the right, it becomes a compressor, with the compression ratio steadily increasing until you get to the three o'clock position, when it reaches infinity:1. But it doesn't stop there: over the last part of its travel, the Function knob actually introduces negative compression ratios ranging from -8:1 to 1:-10. In case you're wondering what that means, the answer is that it actually reverses the dynamic range of a signal, so that peaks in the source are massively attenuated and quiet sections massively boosted. The Atten Limit and Gain Limit knobs override the action of the Function knob, allowing you to impose a fixed maximum amount of attenuation or

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EVENTIDE CLOCKWORKS LEGACY

▶ gain that can applied, regardless of threshold and ratio. Additional buttons allow you to cut the bass content in the signal reaching the detector circuit, insert a fixed 10, 20 or 30 dB cut in input level, and boost the output level by similar amounts. You can use an external signal to feed the side-chain.

I experimented with using *Omnipressor* as a conventional compressor in the usual applications — vocals, drums, buss compression and so on — with mixed results. It works very well on drums, but has a rather aggressive character on vocals which wasn't all that sympathetic to any of the singers I tried it with. It's also a bit awkward to set up, thanks to the lack of a variable make-up gain control. You need to keep trimming the level to compensate as you adjust *Omnipressor* settings, which is a bit of a pain. This is one point where I'd definitely rather have seen realism give way

listening to a recording being played backwards. Using a rhythmic side-chain signal to gate or negatively compress a sustained sound generates additional weirdness. However, I found that more extreme settings often made *Omnipressor* difficult to control, and it's easy to inadvertently generate clipping when you're using high expansion ratios or negative compression — the lack of continuously variable input and output gain controls is probably more annoying within the digital domain than it was in an all-analogue studio. You probably won't find yourself putting *Omnipressors* across every track in your mix, but it is definitely worth having, as there will be occasions where it gives you something that no other plug-in compressor can provide. Unlike the other plug-ins in the bundle, it will work in stereo, too, although you have to select it as a multi-mono rather than a stereo plug-in. A mono instance uses one third of a Mix card DSP chip.

Clock This

As anyone with a MIDI + Audio sequencer will know, it's easy to be greedy when it comes to plug-ins, installing anything and everything you can get your hands on. They all promise so much, but it's a sad truth that

many of them will end up gathering virtual dust in the corner of your plug-in rack. Some of them sound cool on their own but never seem to fit into your mixes; some have interfaces so unwieldy that life's too short to ever get to grips with them; still others just don't seem to deliver on their claims of vintage character or warm sound. None of these problems is likely to arise with Eventide's *Clockworks Legacy* plug-ins. A lot of effort has gone into making them look and feel like the original hardware units, but that's not what's special about them. The main thing is that they sound fantastic, and even though they're recreating technology that is a quarter of a century old, they're immediately usable in modern musical contexts. *Omnipressor* offers some unique dynamic effects that could be ideal for drum-led dance music, while the *Harmonizer* emulations have much more than mere historical interest: you wouldn't try to use them for transparent pitch correction, but they offer a wealth of weird and wonderful effects. If, like me, you've never been very happy with other software flange and phaser effects, you may find that *Instant Flanger* and *Instant Phaser* are a revelation. Either way, the *Clockworks Legacy* bundle is available as a free time-limited demo, and if you own a Pro Tools Mix or HD system, you owe it to yourself to try it out. **SOS**



The documentation includes PDF versions of the original manuals for all five products.

to convenience, and I can't see how adding a fully variable output gain control would have compromised authenticity too much. What *Omnipressor* can do that most other plug-in compressors can't is create some very strange dynamic effects. You can restore punch and life to a dull drum loop with the expander, or do evil things to cymbals with the negative compression, which often has much the same effect as

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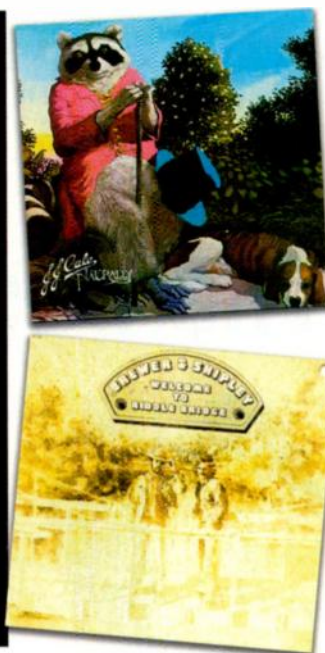
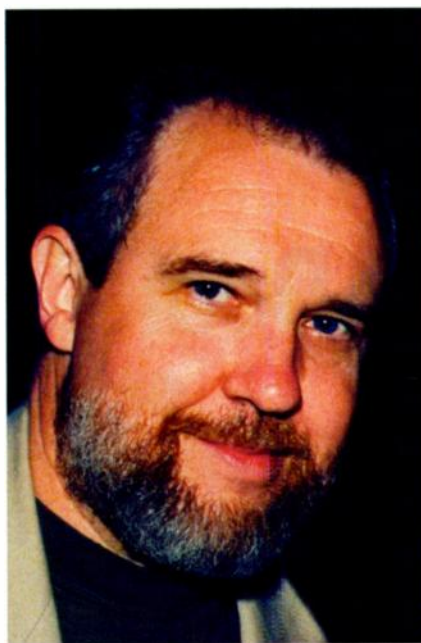
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Norbert Putnam

Norbert Putnam was part of the original Muscle Shoals rhythm section, and as a million-selling producer, helped to bring pop music to the country capital of the world.



Dan Daley

They named a street after the late Chet Atkins off Nashville's Music Row, and a park after the late Owen Bradley, the two producers who are regarded as establishing the Nashville Sound as it's known today. They might well get around to doing the same for Norbert Putnam some day — he's owned and traded about the same amount of real estate around the Row as both Atkins and Bradley, and owned more studios than the two of them put together. And he was the originator of that other Nashville sound, the one that's got little to do with steel guitars and fiddles; the one Nashville ultimately embraced in its rush to pop music in the 1990s.

While Nashville was focused on country music through the 1960s, '70s and '80s, Norbert Putnam was producing much if not most of the non-country music that passed through the city during that time. His productions included records that established such artists as Jimmy Buffett, Joan Baez, Dan Fogelberg, Brewer & Shipley, Pousette Dart Band, Donovan, John Hiatt, JJ Cale, the Flying Burrito Brothers and the New Riders Of The Purple Sage. If it wasn't country and it wanted to come to Nashville, it usually wound up on one of Putnam's doorsteps, the ones leading to the four seminal recording studios that he was involved in, including Quadrafonic, the Bennett House, Georgetown Masters and Digital Recorders.

Beyond The Doorstep

Putnam liked to fiddle as much with the technology as with the music, as well.

The Other Side Of Nashville

Talking from his current home, in Grenada, Mississippi, where he is currently working on the design for the soon-to-be-constructed Delta State University Recording Centre (the orchestral room there will be modelled on Studio One at Abbey Road, where Putnam did string sessions for productions), Putnam recalls how he helped shepherd in the age of transformerless microphone preamps. "When David Briggs and I started Quadrafonic Studios in in Nashville, in 1970, we had a Quad 8 Class-A fully discrete console with Jensen transformers and high-low shelving EQs," he remembers. "About five years later, console automation started to get big and we knew we had to upgrade, so we got one of the MCI 500-series desks that Jeep Harned was designing and building. We wanted a Trident A-Range, because we loved that British sound, but back then they cost around \$175,000 which was a lot of money; the MCI only cost about \$25,000. It gave us automation, but we weren't very happy with the sound of the mic pres, especially after having worked with the discrete ones on the Quad. But one day this guy, Paul Buff, who had a company called Allison Research in Nashville [*which would later become Valley People*], came to the studio to talk about this VCA automation system he had developed and I mentioned my feelings about the mic pres. He said he remembered there was this old Bel Labs design for a transformerless mic pre which he thought he could modify for this console. He said he could do it in about a week. A week later he comes in with

this box with a couple of patch cords hanging off it, and we plug it in and A/B it with the MCI mic pres, and sure enough, this transformerless one sounds better. It sounds just great — fast transient response, high slew rate and no transformer. So I mentioned it to Jeep Harned and he says if they really do sound better than his mic pres, he'll pay for the installation of the Allison ones in my console. And when he heard them, sure enough, he agreed and paid for the switch. Within a few years, everyone had pretty much switched to transformerless."

More Muscle

But before there was technology, there was just plain music. Norbert Putnam was part of the Muscle Shoals crew brought to Nashville by Elvis Presley producer Felton Jarvis in 1965, because RCA Records artist Presley used his label's studios there and Jarvis wanted musicians with more of an edge than the current Nashville A-Team which included drummer Buddy Harmon, bassist Bob Moore and guitarist Grady Martin. Over the course of a few years between 1964 and 1967, much of the core of the original Muscle Shoals team headed north to Nashville, including Putnam, keyboard player David Briggs, drummer Jerry Carrigan and saxophonist Billy Sherrill, a crew that would become Nashville's second generation of first-call session players. Putnam, a bassist, became a musician simply because, he says, "There was nothing else to do in Muscle Shoals back then. If you

didn't play music there was nothing to do. It was such a small town that if you stole a car they'd know who stole it."

Muscle Shoals is a small town with a big history, tucked in the hill-and-lake country in the northwest corner of Alabama and about a three-hour ride from Nashville. The place was a momentary blip on the peripatetic journey of R&B music on its way to Detroit and elsewhere, leaving behind a small but talented collection of white southern musicians and writers on whom R&B's voodoo had a lasting effect. The first hit black artist the town produced was the late Arthur Alexander — who at the time was the bellhop at the Muscle Shoals Hotel — with his recording of 'You Better Move On'. The manager of the local movie theatre, Tom Stafford, then a gangly kid, would offer the musicians free passes to the movies in exchange for playing on his demos, recorded in the dilapidated offices above his father's corner drugstore, playing to an old Roberts mono tape recorder with only enough microphones to record half the drum kit and a Heathkit recording console with no volume fader — the fade-outs were accomplished by turning the console off and letting the tubes die out.

"We'd hang out with Tom, go to the movies then go upstairs over the drugstore," recalls Putnam. "Occasionally he'd go down and fill a codeine cough syrup prescription and share it with us. Arthur Alexander was coming over and bringing songs to Tom. Tom got Arthur together with Rick Hall [founder of the legendary FAME Studios who would go on to produce Alexander and other country, pop and R&B artists], who was the bass player in a band called the Fairlanes. Billy Sherrill [who went on to produce Tammy Wynette and run Columbia Records in Nashville] was the sax player in that band. Rick called up Briggs, Carrigan and me. We did two songs, one of which was 'You Better Move On', and got in his car and drove to Nashville and played the tapes for Chet [Atkins] and Owen [Bradley] who said they couldn't do anything with it because it wasn't country. So Rick found Noel Ball, the leading DJ in Nashville. He had a sock hop on a

local television channel on Saturday. He was the Dick Clark of Nashville. He also worked for a record company."

The record made the top 10 two months later.

"That launched Muscle Shoals as a recording centre," says Putnam, who goes on to describe what made this tiny dot on a map so musically unique. "It wasn't as soulful as Memphis. We were listening to Burt Bacharach and Bobby Blue Bland. We

had experience playing black music, but it didn't come out as black as Memphis. The profits from that record funded Rick Hall's FAME Studios. It also attracted [publisher/producer] Bill Lowery out of Atlanta with his R&B acts. He brought Joe South, Billy Joe Royal, Ray Stevens, Jerry

Reed and Tommy Roe and his bubblegum hits. It was black music but with a white rhythm section. Felton Jarvis would come down to do Tommy Roe for Bill Lowery. Once we got there, we ended up playing for [Monument Records founder and producer] Fred Foster on sessions for Presley and Roy Orbison."

Putnam credits Hall with moulding him into what would become a top-notch

musician, and then producer. "When I was young and working in Muscle Shoals, I didn't know about inventing bass parts, so I was copying other people's parts," Putnam recalls. "If a song sounded like a Drifters song, me and the drummer would play a Drifters part. Then one day Rick came out and said to me, 'We already have Drifters records — you need to come up with something new.' And I've tried to apply that to every session I've ever worked."

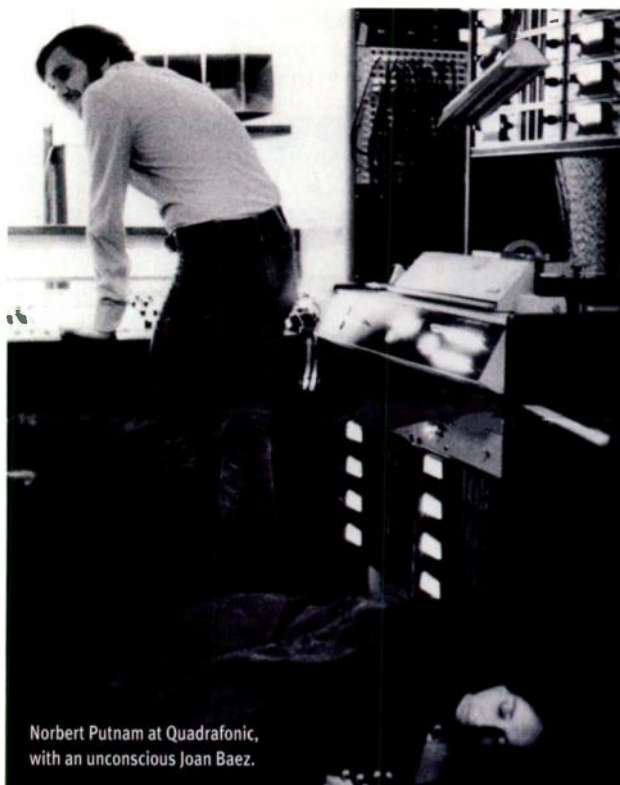
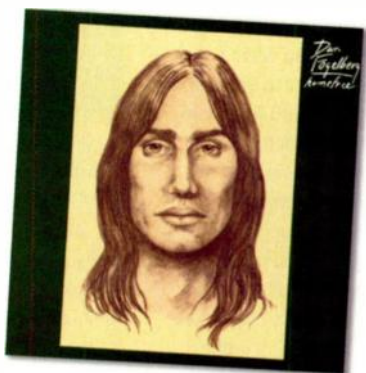
Enterprising Music

Through the 1960s, the Muscle Shoals musician club grew, based mainly out of producer Rick Hall's FAME Studios (the name Fame was an acronym for 'Florence, Alabama Music Enterprises', after a neighbouring town where Hall had his first studio in a converted tobacco warehouse), and together they played on over 500 hit records of all genres.

The Muscle Shoals players who moved to Nashville were soon playing demos for producers Wesley Rose and Jerry Bradley at RCA. "From those demos came all the master sessions. The producers hired us based on those demos," says Putnam. "By 1970 I was doing about six hundred record dates a year." Those sessions included Bobby Goldsboro's 'Honey', Tony Joe White's 'Polk Salad Annie', JJ Cale's 'Crazy Mama' and several Presley hits, as well as the Monument artists Roy Orbison and Boots Randolph.

The Nashville Putnam came to in 1965 had few studios; he recalls only RCA's two rooms, Studios A and B (the latter now a museum run by the Country Music Foundation), and the Quonset Hut, built by Owen Bradley and later sold to CBS Records, after which Bradley built his famous Barn studio, where he recorded classic records with Loretta Lynn and others. Fred Foster had Monument Studios, part of his record label, where he produced records for Roy Orbison.

Like his cohorts in Nashville's factory-like studio trenches, Putnam was approaching burn-out from all those sessions. But when Bob Dylan came to the city to record his influential *Nashville Skyline* album in 1969, it put Music City onto the larger map of the new mainstream pop music. Dylan changed folk music forever when he went electric at the 1965 Newport Folk Festival, and then helped lay the foundation for the coming fusion of country and rock; following his lead, bands like the



Norbert Putnam at Quadrafonic, with an unconscious Joan Baez.

► Byrds were suddenly looking to Nashville as a new resource for music away from the already jaded environs of LA.

Becoming A Producer

And it was a veteran folkie and a brilliant, eccentric and dissolute songwriter who changed Putnam's career course from musician to producer. Putnam had played on several Joan Baez albums in Nashville, produced by her long-time recording mentor Maynard Solomon, who also owned her record label, Vanguard Records. But in 1970, Baez had become enamoured of composer Kris Kristofferson, who had stood Nashville's staid songwriting community on its ear a few years earlier with songs like 'Me And Bobby McGee', which Janis Joplin had turned into a radio anthem, and the brooding 'Sunday Morning Coming Down'. She chose Kristofferson to produce the record.

Meanwhile, Putnam and David Briggs had moved forward with an idea for a recording studio in Nashville that would let them indulge their fascination with technology, do their demos as would-be producers and perhaps make a few quid in the process. Producer Elliot Mazer, who worked on Linda Ronstadt's *Silk Purse* recording in Nashville, upped the ante by telling Putnam and Briggs he would bring projects to a leading-edge facility there.

They fitted the studio — which is still located on Grand Street off Music Row, but now owned by the coincidentally similarly named Quad Studios of New York City — with the Quad 8 desk and a 16-track Ampex MM1 100 two-inch deck. Putnam had been talking with CBS Laboratories engineers in Connecticut about their work with the

nascent quadraphonic format, and sensing a trend, he chose Quadrafonic as the studio's name. "We stuck a pair of JBL 4310 speakers in the back of the room and bang, we had quad," laughs Putnam. The studio had quickly become a hangout for those disenfranchised by the Nashville oligarchy and for the swelling influx of young musicians and writers who were coming to Nashville in Dylan's wake. So it wasn't surprising when Kristofferson, who was known to have a cocktail or two at the time, agreed to use Quad to make what would be Baez's *Blessed Are* album. It also wasn't surprising, at least in retrospect to Putnam, that Kristofferson, who was painfully shy in the studio, intimidated by the technology and the musicianship, and who needed a belt to work up the nerve to bring his gravelly voice in front of a microphone even for demos, came to the first session tipsy and pleaded with Putnam, the bassist and arranger, to take over production chores, as well. The sessions went quickly, including the recording of a cover of The Band's 'The Night They Drove Old Dixie Down', which was Baez's first hit single.

Home Free

This event did not escape the notice of Clive Davis, then president of Columbia Records in New York. He flew Putnam to Manhattan and fêted him for making a record with a folkie and selling 1.5 million copies. "He called me a genius," says Putnam, still bemused by the meeting nearly 30 years later. "I had never been called that before. So I said, 'Mr. Davis, it's my only record as a producer. I might have gotten lucky.' He said 'You must know something, because



Putnam's partnership with Jimmy Buffett yielded lasting success and a classic hit single, 'Wasted Away In Margaritaville'.

she's made 10 records and none of them ever sold more than 100,000.' Then he looks at me and says, like this was going to be the greatest honour a man could bestow upon me, 'I want you to produce all the folkie artists on CBS Records.' I thought to myself, I have died and gone to hell! This would be like conducting an orchestra made up of banjos. I had grown up in Alabama and I liked soul music. Clive said he had just signed Gamble & Huff out of Philadelphia to take care of that for him. Then Clive grabs a tape box and slides it across his desk to me. It was a demo of a guy named Dan Fogelberg."

Putnam produced Fogelberg's debut record, *Home Free*, released in 1973. The record, however, didn't live up to Davis' expectations and it wasn't promoted well. But there was hope. "It was beginning to

Purple Patches

The best producers have the ability to make a successful album from the most unpromising beginnings, and that's exactly what happened when Clive Davis asked Norbert Putnam to produce the New Riders Of The Purple Sage. They were putatively a band, but in reality more of a concatenation of hippies with access to electrified instruments who lived north of San Francisco in a communal house. "Clive says to me, 'I'll be honest with you — you're my fourth choice. Three other producers have already turned me down. But these guys are opening for the Grateful Dead and they're playing in front of 10,000 people a night.' Clive called them 'the Nearly Dead', and I knew I was going to have to smoke a joint just to think about working with them. Oh, and they're also pretty questionable musicians, and I'm used to the best in Nashville. But then he also told me that because of the exposure the band was getting with the Dead, he could guarantee the album would sell 500,000 units."

For independent producers who were now getting larger and larger shares of the points based

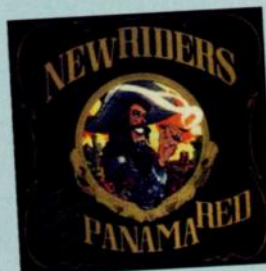
on sales from records in addition to fees, the lure was too great for Putnam to resist. So in 1973 Putnam made the trek to Northern California to meet the band. Upon arrival, he was picked up by a hippie right out of Central Casting, complete with VW Microbus, who proceeded to drive Putnam to the band's communal abode. "We get there and the house is up on a hill in the middle of what looked like a wheatfield," he remembers. "The women are all walking around wearing mumus and the kids are running around naked, and here I am this clean-cut guy from Nashville walking into all of this. I was ready to call it a mistake and walk away then and there."

Before Putnam could do that, however, the Riders' lead singer and vibemaster Marmaduke walked out and greeted him. "Marmaduke says we have to have a band meeting and we all walk out into the middle of the field. We sit down on the ground and the

wheat is so high I can only see people's heads. I had this speech rehearsed and was ready to tell them this wasn't going to work. I put my hand up to make a gesture and all of a sudden this butterfly lands on it. The band sees this. They stare at it. No one says a word. Then Marmaduke pipes up and says 'That's an omen, man! You're our producer. You've been chosen!' I think to myself, you gotta play the cards you're dealt. So I say fine, let's do it."

The Adventures Of Panama Red wound up being the only platinum record the Riders ever had. Putnam had to sneak a few musicians onto the project to buttress the Riders' playing skills, and still the project took four weeks

at the Record Plant in Sausalito just to get 10 usable basic tracks. "If Spencer Dryden didn't drop his sticks during a song, then we had a take," Putnam recalls ruefully.



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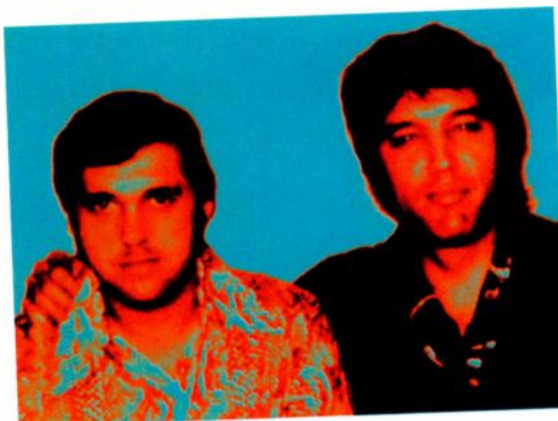


► look like his career was over before it had started, but Dan called me from the road one day that year," says Putnam. "He was playing in Jackson, Mississippi, and he was screaming into the phone telling me that 2,000 people had turned out to see him. Seems a local radio station had played the record and it was getting great response. So a while later, his manager Irving Azoff went to see Clive and asked Columbia to release him. Clive agreed. Then Irving takes the elevator down two floors, walks into [Epic Records president] Don Ellis's office and gets him signed to Epic Records. All in less than an hour or so."

Finger Buffett

Putnam's Nashville location during the 1970s put him in the centre of an increasingly peripatetic music industry. Pop acts were coming to Nashville, using the popularity of country music as a springboard into larger audiences. During the mid-'70s, Putnam produced records for Brewer & Shipley, the Flying Burrito Brothers, Steve Goodman (including his breakout single 'City Of New Orleans'), and Eric Anderson, almost all of them at Quad Studios. In between productions, he continued to play a heavy schedule of sessions as a bassist and arranger, on dates for artists including Linda Ronstadt, Kenny Loggins, Bonnie Koloc, The Pointer Sisters and JJ Cale. Putnam would also become the musical midwife to what has grown into a \$50 million industry of records, concerts, books, videos, merchandising and gift shops all centered around one seemingly stoned but very ambitious individual.

"I had known Jimmy Buffett for a few years when he was in Nashville," says Putnam. "He used to hang around Quad a lot. Me and David had a sort of open bar policy — anyone could come into the studio and drink for free as long as they didn't bother the clients, and on any given night you'd have people like Guy Clark and Mickey Newbury and Jerry Jeff Walker hanging out there drinking. Jimmy was writing songs and also doing interviews with artists for some magazine he wrote for. He was one of the guys in the hall when I needed a bunch of vocalists to make the chorus real big on 'The Night The Drove Old Dixie Down' for Baez. So he was one of about 20 drunks I dragged in there to make the chorus sound real big. He was signed to Barnaby Records at the time, which was owned by Andy Williams. Some time later, I was in Julian's [a legendary but long-gone four-star restaurant in Nashville] and Jimmy came in and said 'I gotta talk to you.' He ordered me



Perhaps the highlight of Putnam's distinguished career as a session bassist was his work with Elvis Presley.

a bottle of Kristal, which was my favourite champagne, so I figured we had at least that in common. He said he wanted to do something more progressive and he wanted me to do it with him. And he wanted to use his band, the Coral Reefers. I thought, this is tragic — I had just been through this with the New Riders [see box]. A bunch of coked-out musicians behind Jimmy singing songs about his grandfather and the ocean. But after a few more drinks the idea didn't sound so bad any more. I went to see them at the Exit/In club, and I told Jimmy, 'Look, if you want to make records about the ocean, you have to get next to the ocean.' I had done that with Fogelberg — he wrote about the mountains, so I recorded him in the mountains [Caribou Ranch Studios, where the 1977 *Nether Lands* and 1979 *Phoenix* albums were recorded]. So we booked time in Criteria Studios in Miami. But after the New Riders, I brought ringers in from the start, like Kenny Buttrey on drums and Teddy Irwin in from New York on guitar.

"One day in the studio, he comes in and starts telling me about a day he had in Key West. He was coming home from a bar and he lost one of his flip-flops and he stepped

on a beer can top and he couldn't find the salt for his Margarita. He says he's writing lyrics to it and I say 'That's a terrible idea for a song.' He comes back in a few days later with 'Wasted Away Again In Margaritaville' and plays it and right then everyone knows it's a hit song. Hell, it wasn't a song — it was a movie."

It was also Buffett's commercial breakthrough record, from 1977's *Changes In Latitudes, Changes In Attitudes* LP. Putnam kept him near the water when he went back into the studio to produce Buffett's follow-up record, *Volcano*, at AIR Studios in Monserrat in 1979; Putnam also produced *Coconut Telegraph*, *Somewhere Over China*, *Songs You Know By Heart* — in all about half a dozen Buffett records.

Studio Economics

Putnam's growing number and breadth of productions was taking him further afield. In the meantime, the studio business was changing. Putnam and Briggs sold Quad in 1980 for \$1 million to a group of doctors from Atlanta. "We paid \$30,000 for the lot and the building in 1970 and put about \$125,000 into it in terms of equipment," he estimates. "The second year we were open the business grossed \$440,000 in sales. We were getting \$150 an hour in the daytime and \$165 at nights and on weekends. The economics of studio ownership were great then. But after I sold it, I swore I'd never do it again."

That promise to himself lasted all of six months. That same year, he purchased an



Putnam's Fender Precision must be one of the most-travelled instruments in rock, but it's on familiar territory here at the Muscle Shoals Hall Of Fame.

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► 1875 mansion called the Bennett House in the Nashville suburb of Franklin, intending to turn it into a combination residence and private studio. But soon he got calls from Kristofferson and Fogelberg, both of whom wanted to work with him again. That led to others who wanted to use the studio itself, including Mickey Newbury. Putnam had hired the sous chef from Julian's to prepare meals at the studio. When then-Christian music artist Amy Grant went to work there in the early 1980s, she was so taken by both the studio — fitted with a Trident A-Range console — and the chef that she told her manager that she wouldn't work anywhere else. "The chef made that studio," laughs Putnam.

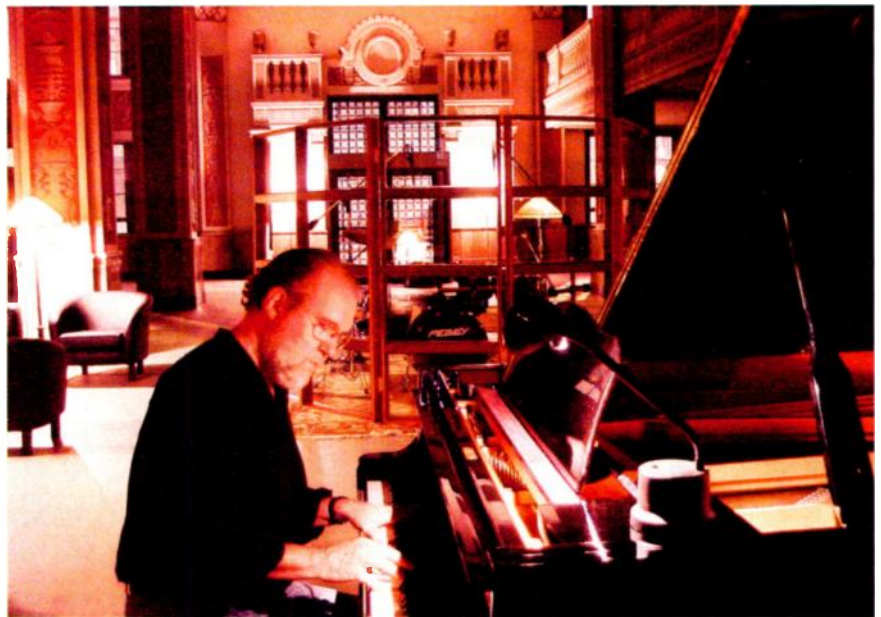
Bennett House was sold eventually, and in 1985 Putnam moved on to Georgetown Masters, a mastering facility he started with mastering engineer Denny Purcell, who passed away last year, and former CBS Records executive Ron Bledsoe. "We wondered, how can we do something different here?" Putnam recalls. The answer was to create a mastering studio that combined the senses of high-end critical listening and home hi-fi, with different speakers and interior designs at each end of the room. "This made mastering more accessible to clients, who felt more like they were in their homes and less like they were in the chemistry lab," says Putnam.

Putnam sold out his interest in Georgetown to Purcell in 1985, and promptly started Digital Recorders, which moved between two locations on Music Row. While Putnam had brought Nashville its first 32-track digital machine, a 3M, at the Bennett House — a format that would become the city's standard for a decade — he expanded on the digital theme at Digital Recorders, installing Nashville's first Sony 3348, among other digital items. "It was always a matter of giving the market something new, and this time it was high-end digital gear," he explains.



Norbert Putnam's current home in Mississippi.

The gear had a purpose — to support his self-appointed mission to make the tracks sound good. "All those years working for Nashville producers in Nashville studios, I said to myself that they didn't spend enough time on the tracks," he remembers.



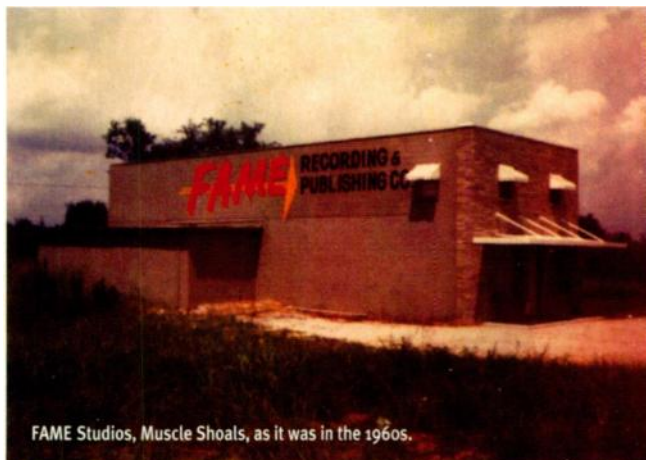
"I said to myself that when I became a producer, I would make sure that the tracks held together."

But Putnam learned something in his years as a producer; or more precisely, he began to realize something he had actually known all along. "I had been all over the world looking for gear and listening to engineers talk about equipment," he says. "I had worked with Geoff Emerick at AIR Studios in London, and I had him engineer Buffett's *Volcano* album. I always thought there was some big secret about equipment that I would learn and

that that would let me make the best records. Then one day I was working with Bill Schnee. He was at the Bennett House and he pulled out a tape and played it through the monitors and stopped about halfway through and says 'There's the curve — down about 2-3dB at 125Hz, the system rolls off at 40[Hz] and it's a little bright around 10k.' I say, 'How do you know that's the right curve?' And he says 'There is no right. It's whatever works.' You can concern yourself with the equipment all you want, but that's not what makes a great record. Elvis and Felton never worried about a mic-pre. We recorded Elvis with an RE15 — a dynamic microphone, not a condenser. And it had foam padding all around it so that he could move around and not have it pick up noise.

We used a U87 on Jimmy Buffett on all the songs and every studio had one, and every studio had an LA2A. It wasn't in the gear. And that's what it's all really about in terms of being a producer: you make the environment right so that the artist can give you an emotionally genuine performance. That's really all there is to it. Felton Jarvis and Fred Foster and the rest of those guys got it right all along: if you could get a great performance out of Elvis or Roy Orbison, then the bass and drums could be a little loose in the track, couldn't they?"

And to punch home that point, so central to his way of thinking, Putnam has one more anecdote that underscored the balance between equipment and talent. "I was on a session with Chet Atkins and some guy comes up to him and says, 'That's the best-sounding guitar I've ever heard.' Chet puts the guitar down on a stand and says back to him 'How's it sound now?' It's all in how you use it." **SOS**



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M Audio USB Audiophile

USB Audio & MIDI Interface For Mac & PC

M Audio's Audiophile PCI card is already a popular choice for musicians needing high-quality audio I/O. Now those without PCI slots can access similar features thanks to the new USB version.

Paul White

With the increase in popularity of 'slotless' computers, such as laptops and iMacs, several manufacturers of traditional soundcards and audio interfaces are extending their ranges to include external units connected by USB or Firewire. For multiple simultaneous inputs and outputs, Firewire is the clear winner because of its greater bandwidth, although USB 2 will level the playing field somewhat when it becomes more widely supported. In situations where the I/O requirements are more modest, however, USB works perfectly well. Packaged as a small, silver desktop unit, the M Audio Audiophile USB works via a standard USB connection and draws its power from an included 9V AC adaptor to provide two channels of analogue I/O, stereo S/PDIF digital I/O and set of MIDI In and Out ports. Bit depths of up to 24-bit are supported with sample rates from 8kHz to 96kHz, though there are some I/O limitations when working at high sample rates or high bit depths. Interestingly, the S/PDIF outputs are also capable of carrying multi-channel surround formats such as Dolby or DTS, which means the Audiophile USB also has applications in computer-based home theatre.

The analogue inputs are on unbalanced



quarter-inch jacks and phonos; using the jacks overrides the phones. The analogue outs are on phonos only while the S/PDIF ins and outs follow the common co-axial (phono) format. No adaptor cables are needed for MIDI as the sockets are the usual 5-pin DINs. Additionally, there's a quarter-inch headphone out with level control, plus an output level control for the analogue phono outs, which means you could easily run this interface with active monitors while retaining physical control over the output level. A standard USB connector is used to link to the host computer and a suitable USB cable is included.

Compatibility

The Audiophile USB runs under Windows 98SE, 2000, Me and XP, and also supports Mac OS 9 and OS X. Any reasonably specified Pentium II 266MHz or Mac G3 or above with USB connectivity can be used with the Audiophile USB, though Mac OS 9 users will need to run Opcode's OMS to use the MIDI port. ASIO drivers are included for Mac OS 9 and Windows users, with separate support software provided for Mac OS X users.

Once the software has been installed from the included driver CD-ROM, the Audiophile USB is set up via its own control panel, the default setting being 16-bit. Ticking the box for the S/PDIF input activates it and allows the Audiophile USB to clock to the incoming digital signal, but problems will arise if this box is ticked when no digital source is connected as the unit will be in external clock mode with no clock signal to lock to.

Because of the bandwidth limitations of

USB, not all combinations of I/O configuration, sample rate and bit depth are available, and full four-in, four-out operation is only possible at 16-bit up to 48kHz. At 24-bit, the number of active stereo ports is reduced from four to three, while 24-bit/96kHz operation is only possible with one stereo input or output activated. The control panel also includes a choice of latency settings to accommodate older, slower computers, though on my G3 600MHz machine, no problems were encountered. Indeed, in normal operation, the latency was insignificant and could be ignored.

The manual also mentions DD/DTS Pass Thru, a control panel button that allows surround-encoded digital audio to be output from a suitable source such as a DVD. This

SOUND ON SOUND

M Audio Audiophile USB £199

pros

- Includes audio and MIDI interfacing in a single unit.
- Installs and operates in a very straightforward way.
- Good sound quality with low latency.

cons

- Operation at 96kHz is limited by not being able to use inputs and outputs simultaneously.
- Need for external power supply limits some portable applications.

summary

Providing the I/O limitations don't get in the way of what you're trying to do, the Audiophile USB is a neat and affordable solution to USB audio and MIDI interfacing.

setting shuts off the analogue output for bandwidth reasons but conventional stereo digital signals can still be output normally in this mode. A suitable surround decoder is required to make use of the DD or DTS signal at the digital output and many commercial decoders have optical digital inputs, so you may need to use an optional co-axial-to-optical converter box. However, the DD/DTS Pass Thru button didn't appear when I installed under Mac OS X so it may be that this feature is only available to Windows users.

Using The Audiophile USB

For this test I installed the Audiophile USB on a Mac G3 iBook running Mac OS 10.2.6. Installation of the software was painless, after which all I had to do was select the Audiophile USB as the designated audio device within *Logic Audio 6.0*, the audio program I chose for testing. I/O settings are easily configured from the control panel, though you don't set the sample rate there. Instead, you get a readout of the maximum available sample rate depending on bit depth and number of I/O ports activated, after which the sample rate is set in the host program.

Once installed, the Audiophile USB did

exactly as claimed with no evidence of glitching or otherwise struggling. The MIDI I/O worked straight off with no other configuration necessary and the MIDI timing felt adequately tight, even though it is probably less good in this respect than a MIDI interface that uses intelligent pre-buffering, such as the Steinberg Midex 3.

The limitations on I/O aren't handled as elegantly as on the Emagic EMI range of audio interfaces, where the output bit depth automatically drops to 16-bit for overdubbing when the bandwidth limitations of the configuration so dictates, but for 'real world' sample rates, the restrictions are not serious. It's more of a problem if you want to work at 96kHz because then you can only use one port at a time, so monitoring while recording isn't possible. While this may be fine for editing, it means that overdubbing multitrack parts at 96kHz isn't possible. Then again, I'm one of those people who sees little point in using 96kHz for multitracking at all unless you have a world-class studio with superb acoustics and converters that cost around the same as a small car, in which case you probably wouldn't choose the Audiophile USB anyway!

Summing Up

Other than not getting the option to switch to surround pass-thru mode under Mac OS X, the Audiophile USB performed exactly as claimed, delivering sound quality that compared favourably with good consumer hi-fi equipment and with no glitching or other foibles. Nevertheless, tales abound of pieces of USB gear that work perfectly on

Test Spec

- Apple 600MHz G3 iBook running Mac OS 10.2.6.
- Tested with Emagic *Logic Audio v6.0*.

one system and are nothing but trouble on others, so you need to know that the USB support provided by your computer is up to scratch and also that you can connect the Audiophile USB directly to its own USB port and not via a hub.

The MIDI In and Out worked first time with no obvious timing problems, so the only significant criticism of the unit is its inability to work in full-duplex mode at 96kHz, though being able to power the unit directly from a USB port would also have been useful in mobile applications as not many beaches in the Bahamas have mains power points! As it is, you have to use the AC power adaptor.

Despite its limitations, most of which are concessions to the bandwidth of USB, the Audiophile USB is ideal for simple audio applications where you only need limited I/O and you are working at sample rates up to 48kHz. It's less useful at 96kHz but it still works fine in this mode for editing or playback. The sound quality is good, with a specified analogue dynamic range of 107dBa. Having an inbuilt MIDI interface that works so transparently (and without sacrificing the ability to use the digital I/O at the same time) is also a huge plus for laptop users as is the headphone monitoring, so on the whole, the Audiophile USB delivers a practical and well-behaved solution for adding audio to slotless computers. **505**

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SE Electronics SE1, SE1000 & SE2200

Cardioid Capacitor Mics



Photos: Mark Evans

One of the most prolific manufacturers in China has launched three new affordable capacitor mics.

Paul White

Available singly or as boxed matched pairs with a stereo mounting bar, the SE1 is a fixed-cardioid capacitor 'stick' mic with a diaphragm just over half an inch in diameter. It is built in China by the

company who build many of the 'badged' budget mics that have flooded the market in recent years, but despite its very low cost the standard of design and mechanical engineering is impressive. SE Electronics is the brand name these mics are sold under when they are not badged for someone else. The wooden case is also very nicely made, with a rigid foam lining and accurate cutouts for the mic, the included mic clips and an impressive solid stereo bar.

With a sensitivity of around 10mV/Pa and a useful frequency range of 30Hz-20kHz, the matched SE1s come with individual frequency plots that reveal a subtle presence peak centred at around 8kHz

SOUND ON SOUND

SE Electronics SE1 £69

pros

- Very attractively priced.
- Sensitive and quiet enough for routine recording jobs.
- Good standard of engineering.

cons

- None at this price.

summary

An ideal general-purpose mic, especially when used in pairs for stereo, and especially good on acoustic guitar.

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SE ELECTRONICS SE1, SE1000 & SE2200

SE Electronics SE1000 & SE2200

Also from the SE stable are the SE1000 basic cardioid capacitor mic and the more sophisticated SE2200 cardioid capacitor model, featuring somewhat different body styling plus additional pad and filter switches. The traditionally styled SE1000 will be familiar to many readers, as it has been badged and sold as an 'own brand' mic by numerous companies keen to cash in on cost-effective Chinese mic manufacture. It features a large-diaphragm capsule, while its noise and sensitivity figures are comparable with other microphones of its type. In its SE Electronics guise it comes in a very nice camera-style case with a shockmount, and it performs far better than it has any right to for anything like the price. For anyone making the step up from recording with dynamic mics, this is an excellent way to experience capacitor mic performance at an 'impulse buy' price. Its nominally flat response, combined with a gentle high-end presence peak and a roll-off above 18kHz, works well for vocals, acoustic instruments and, in pairs, drum overheads. As with all capacitor mics, it needs to be used with a pop shield for vocal recording, though if you've no budget left then a wire coat-hanger with a stocking stretched over it will work just as well.

While the shape of the SE1000 suggests a famous European studio mic, the SE2200 has a tubular body and basket, with two slide switches built into the body immediately below the basket. Overall, it looks rather like a classic tube mic, though both these mics have FET preamps. One of the switches brings in a low-cut 'rumble' filter to



The SE1000 & SE2200 are shipped in robust hard cases with suspension shockmounts included.

reduce the effect of stand vibrations or traffic noise, while the other is a 10dB pad, designed to reduce the output from the mic when it is used close to very loud sources that might otherwise cause your mic preamp's input stage to overload and distort. Nominally one inch in diameter, the capsule again has a cardioid pattern and is well suited to vocal and acoustic instrument recording.

The frequency response goes a little higher than the SE1000 at 25Hz–20kHz, the sensitivity is 16mV/Pa (not untypical for this type of mic), and the output noise is adequately low at just 17dBA. The sound isn't hugely different to that of the SE1000 other than perhaps a hint of extra high-end transparency, though the addition of pad and filter switches adds to the mic's versatility.

▶ which, along with the other small ripples in the response, becomes more pronounced when the mic is used off-axis. The plots don't include noise figures, but in practical tests the noise level was low enough to be irrelevant in all normal applications. The plots also show a better than expected degree of matching when you buy a stereo pair. Being a capacitor mic, the SE1 requires a 48V phantom power source, so connection is via the usual three-pin XLR connector, this one having gold-plated pins. The body of the mic itself is machined from metal and has a chunky, substantial feel with a satin silver finish.

SE1 On The Session

I was fortunate enough to be working on a project with guitarist Gordon Giltrap when these mics arrived, so we decided to give them a try using them as a spaced stereo pair to record one of his Martin acoustic guitars, one mic favouring the neck and the other the body of the instrument. Not knowing what to expect, I was quite prepared to switch back to mics that I knew would do the job well, but as soon as we heard the sound back over the studio monitors, it was clear that these were easily up to the task. The slight presence lift brought out the picking detail in a natural way, but the sound was also full and well rounded with no unnatural coloration. Because of their ability to translate detail without being overstated or aggressive, a pair of these mics would make fine drum overheads or piano mics. They're also sensitive enough to use for ensemble or choir recordings.

As usual I moved the mics around to get the best sound rather than reaching for the EQ and, without needing any EQ or compression whatsoever, we ended up with a wonderful-sounding track — Gordon's playing clearly had more than a little bearing on this! All that was added was a hint of a

small hall reverb and we had a track good enough to master.

We went on to try the mics with other guitars, as well as with other acoustic instruments lying around the studio, and they handled everything effortlessly, so if you're in the market either for a single instrument mic or a matched pair that can be used for stereo recording, I have no hesitation in recommending these as offering a level of performance that goes some way beyond what you'd expect for the price. You can get better quality if you pay 10 times the price, but the difference is less than you might expect. My only gripe was that the included mic clips didn't include European thread adaptors so I had to cannibalise my own mic collection before I could mount the clips on stands — but given the low cost of these mics, I can't bring myself to hold that against them! **SOS**

Information

£ SE1 £69 SE1 matched pair with stereo bar, £199; SE1000, £99; SE2200, £149. Prices include VAT.

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SOUND ON SOUND

SE Electronics SE2200 & SE1000

pros

- Good all-round performance.
- Nice camera-style case.
- Included shockmount.

cons

- None at the price.

summary

Large-diaphragm mics with solid performance, at an 'impulse buy' UK price.

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Speed Tests

Mac Processor Upgrades For Music

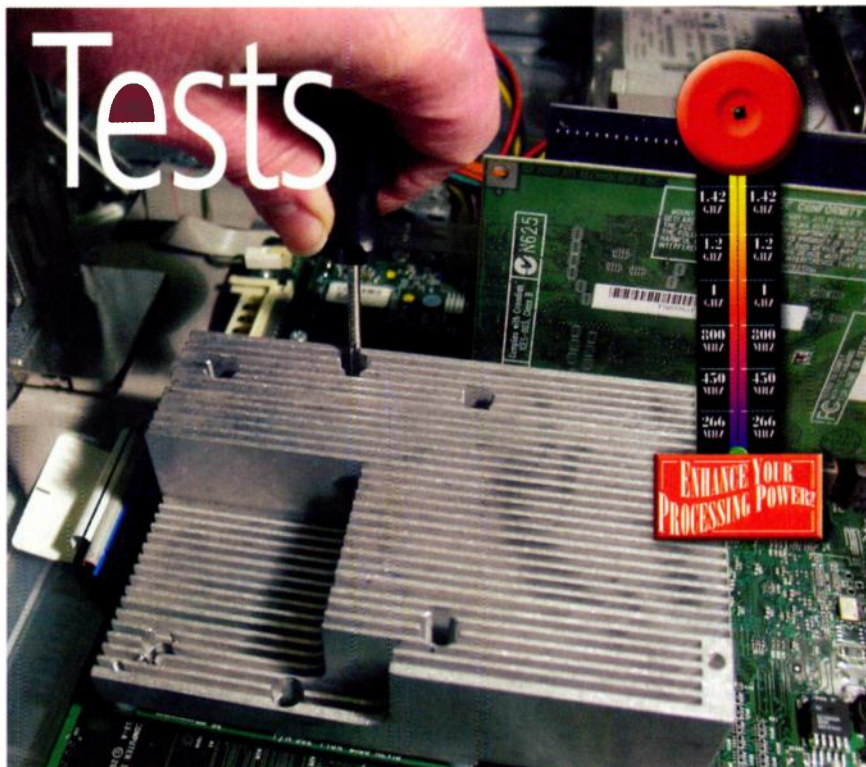
Mike Watkinson

Despite the extensive testing I carried out on processor upgrades for iMacs, Power Mac clones and Beige G3s in *SOS* December 2001, I was unable to form a positive conclusion either for or against the concept. As processor speeds have edged gently upwards, upgrades have followed, usually a few hundred Megahertz behind. At the time of the tests carried out for this article, earlier this year, Powerlogix had a range of upgrades featuring 800MHz and 1GHz processors, and Apple's fastest machine was 1.25GHz. But as this article goes to press in late July, the situation has changed; Powerlogix are now supplying upgrades at up to 1.2GHz, and Apple's fastest G4 processor is 1.42GHz. The 800MHz Powerlogix upgrades tested in this article are still available, but their prices have dropped between testing and publication (see the 'Upgrades & Pricing' box towards the end of this article).

Although Apple do seem to have a policy of nudging down Power Mac prices with each speed bump, there are of course many people using older machines who cannot justify the expense of a new machine, especially if a simple and cheap upgrade could achieve the performance they require. With this in mind, I decided to stage a rematch, with newer machines, and with upgrades which have a tested clock speed nearly double that of the processors they will replace.

The Machines & Upgrades

Although both of the machines I used in my first set of tests this time could be said to belong to the most recent family of Power Mac (those based around G4 processors), both had processors running at less than half the current maximum. They are the

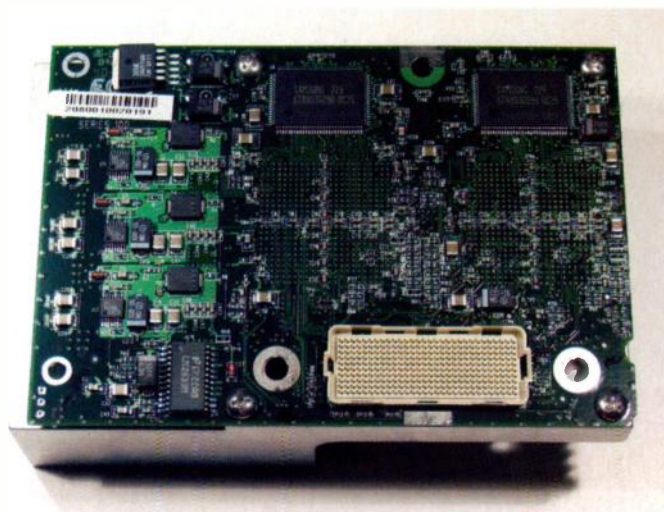


Processor upgrades are a great idea for making older computers in general household use last longer. But how well does a processor speed boost translate into improved performance in *musical* applications on older Macintoshes? We find out...

450MP (dual-processor) Tower and the 450 Cube (see the 'Test Spec' box opposite for the full spec of the machines used in the tests). Both machines are significant milestones in Power Mac development, the former because it was the first dual-processor machine available. In its unmodified guise, it still feels as fast as current machines when running day-to-day tasks. It is also a timely reminder of how quiet the first Power Macs were compared to today's Dyson

impersonators! This particular model is notable in that the hard drive can be plainly heard above the noise of the fans...

The latter machine, the Cube, might have been Apple's greatest achievement. All that power and no fans! It's a shame that Firewire had not, at the time, caught on in the peripherals market in the way it has now, as



The Dual 800MHz Powerlogix upgrade card used in the 450MHz Power Mac G4 tower.

Installation

Installation into the Power Mac 450MP was very simple. The case has the latching side door still used in current G4 machines, and the processor sits on the motherboard which lies flat and unencumbered when the door is fully open. The old processor simply lifts off its connector once the retaining screws have been removed. The upgrade is positioned by lining up the screw holes in the heatsink with the holes in the motherboard, and once this is done, the connector snaps (gently!) into place, and the upgrade is secured with the original screws. The cooling fan is secured on top of the

heatsink using the two bolts provided, though you must make sure that the airflow indicator is pointing down towards the heatsink (see picture, below right). The last task is to connect the fan's power cable to a spare power supply socket; then you simply close the case and you are ready to boot up.

Physical installation in the Cube is a lot more tricky (see the bottom row of pictures below). Although I tend to enjoy this sort of thing (it brings back many a happy memory of rainy days whiled away with nothing more than an Airfix kit for company), I can imagine that most musicians might be

a little apprehensive about dismantling the innards of such a carefully designed and compact set of electronics. If the thought of 40 steps of instructions fills you with even a small amount of dread, I would thoroughly recommend the employment of an authorised Apple service engineer to carry out the installation. 24 photos also accompany the instructions, but if this is still not enough detail for you, Powerlogix also include an installation movie on the software CD!

The kit also contained a fan and power cables, connecting screws, installation CD and instructions. Did

I say fan? Yes, although the G4 Cube is a fan-less design cooled by convection alone, Powerlogix recommend the installation of one due to the extra heat generated by the faster processor. Surprisingly there is a space (with guides) for a fan inside the Cube's 'core' — it's almost as if the designers were expecting one to be fitted.

Finally, both upgrades require a software installation from the CD provided. This places an extension in the System folder that enables the L3 cache for operation under OS 9. However, this is not necessary under OS X.



Installing the upgrade in the 450MHz G4 Tower was easy. First, the old processor is unscrewed...



... and removed from its connector.



Then the new processor, with its heatsink and fan, is screwed in its place.



Installing the other upgrade in the G4 Cube was much harder. It comes apart OK...



... but several fiddly circuit boards have to be removed inside...



... before you can even get the old processor off and put in the new fan. The 40-step installation guide is a must, as are the 24 pictures that accompany it!

- Instruments in *Logic* under OS X (with the exception of the *Waves C4* and *RVerb*, since at the time of testing, these were VST-only), and ran the *Waves* plug-ins in *Cubase SX*, which has an audio engine with a very similar feel and setup to *Nuendo*, since version 2 for OS X was not quite available at the time of testing.

Note that there are no screengrabs in this article from Mac OS X. This is because the screen-capture function in OS X loads the Mac's processor to the extent that previously running maximum plug-in counts fail! OS 9's screenshot function does not

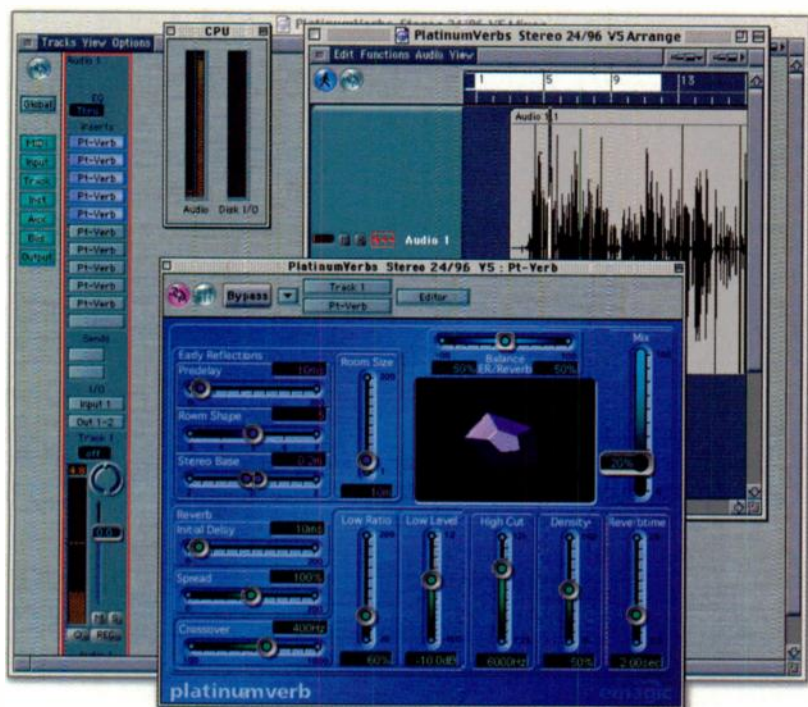
have this effect.

To keep the playing field as level as possible, both operating systems were installed from scratch on newly formatted system disks. In OS 9, the default extension set was left enabled and Virtual memory was off. The disk cache was left set to default, and MOTU's 896 (the audio interface used due to the Firewire requirements of the Cube) was set to 1024 samples per buffer. *Logic's* control panel for the Audio Hardware driver was set to 'Process Buffer Large', with the Larger Disk Buffer not enabled. The equivalent disk buffer settings in *Cubase SX*

and *Nuendo* (both use the same setup method) were left at default, which is four buffers of 128K. In OS 9, each host was assigned 300MB of memory (this is, of course, not a user option in OS X).

Logic requires an audio event to be playing through an audio channel before a plug-in loads the processor, so a new event (a copy of the first) was added each time the full number of inserts (15 per channel) was reached.

Nuendo and *Cubase SX* don't require an audio event to be playing (or even to be present) for plug-ins to load the processor,



Testing processing plug-ins: Emagic's *Platinumverb* running in stereo under *Logic* in OS 9.

which can be a nuisance if you are trying to edit a track close to the limit, since the most noticeable sign is that the graphics slow right down. However, to try and keep comparisons fair, I added a new event each time an audio channel reached its maximum quota of insert plug-ins (eight for both of these hosts).

When the maximum number of plug-ins is reached, *Logic* simply stops playing and flags up a warning telling you that you have run out of power. *Nuendo/Cubase SX* respond differently; the audio starts to break up (with gaps in playback, and/or a grainy, distorted sound), despite the fact that sometimes another plug-in can be added before the sequencer stops playing altogether (with no warning message).

It is therefore a little more subjective as to when the processor is pushed beyond its capabilities with these applications. I decided that the cutoff point for the sake of these tests was when I detected any break-up in the sound, which proved a particular problem with the *Waves* plug-ins due to their heavy CPU consumption.

In order to create a further point of comparison, I took test results at 48kHz and 96kHz sample rates on the 450MP machine (before its processor was upgraded). The majority of the tests were carried out at 48kHz. For reference purposes, the same tests were run on a dual-1.25GHz Mirror Door machine.

Results

To restrict the amount of information presented in each table and allow meaningful comparison, one potentially variable parameter is kept at a constant.

TABLE 1

In Table 1 (shown on the next page), comparison is restricted to one machine in its non-upgraded form, allowing for the following comparisons to be made:

- **A comparison between 48kHz and 96kHz operation under OS 9**

Without exception, plug-in counts at 96kHz are less than half that for 48kHz, proving that running at the higher rate increases processor demand by slightly more than the expected factor of two.

- **A comparison between 48kHz and 96kHz operation under OS X**

The situation outlined above is repeated here, with the more processor-intensive *Logic* plug-ins faring even worse than under OS 9 with the move to 96kHz. Percentage losses appear greater for processor-hungry plug-ins, because it is harder to make small incremental increases near the limit.

- **A comparison between OS 9 and OS X at 48kHz and at 96kHz**

Without exception, OS 9 plug-ins perform slightly better than their OS X



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Host	Plug-In type	Plug-In name	OS 9		OS X	
			At 48kHz	At 96kHz	At 48kHz	At 96kHz
Logic v5.5.0	Logic	Platinumverbs Mono	16	7	15	7
		Platinumverbs Stereo	12	5	10	4
		EVB3 Stereo	3	1	4	1
		ESP Stereo	17	7	15	7
		C4 Stereo	7	3	—	—
Nuendo v1.6 (OS 9)/Cubase SX (OS X)	Waves	Rverb Stereo	4	2	—	—
		C4 Stereo	8	3	4	2
		Rverb Stereo	3	1	2	1

Table 1: The dual 450MHz G4 running without its upgrade (OS 9 plug-in counts versus OS X plug-in counts).

Host	Plug-In type	Plug-In name	450MP	450MP	Cube 450	Cube	Mirror Door
			(no upgrade)	(800MP upgrade)	(no upgrade)	(800SP upgrade)	Dual 1.25GHz
Logic v5.5.0	Logic	Platinumverbs Mono	16	20	14	17	36
		Platinumverbs Stereo	12	16	10	14	27
		EVB3 Stereo	3	5	3	4	9
		ESP Stereo	17	22	15	20	38
		C4 Stereo	7	11	7	9	17
Nuendo v1.6	Waves	Rverb Stereo	4	6	3	5	10
		C4 Stereo	8	12	6	9	15
		Rverb Stereo	3	4	3	4	9

Table 2: All machines (OS 9 plug-in counts at 48kHz).

Host	Plug-In type	Plug-In name	450MP	450MP	Cube 450	Cube	Mirror Door
			(no upgrade)	(800MP upgrade)	(no upgrade)	(800SP upgrade)	Dual 1.25GHz
Logic v5.5.0	Logic	Platinumverbs Mono	15	19	13	16	35
		Platinumverbs Stereo	10	13	9	12	24
		EVB3 Stereo	4	5	2	4	8
		ESP Stereo	15	20	12	17	36
		C4 Stereo	—	—	—	—	—
Cubase SX v1.5.1	Waves	Rverb Stereo	—	—	—	—	—
		C4 Stereo	4	6	6	7	12
		Rverb Stereo	2	2	2	3	8

Table 3: All machines (OS X plug-in counts at 48kHz).

▶ counterparts. Waves VST plug-ins fare the worst by comparison here, perhaps showing up a loss of efficiency when a plug-in is simply ported to work under OS X, as opposed to rewriting it to operate under a new protocol supported at system level (Logic's plug-ins use the Audio Units protocol under OS X).

▪ **A comparison between Logic and Nuendo as VST hosts under OS 9**

There's no clear winner here! Detractors of Logic as a VST host under OS 9 should take note...

TABLE 2

This restricts the operating system to OS 9, allowing the following comparisons to be made:

▪ **A comparison between performance gains according to Logic's plug-ins**
Logic's plug-ins gain from the processor upgrades by an amount roughly in the range

25-35 percent. It has been shown before that Logic plug-in availability does not increase predictably with processor speed, suggesting that they are influenced by other factors, such as system buss speed. Interpolating in linear fashion between figures for the non-upgraded 450 MP and the 1.25GHz Dual DDR machines could give rise to one of two conclusions. On the one hand, if the 800MHz upgrade leads to a reasonable increase in performance, then the 1.25GHz performs better than expected. On the other hand, if the 1.25GHz performance fulfils expectations, then the 800MHz upgrade disappoints.

▪ **A comparison between performance gains according to VST plug-ins (and between VST hosts)**

Gains with VST plug-ins do not appear to be significantly different to those exhibited by Logic plug-ins. The 1.25GHz Dual machine again exceeds the expectations set up by upgrading from 450 to 800MHz, showing

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Testing instrument plug-ins: Emagic's EVB3 under Logic in OS 9.

host to gain the benefit of both processors at all times and for all duties. *Logic's* performance monitor accordingly has only one meter for processor loading in OS X, where two are shown in OS 9.

The figures, however, show only slight gains between the single-processor Cube and its dual-processor equivalent, in both the original and upgraded forms, and these differences are not exaggerated as you might expect by the move from OS 9 to OS X. This shows that in the case of plug-in counts at least, either *Logic's* OS 9 workaround for multi-processing was not the bodge everyone claimed it was, or, more likely, that proper multi-processing is still not available to these hosts under OS 10.2.3.

My guess is that there is some truth in both of these positions!

Conclusions

Deciding whether or not to upgrade your processor is a tough decision based on your needs and financial position. To play devil's advocate for a moment, the advantages of ignoring the processor-upgrade concept altogether and putting your money towards one of Apple's latest machines are numerous — particularly if time hangs on your hands as well as money, and you can wait until the recently announced super-powerful G5s are available. A new machine will afford you significant performance gains — and don't forget, this will be in *all* areas, not just with regard to the number of processing and instrument plug-ins available to you.

Of course, if you simply cannot afford to make the leap to a new machine, then upgrading is your only alternative. However, depending on what you use your Mac for and the reason why you feel compelled to upgrade, this may or may not be worth your while. Test figures for all manner of general-purpose applications are available from sites such as www.xlr8yourmac.com and www.barefeats.com if you wish to consider an upgrade to enhance your household Mac usage, but if increased audio performance is the only reason for the upgrade, then it might be wiser to wait, save and look at buying a new machine. On the basis of my findings in these tests, although there *are* increases in performance to be had from your favourite audio application, the percentage gains are not as large as you might expect from the numerical specifications of the upgrades. **SOS**



Testing more processors: Waves' C4 running under Nuendo in OS 9.

that VST plug-ins also rely on more than just the speed of the processor.

TABLE 3

This restricts the operating system to OS X, allowing comparisons to be drawn as for Table 2. With every figure in this table coming at slightly under that for the comparable figure under OS 9, no evidence is found which conflicts with the conclusions drawn for Table 2. As a whole, this table illustrates that plug-in count is

lower for OS X than for OS 9 for comparable hosts.

Both Table 2 and 3 offer an insight into the benefits of multi-processing. Under OS 9, multi-processing is not supported in the OS itself but in the application. *Logic* purports to assign MIDI duties to one processor and Audio duties to the other. This is backed up by the graphic display of System performance when running many plug-ins. In OS X, it is the OS itself that supports multi-processing, allowing each

My thanks to Abraham and Ephi at Shaye Electronics (www.shaye.co.uk/) +44 (0)870 241 5146 for sourcing and loaning the machines on test.

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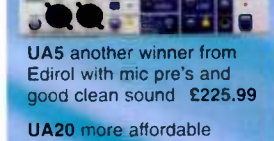
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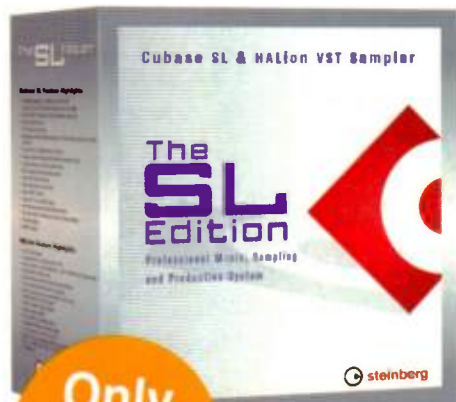
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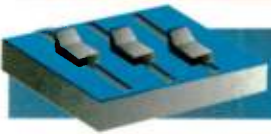
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Zoom MRS4

John Walden

Portable digital studios keep getting smaller and keep getting cheaper. The latest entrant is the Zoom MRS4, a four-track digital studio with a footprint about half the size of your favourite recording technology magazine. The MRS4 can be run from batteries, records onto Smart Media cards and is priced alongside the better cassette-based multitrackers.

The Zoom is up against a number of other portable, Smart Media-based multitracks. For example, Zoom's own PS02, the Boss BR532, Tascam's Pocketstudio 5 and Korg's PXR4 have all been reviewed by SOS over the last couple of years (see the Review Round-up box for details). The Smart Media format means data compression is involved, but the quality of the finished recordings can be perfectly acceptable for demos or mixes aimed at delivery via the Internet. So, if you are looking for a portable digital multitrack for songwriting or demo purposes,

Portable Digital Multitracker

Hot on the heels of Zoom's eight-track MRS802 comes the diminutive and affordable MRS4 four-track, recording to Smart Media cards. Is this the death knell for cassette multitrackers?

how does the baby of Zoom's MRS series fare?

Twiddle, Slide, Press

The physical layout and operational procedures of the MRS4, while obviously slimmed-down, are similar to the other multitracks in the MRS series, including the MRS802 reviewed by

Paul White in the July issue (www.soundonsound.com/sos/jul03/articles/zoommrs802.asp). The MRS4 provides four-track playback and can record two tracks simultaneously via the two quarter-inch input jacks. Each of the four tracks also offers eight virtual tracks that can be used to hold alternative takes or for track bouncing. Unlike the MRS802, however, there are no built-in rhythm functions other than a metronome.

Two RCA jacks supply the main outputs and a second pair of quarter-inch jacks provide an Aux In. The signal from these is passed



directly to the outputs, so they cannot be used as additional inputs while recording. They could, however, be used to pass the output from a drum machine to a monitoring system or master recorder, and the MIDI output of the MRS is intended to provide sync for just such an application — and if you need a suitable drum machine, Zoom will be happy to interest you in their new MRT3 Rhythmtrak. A headphone output is also provided. Audio quality can be set at either Hi-fi



In keeping with the portable ethos, the MRS4 can be powered from four AA batteries.

(32kHz) or Long (16kHz). In Hi-fi mode, the supplied 32MB Smart Media card provides 17 minutes of track time (that is, just over four minutes of four-track recording), so you might just squeeze in that three-minute tune plus a stereo mix bounced to a pair of virtual tracks.

As with the other MRS-series recorders, all the user feedback is provided via the LCD and, while some functions require a little bit of cursor control, it is not that much of an ordeal to set up things like track EQ, pan or send effect levels. Audio editing functions such as copy and paste are a little more involved (and certainly harder work than on a computer-based audio sequencer) but no worse than on any other unit of this type.

A mains adaptor is provided, but battery life from four AA-sized batteries is very good. The only other issue is data backup: as there is no USB out, a computer and Smart Media card reader are pretty much essential, although if all that is needed is data archiving and a spot of CD burning, the computer need not be of the latest specification.

Zoom-a-tune

Unsurprisingly, given that the MRS4 is pretty much a 'no frills' device, operation is very

straightforward. Recording simply requires plugging in, switching on the input, setting the input level and then record-activating the required track by pressing the appropriate button above the channel fader. This is barely more complex than on a cassette-based multitrack and, as the manual provides a step-by-step guide, even the novice user ought to be up and running in a matter of minutes.

In Hi-fi mode, the recording quality is surprisingly good. Subjectively, it is both less hiss-prone and clearer than on a cassette-based unit, and very respectable demo recordings are therefore possible with the MRS4. The possibilities are enhanced further by the now-familiar virtual track system, as track bouncing is all done in the digital domain and, with a little forward planning, the original recordings can be retained on a virtual track and remixed later should the need arise. Long mode doubles the recording time available and is absolutely fine for sketching out song ideas but the audio naturally lacks top-end sparkle compared to Hi-fi mode.

In use, perhaps the most obvious corner that has been cut in keeping the cost of the MRS4 down is in the internal effects. While

Review Round-up

SOS has reviewed a number of other Smart Media-based portable studios in recent years. These include:

- **Zoom PS02: February 2001**
(www.soundonsound.com/sos/feb01/articles/zoomps01.asp)
- **Boss BR532: October 2001**
(www.soundonsound.com/sos/oct01/articles/bossbr532.asp)
- **Korg PXR4: December 2001**
(www.soundonsound.com/sos/dec01/articles/korgpxr4.asp)
- **Tascam Pocketstudio 5: November 2002**
(www.soundonsound.com/sos/nov02/articles/pocketstudio.asp)

MRS4 is required. The Send effects include delays, reverbs and chorus but, again, aside from send levels from each track, there is little user control. The reverb is pretty basic and certainly needs to be used fairly sparingly.

Competition Time

As the MRS4 is 'audio only', it differs from the other Smart Media 'pocket' studios mentioned earlier. Bar the excellent virtual track system that really does expand what



Two tracks can be recorded simultaneously, and an additional pair of input jacks allows you to play along to a drum machine or sequencer.

the two-band EQ is respectable enough with both gain and frequency controls, the Insert, Send and Mixdown (applied to the stereo output) effects are pretty limited compared to the more upmarket MRS-series units. For example, the Insert effects offer a choice between a Limiter, Compressor, Cabinet Simulation and various Microphone processors, but each has little in the way of editable parameters. The Cabinet Simulator is a simple choice between three types — Combo Amp, Bright Combo Amp and Stack Amp. There are none of the guitar or bass multi-effect algorithms found on units like Zoom's PS02 or MRS802. If you already own an amp modeller or are happy to mic up a real amp (shock horror!), then this is not a problem. However, if you really want all these functions in a single studio box, then something a little more expensive than the

is possible (but is also found on some of the competition), the MRS4 has perhaps the most streamlined feature set, with no built-in rhythm or bass parts, no USB out and limited internal effects. It is also, however, the unit with the lowest suggested selling price and, for what it is designed to do (audio recording), it is actually pretty good. As long as I had access to a suitable computer for data backup, I'd certainly pick the MRS4 over a cassette-based unit. **SOS**

SOUND ON SOUND

Zoom MRS4 £229

pros

- Respectable audio quality in Hi-fi mode.
- Very portable with good battery life.

cons

- Limited built-in effects/amp modelling.
- Backup requires a suitable computer and Smart Media card reader.

summary

The Zoom MRS4 is capable of very respectable four-track recordings and is also extremely portable with good battery life. If you don't need built-in drums and comprehensive amp modelling, then the MRS4 is currently the cheapest of the Smart Media multitracks and would make an excellent tool for the mobile songwriter.

Information

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Roland VariOS

Variable System Module

Paul Nagle

A subtle revolution is taking place in our studios, right under our very noses. Increasingly, instruments and effects rely more on DSP programming than hardware. We are becoming used to gaining new functionality via software upgrades and, in some cases, we even forgive manufacturers for releasing 'unfinished' products, based on a belief in future development. What if the time is drawing near when we can no longer categorise *any* instrument or effects unit according to function — because functionality is no longer set in stone?

This isn't a deliberately vague introduction. The VariOS module is a freely configurable hardware and software combination, one of several that are starting to appear. As it stands today, it is capable of being a DSP-modelled analogue synth one moment, and a sample player, arranger, or manipulator the next. In the future, it may be transformed into, well, whatever Roland care to make it. If

Is it an effects processor? Is it a Variphase processor? Is it a virtual analogue synth module? The truth is, Roland's VariOS can be *any* of these. Is this the flexible future of hardware? We find out...

you're still wondering "yes, but what *is* it?", this is a tricky question to answer — put simply, it depends! The VariOS is designed to work in conjunction with software loaded onto a host PC or Mac — although it can operate in stand-alone mode too. It arrived here for review accompanied by a lone program, *V-Producer*, and this was where I started. Later, two more instruments — software synths named *VariOS 303* and *VariOS 8* respectively — became available for VariOS, and I reconfigured it to run them as well. The newer instruments are described as 'reminiscent' of a TB303 Bassline and unspecified 'Roland analogue polysynths'.

The VariOS Hardware

We'll begin with the easy part — the hardware. The VariOS is a cheery-looking module, one rack unit high and with a minimal user interface. The contoured front panel is made of striking red plastic, which contrasts nicely with the yellow-green 2x16-character backlit LCD. Additional information is represented by four small indicator LEDs, which light to indicate clock tempo, MIDI data and the status of computer and USB connectivity.

To the left of the display, three small knobs perform different functions according to the software loaded, while on the display's right there are buttons for navigating the Menu system when using the module in stand-alone mode (Menu, Exit, and Cursor left/right). Parameter adjustments are made via the Value dial, also located here, and pushing this confirms values, so it behaves like an Enter key. You can push the main volume knob too, in which case it auditions the current sample (or synth sound, if that's how the VariOS is set up at the time).

A PC card slot is provided for external data storage using Microdrive, Smart Media or Compact Flash (with a suitable PC card adaptor). A headphones socket and on/off switch complete the front panel.

The rear panel has MIDI in and Out — but no Thru. It also features a USB socket — the vital connection for data transfer between computer and module. Digital outputs are provided in both co-axial and optical form, but the inputs are analogue-only with a level-adjustment pot and a line/microphone selector. At present, the inputs are not referenced by any of Roland's software — so the VariOS can't (yet) function as a sampler or effects unit. The stereo outputs are supplemented by two individual direct outputs.

Installing V-Producer

With *V-Producer* loaded on your computer, the VariOS module can perform 'elastic' audio file manipulation based on Roland's Variphase technology. Rather than use precious space here on all the details, please see the *SOS* reviews of the VP9000 Variphase Sampler and the V-Synth (*SOS* June 2000 and May 2003, or at www.soundonsound.com/sos/jun00/articles/rolandvp9000.htm and www.sospubs.co.uk/sos/may03/articles/rolandvsynth.asp respectively).

Software and driver installation from the supplied CD-ROM is straightforward enough if you follow the given instructions. The software resides in the VariOS module itself, as well as in your studio computer. There was rather too much rebooting of my PC and unplugging of the (supplied) USB cable for my taste but

SOUND ON SOUND

Roland VariOS £999

pros

- Flexible, programmable system.
- Incorporates Variphase technology.
- Analogue emulations sound good, especially *VariOS 303*.
- Hardware module performs processing rather than host computer.

cons

- A system not (yet?) open to developers other than Roland.
- MIDI implementation of the two current software synths is poor.
- The *V-Producer* software is basic, and doesn't sample.

summary

A tough package to summarise. As it stands, the VariOS hardware is under-exploited by the *V-Producer* and 303/Polysynth emulations. With no developer kit having been issued, Roland themselves must keep working on it. Only at the stage where no further development is being done can we really assess the true worth of the complete VariOS system.





ROLAND VARIOS

► overall, I had no problems. I installed the supplied software on the CD-ROM, but regretted it later when I found out that a newer version was already available from the updates part of Roland's US web site (see the box opposite for more on this). I did my review on a PC running Windows XP, but the software is supplied on dual-format CD-ROM for both PC and Mac (see the 'Computer

five minutes mono. Maximum polyphony is 14 notes; this figure is halved for stereo samples.

Sound Management

The VariOS's 46MB of non-expandable internal Wave memory can only hold a single collection of samples (or Performance, as Roland call it), comprising six multitimbral

V-Synth, I had a brand-new PCMCIA adaptor and 128MB Compact Flash card, which I dedicated to the VariOS during this review.

I should point out that the maximum sample time does not impose limits on the length of songs you can create with *V-Producer*. It is not a hard disk recorder after all, but a sample player/manipulator; the samples are played back via MIDI. When used



The VariOS's default *V-Producer* software. The Vari Track window (top left) closely resembles a piano-roll editor in a sequencer. On the right is the VariOS Mixer, and several effects are visible (chorus, reverb, and multi-effects), as well as the on-screen keyboard, which displays input MIDI note data.

in stand-alone mode, the six parts operate in typical multitimbral fashion.

Requirements' box on page 95).

When running *V-Producer* for the first time, you need to specify the MIDI ports you're using. USB is ideal for two-way communication between host computer and module and, as well as carrying sample data, it also serves as a MIDI interface. Having set the program's input and output connections to this interface ('VariOS MIDI') a further field allows you to define an input for your MIDI keyboard. This can be via the VariOS's five-pin MIDI connection (the MIDI Input) or the USB driver's proffered 'VariOS External MIDI' option.

Having got *V-Producer* up and running, a quick exploration of its windows revealed a six-track sequencer with Variphrase manipulation, a mixer, an effects section and a basic sample editor. If you have experience with any MIDI sequencer software, it should look familiar. The tracks on the so-called Vari Track window feature the usual Solo, Mute and Record buttons, and musical parts can be dragged around with the mouse. All in all, it's like a more basic version of *Cubase* or *Cakewalk*. However, its function is tied irrevocably to the VariOS module and, if the module is not present, *V-Producer* does nothing at all.

All the audio processing is done within Roland's hardware rather than in your computer and the VariOS has a maximum sample storage time of 2.5 minutes stereo,

parts and up to 128 samples. To back up this working pool of storage, 32MB of internal flash RAM is provided and yet more data can be stored via the PC card option. In practical terms, you could store many projects for quick retrieval from card. This can be done even without *V-Producer* or a computer present. Having recently purchased a Roland

I've already stated that the VariOS does not, itself, sample, but it's worth repeating this point to drive it home. Instead, *V-Producer* is the means by which sample data is loaded from a computer over the USB link. The program can handle its own Variphrase-format (VPW) files, or WAV, AIFF, and *SDII* files, and these are selected from an Explorer-style dialogue box. Having chosen



Here the Sample List window can be seen below, with a waveform selected for editing.

a series of audio files to use in a song (via the Add button), you must load them into the VariOS's memory before they can be used. The program's Load button makes this both quick and transparent, automatically encoding the files and saving them to a working directory on your PC. The load screen also features a 'Free Memory' display, so you can tell how full the module's wave RAM is.

Mapping & Encoding

Did you notice how I've just slipped the term 'encoding' quietly past you? If you recall the V-Synth and VP9000 reviews, you'll know that this is an integral and essential part of the Variphrase functionality. There are three encoding types on offer: 'Solo' (designed for solo instruments or vocals), 'Backing' (for percussive samples) and 'Ensemble' (think 'pads'). By default, encoding is automatically set to 'Backing' on the Load screen, since this covers the broadest range of sounds, but if you tick the Manual box, the other types may be selected. However, you can always re-encode later, so if you select the wrong type, it's not a problem. One situation where you might prefer manual encoding is when loading loops. In such a case, you have the option to enter the loop's tempo — otherwise the program will calculate it for you.

Before recording your first song, there's one final setting you might wish to make. Keyboard Map is an almost invisible on-screen parameter in the sample list that specifies how a sample will play when triggered via MIDI notes. It has two modes: Phrase Map (denoted by a blue 'P') and Groove Map (a pink 'G'); the former is used for conventional sample playback where sample pitch is set according to the note you play. In the latter, the sample is divided non-destructively over a range of keys and is therefore the equivalent of the V-Synth's Event playback mode (I'm not sure why Roland chose to mix their terminology).

Supposing you want to run a drum loop throughout the song (hey, it happens!), you simply drag your loop onto the Vari Track window, then hold down the right mouse button and click on the newly created part to perform various actions such as copy and repeat. To relieve the monotony of the loop, you could overdub some knob tweaks. The three knobs on the VariOS module control Time, Tune and Formant; you can twiddle these and record the results.

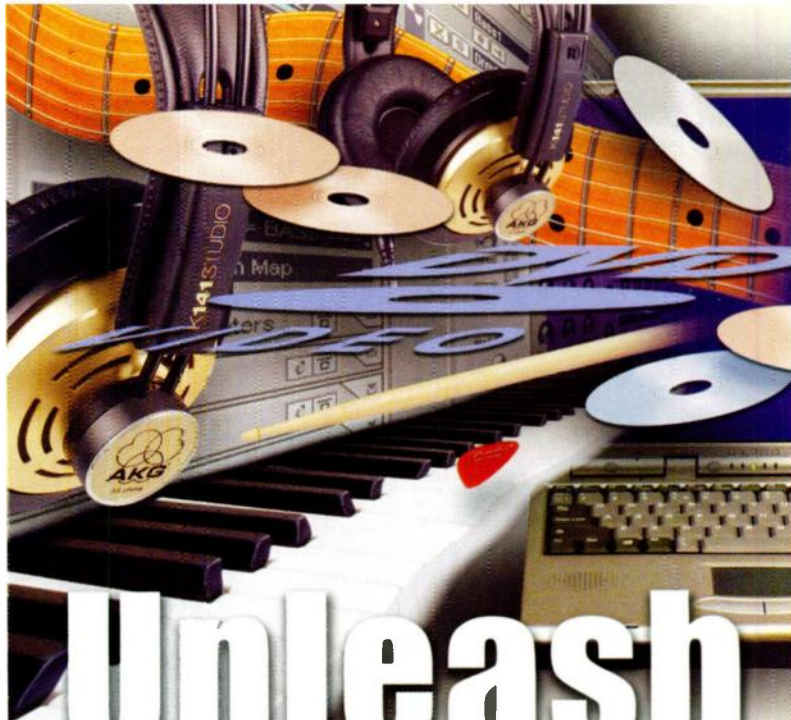
If your song's tempo does not match that of the loop, open the Sample Edit window and ensure the Time Control button is set to 'on'. Having done this, the loop will adapt smoothly and without fuss, *Acid*-style, whenever tempo is changed. A simple

Out of the Box

The VariOS module arrived for review with a CD-ROM that was obsolete even before I unsealed it. Roland's US web site (see www.rolandus.com/products_static/varios/) now has new versions of the USB drivers and V-Producer software for free download (plus the two software synths) that weren't even included on my CD.

After a download of approximately 30MB, I was ready to go. OK, I admit it: first I installed the V-Producer software and USB driver from the CD, then I looked on the web site and realised I was behind the times. You can learn from my mistakes here...

If you are still on a dial-up connection, it's worth contacting your dealer, as Roland should be able to supply you with a CD of all the latest software. With luck, by the time you read this, VariOS modules will ship with the latest software included — unless they're out of date again by the time that happens, of course!



Unleash

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ROLAND VARIOS

▶ time/tempo map is provided, although the tempo is accurate only to two decimal places, whilst the Sample Editor's tempo calculator is accurate to four.

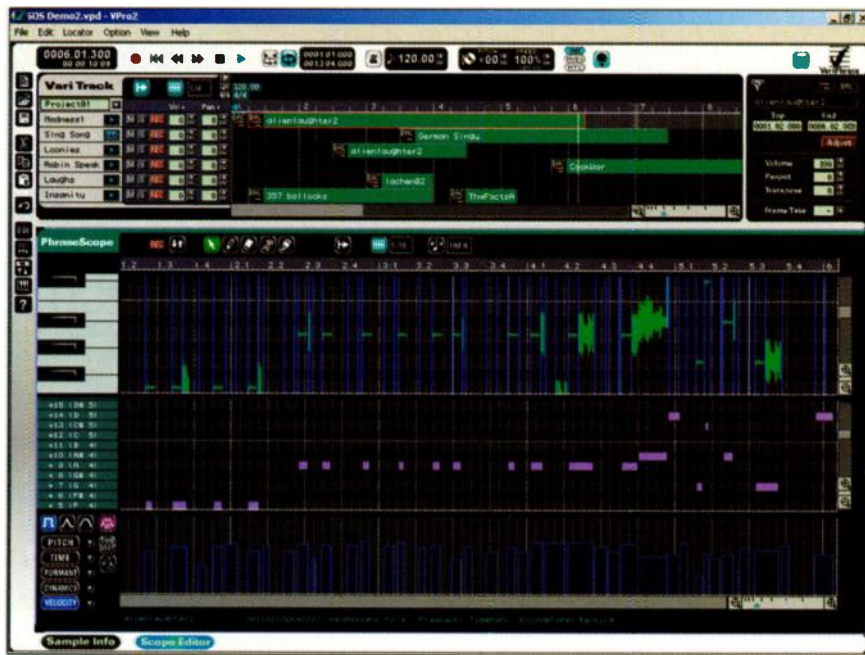
V-Producer has standard transport keys for play, record, rewind and so on. Loop points may be configured for a small section or for the whole song, and if you're recording in loop mode, you can decide whether to keep discrete 'takes' for each pass or overdub data into the same track repeatedly.

Mostly, you will use *V-Producer* in the same way as other sequencers: select your sound source (from the sample list) then play it, recording the performance into a track via a connected MIDI keyboard. The VariOS sound engine doesn't have the bells and whistles of, for example, the V-Synth, so there are no COSM filter options, external signal processing or analogue waveforms to play with. But at least all the Variphrase tools are at your disposal. If encoded using the 'Solo' option, a sample has access to the full range of Variphrase favourites including formant control and robot voice. The trademark time/pitch manipulations are available to all encoding types.

I explained in my review of the V-Synth how this technology endows a single sample with a far wider playable range than a conventional sampler. An assortment of playback modes offer Retrigger, Step and Time Sync in very much the same way as I've described when discussing Variphrase before. It's when you start to overdub using vocal samples that *V-Producer* really shines. For a start, the 'Poly' key assign mode, in conjunction with Time Sync, means you can play passages where new harmonies are added as the sampled phrase progresses, without restarting the sample on each new note. You can use the key-assign mode 'Solo' (not to be confused with the encoding type of the same name!) to replay a musical phrase, but replacing its melody with one of your own. These are just two of the reasons I loved Variphrase when I first encountered it.

Scopes & Effects

The Scope Editor window is where you make detailed adjustments to a track, and its nature depends on the Keyboard Map setting for the sample. If you are using the conventional Phrase Map, the resulting PhraseScope window (shown above) places the sample along the top, its start position corresponding to each note. You can't modify the wave itself from this pane, but you can in the next one down, in which MIDI note information is displayed. Here notes may be added, deleted, moved, and so on. Finally, the lowest pane displays either sample pitch, time, formant, dynamics or velocity. If you have recorded time, pitch or formant changes, perhaps by



Editing a melodic phrase in the PhraseScope window (the lower of the two windows shown here). The waveform can be seen at the top, split into vertically arranged fragments corresponding to the different pitches in the phrase. These notes may be edited by MIDI note number in the pane below. The lowermost display is assignable and can be set to display velocity (as it is here), pitch, time, or formant information.

tweaking the VariOS module's knobs during playback, or by sending the appropriate MIDI controllers, these are shown graphically. With a quick mousey flourish, you can edit them or create new events from scratch.

If the keyboard Map parameter is set to Groove Map, the Scope Editor window becomes the GrooveScope, displaying the time-sliced audio in the loop and allowing you to swap the slices around to create new variations and patterns — and all non-destructively. As before, each event's pitch, dynamics, and time can be tweaked graphically.

If you don't have a MIDI keyboard, the on-screen red keyboard may be used to input notes or controller information, and serves as a real-time display of notes that are playing on the currently selected part. The keyboard window also has a 'surface controller' option, accessed by double-clicking on the middle area. This opens a rectangular frame (akin to the Time Trip pad on the V-Synth) within which mouse movements can be recorded to tweak any combination of time, pitch and formant.

The levels, output routing and panning of each track/part may be set from *V-Producer's* Mixer window, and the objects in this window handle nicely with the mouse, although their actions are not recordable. The finishing layer of polish is accessed from here, courtesy of three buttons that open up the wonderful world of the effects section. With nine reverb algorithms, eight chorus types and 40 multi-effects, these are a great way to breathe life into your *V-Producer* creation. Dedicated

windows for all the effects parameters make the editing process painless, although again, I'd have liked the ability to record on-screen tweaks into a track. The effects are of a high quality and the multi-effects in particular have some funky algorithms, comparable to those I admired in the V-Synth.

Export Options

With a finished masterpiece waiting to be unleashed on an eager world, there are several options at your disposal for combining *V-Producer's* output with other software. The song data can be exported as a standard MIDI file for use in your favourite MIDI sequencer. Choosing Export from the File menu creates the MID file with up to six tracks, including all the data necessary to play back the parts from your sequencer rather than *V-Producer*. Of course, the VariOS wave memory needs to contain the correct project data when you play this MIDI file at it, and your sequencer tracks must be routed to the appropriate VariOS input (either the MIDI input or the USB port's simulated MIDI input — either of these methods worked fine for me in practice). If you're using the five-pin MIDI port, you have to ensure that the VariOS module knows it by selecting the 'Internal' MIDI Mode from within the Module's menu system.

I should refer to the VariOS hardware's menu system briefly here. It isn't something you will typically use when *V-Producer* is running; the on-screen panels are far, far more friendly than the small LCD, menu button and Value knob. However, if you're using the VariOS as a stand-alone module, you

can navigate through most of the options using these controls, although it takes a little time. I expect you'd only resort to using the menu system for simple project load operations, either from Flash RAM or from the PC card.

The other means of getting your work out of the VariOS is to export it as audio. You can, in turn, do this in one of two ways: either export it as a completed stereo mix or as multiple files (one for each part). The resulting WAV files can even be used to overdub the VariOS module multiple times, in conjunction with an audio sequencer.

Finally, *V-Producer* can run simultaneously with your other software, taking synchronisation information from it. I ran it alongside *Cubase VST* and found it sync'd to either MIDI Clock or MIDI Time Code with no problems. I was surprised to note that MIDI Clock seemed to have the edge in practice. Its timing was good enough and it locked up far quicker than it did to MTC, which required a couple of seconds to work out where it was before starting playback.

V-Producer can also act as your MTC or Clock master, but I would generally recommend using your main sequencer as the

master unless you have a valid reason not to — using your soundcard as a sync source generally gives the tightest MIDI/Audio sync).

I'll end this section by saying that *V-Producer* combined with the VariOS module is an interesting vehicle for the Variphase technology; I certainly achieved some good results with it. But if it were all this system had to offer, I would feel slightly underwhelmed. Fortunately, the VariOS is no one-trick pony. Roland's release of two completely free software synths for it was my cue to start this review all over again.

Introducing... *VariOS 8*

VariOS 8 is a software emulation of an analogue polyphonic synth. The graphics are intended, I think, to recall a Jupiter 8 — albeit a less colourful one. When scanning the advertising blurb, I noted the absence of any specific claim to replicate the mighty Jupiter, and there's a reason for this — *VariOS 8* offers far more synthesis options than a Jupiter 8 ever did, but has a sound more reminiscent of a generic virtual analogue synth. This isn't to deny its ability to get pretty close to some Jupiter (and Juno) patches, but side by side with my own Jupiter 6, there was little doubt

Computer Requirements

For the most recent information and updates on VariOS, the Roland US web site seems to be on the ball — as my review was in progress, updated drivers for Windows 98SE and Mac OS X (not originally supported) appeared.

Windows PC users may use Windows XP (Home or Professional), Windows ME or Windows 98. Windows XP/2000 are recommended. The minimum CPU requirements are a Pentium or Celeron processor with a minimum 128MB of RAM, though 256MB is recommended.

As for Apple users, the VariOS USB driver now supports Mac OS X, and version 2.1 of the *V-Producer* software now supports OS X too. The minimum CPU requirements are a 233MHz G3 or better. Again, 128MB of RAM is quoted as the minimum, with 256MB recommended.

which was hardware and which was software.

Once I had copied the *VariOS 8* program onto my PC card, the VariOS module happily detected and automatically loaded it on power-up. If you have stored the *VariOS 303* software in the same place, you are asked on the module's display which one you want to

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ROLAND VARIOS



Some of the screens in VariOS's 'polysynth' emulation, *VariOS 8*. The main screen leaves you under no illusions as to *VariOS 8*'s heritage, but the more detailed control panels for the TVF and Oscillators shown here are welcome additions. And a hardware Jupe owner could only dream of a built-in effects section like the one on the right...

► load. This is not terribly intuitive, though; *VariOS 8* is referred to as 'VPI-01' and the 303 emulation rejoices under the moniker 'VPI-02'. This is fine while there are just two to remember, but I hope Roland will change their naming standard at some point to make the selection rather clearer.

One thing to note is that once you've saved either or both of the software synths to your PC card, if you then want to use the *V-Producer* software instead, you must boot VariOS *without* the card present. I became rather fed up of constantly switching on and off in order to use the three items of software at my disposal but I expect, in practice, you would be unlikely to jump between them with quite the same frequency as I did during this review.

VariOS 8 is actually composed of two pieces of software. One is loaded into the module itself, the other — the graphical front end — runs in your host PC. With *VariOS 8* loaded, the module's three hardware knobs act as high-pass cutoff, low-pass cutoff and resonance controls, their tweaks recordable into your sequencer. For more extensive control, the results of on-screen mouse movements are transmitted too. The onscreen sliders and knobs generate SysEx data; I wish Roland had designed VariOS so that adjustments could be made using MIDI control changes instead.

VariOS 8 Specs

VariOS 8 is a two-oscillator polyphonic synthesizer with up to 24-note polyphony, depending on load. The first 30 factory sounds are full of classic old-style sounds with names like 'Jupiter Strings' and 'Juno Bass', but

there are a further 98 Blank patches ready for hot, uncensored mouse/slider interaction. Some of the factory sounds are very useable indeed and the interface for programming new patches is clear and logical. In order to keep the screen footprint small, additional windows are opened by clicking on the various orange 'Detail' buttons — so the synth is actually more complex than it might first appear. The end result, though, is lots of little windows strewn across your desktop.

Each oscillator has access to the same waveforms as Roland's V-Synth — namely a mixture of low- and high-quality analogue waves, a noise source and a 'Juno' wave. A Sub function is available to all sources except the high-quality sawtooth, square wave and noise, although it acts more as a bass boost than a traditional divided-down square sub-oscillator. Similarly, each wave except the high-quality sawtooth and noise may have their pulse width modulated via an LFO or a dedicated envelope (one for each oscillator).

The low-pass filter has just two modes — 12dB- and 24dB-per-octave — but it does a decent job. A non-resonant high-pass filter allows you to really thin out a sound if you need to. The Detail menu for the filter contains a separate envelope for both cutoff and resonance, and there's a dedicated LFO as well, the latter sync'able to MIDI Clock.

No Jupiter wannabe would be complete without an arpeggiator. This one is realistically basic, lacking only a Hold button — but at least it responds to MIDI Hold pedal information. It can also sync to MIDI Clock.

Rounding off this comprehensively specified polysynth, there's an effects section consisting of reverb, a chorus/flanger and multi-effects. The latter section features a ring modulator, three-band EQ, pitch-shifter, phaser and delay in series.

Neither *VariOS 8* nor *VariOS 303* support the module's audio inputs, so you cannot

process external signals via the filter models. Well, not yet, anyway!

It is the *VariOS 8*'s MIDI implementation that most reminds me of a Jupiter — it's abysmal! For reasons known only to Roland, the synth responds to *all* MIDI channels, emulating the MIDI cockup of the Jupiter 6 that powered up in Omni mode. Twenty years ago you could forgive this, especially as the Jupiter 6 was fixed in a later ROM update so that it could operate on specific MIDI channels. With a USB MIDI driver serving as your exclusive connection to the VariOS, this behaviour would still be acceptable, but if you wanted to take the VariOS to a gig and have it perform stand-alone polysynth duties, you'd need to dedicate a whole MIDI port to it. Madness!

VariOS 303

Many people have pleaded with Roland to remake the original TB303, and such is the allure of its acid squelch that, even now, the originals can fetch over £600 second-hand. OK, we're not talking about an analogue rebuild, but at least Roland have finally created a pretty faithful rendering in software — complete with the thing that *really* made the TB303 interesting — its sequencer.

Take a look at the screenshot on the right and you'll have to confess that Roland have done a nice job in capturing the look whilst throwing in a little new functionality too. All the controls work as you'd expect; start one of the TB303 patterns running and you could almost be fooled into believing it was the real thing. Listening closely, the square wave doesn't sound as hollow as memory tells me it should, but the sawtooth is sufficiently full and the filter is wet, warm and fattening — like chips soaked in vinegar. The higher resonance settings are more shrill than squelchy and Roland haven't quite nailed the characteristic bloopiness on accented notes either, but I'm being picky: it's a creditable job

unless you're an analogue die-hard.

The 303 emulation is monophonic and shares the same MIDI limitations as the *VariOS 8*. It receives on all MIDI channels and you can't access the knobs via MIDI control changes, having to rely on the less wieldy system exclusive. But the user interface was the biggest difference for me. The TB303 was a tactile little beast, brought to life by twiddling. Turning on-screen knobs with a mouse is as satisfying to the performing musician as watching somebody else eat your favourite meal. But if you're an adept rodent wrangler, you are probably already sneering at my dinosaur-like misgivings. Fortunately for the likes of me, with *VariOS 303* loaded,

rather than the 'VariOS Sync' port.

The Pattern on/off button determines whether MIDI Note information is used to govern pattern playback. With this activated, if you take your hands off the keyboard, pattern playback stops. The Pattern Shift button also allows you to transpose the current pattern via MIDI, which could be useful.

Of course, the original TB303 had no effects, but Roland have added a compressor, overdrive/distortion, chorus, delay and three-band EQ—all connected in serial. For me, the compression and distortion really shone in this context, throwing up many of the sounds popularly associated with the TB303. If you've been wondering what the

without a computer even being present.

If Roland continue to expand the platform — for example by finishing the MIDI implementation of their two free software synths — *VariOS* could become a flexible multi-purpose tool. I enjoyed myself playing extensively with *VariOS 303*, but was less blown away by *VariOS 8* — not because of its sound, which was fine, but because it seemed to really need multitimbrality to exploit it fully. In its present incarnation, it's not even bi-timbral like the Jupiter 6 or 8 were.

Roland make much of the fact that the *VariOS* module handles all processing, preventing drain on the host computer's CPU. However, modern PCs are increasingly



The *VariOS*'s TB303 emulation, *VariOS 303*. The screen on the left here shows the step-sequencer mode, while in the other, each individual step is editable on its own slider (try doing *that* on a real TB303). The built-in effects can be seen in their own window at the bottom of the screen.

the module's front-panel knobs control Tune, Cutoff and Resonance.

VariOS 303 Sequencer & Effects

Each of the 128 patches (with 20 to start you off) contains up to six patterns that may be selected with a click of the mouse, even during playback. The Step input screen faithfully reproduces the look of the original but I wanted to see all of *VariOS 303*'s 16 available steps — and sod the purists! Fortunately, the 'Slider' mode does exactly that, allowing you to see the full range of steps, program their values, add slides and ties, mute steps and enable Accent. It's a welcome addition to supplement the original method of pushing the Next and Back buttons to select the step to edit. I liked the way you could make changes during playback and, with careful programming of accent and slides, the results were fun. This rapidly became my favourite *VariOS* program.

The sequencer will sync to MIDI Clock, although it seems to deviate from the method used by *V-Producer*; it requires clock information via the 'VariOS External MIDI' port

secrets were all this time but didn't dare ask, Roland have hidden some of them in here for our edification.

My Ever-Changing Module

It's still early days for the *VariOS*, and given that its major selling point is its completely fluid nature, it's rather hard to reach any solid conclusions about it. The hardware is indeed capable of wondrous things, but it is only as good as the software that powers it. I have to say that this currently feels hastily implemented and rather unsophisticated.

As it stands, I found *V-Producer* useable but unremarkable. Although it's now hard to track down, the VP9000 Variphase sampler, even with its reduced polyphony, seems to offer a more rounded implementation of the same technology given its ability to sample and work in stand-alone mode. That said, it isn't hard to get your head round *V-Producer*, and impressive Variphase tricks are easy to accomplish; I especially liked its ability to export songs as WAV or Standard MIDI Files. For live work, you could quickly load projects from internal Flash memory or the PC card

laughing off even the most complex software synths, so this alone may be unlikely to sell the *VariOS*. I believe the way forward must be for Roland to release a Developers' kit as, for example, the Spanish company Soundart have with their own 'Reprogrammable DSP', the Chameleon (more on this in a forthcoming issue of *SOS*). In this way, the *VariOS* could truly become an 'Open System', as it is rather optimistically described on its front panel. With devoted users beavering away on its behalf, a much longer shelf life would be guaranteed. For now, we can only speculate on what is coming next.

The potential to turn the *VariOS* from a synthesizer into an audio processor or even a sampler (assuming those audio inputs are included for a reason) should not be underestimated — this could still become a very versatile system. For the moment, however, the jury is still out. **OS**

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Photos: Richard Eccleston

Live Wires

Tony Colman & London Elektricity

There's a drum & bass revival going on, and London Elektricity are taking the genre in new directions — including live stages across Europe.

Sam Inglis

The sound of drum & bass has really changed a lot," says Tony Colman. "When drum & bass started, around 1989-90, it was all about an Akai S900 and an Atari, so there was a lot less you could achieve, and the tunes were a lot rawer. If you bring it up to date now, producers generally have a massive knowledge of how to shape their tunes sonically, how to get

everything really fat, and how to actually compose music. We're signing an artist at the moment called nu:tone who is a fully trained organ scholar, but he makes serious drum & bass, and it's not noodly. The thing about drum & bass is that there's an incredibly strong community, not only of producers but followers, and they integrate with producers."

Colman is certainly a pillar of this drum & bass community. He's the co-founder of specialist dance label Hospital Records, a

respected DJ, and the writer and producer behind London Elektricity. Initially a studio project, the latter has now mutated into a live band, who at the time of writing are about to set off on a lengthy European tour. Colman's roots in the music industry reach beyond the birth of drum & bass, and it's no surprise to discover that he has previous form as a producer and musician in the '80s funk and acid jazz scene. As well as an unfashionable enthusiasm for playing live, this broader musical background is apparent in the construction of most of the tracks from London Elektricity's 2003 album *Billion Dollar Gravy*: the breakneck tempos, whipcrack snares and soulful double basses are all present and correct, but they're often welded to surprisingly traditional pop song

Some of the outboard in Tony Colman's studio (from top): Scamp multi-purpose outboard processing modules, Akai EX75N noise reducer, Dbx 263A de-esser, MXR dual limiter, Cheetah MS6 rackmount synth module, Yamaha TX802 FM synth, Roland JV2080 sound module and Mutronics Mutator filter bank.



sitting at the keyboard to do that. Then the songwriting process takes over, and then I'll go back in on the original groove and start to mutate that to fit the song that I've written. That's when key changes will happen and I'll bring in different samples or whatever."

Real Drums & Bass

Unlike some dance producers, Tony Colman works out of a studio that's fully equipped for live recording, with separate live areas. This gave him the luxury of not having to rely solely on samples for the drums on *Billion Dollar Gravy*. The first problem was finding the right drummer. "I know lots of drummers who could play drum & bass, but they're not really angry enough. However, I was lucky enough to meet this guy called Chris the Jungle Drummer, who was introduced to me by Nicky Black Market, one of the don DJs in drum & bass, who runs Black Market Records. He said I had to check the Jungle Drummer out, and I'd never seen anything like it — if you imagine Billy Cobham had grown up listening to jungle and hip-hop, that's what

structures.

"Having been a songwriter all my life, I find it hard to break out of that," admits Colman. "In some ways it's a strength, in some ways it's a weakness for the dancefloor. It's a constant battle when you're making dancefloor music but you've written a song for it. Does it work on the dance floor, is it going to work at home? That's hard work to get right.

"For instance, there's a track on there with [singer] Robert Owens called 'Different Drum'. I'd written a sketch and wrote the song for him, went round to his flat and taught it to him, and he came down and laid the vocals down over the sketch. There followed a tortuous three months trying to get the music to sound right. It's basically an 'Amen' tune — using the classic 'Amen' break, which is the old-school jungle break — and I wanted to use that break with a full song. It's almost like a full gospel tune, really. That was definitely a struggle.

"I normally start off with the germ idea of the tune, which is usually a sample. It could be a sample that I've created, or it could be

a conglomerate of slices of chords from different albums, or whatever, and I build the tune up around that. I usually start with a kernel musical element, and I build the drums and the bass line around that. If it turns out to be a song, then once I've got a sketch, I'll write to it, and usually I'll be

he does.

"To get live drums to sound live and fat enough is very difficult, because it usually sounds like a funk drummer. Luckily, the Jungle Drummer plays so hard, it's like John Bonham. We did some of the drums in the live room with fairly basic miking — kick,

The Sound Of Sequencers

Ever since sequencer programs began to add audio recording to their lists of features, debate has raged about whether different pieces of digital audio software sound different. On the one hand, there are those who maintain that this is impossible, that two different programs playing back the same stream of numbers through the same D-A converter must always sound the same. On the other, there are those who swear they can hear a difference. Tony Colman is firmly in the latter camp. "Nuendo was a revelation to me," he explains. "I don't normally get carried away about software — I've been a Cubase man since the Atari days, and when I discovered Nuendo it was

what I wanted because it sounded better than *Pro Tools*, but it's got the most amazing functionality. It's almost as easy to automate as *Reason*.

"When I got it, we had this theory that all programs made audio sound different, so we sat down and we put some Villa-Lobos in, and some Ry Cooder, really hi-fi music, in *Cubase VST*, the *Reason* sampler, *Pro Tools*, *Nuendo*, *Logic*, *Recycle*, just to see, and the differences were quite amazing. You need to sit down and do it in a controlled situation. They've all got different audio engines, so they all sound different. So far, *Nuendo* has come out tops. *Pro Tools* is hi-fi, but *Nuendo* does sound quite different from *Pro Tools*, even using

the same hardware, same computer, everything.

"*Cubase VST*, not *SX*, is actually really good for drum & bass, because it adds a certain hardness to the sound. It's not 100 percent hi-fi, but it adds a certain something to it which really gives it added punch. On a couple of tunes on the album, I had done them in *Nuendo*, but they were sounding too 'bling' and not rough enough, and I put them into *VST* and they got a kind of roughness, even without using the EQ — just from playback. *Reason* is an amazing piece of software, but a complaint that some people had about it is that sounds disappear in it. There's a compromise in *Reason* because the file size is diminished — you put an

audio file into it, and when you save it as a self-contained file which includes all the audio data, it's smaller. There is a sonic compromise which enables them to get so much power out of a modest processor, and you do lose stuff in there.

"While I was making this album it was getting stupid, because there's tunes that have been done completely within *Reason*, there's tunes done in *Reason* and output into the desk, there's tunes that have been done in *Nuendo*, and tunes that have been done in *Reason* Rewired into *Nuendo*, and *Cubase*. I took so many different routes to achieve the end goal on each tune. For me, this album was all about learning about this new software."



Tony Colman's studio. The live area is behind the DDA desk; equipment racks are to the right, while Roland Juno 106 and Access Virus kb synths are visible to the left.

► snare, toms, two overheads and random mics in the room, which is what I like to do, feeding it through whatever I've got here, making it sound good on the day. I record onto ADAT and then mix down at leisure. To get a totally different sound I put the drums in the lobby — you get a really wicked, claustrophobic, boxy sound — and we've got a shower room through there which

gives you a really nasty stone sound. He's got two snares, and you need that with drum & bass because you've got the main backbeat and all the ghost notes. Apart from that it's a fairly standard kit, it's not a huge kit.

"You have to turn it into loops, but what I like to do is, if there's one really good performance, to try to keep the quantise

from the original performance, because that's what makes it unique. You choose all the best parts of it, check which ones roll the best, you might need to do a bit of *Recycle*-ing and shifting things around, but that's the best way. The way we work with Jungle is that we set him up and basically play other people's records to him, and he'll just play along to them, because that's what

In The Racks

Tony Colman's studio has something of a history behind it: it achieved some fame under previous owner Steve Parr, when it was called Hear No Evil, and before that, as Rooster Two, had a reputation as one of the few affordable 24-track studios in London in the '70s. Tony still has the mid-'80s DDA desk from Hear No Evil days, and a collection of outboard. Now that most of his recording and sequencing is done in the Apple Mac, however, this equipment gets used more for its sonic peculiarities than out of necessity.

"I inherited the Scamp with the studio," he explains. "It's a really old budget outboard unit with compressors, ADTs, gates, chorus, EQ and stuff. It sounds crazy. A lot of them are broken, but the ADT still works, you get that real bucket-brigade analogue double-tracking which can sound really nice on bass tones. The MXR limiter sounds wicked on bass. It's really noisy, I don't know what it does, but I use it on bass lines a lot. My MIDI stuff isn't getting used so much any more apart from the

Yamaha TX. It's all about FM bass lines, you can't get a better sine wave for garage bass lines, it's brilliant — particularly if you need to put in some sub-bass underneath to fill up the whole spectrum.

"The 'Troupier Series' limiter is my secret weapon. It's a limiter that was built for a PA, and on bass lines it's fantastic. It gives a real graininess to the bottom end. It's solid-state and really noisy, but it's part of my sound now. The Manley sounds wicked on drums and vocals, the Dbx is a brilliant compressor, I use that on almost everything. It's fantastic on individual parts and over a mix. The Lexicon PCM41 delay has a really nice sound. Very good for dub delays and stuff like that. You can do the old trick where you route it back on itself via the desk and filter the loop so you get that real Studio One-style delay, progressively cutting out all the bottom end and boosting the resonance. The Sherman Filterbank is no good on bass, but really good for those strange bleepy effects that come in and out of tunes, you

can just sculpt sounds with it and it does things I haven't heard any other filter do. The Space Echo is indispensable.

"I still use my Casio FZ10M, mainly because I haven't transferred the library over into the computer. It was my first ever sampler, and I still really like some of the sounds. I paid £120 for the 1MB memory expansion! There's all sorts of loops in there from my early days on floppy disks. The Bosendorfer piano in there sounds amazing — really."

Lurking on the table is a less familiar piece of '80s technology: "This is a Fairlight Voice Tracker. I haven't figured out how to use it yet. I even tracked down the manual off the Internet, but I still can't make it work. I think they only built about 200 of them — it's a voice-to-MIDI unit, though I don't know why anyone would want to build a voice-to-MIDI unit. I've been plugging stuff into it to see if it does anything else to sound, but nothing yet!"

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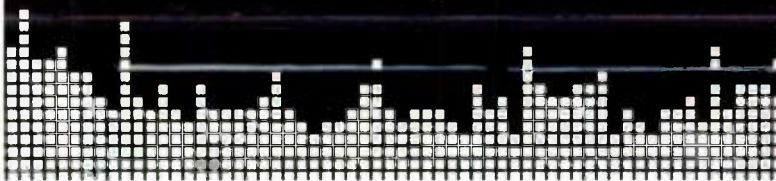


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► he's used to doing in a club situation. For some of the tunes on the album I already had one or two elements sketched down, which I'd play to him, but a click's a no-no. It's not exactly inspiring."

Going Live

Finding the Jungle Drummer, and a chance offer of a live session for BBC Radio One, gave Tony the idea of developing London Elektricity as a full live act. "I'm a live music fanatic," he says. "Most electronic acts that go live are slave to a click, and that kills it for me every time. I've never seen a show that I've enjoyed where the drummer's got headphones on, I'd rather either hear a completely live band or a DJ. So the challenge with London Elektricity live was to get a drum & bass act that smashed it but had no click. With the drums and the bass it's kind of easy, because the Jungle Drummer sounds like a mental 'Amen' break anyway, and we've got an amazing bass player called Andy Waterworth on upright bass. The difficult bit is the samples — what do you do to take it live? Basically, what we decided to do is *Recycle* everything. A lot of the tunes have got filtered loops — there might be an orchestral loop that's very rhythmic, and over time it gradually needs to filter up and then close. So how do you do that live? Well, we *Recycled* everything,

Tony Colman's aged Revox B77 stereo reel-to-reel recorder.



and we've both got five octaves each, just covered in different REX files, and we're like human sequencers. It's like being in the Philip Glass ensemble or something, but it works, because it means that the band can speed up or slow down. You don't normally see that in dance music — we'll be in the middle of a drum & bass tune, and we'll suddenly cut into garage tempo or drop down to hip-hop, but still maintain the fatness that having all the samples gives you.

"As a producer, for it to be properly live, you've got to let go of all your control over the music. I think this is why a lot of projects that are born in the studio and then taken on the road just end up sounding like the record. It's because the producer, who's probably part of the band, doesn't want to let go of that control. But if you don't let go of the control, how can anything really exciting happen?"

Getting On With It

Once the hottest thing on the planet, before fading from view behind the rise of UK garage, drum & bass is now undergoing a serious revival, and Tony Colman is in the vanguard.

"It's become a mature genre of music, like hip-hop is," he says. "When any genre starts there's a flurry of activity and it's the latest thing and the music press jump on it — but in England, the music press will jump on something, big it up, and then try to kill it when they've got nothing else to write about. One year it was 'It's all about jungle,' the next year 'Drum & bass is dead,' but now they're all into it again. So you just have to get on with it really." With upwards of 30 tour dates in the books, *Billion Dollar Gravy* in the shops and a busy release schedule planned for the Autumn, that's exactly what Tony Colman is doing. **ES**

Mastering Drum & Bass

As in most specialist dance genres, vinyl is a crucial medium for the drum & bass producer, and when Tony Colman finishes a London Elektricity tune he'll often produce different mixes for record and CD. "The process I've ended up doing, which quite a few people do now, is like this: when you finish a tune, you cut it onto a dub plate and play out, and then if you're sure about it you give it out to other DJs on plates, and it's normally over-mastered. You have to make it too fat, fatter than you would for a commercial release, because when people are

cutting dub plates it's like 'Bung it in, cut it, walk out the door.' It's done really quickly, and you've got to make sure that what you're giving them is really loud. Otherwise it won't sound good off a plate. So you want to do exaggerated mastering for dub plate.

"You've got to go easy on the bass if you're making vinyl. You've got to remember that DJs do have control over the EQ, and most systems are enhanced on the bottom end anyway, so it's much more about clarity in the bottom end than weight. It's about getting the spaces right in the mix, so

you do that dub-plate version, and then when it comes to the album, for example, I do different mixes for the vinyl and the CD. They may be structurally the same, but they'll be sonically different, because different things work on CD than on vinyl.

"I master all the CDs here using *Nuendo*, though I also put some tunes onto tape at the end. Some tunes I didn't put onto tape, because I didn't think they needed it. I generally like to go onto the Revox if the tune's still sounding a little bit mechanical or brittle. That may just be to make

myself feel better, but I think it works, it adds a certain amount of low mid-range compression and distortion, and it definitely warms the track up. I've had the Revox for years and the heads are really mashed up, but it sounds good. I still take drum & bass tracks down to Metropolis, where we master, on quarter-inch sometimes, and they always get annoyed because they have to wheel it out. But if there's a tune that's been made just in a computer and it's sounding a little bit empty, you can totally transform it if you stick it on tape."

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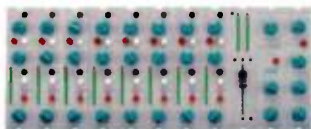
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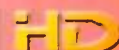


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Uncharted Territory

I was excited when I saw the title of your 'What Mic Should I Buy First?' feature in the July issue. I was just a little disappointed that it didn't include a chart showing how different mics at different price points are suited to different applications. My first (and only) mic is a Shure SM57 (which was mentioned in the article) which I think does a good job for a lot of things, but as I now have both the money to afford better, and have the facilities to take advantage of a higher-end mic, some kind of chart or table would have been a useful reference for choosing which mic to buy.

Matt Long

Reviews Editor Mike Senior replies: *I'm afraid I'm not sure that such a chart would be of any real use, and it would also almost certainly be gravely misleading. Mic choice is so much a matter of personal taste, and varies so much from session to session that it's simply not possible to make much in the way of a generalisation. If you look at some of the interviews with producers and engineers in our past issues, you'll soon see that not even the most well-known names in the industry agree on how to mike up a snare, a guitar cab, and so on (despite their usual protestations that they just 'do it the standard way') — and not only with regards to mic choice, but also in terms of positioning and processing.*

If you've got less than about £500 to spend, then read reviews of microphones and interviews with your favourite engineers, and ask friends' opinions. If you've got more than £500 to spend, then I'd seriously suggest A/B-ing some mics at a local shop — for that amount of money they should be happy to oblige. Another tactic would be to check out 3D Audio's mic comparison CD (www.3daudioinc.com), as reviewed this month on page 106. If you've got more than £1000 to spend, then think about hiring a few mics for a day so that you can test them in your own studio and avoid an expensive mistake.

If you still can't decide after all that, then you've got two choices. Firstly, you can look at all the reviews of Far East-produced large-diaphragm condenser mics under £250 we've featured in the last 18 months (the Samson C01 in January 2003, the Studio Projects C1 in December 2002 and the Red5 RV8 and RV10 in June 2002 spring to mind), and buy one of them. We've found them all to be quite similar-sounding, although any deviations from this trend will be stated in the reviews. Many other manufacturers are

producing condenser mics priced around or below the 250-pound mark, such as ADK, AKG, Audio-Technica, Beyer, Cad, MXL and Superlux. Given the price/quality ratio, you'll probably be getting a good deal whichever you go for, and they'll all let you learn a



Personal taste plays a large part in choosing the right microphone.

great deal about recording without breaking the bank. With a little care you should be able to get release-quality recordings out of them too.

The second option is to buy yourself a Neumann U87! This is possibly the most common professional all-rounder when it comes to large-diaphragm condenser mics, and it appears in almost every professional studio around the world. It has been used on so many hit records that, if you're not getting a good sound, then you're almost certainly the one at fault! It's expensive, like all premium-quality products, but, with care, you'll get a lifetime of pristine professional audio from it.

Impedance Impaired?

I just wanted to make a couple of comments on Hugh Robjohns' answer to the question, 'What advantages are there to variable input impedance?' [Q&A, SOS June 2003]. The figure of 1.2kΩ as a preferred input impedance, described by Hugh as the 'normal' input impedance, became lore in the '60s and '70s, as this was the best compromise to get the optimum signal-to-noise ratio. Five times the source impedance of 200Ω seemed like a good figure. But then Hugh gets his physics back to front. He states that a higher impedance input gives less HF loss from the cable — I'm afraid that's not true. On long cable runs in particular, high input impedance means that the capacitive effects (HF loss) of the cable

are made worse. All my most recent designs try to fool the cable into thinking it's a short-circuit that it's seeing — that way, this effect is eliminated. But for most purposes the effects are minimal. They become more significant with increasing cable length.

Hugh also says that dynamic mics produce a 'more uneven frequency response' when driving into a lower input impedance. While this is true for a few microphones, I would suggest that the majority are noticeably happier working into lower impedances. After all, dynamic mics are current producers — they generate a voltage by virtue of the impedance of the preamp (and most preamps work by amplifying that voltage). The ribbon microphone is the supreme example of a 'current-producing' mic that needs these lower impedances, as is acknowledged by Hugh.

Lastly, I heartily endorse Paul White's comments [Leader, SOS June 2003] on studio equipment; a studio is a set of tools and there should be no conflict between hardware and software studios — they are both valid.

Ted Fletcher, TF Pro

Technical Editor Hugh Robjohns replies:

I am indebted to Ted for pointing out that I had my 'physics head' on backwards the day I wrote that Q&A reply! It is indeed the case that a high-impedance load at the end of a long mic cable will increase the capacitive cable losses, and thus reduce the amplitude of higher frequencies more than the same cable loaded with a very low impedance. However, I have noticed that, in practice, with most modern capacitor mics (using active electronic output circuitry), a relatively high input impedance appears to counteract the physics to some degree — presumably because of the reduced loading on the output buffers. Certainly, on the few preamps I have tried with adjustable input impedance, I have frequently perceived an increase in the 'air' and HF ambience of the signal captured by various capacitor mics when selecting the high-impedance input mode.

*I happily accept that current-producing dynamic mics are generally happier working into low impedance, but the precise effect that input impedance has on the tonal characteristics of these kinds of mics does seem hard to predict — some becoming noticeably more coloured and others less so. Being realistic, though, the adjustable input impedance facility on suitably equipped preamps is going to be treated by users as a kind of tone control, rather than as a means of ensuring technically optimised impedance matching, so whatever sounds right is best! **SCS***

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Creating A Test CD

Hugh Robjohns

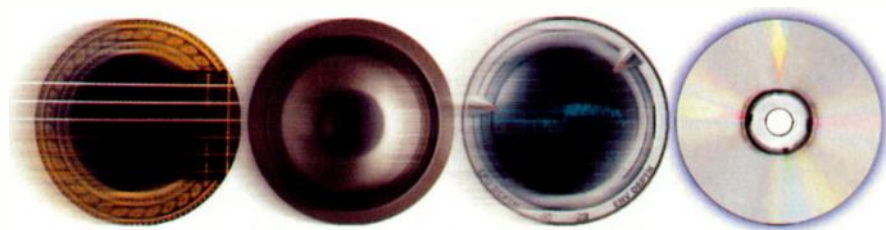
As audio engineers or producers, one of the things we all have to do from time to time is to make judgements about audio quality. It might be about the balance of a mix or the sound of an instrument, it might be about a particular piece of equipment or signal processing, or it might be about a monitoring system or listening environment. Whatever the case, an essential prerequisite is to have a valid frame of reference — something upon which you can base a subjective opinion.

The easiest and most flexible way to establish a frame of reference is to use some sort of reference CD, and there are several available commercially. For example, one of the most widely available is Alan Parsons' *Sound Check* CD, but others include the Canford Audio *Quick Check* CD (there's more about these first two elsewhere in this article), and the three-volume set of *Test Discs* produced by *Hifi News* magazine. Other reference discs which are useful (but much harder to track down) are the BBC Radio Group 2 *Acoustics Test CD* and the EBU SQAM (Sound Quality Assessment Material) disc.

Useful though these commercial discs certainly are, the range of technical test tracks is often inappropriate for the majority of needs and the selection of musical material rarely matches personal preferences. So why not create your own reference CD — a disc of



If you can get hold of the original *Hi-Fi News & Record Review* test CDs, now discontinued, these are an invaluable resource. If not, why not check out the selection of titles still available at their web site www.britishaudio.co.uk/testcds.htm.



Audio Reference Materials For Your Studio

SOS reviewers often mention their test or reference CDs — compilations of what they feel to be well-mixed, well-recorded audio, which they use to evaluate converters, monitors, and so on. But how do you go about making one yourself? We reveal all...

test signals and audio material which suits your own preferences, styles and requirements, and with which you are extremely familiar? After all, creating an audio CD is hardly rocket science these days, and provided a little care is taken during the sourcing of material and the production of the final product the end results will be as reliable as any commercial disc, but more relevant and useful.

Once created, this personal reference disc can be used as a reliable reference to help judge the quality of almost any audio equipment, including processors, consoles, and loudspeakers. It can also be used to help assess the acoustic characteristics of the listening environment, and to provide comparison tracks with which to judge a mix or the validity of a mastering process.

Obviously, the precise contents of a reference CD will vary from person to person to suit individual requirements and tastes. However, the basic ingredients will be largely the same for all — some technical test tracks, some solo instrumental and vocal tracks, and some commercial music tracks — its just a case of

deciding the specific roles in which the reference disc has to satisfy.

Calibration

An essential technical requirement for any reference disc is to enable the accurate calibration of an audio system. This involves being able to check and set such parameters as identification of the left and right channels of a stereo system, the relative phase of two channels, the standard operating level, the amount of headroom, and the frequency response. The specific test signals required by different users and systems may differ, so I'll list those which I have found useful enough to include on my own reference disc (which has evolved gradually over many years).

My first track actually answers the first three requirements in one hit. It is a test signal known as GLITS, which was developed by a BBC

TV Sound Supervisor called Graham Haines in the mid 1980s. GLITS is an acronym for 'Graham's Line Identification Tone for Stereo,' and it comprises a 1kHz sine wave tone normally at a level of -18dBfs. (If you use a 440Hz tone frequency, it can serve as a tuning aid as well!) The left and right

BBC RADIO

Acoustics
Test
CD

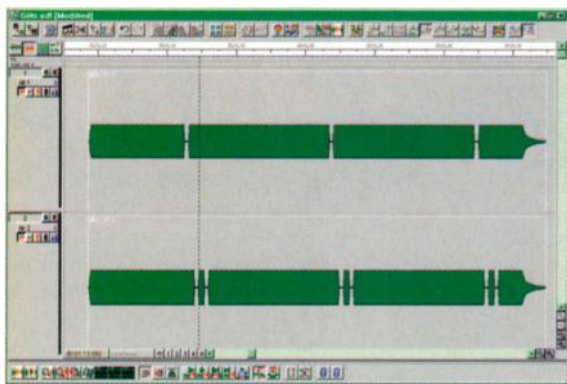


The BBC Radio Group 2 *Acoustics Test CD* is invaluable, but unfortunately, it is now hard to find.

channels carry an identical level tone which is in the same phase on both channels.

Although the European standard digital operating level is -18dBfs (which equates to 0dBu), there is nothing to prevent the use of a different level of tone if the alternative is more appropriate to the specific requirements of the user. For example, those working with analogue desks and standard VU meters may prefer to use a test level of -14dBfs which equates to +4dBu in the European environment and therefore zero on the VU meter. (It might be worth reminding Mackie console users at this stage that the meters on those desks are calibrated for 0VU = 0dBu, not +4dBu.) Whatever the choice of line up level, it is vital that you document precisely what's on the disc in the sleeve notes so that anyone else using your disc knows what to expect.

To provide channel identification the GLITS tone is interrupted at regular intervals — once on the left channel and



The GLITS test tone, viewed here in a waveform editor to show the deliberate discontinuities in the left and right channels.

twice on the right — forming an equally spaced group of three interruptions. The length of each mute and the repetition rate aren't critical: there simply needs to be enough continuous tone between mutes to allow a reasonable chance to adjust gain controls, and the mutes themselves have to be large enough to enable a meter with a slow fall-back ballistic to react sufficiently to be easily observable. A good starting point is a mute period of about 0.5 second and a repetition rate of five seconds. This is a very easy signal to create and tailor to your own requirements in any audio workstation, but make sure the mute period fades are as fast as possible, otherwise it can be hard to hear which channel is muting!

Since the tone on each channel is recorded in the same polarity, summing the two channels to mono will quickly reveal a polarity error in the system. If everything is correct then a constant tone will be heard with three 6dB dips in level. However, if one channel is of opposite polarity then the continuous tone periods will become mute (since the left channel signal will cancel the right), and the interruption periods will become three full level pulses instead. All in all, this is a quick, simple, and extremely useful test signal which is absolutely perfect for establishing the signal routing and level calibration of consoles, record machines and effects units, as well as checking metering and monitoring systems.

The only real weakness of the GLITS signal is when trying to assess the phasing of loudspeakers by ear, since checking with a constant tone is surprisingly difficult. For that reason, I also include a simple spoken voice test track which consists of a clean recording of someone saying "In phase... out of phase... in phase... out of phase", recorded equally in both channels but

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▶ with the polarity of one channel being flipped at the appropriate moments. When playing the track back, if your ears agree with the commentary then all is well... and if not you need to start hunting out the reversed connections!

When it comes to checking the headroom of a system, it is very simple to create a test-tone signal at the peak level of 0dBfs. However, to avoid potential embarrassment or the destruction of the loudspeaker drivers, I prefer to use a test signal which starts off at the reference operating level and builds slowly to peak level. It may help to differentiate this peak level track from other, safer, test tracks by using a different tone frequency, or with different frequencies on each channel. My own peak level test track

starts at an initial level of -18dBfs, and then fades linearly up to 0dBfs, taking 18 seconds, followed by a further 10 seconds at peak level. Increasing the level by 1dB each second means that the CD player's track timer can be used as an approximate level display. The seconds display represents the number of dB above the standard operating level (up to a count of 18), which is sometimes a useful facility.

Being able to check the approximate frequency response of a system is often another useful facility, particularly when it comes to auditioning loudspeakers and rooms. There are several different ways in which this can be done, each with its own advantages and disadvantages. The first is to use a 'sweep tone' which is a sine-wave test

signal at a constant level (usually the standard operating level, -18dBfs), which starts at one end of the spectrum and gradually changes pitch until it reaches the other extent of the spectrum. It doesn't matter whether the sweep builds up from 20Hz, or down from 20kHz, but it helps a lot if there are a few seconds of tone at 1kHz at each end to define the beginning and end of the sweep — few loudspeakers (and even fewer ears) will be able to generate (or hear) the frequency extremes. This test signal is harder to construct than the simpler level calibration signals described earlier, but you



Suggested Reference Tracks

The recordings listed here are not meant to comprise a definitive collection of the best recordings ever made — although I happen to think many of them probably are! Nevertheless, I believe all the tracks detailed below are excellent recordings of superb performances. The listing is not meant to be exhaustive and nor does it contain examples of every genre — these are simply musical works and performances that I happen to enjoy hearing. The key to their inclusion here is really that they have all proved useful to me in different ways when evaluating audio systems and rooms. If you'd like even more suggestions for critical listening, check out mastering engineer Bob Katz's CD Honour Roll at www.dlgido.com.

CLASSICAL

MAHLER

Symphony No 5 (Track 4 — 'Adagietto').

New

Philharmonia Orchestra/Barbirolli. EMI Classics (7 64749 2)

BERLIOZ

L'Enfance Du Christ (Disc 1, Track 10 — 'Il s'en va loin de la terre'). English Chamber Orchestra/Davis. Decca (443461-2).

MUSSORGSKY

Pictures at an Exhibition (Track 14 — 'Baba Yaga'). Jean Gillou. Dorian (DOR-90117).

CANTERBURY CHOIR

A Canterbury Christmas (Track 9 — 'O Magnum Mysterium'). York (CD136).

FAURE

Requiem (Track 4 — 'Pie Jesu'). Cambridge Singers/Rutter. Collegium (COLCD 109).

EMMA KIRKBY

A Feather on the Breath of God (Track 1 — 'Columba Aspexit'). Hyperion (CDA66039).

DEBUSSY

12 Etudes (Track 12 — 'Pour Les Accords'). Uchida. Philips (422 412-2).

BRAHMS

Clarinet Quintet (Track 4 — 'Con Moto'). King/Gabrieli Quartet. Hyperion (CDA66107).

HANDEL

Italian Cantatas (Track 3 — 'Tu Fedel? To costante?'). Kirkby/Academy of Ancient Music. L'Oiseau-Lyre (414-473 2).

CONTEMPORARY

SHAWN COLVIN

A Few Small Repairs (Track 1 — 'Sunny Came Home'). Columbia CK67119.

NITIN SAWHNEY

Beyond Skin (Track 6 — 'Nadia'). Outcaste Recordings (Caste9CD).

THE VOICE SQUAD

Holly Wood (Track 4 — 'A Stor Mo Chroi'). Hummingbird Records (HB CD0002).

STEELY DAN

Pretzel Logic (Track 1 — 'Rikki Don't Lose That Number'). MCA (MLCD 19081).

RICKIE LEE JONES

Rickie Lee Jones (Track 5 — 'Easy Money'). Warner Bros (256 628).

JENNIFER WARNES

Famous Blue Raincoat (Track 2 — 'Bird on a Wire'). RCA (PD90048).

DONALD FAGEN

The Nightfly (Track 7 — 'The Goodbye Look'). Warner Bros (7599 23696 2).

MICKEY HART

Planet Drum (Track 7 — 'Temple Caves'). Ryco (RCD 10206).

NORAH JONES

Come Away With Me (Track 3 — 'Cold Cold Heart'). Parlophone (7243 5 38609 2).

R&B

TOWER OF POWER

Direct (Track 3 — 'Squib Cakes'). Sheffield Lab (CD17).

ARTURO SANDOVAL

I Remember Clifford (Track 9 — 'Jordu'). GRP (GRD-9668).

STEVIE RAY VAUGHAN & DOUBLE TROUBLE

Texas Flood (Track 8 — 'Dirty Pool'). Epic (EPC 460951 2).

JOHN LEE HOOKER

Mr Lucky (Track 5 — 'I Cover The Waterfront'). Silvertone Records (ORE CD519).

KEB MO

Just Like You (Track 4 — 'I'm On Your Side'). Okeh/Epic (484117 2).

JAZZ

LINDA RONSTADT WITH NELSON RIDDLE & ORCHESTRA

Round Midnight (Disc 2, Track 15 — 'Straighten Up and Fly Right').

THE DAVE BRUBECK QUARTET

Time Out (Track 3 — 'Take Five'). Columbia (CK 651122).

BUENA VISTA SOCIAL CLUB

Buena Vista Social Club (Track 5 — 'Dos Gardenias'). World Circuit (WCD 050).

WYNTON MARSALIS

Think Of One (Track 3 — 'My Ideal'). CBS (CDCBS25354).

RY COODER

Jazz (Track 2 — 'Face to Face That I Shall Meet Him'). Warner Bros (7599-27355 2).

REBECCA PIDGEON

The Raven (Track 12 — 'Spanish Harlem'). Chesky (JD115).

PASQUITO D'RIVERA

Tico Tico (Track 6 — 'Tico Tico'). Chesky (JD34).

PATRICIA BARBER

Modern Cool (Track 7 — 'Company'). Blue Note (5 21811 2).

may be able to 'borrow' and modify a suitable sweep test signal from one of the commercially available test discs.

The sweep test is a certainly a handy and quick check signal, but when testing speakers or rooms it is often more revealing of certain problems to use constant signals at specific frequencies, typically at 1/3 octave intervals: 20, 25, 31.5, 40, 50, 63, 80, 100, 125, 160, 200, 250 and 315Hz. Again, these are sine wave tones at -18dBfs, recorded on the disc with a different track for each frequency. Each tone should last between 10 and 15 seconds, which seems about right for tracking down resonances and room modes. Most test discs continue the 1/3 octave spot frequencies right up to 20kHz, but I rarely find I use anything above about 315Hz.

A third common frequency response test signal is noise — usually pink noise which is filtered at 3dB/octave to provide constant energy in each octave (or 1/3 octave) band. At the very least, you should include 30 seconds of a 20Hz-20kHz pink noise track, once again at an averaged level of -18dBfs (although peaks will typically be about 12dB higher). This is an incredibly revealing test signal for all kinds of frequency response

Sound Check & Quick Check CDs

Alan Parsons' *Sound Check* and Canford Audio's *Quick Check* CDs are great resources for test material if you don't wish to spend time developing your own. The *Sound Check* CD contains line-up, tuning, pink noise and peak-level test tones, as well as audio designed for phase checking, and a couple of examples of well-recorded male speech, including the BBC Shipping Forecast.

Sound Check is more detailed; it has all the kind of material on the other disk, but with more variations — for example there are test tones at a bewildering variety of frequencies, and sweep and warble tones for speaker tests. There are also recordings of many different types of instruments and percussion, extracts from a few audiophile musical recordings and some bizarre sound effects, including a steam train and a Chieftain tank (well, you never know when they might come in handy...).

Both CDs are available from Canford Audio's catalogue or web site, and you can find more

Information about them at: www.canford.co.uk/catalogue/pdf_files/page795.pdf and www.canford.co.uk/catalogue/pdf_files/page796.pdf.

E *Sound Check* CD, £25.28; *Quick Check* CD, £21.15. Prices include VAT.

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Alan Parsons' *Sound Check* and Canford Audio's *Quick Check* CDs, both available from Canford's catalogue and web site.

problems. If you find yourself testing or auditioning loudspeakers regularly, then octave or third-octave pink noise tracks can be even more useful, and the *Sound Check* test CD includes band-pass pink noise tracks

which incorporate polarity reversals in one channel specifically intended to check individual drive units in multi-way speakers for matching, level and polarity.

The final track which I include in the

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- calibration section (although many would put it in the following Instrumental section, is of a very well recorded spoken voice. There are a couple of good examples on the Canford *Quick Check* CD as well as on the *Sound Check* CD. Since we listen to the human voice everyday our brains are highly attuned to any irregularities, and I find this a very good test for revealing frequency response problems, particularly in loudspeakers, as well as distortion and compression artifacts. If you choose the signal level carefully a spoken voice track can also act as a useful monitoring level reference — its remarkable how accurately and repeatedly most people can set the level of spoken voice!

Instrumental References

This section is harder to generate or source than the preceding test tracks, because what is needed is a wide variety of very well recorded solo instruments and voices. Fortunately, there are some good examples of this kind of material on the *Sound Check* CD, as well as the SQAM disc and the BBC Radio disc, and some of the signal processing manufacturers like TC Electronic and Lexicon often incorporate suitable material in some of their demo discs.

The tracks in this section can be used in a variety of ways, and the first is to provide a tireless source of audio which can be used when trying to arrive at some initial settings in effects and dynamics processors. The second is to provide clean reference recordings which are useful in judging the quality of an instrumental source or the processing being applied during a recording or mix. The third main use is to assist in finding resonances, distortions and response problems in the recording and monitoring equipment, and this role is a particularly important one. For example, a well-recorded bass guitar or upright bass (ideally playing scales or walking bass lines in different keys) can be a far more educational and realistic test of low frequency room mode and loudspeaker response problems than any of the sweep, spot-tone or noise test signals!

Vital instrumental sources here include solo piano (rock piano miking techniques are very different to those employed for classical piano, so choose this material carefully), string bass, electric bass (without any processing), acoustic guitar (in various styles of strumming and picking), and an array of percussion. This should include a complete acoustic drum kit, a couple of different snare drums, kick drums, orchestral bass drum, cymbals, and perhaps congas or tabla, as well as triangle, tambourine, glockenspiel, and maybe even tubular bells, since these all have complex high-frequency components. It is also useful to include instruments such as

Web Resources — Build Your Own Reference CD

If you don't fancy getting hold of any of the commercially available test CDs available, you can create your own if you have access to the Internet, although it will take a little effort. For a start, there are WAV files of test tones at different frequencies and digital levels, including -18dBFS, available to download from the site of Impact Televisual Productions (www.execulink.com/~impact/utesl1st.htm), while Mark's Car Stereo Page (<http://users.netmatters.co.uk/mea/test.html>) offers pink-noise files both in and out of phase. If you can't find the tone levels you need, then there are signal-generator applications for both PC (Natch Engineering's *SigJenny* at www.natch.co.uk) and Mac (*Mac Audio Toolbox* at

www.blackcatsystems.com or Audio Ease's *Make A Test Tone* at www.audioease.com) which provide more options.

In addition to these, there is a fantastic resource available at www.tnt.uni-hannover.de/project/mpeg/audio/sqam. Here you can download a small selection of the tracks originally offered on the SQAM test disc mentioned in the main article, in particular pristine recordings of speech, singing, harpsichord, cello, horn and trumpet, which are ideal for critical listening. With a little editing, these resources should allow you to build most elements of the test CD mentioned in the main text — just add a few of your favourite mixes!

Track	Index	Time	Signal description	File
07	01	0:35	Electronic tune (Frère Jacques)	M: Eres07_1.wav
10	02	0:37	Violoncello	S: Vico10_2.wav
21	02	0:23	Trumpet	S: Eres21_2.wav
23	02	0:31	Horn	S: Eres23_2.wav
35	01	0:35	Glockenspiel	S: Eres35_1.wav
35	02	0:24	Glockenspiel	S: Eres35_2.wav
40	01	0:23	Harpsichord	S: Eres40_1.wav
44	01	0:28	Soprano	S: Eres44_1.wav
47	01	0:30	Bass	S: Eres47_1.wav
48	01	0:28	Quartet	S: Eres48_1.wav
49	01	0:23	Female speech	M: Eres49_1.wav
50	01	0:22	Male speech	M: Eres50_1.wav
51	01	0:21	Female speech	M: Eres51_1.wav
52	01	0:24	Male speech	M: Eres52_1.wav
53	01	0:21	Female speech	M: Eres53_1.wav
54	01	0:21	Male speech	M: Eres54_1.wav

The European Broadcasting Union's SQAM (Sound Quality Assessment Material) CD is invaluable — and some of the audio from it can be downloaded in WAV format from the web site shown.



flute, clarinet, trumpet, trombone, orchestral strings (solo violin, viola, cello, double bass). Finally, a range of solo voices — male, female, soprano, alto, tenor, bass — are essential, ideally with a variety of different musical styles.

Try to make sure these instrumental tracks are reasonably long — between thirty seconds and a minute is ideal — or you'll find yourself continually having to hit the track repeat button on your CD player.

Musical Tracks

The material included in this section really is down to personal choice, and if you tend to work in one particular genre of music then your choice of reference tracks may naturally tend to reflect that. However, it pays to choose a selection of tracks which span as wide a range of musical styles, groups, and instruments as possible, as this may well be more revealing of a system's characteristics.

Whatever the final selection of tracks, it should incorporate material that you know particularly well and won't tire of — and try to avoid anything overly dramatic. For some

bizarre reason most of the commercial test discs include recordings of low flying airplanes, cannons being fired, or people banging frantically on garage doors! Unless you record sound effects for a living, such tracks are utterly pointless and potentially damaging to your speakers, as few of us are in the fortunate position of owning monitors which can accommodate anything like real-world dynamics.

Since most of my own recording work is performed on location and mainly involves orchestral, choral and jazz music, I have chosen to include various examples of what I consider to be amongst the best recordings in these genres. These tracks not only provide a quality standard to which I continually aspire, but also provide a reference with which to compare my own recordings in the same acoustic environment.

My reference tracks include recordings of symphony and chamber orchestras (mostly dating back to the 1960s, oddly enough), various cathedral choirs of different sizes and in different acoustics, some piano and harpsichord pieces, and examples of acoustic

and electric jazz involving groups of widely varying composition, and with recordings from several eras.

There are also a number of more 'popular' tracks including some well known 'hi-fi test tracks' which I have come to trust over the years. These include such classics as Jennifer Warnes' 'Bird On A Wire', Donald Fagen's 'IGY', Rickie Lee Jones' 'Easy Money', Voice Squad's 'A Stor Mo Chroi', and so on. Essentially, these are well-recorded, well-produced tracks in a variety of styles and with various degrees of complexity which help me to assess the resolution of a monitoring system and the way it is interacting with the listening environment.

Final Compilation


Having created or 'borrowed' the necessary test signals, sourced the instrumental tracks and selected a collection of suitable reference music, the final task is simply to sequence the material and burn the reference CD. Since there can be up to 99 tracks on a CD, and a maximum of about 80 minutes of material, it may necessary to choose the reference music tracks carefully or be prepared to do a bit of editing in order to make everything fit.

For the purposes of auditioning equipment there is no need to retain the music tracks in full — most tracks can lose a verse or two without affecting their worth as a reference track, if it means you can incorporate a more diverse range of material on the disc! The only thing to be careful of is not to change the levels of any commercial tracks while compiling and burning the disc, since this may damage the original dither information and result in quantisation distortion.

Although it probably makes sense to keep tracks grouped together in the sections I have outlined above, the order in which you sequence the individual tracks, and the order of the sections themselves, is completely optional. This is not a disc that is going to be played from start to finish under any circumstances so the sequencing is far less critical than it would be if mastering a normal music CD. However, you may want to give some consideration to the order of the musical reference tracks, since you may well find yourself playing these through one after the other when auditioning loudspeakers, for example.

My own test disc starts with the GLITS calibration track, a broad-band pink noise

track and a spoken voice track. Track 4 is the first of the collection of musical reference tracks. The instrumental tracks follow after these, and the more technical test tracks (peak levels, spot tones, pink noise tracks and so on) bring up the rear of the disc. This arrangement allows me to start the disc, quickly check the system for correct channel identification, operating levels and phasing, and then start the auditioning using my reference listening tracks. If I need to get more involved with the technicalities, or if I want to access material to help set up signal processors and the like, it's very easy to dial in the appropriate track number, as necessary.

Finally, reference discs of this kind tend to evolve — I end up creating a new one every couple of years to include some new music tracks which I have found particularly useful, for example. For that reason I permanently store the source audio files and playlist in the workstation computer, ready to be updated at a moment's notice. Also, because the disc is used virtually daily in my particular case, it is prone to damage and so often has to be replaced. It is obviously better to burn a new disc from the original source files than try to copy the disc. 

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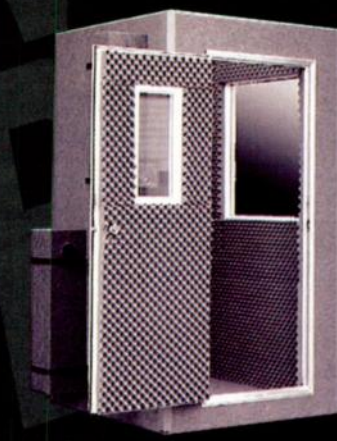
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NI Vokator



Vocoder, Synth & Effects Plug-in For PC & Mac

Paul White

Vokator is Native Instruments' latest sound-mangling tool and can be used as an instrument, as an effects processor and a powerful vocoder — or all of these together, to create monstrously complex new sounds. It is dual-platform, running on Windows 98/Me/2000/XP and Mac OS 9.2/OS X, and can be used either free-standing or as a plug-in. In addition to working as a VST2 plug-in (including under OS X), *Vokator* also supports DXi, RTAS and Audio Units formats. Installation is from CD-ROM, and the serial number from the manual must be entered. Reauthorisation will be necessary if the computer is changed

or if any hardware changes are made to it. Any relatively recent computer can run *Vokator*, but if it's close to the minimum spec, you may be very limited in what else you can run at the same time.

At the heart of *Vokator* is a vocoder based on the filter technology first used in the NI *Spektral Delay* plug-in, and some of *Spektral Delay's* more complex processing tricks are included for good measure. All vocoders require two inputs, one to act as a carrier and the other to act as a modulator, and *Vokator* achieves this via a side-chain facility that can be 'pointed at' any audio track or virtual instrument track. Input A can choose as its source a Live input (an audio track or another virtual instrument) or *Vokator's* own file player, which can be used

Native Instruments' latest plug-in combines up to 1024 bands of vocoding with frequency-domain effects and a neat granular synth.

to play any compatible audio file on your hard drive, including sampled. Input B can select from Live input or *Vokator's* built-in synthesizer, which offers standard and wavetable/granular modes.

Both the A and B inputs pass through identical effects sections, where dynamic processing can be applied along with digital delay and the Spectral Effects pillaged from *Spektral Delay*. The FFT (Fast Fourier Transform) analysis stage necessary for the vocoder comes before the spectral effects as these are applied in the frequency domain. Once duly processed, the two inputs pass into the vocoder, which unlike most vocoders can apply between 128 and 1024 bands of filtering, the drawback being that more bands equates to greater latency and higher processor overhead. Bands may also be grouped together (giving, in effect, between four and 32 bands) to emulate the sound of classic analogue vocoders, where the total number of bands could usually be counted on fingers and toes. As with most vocoders, there's also a voiced/unvoiced detector to deal with non-pitched vocal utterances, such as 'S' and 'T' sounds. In an analogue vocoder, these non-voiced sounds would be emulated using a noise source, and *Vokator* produces an output control signal that is related to the spectral energy of the input signal. A variable threshold sets the voiced/unvoiced detection level, and careful adjustment improves the intelligibility of the vocoder sound. Another analogue vocoder trick replicated here is the ability to offset the centre frequencies of the analysis filters so that activity in one part of the spectrum causes the output to be vocoded at another. This can result in anything from a mild weirdness to an almost totally abstract sound depending on the degree of offset.

The outputs from the vocoder section are available as no vocoding, input A vocoded with B, input B vocoded with A or a mix of B

to A and A to B. The chosen output or mix of outputs can then be processed using compression and EQ before the FFT resynthesis stage, where the audio is turned back into the time-domain stuff that we all know and love. After this comes audio routing and control, where the processed signals are routed to the outputs.

A Window On The World

Because *Vokator* has so many facets, its main window simply provides you with a means to open the other modules for editing plus a choice of input selection and routing options. Settings may be saved as total recall files, synth snapshot files or morph files, where the morphing facility is used to make smooth transitions between up to five stored synthesizer presets. An input manager section allows the A and B inputs to be selected, soloed or muted and there are also general system parameters such as sample rate, spectral filter resolution and tempo (this for tempo-related effects or sequences). *Vokator* includes sample-rate conversion at its inputs and outputs enabling it to work at lower bandwidths for greater efficiency if required; several sample rates from 11 to 48 kHz are supported.

As well as the ability to use either input A or B as the carrier signal and the previously mentioned facility to mix the A to B and B to A modes, these elements may also be panned independently. You can also mix the A and B inputs with no vocoding so that you can use the file player or synth without vocoding. Group mode, described earlier, enables analogue-like vocoder effects to be emulated by arranging the filter bands into a relatively small number of groups and of course there's a sync option for relating internal effects to the tempo of the song playing in the host sequencer. For live use,

Horse Feathers

Vokator's input spectral filtering effects are based on those developed for NI's *Spektral Delay* and have names like *Jello Mold*, *Smear*, *Time-Sponge*, *Lime Twist*, *Horse Tail* and *Phase Blaster* — to name about half of them. These all work by getting the signal into the frequency domain by means of Fast Fourier Transforms, then doing something unforgivable to it before reversing the process to get it back into real-world time-domain audio. Most processes

have between one and three variable parameters and the effects work by either punching holes in the frequency spectrum or by changing the levels/frequencies/time delays of parts of the signals. The audible results vary from subtle comb filtering to something like a distorted and flanged fax machine, and pretty much all of them have a predominantly 'digitally treated' sound to them. On the whole, these are not 'pretty' effects, but they make you sit up and take notice!

there's a special low-latency mode which sacrifices some audio quality for speed.

The Edit button on the main panel allows subsequent windows to be opened for editing, and these are arranged as sections of one large window, so if you open too many at once, the entire window may not fit on the screen without scrolling. Bringing up the Mix window allows the various vocoder outputs to be mixed in any combination, while Out allows a graphical EQ envelope to be applied to the output signal. Here you can see a spectral representation of the output signal with the EQ envelope above it; new breakpoints can be added by holding Ctrl and clicking. Tape shows the file player window if input A is set to Playback, and it's a simple matter to browse your drive and drop a file in for playback, though choosing a file at the wrong sample rate will result in playback at the wrong pitch.

FX buttons for inputs A and B access the effects that can be applied to the two signal paths before the signals are vocoded. The post-vocoding compressor is a straightforward ratio compressor in most ways, but has an additional 'shape' parameter that makes the compressor frequency-dependent so that the high end can be compressed more than the low end, or *vice versa*. There's no gain-reduction meter, so everything has to be set by ear. The input dynamics sections are somewhat different and comprise a gate, which is pretty self-explanatory, plus a More control. More splits the incoming audio into short 'frames' and then normalises the level of each one so that the vocoder has the maximum possible level to work with at all times, which is important if you wish to retain the dynamics of the other input. The input channel delay effects are straightforward mix/delay-time/feedback affairs with tempo sync buttons, the latter allowing the user to choose anything from 1/32nd to quarter-note delay times.

By contrast, the synth (see box on next page) is rather more sophisticated than it looks and can operate in two modes: as a waveform-based synth and as a sample player. A miniature on-screen keyboard may

be called up for testing sounds without the use of a hardware keyboard, and this includes a chord memory function to make up for the lack of polyphonic mice! A separate window accesses LFO and other modulation facilities, and the modulation sources include two 'step sequencers' that work rather like old analogue sequencers and offer from two to 32 steps. The modulation capabilities of this synth are quite extensive, with each source able to control a list of possible destinations.

When the file player input source is selected, sounds can be played directly from a file on the hard drive without it having to be imported into a sequencer track. Start and end loop points may be added for continuous looping and there's the option to start and stop playback using MIDI Note On and Note Off commands, though the pitch of the file being played back is not controlled by MIDI. When controlled by MIDI, the file restarts playback from the same place whenever a MIDI Note On is received.

Using *Vokator*

I did my testing with *Vokator* using *Logic 6* running under OS 9.2 on an 800MHz Mac G4 and had no problems installing or configuring it. *Vokator* was also quite happy using another virtual instrument as one of its input sources, as an alternative to an audio track. It does increase latency when used in high-power mode with lots of frequency bands, but not as alarmingly as I expected it to, and because of the nature of vocoding, it is likely to be used most heavily after recording, at which stage latency isn't a problem providing your host sequencer offers plug-in delay compensation. The vocoder section is capable of extremely good articulation, as you'd expect with so many bands, though there's something charmingly 'right' about the classic vocoder sound that you get when you switch the filters into groups. A number of presets are thoughtfully provided, so new users don't have to learn everything in depth all at once.

Traditional vocoder effects are pretty standard stuff these days, but you can still

SOUND ON SOUND

Native Instruments *Vokator*
£200

pros

- Huge creative potential beyond simple vocoding.
- Includes sophisticated processing taken from NI's *Spektral Delay*.

cons

- The sheer number of processing options might be intimidating for inexperienced users.

summary

Vokator is a great creative tool for anyone who likes their sounds to be a bit out of the ordinary. It performs all the classic vocoder effects effortlessly, but really comes into its own when its sound shaping and synthesis potential is explored to full.

NATIVE INSTRUMENTS VOKATOR

► use them to get new and interesting sounds by using them on other sound sources than the human voice, especially when you have this many filter bands to play with. The integral file player is a novel idea as it allows you to use any sound source as one of the inputs and retrigger it from the start whenever you press a key. The synth section is also more powerful than it looks and the waveform generators in particular have a tough, assertive quality that can be brought out even more by the application of ring modulation and FM. I like the way you can watch the wave shape change as you make adjustments and the same is true of the filter and level envelope settings.

Using the synth in sample-player mode is also interesting. It isn't a fully fledged sampler as you can only load in one sample, but the way the speed control lets you scan through the sample slowly in either direction to create granular synthesis effects is both clever and very intuitive. Again, the dynamics and graphical EQ effects are fairly straightforward, and the ability to continually normalise incoming audio levels to keep the vocoder running at maximum signal level is definitely a good feature. The chorus and delays are intuitive enough, though the spectral effects are anything but familiar. You really have to play with these to get a feel for what they can do, so existing owners of NI's *Spektral Delay* are at an advantage here. It is possible to create subtle effects using these frequency-domain treatments, but at more extreme settings the sound is changed to such an extent that it can become unrecognisable. Furthermore, when you throw in the spectral effects, the granular synthesis (and the synth preset morphing) and the vocoder, it's very easy to end up with a sound akin to a heavily flanged fax machine being thinly sliced by an angle grinder, so the secret to creating usable sounds is not to use everything at once!

I felt that for most part, the user interface was pretty good and largely intuitive, but the routing and mixing page could have been improved. In fact I'd have liked a master page that looked something like the block diagram in the manual where you could click on sections to bring up the relevant editor pages, and where the mixer section was set out like a conventional mixer with full level control over all the

Test Spec

- NI *Vokator* v1.0.
- Apple 800MHz G4 Mac running Mac OS 9.2.
- Tested with *Emagic Logic* v6.0.

The *Vokator* Synth

Vokator's synth section can be used in oscillator mode or can create granular synthesis effects using an audio sample as its source. It's also possible to morph between presets, though these must all be of the same type — oscillator or sample. A morph comprises five complete synth presets, and morph files may be saved separately. The morph fader may then be used to move smoothly from one preset to the next, or alternatively, MIDI Controller 1 may be used to control the morph rate externally.

When the oscillator synth mode is being used, there's an arpeggiator function with a choice of note lengths and styles, all rates being related to the host sequencer tempo. Different velocities may be drawn in for each arpeggiator step.

The synth oscillators are presented as square panels with an oscilloscope waveform display in the centre. Four sliders on the edges of the first square allow the user to continually adjust the waveform shape through sine, triangle, square or noise, to adjust the harmonic content of the

oscillator, the waveform symmetry and the amount of detuning. The second oscillator is similar except that the Detune slider is replaced by an FM slider allowing oscillator 2 to be frequency modulated by oscillator 1. The synth's mixer section also allows the two oscillators to be ring modulated, after which comes an LFO section that can be used to modulate not only pitch but also harmonic content, FM depth and wave shape.

In sample play mode, a sample is loaded into RAM and used instead of the synth's usual oscillators: AIFF, WAV and SDII formats are supported. A sample start time may be defined for MIDI triggering and the sample may also be looped. Playback speed controls the granularity of the sample playback and it can be adjusted between forwards or backwards at normal speed to freezing a single grain. More conventional filters and envelopes follow the oscillator or sample sections and there's also a chorus effect section with feedback for creating flange-like effects.



possible sound sources. Nevertheless, you soon get used to the adopted system.

More Than A Vocoder

Vokator isn't particularly difficult to use, especially when you examine the sections individually, but it is still very much a heavyweight sound design tool and you need to play with it for a while before you can get a handle on what it can do. The factory presets are a big help here as they allow you to apply ready-made treatments to your own audio sources, and of course you can achieve a lot by loading a preset and then making changes to it.

As a vocoder, *Vokator* can produce spectacular results, but to call it just a vocoder would be to miss much of its potential — it's also a synth and an effects unit, where the available effects cover both the very familiar and the seriously weird. I get the impression that it's one of those software projects that has been added to during development simply because it was possible, but once a section is bypassed, its controls can be hidden from view so you're not forced to use everything.

Viewed as a synthesizer, *Vokator* combines simplicity of use with hugely flexible modulation capabilities, those very visual oscillators and an easy way to dabble with granular synthesis and patch morphing,

so even without the vocoder there's a lot of fun to be had in this section. It also works as a demonic signal processor, though be warned that the results may not be suitable for those of a nervous disposition.

Ultimately, *Vokator* has a definite character to it and it would probably be overkill to buy it for vocoding alone, so what you really need to ask yourself is where the synth section and the rather radical effects fit into your sound-design plans. Creating metallic, overtly digital or sinister sounds is something *Vokator* does well and it has lots of tools for creating evolving textures. The more adventurous dance and techno composers should find lots of applications for it, as might those writing music for film or TV, but if you're the type who likes to sit down at the end of the day with a mug of Horlicks, a digestive biscuit and a sampled piano, it may not be quite your thing! **ES**

information

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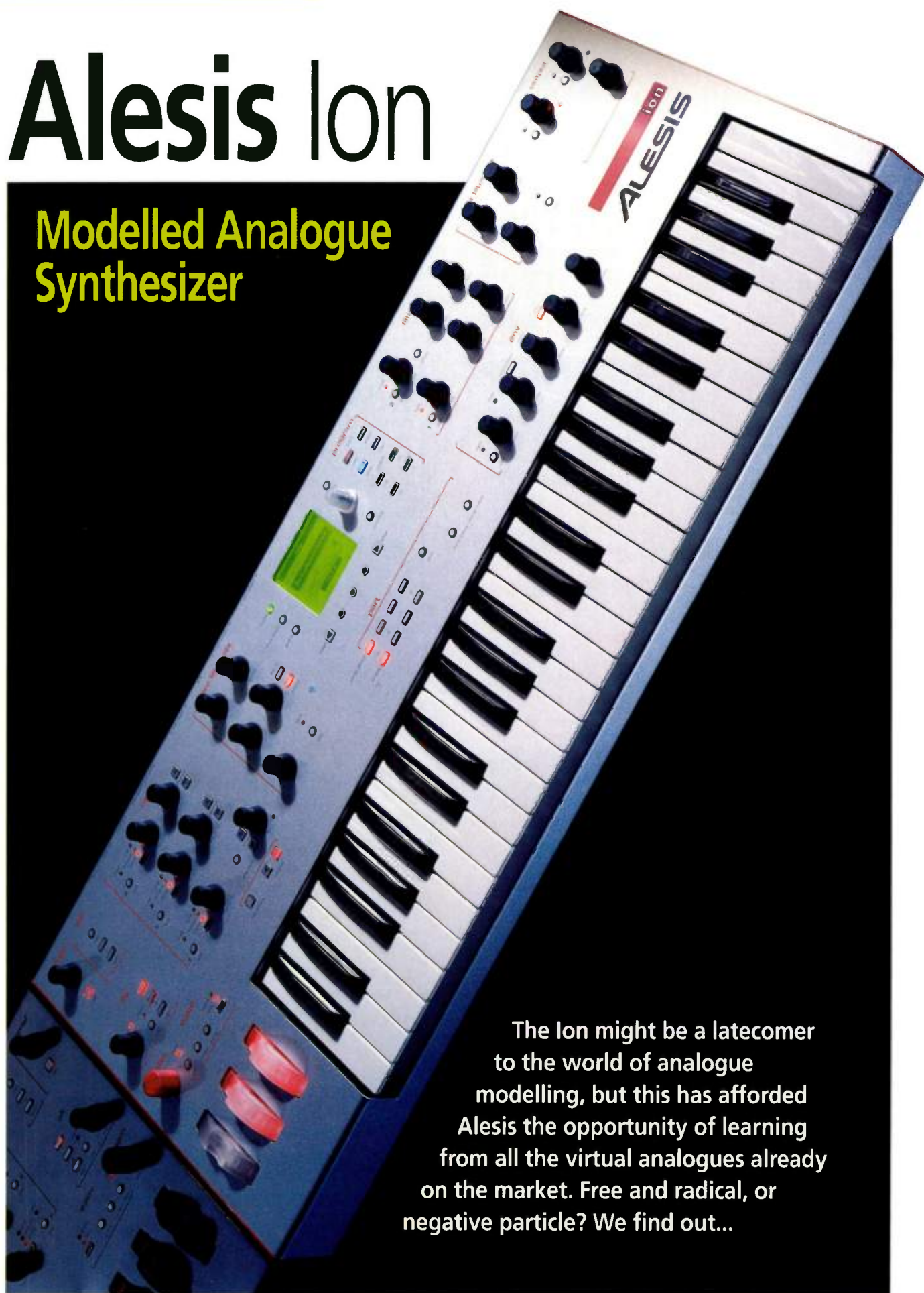
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Alesis Ion

Modelled Analogue Synthesizer



The Ion might be a latecomer to the world of analogue modelling, but this has afforded Alesis the opportunity of learning from all the virtual analogues already on the market. Free and radical, or negative particle? We find out...

Photo: Mark Perry

It was something of a surprise when Alesis announced the 'analogue' successor to their flagship polysynth, Andromeda. It was not to be, as many hoped, a cheaper spin-off of the same technology, but a DSP modelling synth instead.

The Andromeda was a daring experiment: a modern analogue keyboard-based megasynth, seemingly designed by committee and with a plethora of features to befuddle us elderly gentlemen raised on Jupiters and Prophets. On my first encounter with it, I remember gazing helplessly over its complex facade and wondering where to start. In contrast, the Ion's spacious panel is much less intimidating and, although it hasn't a true analogue bone in its body, any major compromise in sound is hard to spot except, inevitably, in the minds of those for whom analogue will always be best.

Flat Ion

The Ion looks striking; perhaps suggesting a certain Waldorfian character with its red and silver colour scheme and chunky 360-degree, high-resolution pots. There are 30 of these dark, rubbery, grabbable beasties, the only significant drawback being the single set of envelope controls shared by filter, pitch/mod and amplifier. The knobs feel great, but the buttons — 70 of them — are (very) small and feel rather cheap.

The front-panel legending is rather small for my eyesight, and this is worse in low lighting conditions. This point aside, however, the Ion looks great in a dimly lit environment with its many useful indicator LEDs. Some of the LEDs are built into buttons and can change in intensity according to underlying parameter values. Thus, transposing the oscillators from zero by up to three octaves generates a progressively brighter red from the Up switch indicator. And while we're discussing impressive visuals, the three performance wheels are also backlit, and may be configured to grow brighter as you move them. Because this looks lovely, it is the default action — but you can have them constantly backlit if you prefer it.

The 160x160 LCD is fine but, because the synth is perfectly flat with no raised control panel, I found myself stooping far over the keyboard in order to see it properly. Nevertheless, page and 'soft' keys guide you through the various menus and the use of graphics is very informative throughout, especially when displaying envelope curves and waveforms. There are

Test Spec

• Ion OS version reviewed: v1.0.

many parameters for which there are no dedicated controls, so strategically placed Edit buttons (backlit in green) access additional options. Data entry is performed via a combination of 'soft' buttons and a notched clear plastic pot. This data-entry knob doesn't always perform intuitively, requiring clockwise turning to increase values, step on through patches, and so on, but *anti-clockwise* turning within some menus (to progress through the mod matrix slots, for example).

Overall, I found the panel design a bit of a mixed bag. I liked the large knobs and found the space between them to be generous, but the layout seemed a little eccentric. For example, oscillators, mixers and filters are numbered not from the top of the panel but from the bottom, although the two LFO buttons are placed in the conventional order. Then there's the positioning of the envelope mode selector buttons behind the knobs, meaning you must reach your fingers over them to select which of three envelopes are active.

Whenever you touch a knob, the screen displays the relevant menu, as if you had pressed an Edit button. As this behaviour is not something you'd always want, it can be turned off globally — but then you lose the handy display of values for cutoff,

resonance and so on, until you specifically enter an Edit menu. I think a better solution would be for the various menus to time out automatically and return to the Home screen after a few seconds (you can do this at any time by pressing the Home button — located, inconveniently, close to the top of the panel).

Turning to the keyboard for a moment, it is an insubstantial four-octave affair with velocity and release-velocity action — but sadly no aftertouch. You can assign Mod Wheel 2 to transmit aftertouch as a limited compromise.

The synth's rear features stereo audio outputs, two additional outputs, control and sustain pedal inputs, the ubiquitous MIDI trio and also stereo audio inputs. All audio ins and outs are 24-bit balanced, and power is courtesy of a standard IEC 'kettle' connector.

Ion Drive

Alesis have given the Ion considerable DSP muscle courtesy of a combination of processors. The main CPU is a 32-bit Motorola Coldfire and nine further DSP chips of Alesis' own design (one for each voice plus one for the effects) work together to form a sound engine running at 500MIPS (Million Instructions Per Second). So how does this translate to real-world features? Well, the Ion boasts just eight notes of polyphony and four-part multitimbrality, so you probably won't be creating monster layered patches or writing full songs on it — not without overdubs, anyway. Alesis have concentrated on sound quality first and foremost — and if that means a synthesizer with only eight voices, so be it.

First impressions are important, and, compared to other virtual analogues in its class, the Ion's raw sound might not immediately grab you. It's curious that Alesis — of all companies — chose to bestow such a limited effects processor upon their new synth. There's no reverb and the delay is hardly worth speaking of (don't worry though, I will). Indeed, it was only when I got the Ion into my studio and began in-depth analysis of its sound alongside an array of real analogues that I started to get impressed. And, after a few days, I was *very* impressed.

Oscillators

The Ion has three oscillators per voice, each with continuously variable waveshapes. Select a square waveform and the waveshapes available range from a narrow pulse to a full, hollow square wave. The sawtooth varies from positive saw, through triangle, to negative saw, and the sine wave changes to a 'deformed sine' that adds

SOUND ON SOUND

Alesis Ion £679

pros

- The sound — this is simply the best virtual analogue recreation yet.
- So much flexibility — in the envelopes, signal routing, and modulation options.
- So many filters, so little time.
- The wheels light up (hey, these are *my* pros, OK?).

cons

- Eight-note polyphony doesn't compare well to its rivals.
- Keyboard is very light and lacks aftertouch.
- Position and angle of display could be better.
- Effects section lacklustre.

summary

A synthesizer that can sound like a living, breathing chunk of electronics. In a side-by-side comparison with its close rivals, the reduced polyphony and limited effects implementation might mean it sounds less impressive initially. However, look beyond those things and you discover the delights of an idiosyncratic but full-sounding, flexible synth with an impressive palette.

ALESIS ION

MIDI Transmission

All the front-panel knobs transmit data so that it can be recorded by a sequencer; specifically, it is MIDI NRPNs (Non-Registered Parameter Numbers) that are sent. Whilst more editable than a stream of system-exclusive data, this does create its own problems for those of us who like to play around with sequencers — or simply edit controllers by redrawing a few curves in *Cubase*.

An example will best illustrate why I find NRPNs frustrating. First, turn the Ion's 'Cutoff1' knob and record its output. You will see that, as you turn the knob, four MIDI controllers are generated. These correspond to the parameter identifier in LSB and MSB format (ie. Least Significant Byte, CC98; Most Significant Byte, CC99) plus the actual data. Again, this is in LSB

and MSB format — data entry being a combination of controller numbers 38 and 6. When your tweaking involves the turning of a single knob, you can easily find the data-entry curves in your sequencer and make edits — but how about if you turn several? All those nested data-entry controllers become a total mess in such a situation — but on the plus side, they *do* allow a greater resolution than standard MIDI controllers with their range of values from 0-127 only.

One way to make your tweaks more editable is to use the modulation matrix to 'remap' specific MIDI controllers to those functions you wish to control remotely — but it's a bit of a drag if you like to do this sort of thing a lot.

algorithms available that modulate the oscillators in various configurations. There's 3>2>1 (where Oscillator 3 modulates Oscillator 2, which in turn modulates Oscillator 1), 3>1<2 (Oscillator 3 and 2 modulate Oscillator 1) or 2>1 (where Oscillator 3 plays no part in FM). FM may be either linear or exponential, and it has a dedicated level control for instant gratification.

The oscillators pass through a pre-filter mixer stage along with noise (selectable from white or pink), ring modulation (using Oscillators 1 and 2) and the external audio input. As with almost everything on the Ion, this mixer isn't as simple as it might appear. The synth has two filters per voice, so the mixer menu is the place to decide how much of each audio source to route to each filter — with the default setting being to send equal amounts to both. Since the external audio signal is a stereo source, the routing is a balance. In its 'middle' setting, the left channel goes entirely to Filter 1 and the right channel to Filter 2. Altering the balance allows the signals to be sent to either of the two filters in the amount you desire. A further choice in the mixer menu routes the output of Filter 1 into Filter 2, so you can cascade them in series. There are

- ▶ higher harmonics. All the waveforms are shown graphically on the display. Each oscillator's pitch may be transposed in octaves (within a range of ±3), semitones (±7), or may be fine-tuned in half-cent intervals (a cent is one percent of a semitone). The oscillators sound great, especially when subtly detuned against each other, and they offer several noteworthy features to cause envy amongst rivals. Firstly, oscillator sync is available in hard or soft modes. Hard sync is the one we're all

familiar with, where the sync'd oscillator resets its waveforms in line with the master. With the Ion's soft-sync implementation, the slaved waveform reverses direction whenever the master waveform begins its cycle, resulting in a wave with no sharp edges and a different mixture of harmonics. Oscillator 1 is always the master and either Oscillator 2 or both Oscillators 2 and 3 may be sync slaves. The second spicy feature is an impressive FM implementation with three



The Ion's control panel is laid out from left to right to reflect its signal path, with the controls for its three oscillators on the left, followed by a pre-filter mixer. Performance controls, such as the three lit wheels and the buttons governing portamento and the arpeggiator, are situated at the edge of the control panel and fall easily under your left hand.

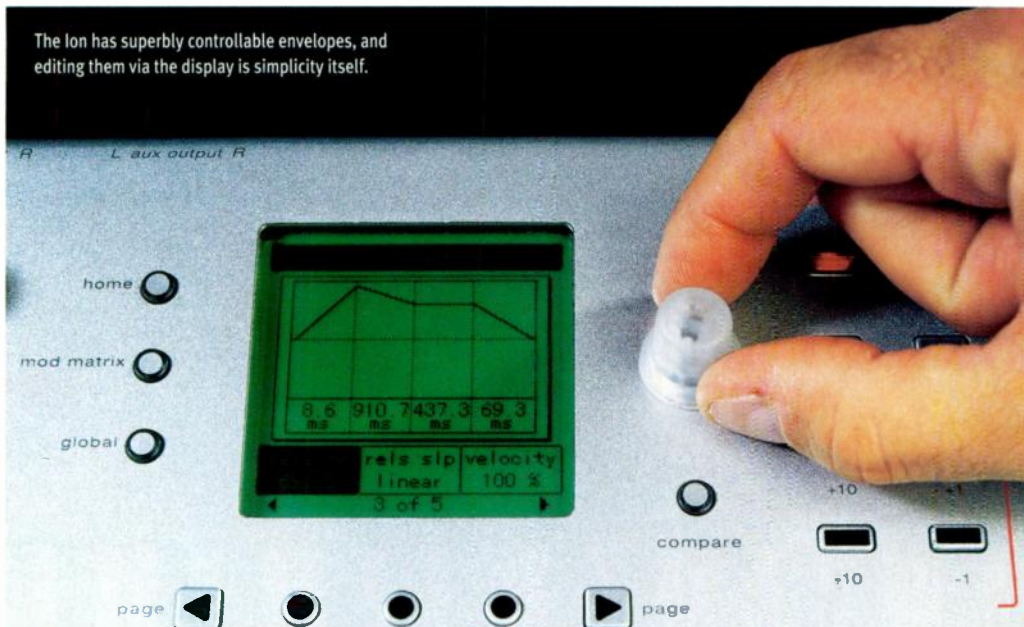
yet more signal routing options to discuss, but as they happen after the filter section, we'll head straight into that first.

Filters

Alesis have really gone to town on the Ion's twin filters, with no less than 17 different types available to each, plus a bypass option. If I list them all, you must promise not to drool on your magazine (or keyboard, if you're reading this on the SOS web site). The full list can be found in the box below.

Each filter has a dedicated bi-polar envelope amount knob and the Edit menu provides a graphical representation of all settings via on-screen sliders (with filter frequency displayed in Hz), plus a further option — key-tracking. Finally, Filter 2 has an offset function. When enabled via its button, this ties the frequency of Filter 2 to a fixed offset from that of Filter 1. In this case, adjusting Filter 1's cutoff sweeps both of them.

If the wonders of the Ion's filters seem complete, there is still the not-insignificant matter of the Post-Filter Mixer to examine. This useful little extra determines the amount of each filter that will be sent to the output stage and the panning of each of them in the stereo field. And there's more, because at this stage, you can introduce a 'Pre-Filter' signal back into the mix. The source is selectable from any of the oscillators, the ring modulator, noise



The Ion has superbly controllable envelopes, and editing them via the display is simplicity itself.

source, or even the whole 'pre-filter' input mix. With dedicated knobs for each mix signal, too, this is pant-wetingly good fun (forgive me; I don't get out much).

Modulation

Three envelopes, two LFOs and separate Sample and Hold serve as familiar modulation sources, but there are even more available within the modulation matrix. Accessed via a dedicated button to the left of the display, 12 totally free modulation connections may be made for each program. You can use them to dynamically control waveform pitch and shape (for all waves, not just the square wave), filter routing, panning, frequency, mixer settings, effects and more.

Modulation parameters include: source

(36 choices plus MIDI controller numbers 1 to 119), level, and destination (78 of them!) plus an additional modifier — offset. With this, you can add a fixed offset — positive or negative — to the destination value. In a nutshell, the Mod Matrix is a cracker and covers virtually everything you could expect to see. It's so comprehensive it can hold its head high next to classic synths such as the Oberheim Xpander — especially given the inclusion of exotica such as a 'tracking generator'. The purpose of this is to remap a modulation source (for example the mod wheel, a note value, or velocity) to produce a warped, decidedly non-linear output. In practical terms, you might use it to create unusual pitch variations over certain areas of the keyboard or to rescale a MIDI controller so that it only starts to act after

Filter Types

The Ion's manual is careful not to name the specific synths on which its various filters are modelled, but if I borrow some of its language, and you look closely at the two-letter names for the various types, you should find it pretty easy to guess.

- 'mg': a four-pole low-pass modelled on that of the most famous monophonic analogue synth ever made.
- 'ob': a two-pole low-pass closely resembling the one in a classic synth xpander... whoops, I mean expander module.
- 'ob': a two-pole band-pass.
- 'ob': a two-pole high-pass.
- 'rp': a four-pole low-pass modelled on the one in a popular semi-modular synth.
- 'tb': a three-pole low-pass (think 'little silver bass synth').
- 'jp': a four-pole low-pass (from an eight-voice

synth noted for its coloured buttons amongst other things);

- 'Eight-pole low-pass': all the filters from here on were created for the Ion; this one gives a very steep cutoff.
- '8ve dual band-pass': two two-pole band-pass filters spaced one octave apart.
- 'six-pole band-pass': like an exaggerated version of the 'ob' band-pass.
- 'phase warp': an analogue phaser effect based on eight all-pass filters in series.
- 'comb filter 1': multiple resonant peaks and notches which are not harmonically related.
- 'comb filter 2': as above, but the signal is additionally filtered to warm up the sound.
- 'vocal formant 1': three band-pass filters emulating 'ah' and 'oo' vowel sounds.
- 'vocal formant 2': as above, but 'oh' and 'ee' vowel sounds.
- 'vocal formant 3': a five-band formant filter.

- 'band limit': a two-pole high-pass filter and a two-pole low-pass filter in series, limiting the signal to everything between them; resonance adjusts bandwidth.

That's quite an impressive collection — imagine the hardware required to build a polyphonic analogue synth containing that lot! There are some beautiful filters here, ranging from the (A)RP low-pass that clips when it gets a loud input level, to the delightful phasing filter and the expressive vocal filters. They all respond smoothly, with only the maximum resonance settings (in some cases) proving a little harsh and digital-sounding. And with two such flexible filters to play with, you are not reduced to merely emulating such classics as Moogs, Oberheims, Jupiters and so on, but can go where no-one has gone before. Perhaps this truly is the first of the next generation of Virtual Analogues?

ALESIS ION



On the right, the top panel continues to reflect the signal path through the Ion. After the twin filters, the signal passes through another mixer to the output. The single set of envelope controls (one of the Ion's less welcome aspects) are underneath, and the buttons relating to patch and part programming and selection are sensibly grouped in the middle with the display.

▶ exceeding a specific value. Such concepts are far easier to grasp after a little hands-on time, but for the experimentally inclined, they're a godsend.

All the waveforms of both LFOs are simultaneously available in the modulation matrix. These waves include the expected sine, triangle, sawtooth and square along with phase-shifted versions of each. Additionally, totally random modulation sources are on hand as well as sample and hold. Most S&H implementations on modern instruments sample a noise waveform to produce a random output, but the Ion's S&H adopts a more versatile approach. It can sample sources such as note velocity, LFO waveforms, MIDI controller numbers, envelopes and the tracking generator output, again reminding us of the Oberheim Xpander. There's a smoothing parameter, and the S&H-rate, reset-on-note, and sync-to-MIDI-Clock parameters are comprehensively programmable, as with the LFOs.

If the S&H and the LFOs have a fine spec, then the envelopes are damn near perfect. Indeed, the Ion has my favourite envelope

implementation ever, of any synth I've had in my studio. There's only one fly in the ointment; there's just a single set of hardware controls for all three envelopes.

This aside, why are the envelopes so good? Well, for a start, you've got control

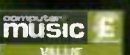
“Alesis have raised the bar in terms of what we should expect to hear from future modelled analogue instruments.”

over the slope of the attack, decay and release components of the envelope independently — with a choice of linear or exponential curves (positive or negative). The envelope times range from a snappy 0.5ms to a languid 30 seconds for attack, decay or release time. Better still (and reminiscent of the Chroma Polaris) if you set the release to maximum, it enters Hold mode, sustaining indefinitely. All envelopes

should do this! You'll note that the envelopes have five knobs rather than the traditional four. The extra stage is a sustain time — so you can have the sustain level gradually die away to nothing if you like — or set it to maximum for behaviour like a standard ADSR. And we're not finished yet! Envelopes may be programmed to 'free-run', which means they pass through an entire attack-and-release phase, regardless of how long you hold a key. This is ideal for triggering spot effects, especially when you want to create a long, evolving sound without tying up your hands to do it. The envelopes can reset at zero whenever a key is played or work in legato mode, where they carry on from their previous level on hitting a new note. This latter is great for monosynth emulations. Finally, envelopes may be set to loop, and there are various modes available. One of these involves looping the attack and decay portion for as long as you hold down a note — or forever if the envelope happens to be set to 'free-run!' The manual advises you not to do this accidentally for the amplifier envelope; ▶

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ALESIS ION



The Ion's rear panel sports two stereo outputs, a headphone jack, a stereo input, and sustain and expression pedal connections. There are also the usual MIDI In, Out, and Thru sockets.

► if you do, you can then only kill the note by playing enough non-looping notes to steal the voice. As I didn't read the manual right away [*you shock me, Paul — Ed*], I found this behaviour rather disconcerting, stumbling across a scenario where an envelope continued to loop even when looping was deactivated.

To briefly summarise: the envelopes are awesome! Having one of them freely assignable (the 'pitch/mod' envelope) in combination with the Modulation Matrix allows for completely different envelope shapes for each filter. Or you can perform such cool tricks as fading a signal between the filters using the mod envelope whilst doing traditional filter sweeps with the filter envelope. This is not a synth you're going to explore fully in a few days — or even a few months!

Sounds

With four colour-coded banks of sounds — 512 patches in total — the Ion has plenty to audition. The banks are titled Red, Green, Blue and Yellow, and the last of these is supposedly the user bank, but this is slightly misleading, as *all* the banks may in fact be overwritten with user patches. Patch locations follow roughly the same order in each bank, starting with synth bass and leads and ending with sound effects and percussion.

For multitimbral play, there are 64 Setup locations that refer to (up to) four patches, each with their own MIDI channel, output routing and panning, high and low key ranges, effects level, transpose settings and response to the mod wheels. Each of the four parts in an Ion Setup (labelled A-D) may

be enabled or disabled via dedicated front-panel buttons located below the display; a second row of buttons denotes which part is currently active for editing (only one at once). With careful use of panning, each part can be routed to its own output if necessary.

I was struck by how fat and 'American' the Ion sounds when compared to other modelled analogues I own. And its bass can be as warm or as cutting as the best of my analogue monosynths too — always a good test. It may be modelled analogue, but carefully audition a few of its patches and then tell me whether you care! Alesis have clearly put a lot of effort into minimising digital artifacts and the result is one of the most organic-sounding DSP-based instruments yet. For some of my favourites, see the box below.

One slight gripe — whilst playing some

of these patches, I really missed having an aftertouch-enabled keyboard and, despite being no Keith Emerson, I started to find the Ion's a little light. Also, its flat, squarish shape leaves the keyboard indented slightly and my sloppy fingers often hit the panel as I hurtled in typical careless fashion towards the highest note.

Effects

In contrast to the generous options in its synthesis engine, the Ion's effects offer slim pickings. This was a surprise — and a disappointment given Alesis' undoubted history in this field. Each of the four parts has its own modelled Drive effect selectable from six types: 'Compressor', 'RMS Limiter', 'Tube Overdrive', 'Distortion', 'Tube Amp' and 'Fuzz Pedal'. These do an adequate job of boosting and dirtying things up, but I probably wouldn't have pined had they

Factory Favourites

Here are just a few of the Ion's factory sounds I particularly liked — many of them from bank Green, as it happens.

- Red, 041: 'Clusters' — a resonant, string-like pad making good use of the Phase Warp filter.
- Green, 003: 'J00p1t3r' — very analogue and Jupiter-like, and lovely at the bass end.
- Green, 010: 'Mini Classic' — a lovely solo patch for those 'where's my cape?' moments.
- Green, 018: 'Porta Lead' — another marvellous, warm lead.
- Green, 027: 'Massive Pad' — mod wheel 2 brings in noise under this, well, massive pad...
- Green, 030: 'Aeon Choir' — this uses the two-pole high-pass and warp filters to produce a lush vocal texture.

- Green, 051: 'Profit Strings' — my Prophet 5 never sounded quite this good.
- Green, 052: 'Violacoder' — a stunning vocalised solo string that makes great use of the 40-band vocoder.
- Green, 081: 'E.P.?0.K.!' — this virtual analogue synth can also do electric pianos, organs, clavs and so on. This was my favourite of the pianos.
- Blue, 021: 'Phase Pad' — OK, I'm a sucker for these warm pads.
- Blue, 058: 'AbitOffTheTop' — a zappy, brassy, Xpander-like patch.
- User, 058: 'Kugel Flugel' — a simple brassy sawtooth, but very usable.

Add a splash of external reverb or delay to this lot, and you're ready to gig.

been omitted entirely.

The Master effects are slightly more interesting, consisting of the following types: 'Super Phaser', 'String Phaser', 'Theta Flanger', 'Thru Zero Flanger', 'Chorus', and 'Slap Back'. Some of them sound particularly analogue and convincing — especially the flangers — but there are no reverbs, and the only pure delay effect ('Slap Back') — has a maximum time of just 80ms, rendering it useless for echo duties. Quite why Alesis couldn't have added one of their cheap multi-effects chips at the end of the signal chain, I don't know, but at least the effects parameters, such as they are, are present in the Modulation Matrix.

Also included in this section is a 40-band vocoder. So many synths include these today that it's easy to overlook them, but Alesis have provided a generous selection of tweakable parameters and routing, enabling you to process the synth's own signals or use the stereo audio input to provide both the source and carrier signals to drive it. Some example patches in the (Yellow) User bank were perfect starting points and, overall, the vocoder does a splendid job.

Don't expect Novation-style effects per multitimbral part, as Alesis have spent their DSP currency elsewhere. Thus, all Master effects settings refer to part A of a multitimbral setup only; parts B-D have merely a send amount.

Performance Tools

It's great to see dedicated buttons included for Unison mode and mono/polyphonic operation, and the portamento settings in the Voice Edit menu are comprehensive, as I came to expect from the Ion. You can choose from portamento or glissando with either a fixed or scaled rate — in other words, you can choose whether the time to glide between notes is the same regardless of their distance apart or whether it should vary according to the interval. Portamento can be set to work on all notes, or just on those played in legato fashion.

Also in this menu is a pitch-wheel option by means of which the wheel may be set to operate on all notes or just held notes — a handy performance feature. Then there's 'analogue drift'; a means to make your perfectly-tuned digital synth behave like a temperamental box of old-fashioned circuits. Setting this to extremes, I was able



to recreate an almost exact replica of my Jupiter 6 before I've had a chance to hit its Tune button.

At the top left-hand corner of the panel (not traditionally the location for such a performance tool) is the arpeggiator. Its interface consists of a tempo knob and a tap-tempo button that also serves as visual tempo indicator, courtesy of its integral LED. Buttons to enable and latch the arpeggiator are provided too, and the associated LCD-based Edit menu offers access to 32 preset patterns complete with settings such as arpeggio length, range, span (in other words, whether arpeggios go above, below or above and below the base notes) and note order.

Final Thoughts

Alesis have raised the bar in terms of what we should expect to hear from future modelled analogue instruments. The Ion's rich, warm tones, its many varied filters and versatile signal routing, the powerful modulation matrix and marvellous envelopes all add up to a synthesizer that even the most nerdy analogue anorak cannot simply dismiss as cold and digital.

Sometimes the user interface delights, at other times it frustrates. I loved the knobs, disliked the buttons, loved the wheels but wasn't keen on the feel of the keyboard and the angle of the display. In the end, though, whether or not I like an instrument always boils down to the sound. When this is right, I find you can forgive practically everything, and, despite its surprisingly limited effects implementation, the Ion delivers beautifully in the sonic department.

How it will sell in music stores, perhaps standing next to polished, more polyphonic competitors such as Novation's KS series, I can't predict. But it deserves to do well, especially with those of us who really enjoy getting in deep and exploring.

Problems were remarkably few given the early version of the operating software (v1.0). I noticed the occasional 'crack' when playing some patches — this is possibly caused by the free-running nature of the oscillators (apparently, a future OS upgrade should add an option to reset the oscillators' phase when a note is played). I also managed to crash the Ion by

recording too many knob twiddles into *Cubase* and playing them back again. I sent Alesis a MIDI file of my wild excesses, whereupon they quickly spotted the bug at fault. The plan is that an upgrade to fix this particular problem should be available by the time you read this, but if your music is of the controller-heavy type, try before you buy. Aside from these niggles, and my initial confusion with envelope looping, the Ion performed well.

The factory sounds are, on the whole, good, but it's when you start programming your own material that the instrument makes you grin and mutter 'aha' a lot. In fact, if I didn't already own a stack of DSP synths, the Ion would probably be part of my collection by now, and if Alesis release a rack version, I doubt I'll be able to resist. After all, none of my ageing analogues are getting any younger, and the Ion's range of Moog, Oberheim, Roland and ARP sounds is very convincing. What's more, the Ion's exotic vocal textures and comb and phasing filters offer the potential for much more tonal tinkering than any of its immediate rivals. If you are looking for a modelled analogue synthesizer and put sound and flexibility above polyphony and effects, you owe it to yourself to spend time with the Ion. **SOS**

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Synth Secrets

The Monty Python team once famously claimed that being able to play the flute was a simple matter of 'blowing *here*, and moving your hands up and down *here*'. But there's a lot more to it than that...



is pushed upward, and we soon reach the situation shown in Figure 2. Now, the net atmospheric pressure is downward, and we quickly move back to the situation shown in the first diagram.

If the edge is connected to a pipe of some sort, it doesn't take much of a leap to realise that, at some frequency, the up/down vibration of the airflow will match the pipe's resonant frequency, and a standing wave will result, generating a sustained note. It turns out that the speed of up/down oscillation is roughly proportional to the speed of the air stream (ie. how hard you blow), which explains why, when you blow harder into an instrument of the flute family, the note jumps from the fundamental to the second harmonic, and then the third, and the fourth... and so on, as the increasingly rapid up/down motion excites higher modes of oscillation in the pipe.

The second difference between the pan flute and the Shakuhachi is that the latter is open at the bottom. Therefore, as explained in part 24 of this series (see *SOS* April 2001, or surf to: www.soundonsound.com/sos/apr01/articles/synthsecrets.asp), the standing wave within it contains both odd and even harmonics. Indeed, all the instruments of the flute family are 'open' if they have holes, so the pan flute proves to be an oddity... it's the only flute that generates no even harmonics (this is not strictly true, although it is true for orchestral flutes. There is a class of organ pipes called stopped flutes that are closed at the top using wooden plugs. These generate the odd-harmonic series discussed last month, and offer a significant advantage to the organ builder; for any given pitch, they need only be half the length of their open brethren. Given that the longest open pipes are typically 32' long, this means that an organ with stopped 16' pipes can produce the same, deep pitches as larger instruments).

Thirdly, the Shakuhachi has holes. All the pipes we have considered before — whether open at one end or both, whether cylindrical or conical, and whether made from wood or brass — have boasted continuous bores. Even the valves on instruments such as the

Synthesizing Simple Flutes

Gordon Reid

Last month I discussed the sound of the pan flute, leaving you with a diagram that showed how you could use a large modular synth to create a remarkably accurate simulation of the instrument. Successful though it was, the patch was a monster, and not one you could create on any basic (read... easily affordable) synth. This month, we'll look at another of the flute family, and see whether we can synthesize it using something rather simpler.

But first, I want to take a look at the Japanese Shakuhachi. Made from a single piece of bamboo, this is another instrument that requires you to blow over an aperture, but it differs from its more primitive cousin

in three ways.

Firstly, you excite the air by blowing over a sharp edge at the mouth of the pipe. If you consider Figure 1 (below) you can see an instance when a jet of air blown against such an edge is deflected downward. At that moment, the part of the stream shown in orange is moving minutely faster than that shown in red, so the air pressure on the flow tends to press it upward. This is the principle that keeps aeroplanes in the sky: air moving faster over the top surface of the wing generates less pressure than that moving more slowly along the shorter underside. The net effect is therefore an upward pressure that lifts the machine off the ground.

If the upward pressure in Figure 1 is sustained for a fraction of a second, the jet

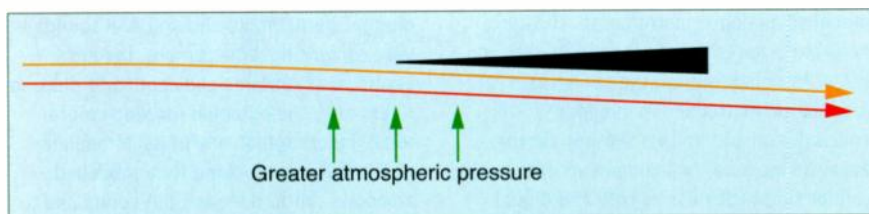


Figure 1: The pressure exerted when air passes under a sharp edge placed in the stream.

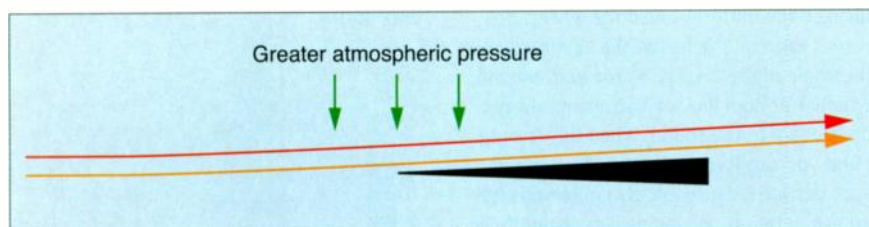


Figure 2: The pressure exerted when air passes over a sharp edge placed in the stream.

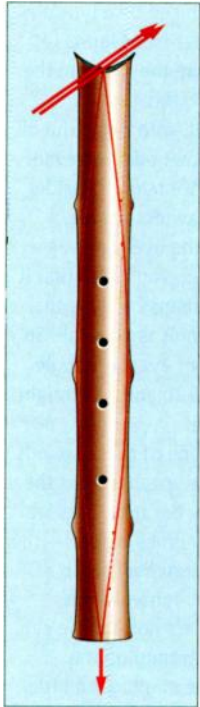


Figure 3: Blowing a note on the Shaku-hachi with all holes closed.

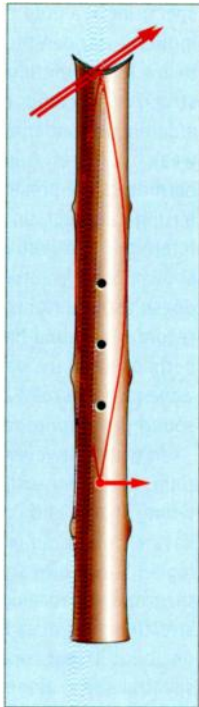


Figure 4: Blowing a note on the Shaku-hachi with all but the lowest hole closed.

trumpet do not change this: they alter the length of the pipe, but they don't allow air to escape before the end is reached. Sure, there have been all sorts of complications such as end effects and harmonic stretching, but when it comes down to it, open pipes of a given length have always had a fundamental frequency of a certain pitch, (or an octave lower if you consider their closed brethren).

The holes complicate matters considerably, but for now we'll consider them simply to be ways of shortening or extending the effective length of the pipe. If you look at Figure 3 (above), you can see that, with all holes closed, the Shaku-hachi produces the pitch associated with its entire length. But when you open the bottom hole (as shown in Figure 4), the effective length becomes shorter, a standing wave of shorter wavelength is generated, and a higher pitched note is produced. Figure 5 (right) then shows what happens when you open the next hole... and so on. Given that the Shaku-hachi has five holes — the four that you can see in these diagrams, plus a thumbhole that you cannot — it's not surprising that the instrument is ideal for playing the pentatonic scale that

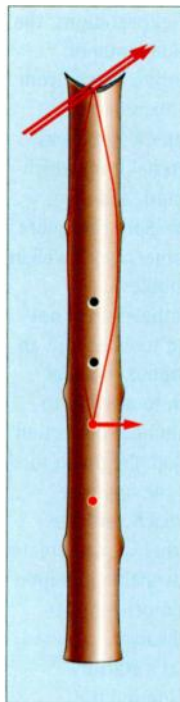
Figure 5: Blowing a note on the Shaku-hachi with all but the lowest two holes closed.

characterises traditional Japanese music.

The Recorder

In the western world, the most common flute with holes is probably the recorder (see Figure 6, right). There are many members of this branch of the family, some with cylindrical bores and some with a combination of cylindrical and truncated conical bores, but all excite the air by passing it over a sharp edge, as shown in Figures 1 and 2.

The shape of the recorders' bore is no accident. A few pages of physics (which, thankfully, we will not reproduce here) show that, if you want to play chromatic music over more than one octave using pipes with holes in the side, only cylinders and conical sections will work correctly. But if the recorder shares with most brass instruments its truncated conical bore and full harmonic series, why doesn't it sound like a trumpet? Clearly, the different excitation methods — lip valve versus edge — must have an effect, and it's no surprise that the recorder lacks the 'purr' of the brass instruments. But perhaps more significant is the fact that the air inside the recorder is excited at its widest point, and the bore then tapers towards the end, whereas you excite a brass



instrument at its narrowest point, and the air column then flares towards the end. What's more, brass instruments have a horn that stretches the frequencies of the harmonic series considerably, and recorders do not.

All recorders share the same fingering system: six primary holes, a thumbhole underneath the pipe, and an additional 'little finger' hole at the far end. You might think that this would restrict the number of pitches available, but it turns out that every semitone is available,

Figure 6: The recorder.



although the tuning is stretched by more than a semitone from the lowest note to the highest. Fortunately, it is possible for the player to correct this (or at least reduce its effect) by blowing low notes more strongly than high ones.

If you have played a recorder (and who, in an English primary school, ever escaped?) you will know that there can be numerous ways to finger a given note. But if this is true, the holes are not the simple features that we just discussed. Consider Figures 7 to 9 (below), which, for convenience, ignore the conical section within the instrument. These show three notes as played on the common descant recorder. The first diagram shows the instrument with all holes closed, playing the lowest pitch that it can produce. In this case, it's a low 'C'.

The next diagram (Figure 8) shows the same recorder with the lowest hole (ie. the one furthest from the mouthpiece) open. Like the Shaku-hachi, this has the effect of shortening the pipe, resulting in the instrument playing a pitch somewhat higher than that in Figure 7. In fact, the note is a 'D'.

But what's happened to 'C#'? Clearly, you cannot play all 12 semitones on an instrument with just eight holes simply by lifting your fingers progressively toward the

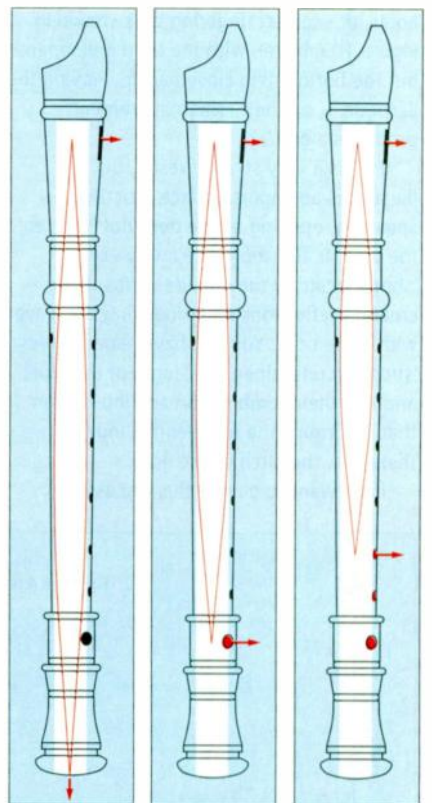
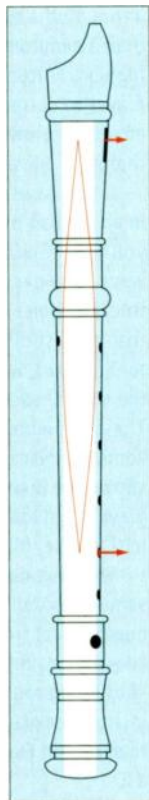


Figure 7: Playing a low 'C' on the recorder.

Figure 8: Playing a low 'D'.

Figure 9: A German recorder's fingering for a low 'F'.

Figure 10: The Baroque recorder's fingering for a low 'F'.



▶ mouthpiece. Nonetheless, the recorder is capable of reproducing the complete scale. The reasons for this lie in some more physics that we'll skip, but which shows that it is not just the position of the holes that change the effective length of pipe; it's also the size of the holes and the amount by which each is covered. The hidden 'C#' is therefore revealed if you 'half-hole' the lowest hole.

Next, we come to Figure 9, which shows the instrument with three holes open. You might expect this to produce an 'F', which it does, if you are playing the 'German' recorder shown in Figure 6. If your instrument is based on the different, so-called Baroque style of recorder, with a different arrangement of large and small holes, the correct fingering is as shown in Figure 10 (above), with the third hole open, but the bottom two closed again. Playing the Baroque 'F' on the German instrument produces a dull 'E'.

This is a very strange result, but it illustrates an important fact: strictly speaking, opening a hole does not 'shorten' the pipe. It acts more like a valve or 'short-circuit' to the outside atmosphere, creating reflections and modifying the wave within the bore. You can have many of these 'short-circuits' along the length of the pipe, and it is their combination and interaction that determine the wavelength and, therefore, the pitch of the note.

If we want to pursue this discussion

further, it becomes a bit intense, but the outcome is that there are many ways to combine blowing pressure, aperture size, and closed/open holes to obtain similar pitches on a recorder. Some of these pitches will lie almost exactly on a desired note, while some will be a little sharp, and others will be a little flat. Furthermore, the tonality will differ from one fingering to another, so a skilled player will pick the right fingering according to the demands of the music. This multiplicity of *almost* identical notes leads to a significant problem for the synthesizer programmer; a simple VCO/VCF/VCA patch will never capture the nuances of the instrument. Indeed, this problem is not limited just to the recorder. Many basic wind instruments such as penny whistles, crumhorns, kortholts, rauschpfeifen and cornemuses require alternative fingerings if they are to play a wide range of music. What do you mean, you've no intention of synthesizing crumhorns, kortholts, rauschpfeifen and cornemuses? Oh well...

A Recorder Patch (Take I)

If you trawl through the patchbooks of history, you'll find that almost no synths offer a 'factory' recorder patch. I checked the books supplied with the ARP Odyssey, ARP Axse, Roland SH101, Korg 700, 700S, 800DV and MS20, and found... nothing. There may be a simple reason for this — that few programmers in the 1970s found the instrument to be very interesting — but I suspect that the true reason is more basic: that it's very difficult to program a convincing recorder patch. Indeed, it's even more difficult than it was to recreate the sound of the pan flute last month. Contrary to most peoples' expectations, the recorder can produce a huge range of timbres, ranging from warm to harsh, from gentle to glassy to brash. Many factors affect this, including the precise size and shape of the bore, the material from which the instrument is constructed, and the quality of the various parts. Some are more suited to solo use, while others work well in ensembles.

Nonetheless, I'm not going to wheel out an enormous modular synth to attempt to obtain near-perfection. Instead, I'm going to take the opposite approach, and see whether we can create a reasonable imitation on a much simpler synthesizer.

Let's start by considering the

spectrum of a note produced by a typical, modern, wooden recorder (see Figure 11, below left). Omitting from the diagram the strong noise component, this has a dominant fundamental, with a handful of weak overtones. Given that odd and even harmonics are present, we might consider basing our patch on a sawtooth wave, filtering it to attenuate the overtones as shown. But if you try this, you'll find that it doesn't sound right, perhaps because the recorder's second harmonic is so weak. So perhaps a square wave or even a triangle wave (see Figures 12a, 12b and 12c) might sound more appropriate.

In truth, however, none of these sounds right, partly because the spectrum has the wrong shape, and partly because — as we have encountered many times before — the higher harmonics are 'stretched' sharp of their mathematical ideal. Ignoring this stretching (because there's nothing we can do about it) and concentrating on the spectral shape alone, we might get a little

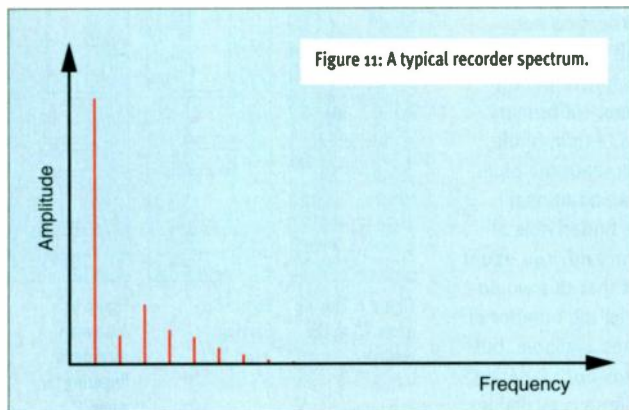
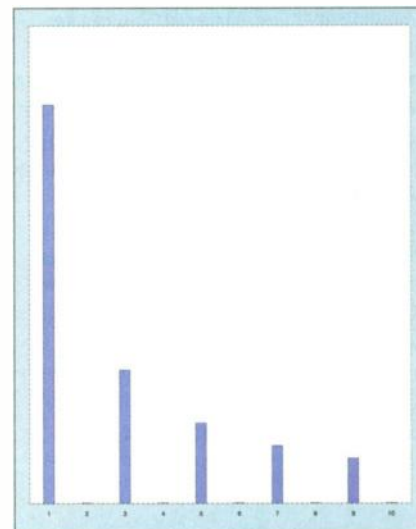
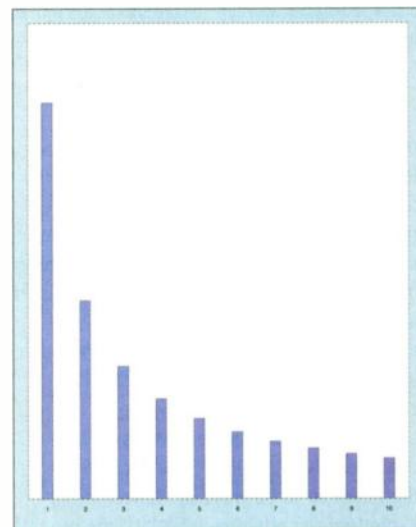


Figure 11: A typical recorder spectrum.



Figures 12 (a) and (b): sawtooth (top) and square wave spectra.



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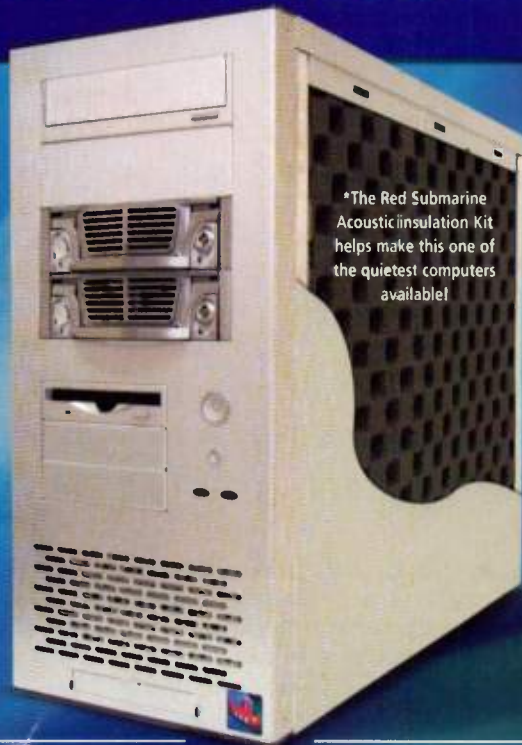
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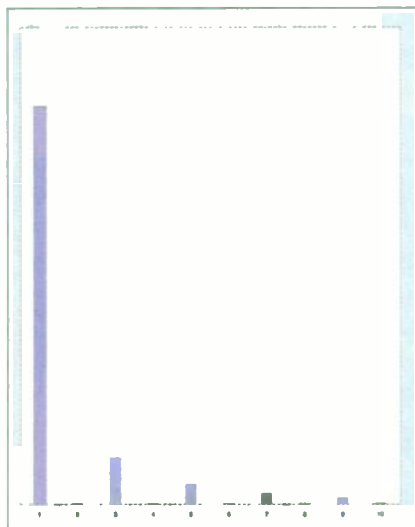


Figure 12 (c): triangle wave spectrum.

► closer by summing two oscillators tuned an octave apart. Unfortunately, analogue synths are not stable enough for this to work, and no matter how carefully you adjust the pitches, you'll obtain an inappropriate chorusing of the sound. Digital, additive synthesis would perform better, but that is outside the scope of this month's article. So where do we go from here?

The only analogue synth that I could find which offers a 'factory' recorder patch is the Minimoog, whose programmer, Tom Rhea, based his sound on the oscillator section that I've reproduced as Figure 13 (below). As

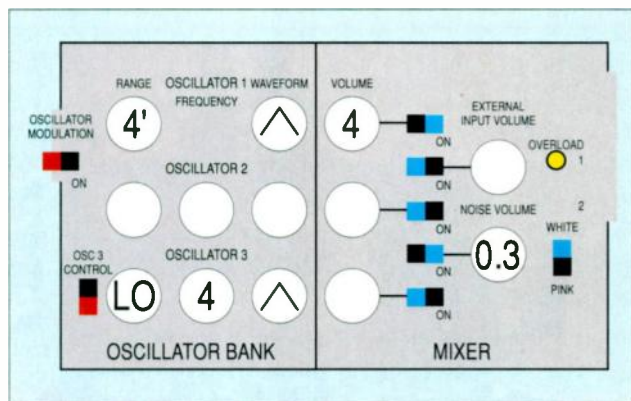


Figure 13: The recorder patch: Minimoog VCOs.

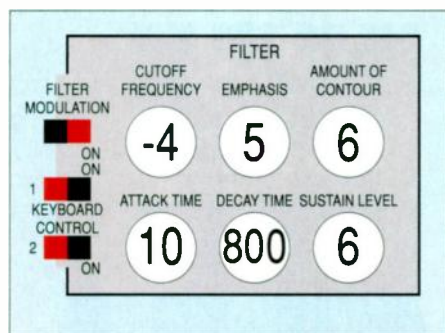


Figure 14: The recorder patch: Minimoog VCF.

you can see, Rhea decided that a low-amplitude triangle waveform gave him the closest approximation to the sound he wanted, with just a smidgen of white noise added in the Mixer.

The output from the Mixer passes next to the filter, as shown in Figure 14 (below).

Note how this is closed until affected by the rapid Attack of the Contour, and that there is a fair amount of Emphasis applied. The uppermost of the three switches is on, so this is where Oscillator 3's output is directed, producing brightness modulation rather than vibrato (if you programme VCO pitch modulation in a recorder patch, it sounds wrong).

Figure 15 (above) shows the amplitude (VCA) contour. The Attack time is rather slower than that of the filter contour, meaning that the brightness of the sound peaks more quickly than the loudness. This relationship is an interesting one, so I have shown it in exaggerated form in Figure 16 (right). This demonstrates that the sound is brightest while it is still getting louder and that, by the time that it reaches maximum loudness, the brightness is already diminished. This lets a small burst of higher-frequency noise through at the start of the note, and goes some way to imitating the sound of blowing the instrument.

If we put all this together, adding the modulation controllers and output section, we obtain the patch shown in Figure 17 (on next page). It will never fool

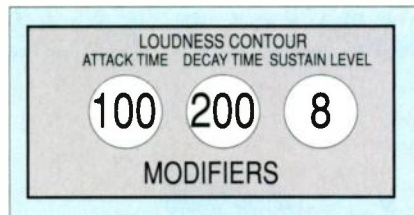


Figure 15: The recorder patch: Minimoog VCA.

you into thinking that you are playing (or listening to) a real recorder, but with sympathetic performance and careful use of pitch-bend to imitate any changes in blowing pressure, it is somewhat 'recorderly'. You can even tune oscillator 1 down to 4' or 8' to imitate alto, tenor and bass recorders, but you must be careful not to play over too wide a range; like the recorder itself, the patch works over two octaves or so, from middle 'C' upwards.

A Recorder Patch (Take II)

For reasons we need not discuss here, I am submitting this article from a hotel room in Tokyo. Given that my studio is somewhat in excess of 6,000 miles to the west of me,

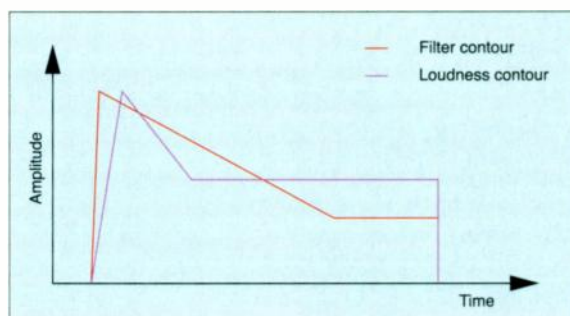


Figure 16: How the contours interact.

I thought that it would be interesting to finish by experimenting with one of the software synths loaded on my G4 Titanium PowerBook to see whether I could get closer to an authentic recorder sound. So I took a trip to Akihabara, bought a Yamaha descant recorder for just 1600 yen (about £8), and used it as the basis for the patch that follows.

Using Gmedia's *Oddity* software (as reviewed in last month's *SOS* — see www.soundonsound.com/sos/aug03/articles/gmediaoddity.htm) that I reviewed last month, I started with an oscillator setting that is not available on the Minimoog, selecting the pulse/square option of VCO2 and setting the pulse width to somewhere in the region of 40 percent. If you followed my explanation of pulse waves and sinc functions a few months ago (see *SOS* March 2003, or link to www.soundonsound.com/sos/mar03/articles/synthsecrets47.asp, you'll recognise that this has a strong fundamental, a weak second harmonic, and a slightly suppressed third harmonic, as required by Figure 11. It retains much of the 'woodiness' of the square wave, but with a bit more 'edge' and, to my ears, is a much better basis for the patch. I set this an octave above middle 'C', made sure that there was no pitch- or pulse-width modulation, and combined the single oscillator with a small amount of



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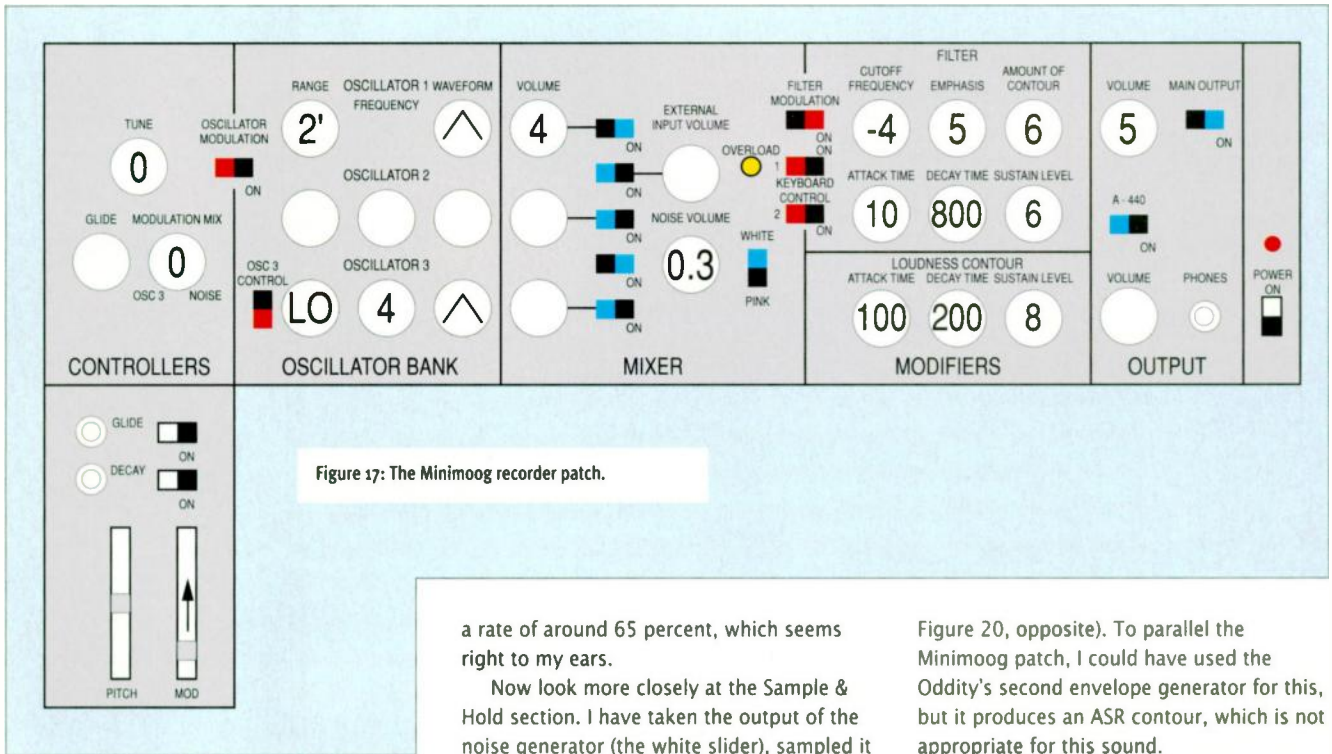


Figure 17: The Minimooq recorder patch.

► white noise (see Figure 18, below).

Next, I set the low-pass filter so that, as on the Minimooq, it opened according to the contour determined by the ADSR envelope. I found that, with the release set carefully, I could create a pleasant wooden 'thunk' at the end of the note. I also added a little resonance to add a touch of edginess to the sound (see Figure 19, opposite). Note that the filter tracks the keyboard; in this case at

a rate of around 65 percent, which seems right to my ears.

Now look more closely at the Sample & Hold section. I have taken the output of the noise generator (the white slider), sampled it at the LFO rate, and then slewed the result to create a smoothly varying random waveform. I used a tiny amount of this (the yellow slider in the filter section, set to five percent or less) to modulate the VCF. This recreates the small inconsistencies in blowing pressure produced by all but the most experienced recorder players.

Finally, I routed the ADSR to the VCA, setting the initial gain to zero so that no sound leaks through between notes (see

Figure 20, opposite). To parallel the Minimooq patch, I could have used the Oddy's second envelope generator for this, but it produces an ASR contour, which is not appropriate for this sound.

The complete patch, shown in Figure 21 (opposite), combines a better approximation to the true waveform of the recorder, an imitation of the instabilities of the instrument, and — in my opinion — somewhat more realistic filtering than we achieved on the Minimooq. But it will never sound convincing, because the recorder has a rather edgy, unstable quality, particularly evident in the flutter that occurs if you blow at a pressure that excites the jet at



Figure 18: The Oddy recorder: oscillators.

Figure 19: The Oddity recorder: filters.

a frequency somewhere between two of the pipe's modes. The resulting instability, and the jump between modes that occurs if you increase or decrease the pressure just slightly, is the preserve of some very complex patching, or of physical modelling synths such as the Yamaha VL1 or Korg Z1. Furthermore, the recorder produces the tuned noise we discussed at length last month. Clearly, a large, modular synth is going to approach the ideal much more closely than either the Minimoog or the Odyssey.

Furthermore, this Oddity patch lacks the expression obtained by human recorder players who use techniques such as tonguing, gentle attacks, and legato to add interest to their performances. Nevertheless, it has a certain quality that is reminiscent of the original instrument and, with careful playing, it is useable. You can also modify it to coax a range of related sounds from the Oddity, including the aforementioned penny whistles and so on. Sure, it's a delicate timbre that will never grace your dance grooves, but that's not the point. You can learn quite a lot about the strengths and weaknesses of analogue synthesis by trying — and failing — to recreate the sound of the humble descant recorder. [SOS](#)

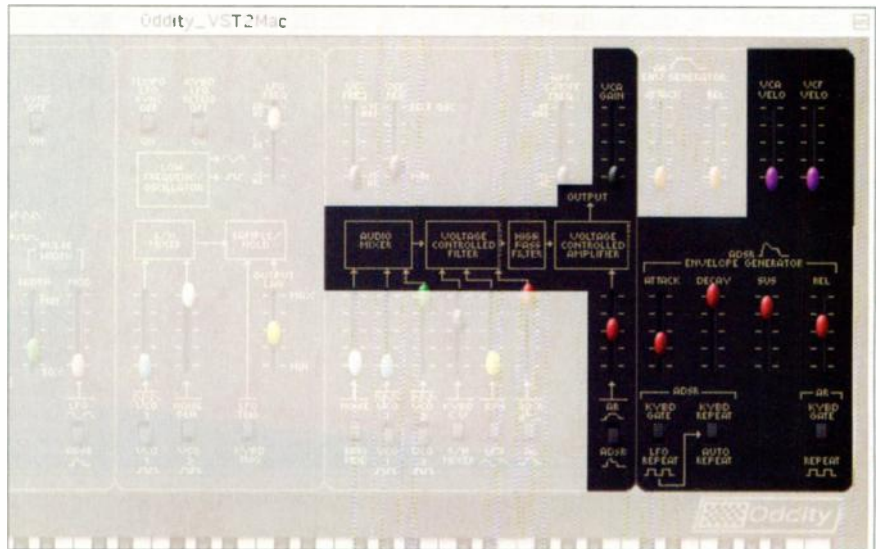
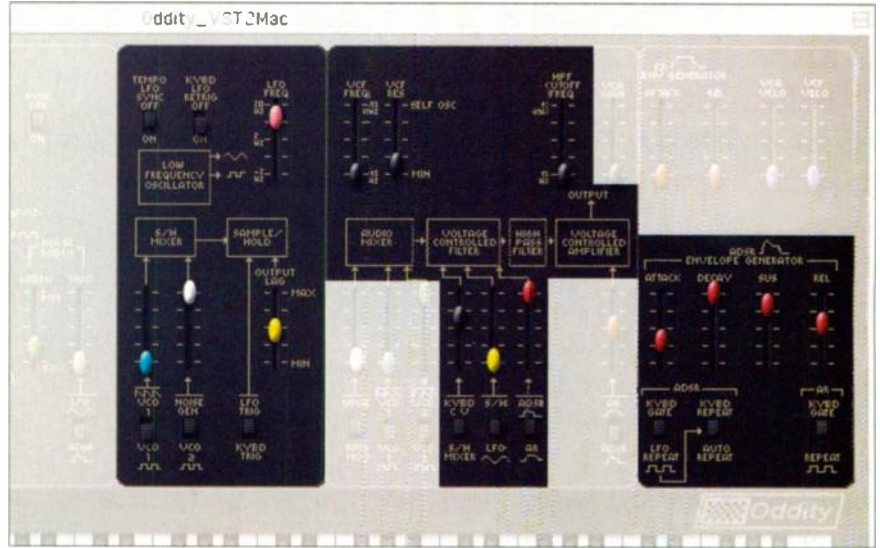


Figure 20: The Oddity recorder: amplifier.



Figure 21: The Oddity recorder: complete.

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The Pro SM6Ps see a big name in hi-fi moving into the home studio market. So should we choose to accept these Missions? This review will self-destruct in five seconds...

Paul White

The name of Mission has been well known in British hi-fi circles for around 25 years, but the Pro SM6P is their first foray into studio monitoring. As with other Mission designs, the speakers are built 'upside down' with their tweeter at the bottom, but the Mission badge can be rotated if you prefer to stand the speakers the conventional way up, or even use them on their sides. This degree of configurability is useful as the tweeters should be arranged to be close to head height, or at least directed towards the listener's head, while at the same time kept as far as possible from reflective surfaces, such as mixing consoles and computer desks. Side mounting should be last resort with any monitor, however, as it significantly narrows the 'sweet spot'.

Design & Build

Based on a fairly conventional ported two-way topography, the Pro SM6Ps are passive and

Mission Pro SM6P

have their ports on the rear panel below the chunky, gold-plated binding terminals. MDF is used for the cabinet construction; the front baffle is an immense 38mm thick and the front corners are generously radiused to minimise diffraction effects. Each speaker weighs 8.1kg and the drivers are mounted symmetrically so that both speakers in a pair are identical. The slightly ostentatious trim around the bass/mid driver gives the speakers a rather hi-fi look, but a smart one! Both drivers are magnetically shielded to allow operation close to old-fashioned CRT computer monitors. The 150mm bass driver is driven by a 32mm voice coil and based around a dual-layer cone material known as Paramid, in effect a sandwich of paper pulp and Aramid fibres giving a structure that is

hard on the outside and soft on the inside, the idea being to combine stiffness with a good level of self-damping.

The tweeter is a soft-dome device 26mm in diameter and capable of working up to 30kHz. It's driven via a passive second-order crossover built from audiophile-grade capacitors and coils. The cabinets are finished in a scratch-resistant black coating and internally damped using Mission's own fibrous damping material, Acufill. A flared outlet profile has been given to the bass port to minimise turbulence noise and the whole system has been engineered to give smooth dispersion characteristics across the frequency range.

What all this adds up to is a compact speaker system that can operate from 58Hz to



SOUND ON SOUND

Mission Pro SM6Ps £349

pros

- Well balanced, non-fatiguing sound.
- Cosmetically attractive.

cons

- Slight loss of definition at higher volume levels.
- Mounting tweeter side down may be inappropriate close to mixing consoles due to reflection angles.

summary

The Mission Pro SM6Ps offer comfortable and tonally neutral monitoring with a useful degree of bass extension in a compact, visually attractive package.

28kHz with a nominally flat response. Its sensitivity is a reasonable 88dB SPL for 2.83 Volts at 1 metre, the maximum SPL is 108dBA peak and the peak power handling is 140 Watts peak or 70 Watts IEC. In practice, this means that using an amplifier rated between 100 and 150 Watts at modest levels should ensure clipping never takes place, and many home studios could get away with half this power. There are louder monitor speakers, but these will provide plenty of level for sensible nearfield listening.

Performance

After wheeling out the usual array of test CDs, I connected the Pro SM6Ps to an amplifier rated at 150 Watts per channel and also set up my AVI Bigga-Tron speakers for comparison. Sand-filled metal stands were used for the test. The Bigga-Trons are around twice the cost of the SM6Ps, but as they behave very well in most respects, they make a useful yardstick for passive speakers of this size.

My first impression was of smoothness when compared with some of the more aggressive monitors I've reviewed over the past few months — these are monitors you could work with for long periods without getting fatigued. At moderate listening levels, this smoothness is combined with clarity and a surprising degree of bass extension — kick drums are interpreted with real weight but without that 'one note' character you hear from over-tuned cabinets. Overall, the tonal balance feels right, though the sound becomes a little less well focused at higher SPLs, and in comparison with my AVIs, the impression of being able to hear 'into' the music isn't so strong — the AVIs definitely have the edge on definition. However, the Missions do compare very well with other passive monitors in their price class, and providing they are mounted on solid stands to keep the bass end tight, they are capable of excellent results. My own view is that they are best suited to the smaller studio where nearfield monitors would normally be used but where a 'grown up' degree of bass extension is preferred.

Conclusions

As we emphasise on so many occasions, loudspeaker design always has to be a compromise, price being one of the more obvious variables. In the Pro SM6Ps, Mission have managed to build an attractively priced passive monitor using decent components and voiced to be as neutral and honest as possible. The compromise is that the sonic integrity suffers a little at high SPLs, but at typical nearfield monitoring levels, there should be no problem. The bass is smooth and even, though perhaps not quite as well defined as you might expect with a more expensive monitor, while the use of a high-quality, soft-domed tweeter means that you get plenty of high-end extension without the speakers sounding brash.

When it comes down to the wire, what really matters is that mixes balanced to sound good on your monitors should also sound right played on other systems, and from my experience with the Pro SM6Ps so far, they should measure up pretty well

in this respect. Some users may also be appreciative of the fact that the Pro SM6Ps look more like hi-fi speakers than studio monitors, especially where the same speakers have to be used for mixing and domestic listening. 


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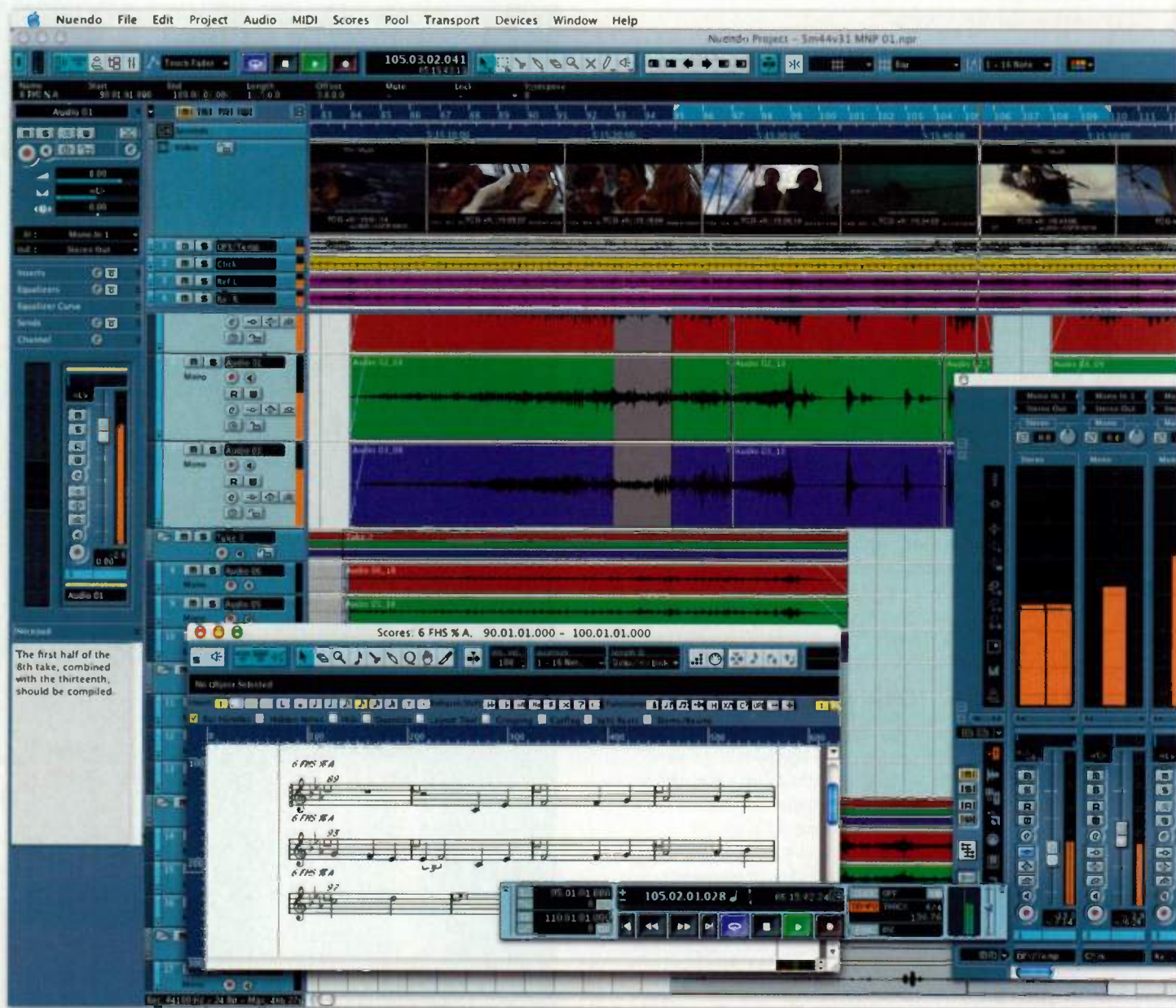
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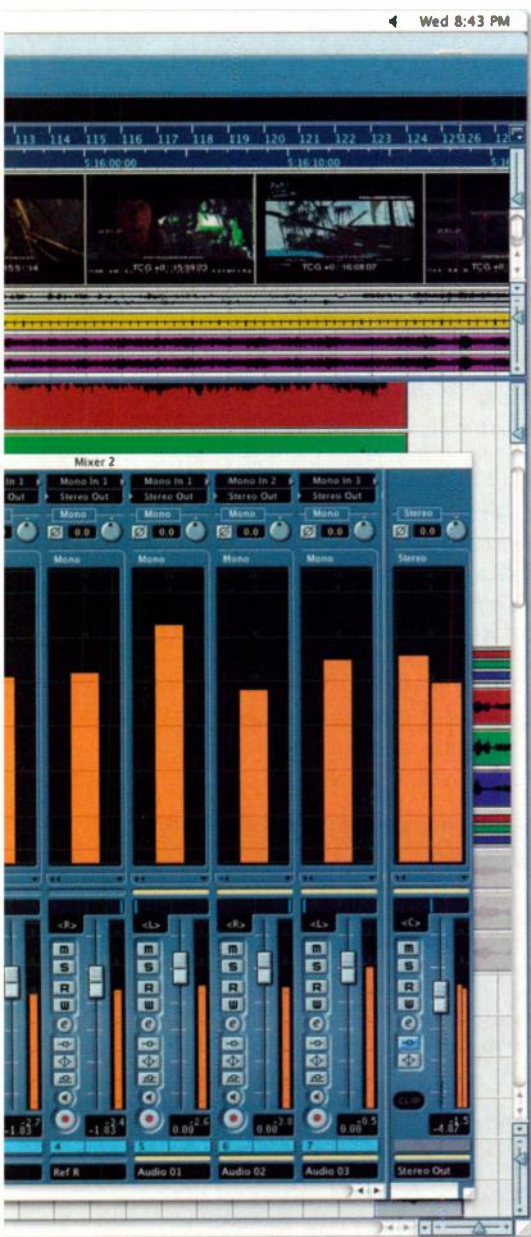


Since its first release three years ago, *Nuendo* has raised a great deal of interest among those who need a professional audio production tool, and with *Nuendo 2*, Steinberg have developed one of most ambitious native-based audio systems yet seen. But in an industry dominated by Digidesign, will it be enough to lure potential users away from their Pro Tools rigs?

Mark Wherry

In recent times, Steinberg have had a habit of releasing highly anticipated applications on what now seems like an annual basis. Only a year after *Cubase SX* was released for Windows, followed by a Mac OS X version some months later, the company have released the second major version of *Nuendo* for both Windows XP and Mac OS X platforms simultaneously. This achievement, coupled with the fact both versions ship in the same box, is worthy of praise by itself, in an era where software companies

Digital Audio Workstation



Nuendo in all its glory. The Track Split feature on the Project window has been engaged to keep the Video and the dialogue, click and reference Audio Tracks held at the top, enabling you to use the lower half as your main working window.

are increasingly aligning themselves with a single platform — predictions among users that Mac support would be dropped after Pinnacle's buyout of Steinberg last year have proved to be unfounded, and while Digidesign also offer a Windows version of *Pro Tools*, it isn't supplied in the same box

as the Mac version.

Nuendo 1.0 was released for Windows in the Spring of 2000 after four years of research and development, during which time it evolved from an application originally announced for Silicon Graphics workstations to one intended for the Windows NT platform. From the start, *Nuendo* was conceived as a native application that would require no additional DSP processing power, where the audio engine could record and play back at any sampling rate and resolution and utilise any installed physical inputs and outputs. The advantage to this approach, which has been diluted in recent years as third-party DSP cards have increased in popularity, is scalability: you can run *Nuendo* on any system, be it a laptop or a desktop, workstation or server, and open any Project without needing to worry about installing extra hardware.

While *Nuendo* was originally released as a Windows-only product, the application itself is based on a portable framework, with Steinberg even announcing a BeOS version at one stage, and a Mac OS 9 version finally became available when *Nuendo* 1.5 was released in 2001. This version added many new features including VST Instrument support, 9-pin sync and printable track sheets, and Steinberg would later add 192kHz support, VST System Link, and AES 31 file import and export abilities in version 1.6. Although a beta version of *Nuendo* 1.x for OS X was announced at the 2002 Frankfurt Musikmesse and publicly discussed on many occasions, a release version never materialised. Instead, Steinberg focused all their resources on the Windows XP- and OS X-only *Nuendo* 2, following in the footsteps of *Cubase SX*.

I've had the pleasure playing around with the beta versions of *Nuendo* since March, getting to know the application as it took the final steps towards release. But during the time I was writing this review, I was lucky enough to get the chance to really put *Nuendo* 2 through its paces on OS X, recording cello and woodwind overdubs at Media Ventures for the soundtrack to the movie *Pirates Of The Caribbean*. This was probably the first time *Nuendo* 2 had been used for such a project, and it highlighted many interesting areas of the application, both good and bad; so many of the comments in this review are based on that particular three-week experience.

Déjà-Cubase

Perhaps the most significant set of new features in *Nuendo* 2 are those inherited from *Cubase SX*: to put it bluntly, *Nuendo* now contains every single feature that can

be found in *Cubase SX*. Although this move has caused mixed feelings amongst *Cubase* users (see the *Nuendo Vs Cubase* box for more information), I think this is actually a brilliant development, because it finally means there's a serious audio workstation that doesn't contain a lacklustre, half-hearted MIDI implementation. *Nuendo* users can enjoy MIDI plug-ins, the Drum Editor, the Logical Editor and processing functions, the MIDI Device Manager, and so on. However, rather than discussing these features in great depth here, it's probably worth taking a look at our original *Cubase SX* review for more information about these features — see the Further Reading box for details.

While it's great that *Nuendo* has inherited all the functionality of *Cubase SX*, there are admittedly some areas in the current version of *Cubase SX* that could be improved. So it's gratifying to see that rather than implement all of *Cubase's* features in their current *SX* 1.x state, Steinberg have fine-tuned certain aspects for *Nuendo* 2, most notably in the Project window, based, to a degree, on user

SOUND ON SOUND

Steinberg *Nuendo* 2 £1000

pros

- An integrated production environment with the best MIDI implementation of any audio workstation.
- The new mixer and routing system is a big improvement over previous designs.
- *Nuendo* maintains its elegant user interface, even with all the new features and the potential for user configuration.
- Some features, such as the networking capabilities, VST System Link, and so on, have no competition at present.
- *Nuendo's* surround sound support is perhaps the best provided by any digital audio workstation software.

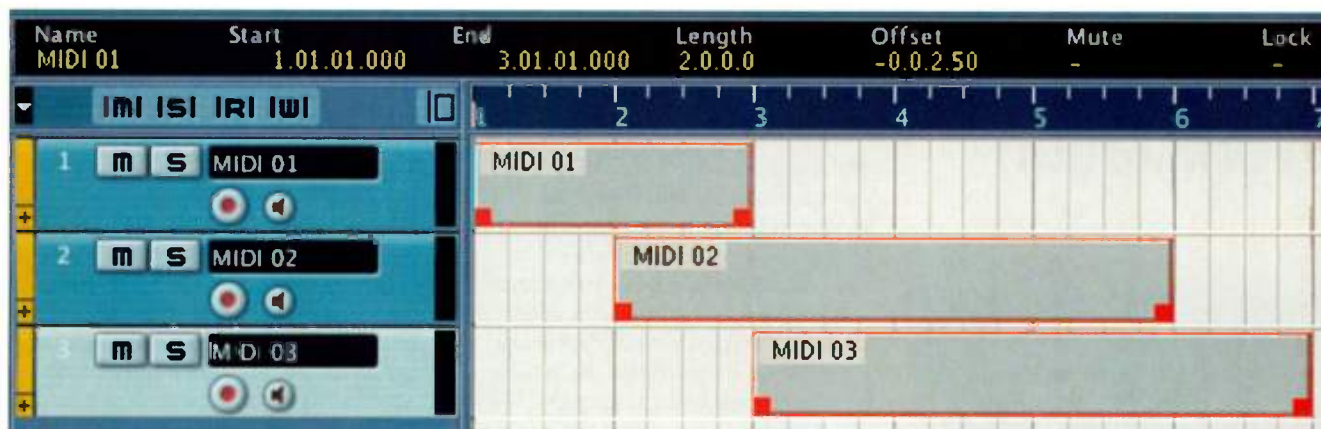
cons

- The lack of features for tempo manipulation at this stage in *Nuendo's* evolution is almost unforgivable for an application designed for media-related production.
- The Mac OS X version isn't always completely stable with certain configurations.
- A few areas of the application still need some attention, such as Channel Linking and recording multiple takes.

summary

Nuendo 2 is the closest any company has come to creating an integrated music and audio production system, offering the MIDI features you'd expect in a sequencer, the audio capabilities of a digital audio workstation, score-writing and more. Despite some final kinks to iron out and a few noticeably absent features, Steinberg have created an amazing application which will really give the competition something to think about.

STEINBERG NUENDO 2



► feedback.

The well-known *Cubase* Inspector makes its appearance in *Nuendo*, meaning that *Nuendo* users can make adjustments to a Channel Strip directly in the Project window, which, as *SX* users already know, is really, really handy. But in addition to the Sections already found in *Cubase*'s Inspector, Steinberg have added a few new ones, including a clickable EQ graph and a notepad. The Notepad Section is a stroke of genius, since so often you want to write a few comments about a Track — which takes were good, what sounds work, and so on — and now you can do this, as each Track in the Track List gets its own independent virtual scribble pad. The fact that the Inspector can be expanded with new Sections in this way without feeling

cluttered or complicated demonstrates that Steinberg really got it right when designing this part of the application.

Nuendo's Range Selection tool has been extended in this new version with the ability to remember and recall two different selections. You can make a selection as normal by choosing the Range Selection tool and dragging on the Event Display — but by clicking the Range Selection tool again, you can choose Selection B and make a different selection. It's possible to toggle between Selections A and B by pressing '2' on your keyboard, and this can be really useful when you need to keep copying from the same area of a Project, for example, in between making other selections.

A neat *Pro Tools*-inspired Locators Follow Range preference makes it possible for the

You can now adjust the parameters in the Event Infoline for all the selected objects on the Project window simultaneously.

Locators to automatically follow the current Range Selection, and, staying with the theme of selection, it's now possible to select multiple objects on the Event Display and adjust their properties together using the Event Infoline. The parameters on the Event Infoline are displayed in yellow to remind you that more than one object is selected, rather than the normal white for a single object — thank goodness this particular old-style *Cubase* feature has returned!

The usefulness of Folder Tracks has also been enhanced in *Nuendo 2*, and simple touches like the ability to open and close all Folder Tracks simultaneously by

Hardware Control

As in previous versions of *Nuendo* and *Cubase SX*, *Nuendo 2* can make use of a variety of hardware control surfaces as an alternative method of interacting with the application, which is especially good for those who would prefer to remote control the on-screen mixer with tactile controls. *Nuendo 2* offers built-in support for CM's Motormix, JL Cooper's CS10 and MCS3000, Mackie's HUI, Baby HUI and Mackie Control, Radical's SAC2k, Roland's MCR8, Steinberg's own Houston, Tascam's DM24 and US428, and Yamaha's 01v and DM2000 consoles. Other devices can be supported by a user-programmed Generic Remote, as before, and since many other control devices are now offering HUI emulation, these can also be used with *Nuendo*.

For this review, I was using a Mackie Control base unit, and although I also had access to Mackie's XT and C4 expander units, *Nuendo 2* doesn't support these just yet, which is disappointing. However, on the plus side, Steinberg's Mackie

Control implementation is very good, with all the features working as you'd imagine, and having such a control surface really does make working with *Nuendo* a slightly more fluid and pleasurable experience. The obvious convenience of being able to adjust a channel's fader without having to rearrange the screen should not be underestimated!

The only small bug I encountered when using Mackie Control, which I assume is a *Nuendo* issue since Mackie Control effectively does nothing without being sent a command, is that occasionally when you move a fader, it moves back to its old position again, even though the level of that fader in *Nuendo* remains at the new position. If this happens, the workaround is to temporarily disable the motorised faders (by pressing the Motors button on Mackie Control) while moving the fader (or faders), and everything seems to work fine again. This doesn't seem to happen often enough to be a major problem, just a couple of times in a session so it becomes mildly

irritating.

However, a more broad complaint about *Nuendo*'s current way of working with control surfaces would be that it's not clever enough! In many ways, this could be viewed as being a little unfair or pedantic on my part, but since a control surface is effectively a dumb box with the responsibility of how it works falling on the software company supporting the surface, I think there's a great deal of potential being wasted. While Mackie Control does work well with *Nuendo*, the operation is rather basic when compared to modern digital consoles, or even Emagic's *Logic* and *Logic Control* system.

For example, in *Logic* there's an option for *Logic Control* to automatically update so the selected Track on *Logic*'s Arrange window is always displayed and available on *Logic Control*. In *Nuendo*, by contrast, you always have to press either the Channel or Bank navigation buttons to manually find the selected Track yourself. But this is just one example: Yamaha's DM2000 console has two

brilliant features called Touch Sense Select and Auto Channel Select, where moving (or even just touching) a channel's fader or control will make that channel the selected channel. Mackie Control's faders are touch-sensitive, and *Nuendo* already responds to this feature when using the Touch Fader Automation Mode, so a facility along the lines of Touch Sense and Auto Channel Select should be easy for Steinberg to implement.

There are many interesting developments on the hardware control surface horizon for *Nuendo* users, with Steinberg's forthcoming ID controller and the strategic alliance with Euphonix that was announced at the same time as *Nuendo* at the 113th AES show. However, since not everyone will be able to afford the ID system, and the fact that any plans with Euphonix are still embryonic, Steinberg should really try to work more closely with other third-party vendors like Mackie and JL Cooper to develop innovative solutions for all *Nuendo* (and *Cubase*) users.

Nuendo Vs Cubase

One of the subjects most zealously debated by both new and prospective users of *Nuendo* and *Cubase SX* concerning the release of *Nuendo 2* is exactly where Steinberg are drawing the line between the two applications. When *Nuendo* was first released, *Cubase VST* was still Steinberg's flagship sequencer, and the purposes of the two products were obvious: *Cubase* was the tool for music creation, and *Nuendo* was the tool for audio production. While *Nuendo* had MIDI capabilities, which were expanded in version 1.5 with support for VST Instruments, few people would have considered using *Nuendo* as a MIDI sequencer over *Cubase*. However, with the release of *Cubase SX* based on *Nuendo*'s foundations, followed by *Nuendo 2*, which could conceivably be described as being built on

Cubase SX's foundations, trying to distinguish the intended audiences for these two products has become more confusing.

Steinberg maintain that *Cubase* will continue as the ultimate tool for those who want to create music, with *Nuendo* being positioned as the ultimate production tool, both for music composition and tasks such as high-end post-production work. This is fair enough, of course, but I think Steinberg have created a marketing problem for themselves in the way that *Nuendo* and *Cubase* keep 'leapfrogging' each other. While *Cubase* and *Nuendo* are both great products, there probably isn't a single *Cubase* user who wouldn't want the enhanced *Cubase* features in *Nuendo 2*, especially in areas such as automation, signal routing, and so on.

One way in which

Steinberg could resolve the 'Cubase vs Nuendo' issue would be to bring the release dates of new versions of both applications closer together, in a similar approach to Emagic's *Logic Platinum*, *Gold* and *Audio* product line. But if you're currently thinking of purchasing either *Cubase* or *Nuendo*, the best way to decide would be to look at the features *Cubase* will never inherit, such as the extensive surround sound support, the ability to import and export in 'professional' file formats such as AES 31, and so on. If you can live without these features, the next major version of *Cubase* is almost certain to adopt many of the core features from *Nuendo 2*, such as the mixing and routing facilities. However, I have to admit that if you have the budget, there can be no doubt that *Nuendo* is the better choice right now.

Control/Command-clicking the Folder Track's icon are very welcome, although it would be great if locked Folder Tracks were exempt from the Open and Close All actions. Folder Tracks also gain Record and Monitor buttons, making it possible to enable recording and monitoring on all the Tracks within a Folder by clicking the Folder's Record or Monitor buttons — very neat. However, I think this concept has the potential to be pushed much further, and it would be good if Group Tracks and Folder Tracks could basically be the same thing, at least where they contain only Audio Tracks. To have to create a Group Track within a Folder and assign the outputs of all the Tracks within the Folder Track to the Group Track seems cumbersome, since *Nuendo* already knows these Tracks are within a given Folder. Even if Folder Tracks just gained a volume control to trim the levels of the Tracks within a Folder (of any type) relative to each other, this would be a big help.

In *Cubase SX*, every MIDI Track features a real-time MIDI Input Transformer that can be enabled to process MIDI data before it gets recorded onto a Track. The only drawback with this feature, though, is that each MIDI Track's Input Transformer is independent, and there is no way to set up a global MIDI Transformer for all the

MIDI Tracks in a Project. Fortunately, this is another area Steinberg have addressed in *Nuendo 2*, and when you click a MIDI Track's Input Transformer icon, a pop-up menu appears so you can choose between Off, Local and Global configurations. This allows you to set a MIDI Track's Input Transformer to use the same, Global settings as other Input Transformers, or specify unique settings for only that Track with the Local option.

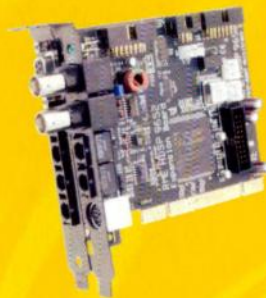
For those who wanted to display multiple Rulers in the Project window, so you could see bars and beats and timecode at the same time, the new Ruler Tracks will be most welcome. A Ruler Track adds another Ruler to the Event Display, although, rather neatly, it can be positioned anywhere in the Track List, which is useful when you want to line up certain Events without having to scroll and rearrange the display of the Project window manually. Clicking on the Ruler Track itself allows you to use any of *Nuendo*'s time bases for that Ruler, such as bars and beats, seconds, timecode, feet and frames, or samples, and you can have multiple Ruler Tracks in a single Project.

Divide & Conquer

In the spirit of saving the best until last, undoubtedly the coolest new Project window feature is the ability to divide

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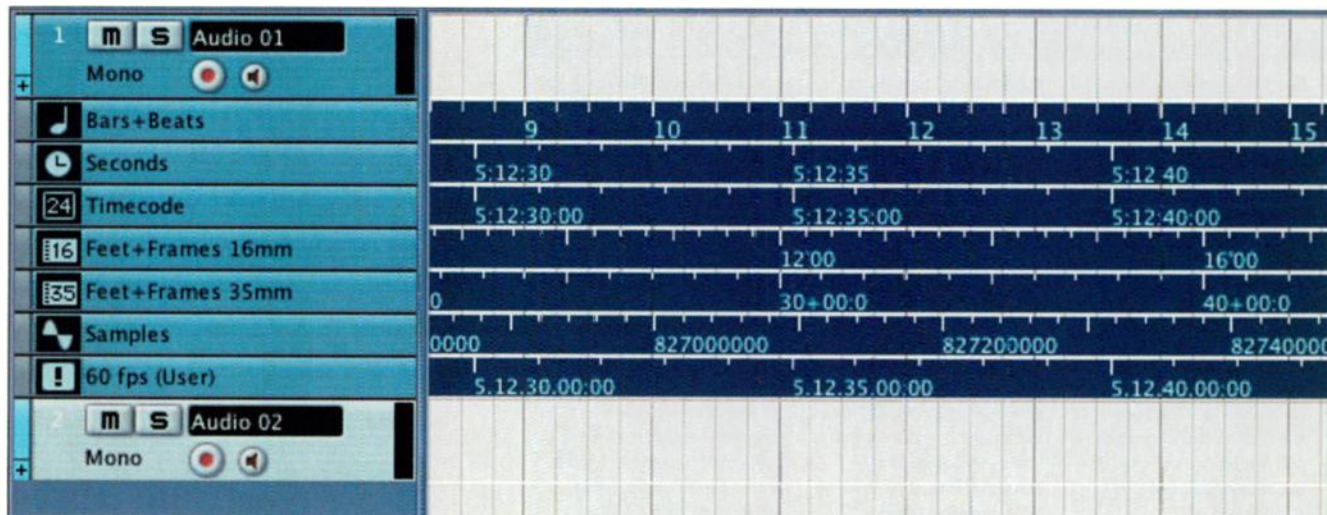


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▶ the Track List into two different sections by clicking the Divide Track List button. The movable dividing line that appears gives you two separate Track Lists and Event Displays in the Project window, rather than two different views of the same Track List and Event Display in the style of *Excel* or *Photoshop*, and Tracks on both sides of the dividing line act in exactly the same way as they always do in terms of their appearance as Channel Strips on the Mixer and so on.

One feature I always wanted to see in *Nuendo* right from the very first version was the ability to freeze the position of, say, the Video and Marker Tracks at the top of the Project window, since it was always annoying that these Tracks disappeared when scrolling down the Track List. The Divide Track List feature is a pretty clever way of making this and much more possible, since you can put your Video and Marker Tracks in the upper part of the Project window and forget about them, while putting all the other Tracks in your Project in the lower part of the window. And since both sections have their own zoom and scroll controls, you can scroll the lower part of the Window while the upper area is left unchanged.

When you enable the Divide Track List button, any existing Video, Marker or Ruler Tracks are automatically moved into the upper part of the Project window, while everything else remains in the lower section. You can create new Tracks of any type in either section by right/Control-clicking in the appropriate Track list and choosing the Track type to add from the Quick Menu; and if you want to move a selected Track (or many selected Tracks) to the other side of the dividing line, you can use the Toggle Track List command from the Quick Menu.

The ability to divide the Track List in two is a great innovation, and for my *Pirates* Projects I placed the Video Track in the top

section, along with the dialogue, click and stereo reference mix Audio Tracks, and used the lower section for the overdub Audio Tracks being recorded into that Project. In this way, it was very convenient to always have the core Video and Audio Tracks on screen, and you can always move the dividing line over the upper Tracks if you want to see more of the lower section.

The only reservation I have with the Divide Track List feature is that the two sections are perhaps a little too separate. For example, if you create Key Commands for vertical zoom settings, they only apply to the lower section, and if you wanted to set all the Tracks on the Project window to two rows in height, you'd need to do this for both sections of the Project window separately. If you use the Select All command, only the objects in the section of the Project window you last clicked in (which isn't indicated visually) will be

Nuendo 2 offers the ability to create Ruler Tracks so you can have multiple (and movable) timelines on the Project window at the same time.

selected; and similarly, if an object is selected in the upper section, this will be ignored when you select objects in the lower section and open an editor. Maybe this is what you'd want, but I think selections in the upper part should disappear when you make a new selection in the lower part, which would make understanding what's happening in the two sections a little easier.

While the Project window has always provided a flexible way to work — a factor that continues to improve with version 2 — there are still a few features that could be added to make life easier, and perhaps the most useful of these would be the ability to nudge the Project Cursor and objects on the Event Display by a different unit from the current Display Format. For example, if you're working with music and audio for

Network Projects

Some of the most intriguing new features in *Nuendo 2* are those designed for collaboration, enabling different people to share and work on the same Projects simultaneously — one person could be compiling vocals while another mixes the guitar parts, for example. Although the networking features (not to be confused with VST System Link) were omitted from the first release version of *Nuendo 2*, to prevent the whole product being delayed by some last-minute issues with these features, they will be available in a later maintenance release of *Nuendo*.

Nuendo's networking

facilities will basically allow you to share a *Nuendo* Project with other *Nuendo* users across a TCP/IP network, whether that's over a LAN or a WAN, so that they will be able to join a Project and have it downloaded to their local machine. The user who 'owns' the Project can set permissions for different users at a Project or Track level, enabling different users to work on separate areas of the same Project without causing problems, and networked users will be able to post their ideas and automatically share a contribution with everyone else.

Given that Steinberg were the first sequencer company to incorporate support for Rocket

Networks' Internet collaboration system in their products, it's perhaps no surprise that *Nuendo's* networking features are conceptually very similar to the way *Cubase* worked with Rocket. However, the working approach has also been tidied up, with a dedicated Network menu being added, along with a set of associated windows and a special Network Section in the Inspector for each Track. Another benefit of *Nuendo's* internal networking solution over the Rocket Networks approach is that you won't have to pay any subscription or bandwidth fees to make use of the facilities.

video, you want to be able to view the music in terms of bars and beats, but with the option of nudging in frame values if need be. While there are some workarounds (such as those discussed in last month's *Cubase Notes* for 24 and 30 fps frame rates), the Grid pop-up menu should really contain all the values for all the Display Formats: bar, beat, second, frame, sample, and so on, especially since you can now have multiple rulers showing different time bases in a single Project. To be forced into manually changing the Display Format depending on the unit you want to nudge by is rather cumbersome.

A Slight Clock-up

Although the sequencing functionality of *Nuendo 2*, like that of *Cubase SX*, is generally excellent, there still appear to be some issues that need resolving when sending and receiving MIDI Clock information. For example, every time you start *Nuendo* (on the Mac, at least), you have to open the Synchronisation Settings window, disable the ports you're sending MIDI Clock to, close the window, reopen it, enable the ports again, and close the

Test Spec

- *Nuendo 2.0*.
- Dual 1.25GHz G4 Power Mac with 1.25GB memory and an ATI Radeon 9000 Pro 64MB dual-head graphics card running Mac OS 10.2.6, with a MOTU 424 card and 24 I/O interface.
- Asus A7S333 motherboard with Athlon XP1800 processor, 1GB DDR (PC2100) memory and an ATI Radeon 7500 64MB dual-head graphics card running Windows XP Professional, with Creamware Power Pulsar and RME Hammerfall DSP 9652 soundcards.

window once more in order to get MIDI Clock to actually be sent correctly out of *Nuendo*. Not ideal, but at least it works.

More seriously, though, many composers at Media Ventures use MIDI Time Code to slave a Powerbook running *Nuendo* to provide video playback from their main sequencer, for example. Although *Nuendo's* video playback features work great when it's used as a stand-alone system, as I did for the *Pirates* session, the video playback can jump and get out of sync occasionally when *Nuendo* is slaved via MTC, most notably when using a frame rate of 29.97fps. While we initially thought about factors outside

the *Nuendo* slave that could be causing the problem, the same system works perfectly when *Pro Tools LE* is used on the laptop for video playback with an M Box.

The good news, however, is that Steinberg are aware of both these issues and confirmed that *Nuendo 2.0* does indeed have problems when slaving to NTSC frame rates. Both of these issues are hoped to be resolved in the 2.0.1 update, which should be available by the time you read this.

See What You Want To See

One of the most immediately obvious changes for existing users in *Nuendo 2* is the new appearance and interface elements, largely based upon the work Steinberg did for *Cubase SX*, which was itself an evolution of the development undertaken for the original version of *Nuendo*. While I liked the look of *Nuendo's* previous user-interface incarnations, with the exception of the ghastly and illegible translucent buttons used in version 1.5, the appearance of version 2 is quite stunning. Although this is arguably a matter of taste, most people I've spoken to seem to like the new look of *Nuendo*; and even if you don't, Steinberg

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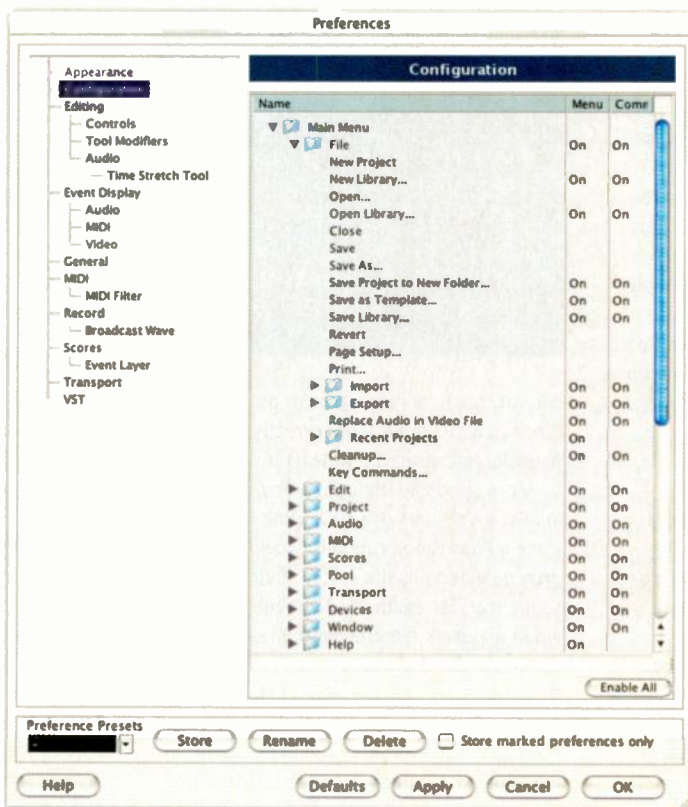
► offer a choice of colour schemes such as the self-explanatory Lighter, Warmer and Aquarium (from which fish are disappointingly absent).

The Transport Panel has been completely redesigned, both aesthetically and functionally, and is now far more powerful than ever before. Perhaps the most welcome feature is that, as in *Cubase VST*, there are now two Time Displays, so you can see bars and beats and timecode simultaneously, for example, or any other combination of time display formats, without having to open the Time Display window as well. The new Transport Panel also offers miniature CPU and disk performance and audio input and out level meters (in addition to the usual MIDI indicators), plus a volume control for the first output buss on the Mixer.

The first 15 markers can now be accessed directly on the Transport Panel, and a virtual jog/shuttle wheel has also been added, which, it has to be said, is more for fun than anything else, since using a jog/shuttle wheel with the mouse is about as useful as trying to control the mouse pointer with a jog/shuttle wheel! However, that's not to say the Jog and Shuttle functions aren't worthwhile because they work really well in conjunction with a hardware jog/shuttle wheel, or via the neat Key Commands for various speeds of shuttle playback in either direction.

Within the on-screen jog/shuttle wheel are two additional buttons for nudging the Project Cursor forwards and backwards by a single frame, and while these would appear to duplicate the +/- Nudge Up and Down buttons, the jog/shuttle wheel's buttons are always frame-based, while the Nudge Up and Down buttons nudge by the smallest unit of the current Display Format.

With so many new features on the Transport Panel, it's good that, as with previous Transport Panels, you can configure exactly what functions you want to be displayed. Moreover, the idea of deciding what features you want to see has also been extended to the Project window's toolbar in *Nuendo 2*, which is very handy indeed, and you can now add a Time Display, Computer Performance Display, Markers and Locators to the toolbar, in



Amongst the many new options in *Nuendo 2*'s Preferences window is the ability to configure which menu items and commands are enabled and disabled to customise *Nuendo* for a particular purpose.

It's also possible to configure the display of the Track Controls for each Track type via a comprehensive Track Controls Settings window. This allows you to specify what controls appear on each type of Track, the allowed lengths for text fields, whether the controls are wrapped to the available size of the Track in the Track List (the default behaviour), the order the controls appear, and which controls get grouped together. And as with the other newly configurable areas of *Nuendo*, you can make presets for different combinations of Track Controls.

addition to hiding any of the elements that were included already on the toolbar in *Nuendo 1.x* and *Cubase SX*.

One of the concerns of existing *Nuendo* users upon seeing the design of version 2 was that the Nudge buttons on the toolbar would be relegated to Key Commands as in *Cubase SX*. But the configurable design of the Project window's toolbar in *Nuendo 2* is a great way of enabling users to decide exactly what elements they want to access on the toolbar, including the Nudge buttons. In addition, you can even make presets of the elements included on the toolbar at any one time, so you can easily recall different toolbars for different situations, such as recording, editing and so on.

But Don't Stop There

The way in which the Transport Panel and the Project window's toolbar can be configured is nothing compared to the way other aspects of *Nuendo* can now be set up in version 2. A new Configuration page in the Preferences window offers the ability for every menu item and command in the application to be enabled and disabled, depending on how you want to use *Nuendo*. For example, should you want to just use *Nuendo* as an audio editing tool, you could disable all the MIDI functions so they didn't clutter up the display, and it's possible to create presets for different menu and command configurations that can be recalled at any time.

While I'm not sure I'd make use of the ability to customise my menu items and Track Controls, I expect many production environments will find this useful to tailor *Nuendo* to the needs of particular users. The only area Steinberg have perhaps missed out on is to implement global application presets that could provide a way of grouping the selected presets in all areas of configuring *Nuendo* into one master

System Requirements

As you would expect for a native-based production system, *Nuendo* is quite demanding when it comes to the host computer system, although Steinberg have worked on a number of optimisations to take advantage of the latest processor technologies such as hyperthreading on Intel's latest Pentium 4 chips, making *Nuendo* as efficient as possible. If you're working on a Windows-based machine, Steinberg recommend a minimum of an 800MHz Pentium or Athlon with 384MB RAM, although a 1.4GHz model with 512MB is preferred. Mac users will need at least an 867MHz G4 chip with 384MB RAM running Mac OS 10.2.6, while a dual-1.25GHz G4 model with 512MB RAM is recommended. I did get *Nuendo 2* to run on my 700MHz G3 iBook with 384MB RAM, incidentally, although I wouldn't actually want to use it for a session.

Nuendo 2.0 is copy protected by a new USB dongle, so you'll also need a spare USB port on your computer, and the best news is that existing *Nuendo* users can keep their v1.x dongle to use on another computer.

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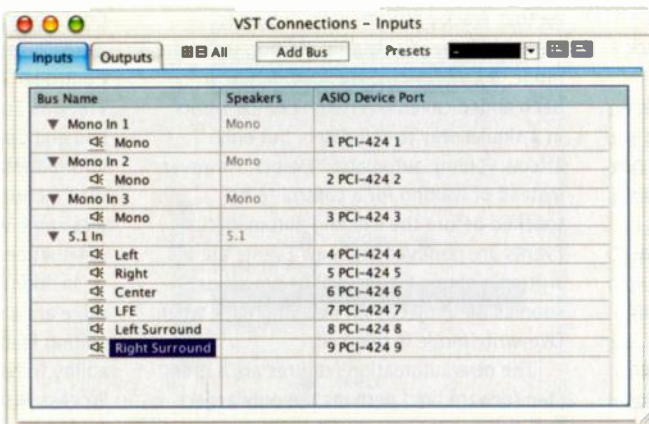
STEINBERG NUENDO 2

The VST Connections window makes setting up input and output busses to your audio hardware easier than ever before.

- ▶ working with audio loops easier, Steinberg have added a few useful new commands that can be used in conjunction with Audio Events where Hitpoints have already been created. Set Tempo from Event sets the current or global tempo of the Project to the original tempo of an Audio Event, for example, while Stretch to Project Tempo uses the tempo information of an Audio Event to accurately time-stretch it to fit the tempo of the current Project.

Routie Tootie

A radical-but-welcome change in *Nuendo* concerns the Mixer architecture and the signal routing in general, since Steinberg's developers have rewritten the underlying audio engine that makes it possible to run a virtual studio on your standard computer



processor. However, unlike some applications that become cluttered as features are added to new versions, signal routing is one area of *Nuendo 2* that's become far more refined compared with previous versions. To begin with, the VST Inputs and Outputs window, where physical inputs and outputs used to be enabled and disabled, are gone forever, having been consolidated into the new VST Connections window, which is far more flexible than its predecessors.

The VST Connections window contains

two pages for configuring input and output busses, and instead of simply enabling inputs or outputs to be routed via the mixer as before, you now have to create an input or output buss and assign this to the relevant physical I/O of your soundcard before it can be routed into the mixer. While this may initially sound more complicated, the concept of input and output busses overcomes an important limitation of previous VST systems, where the channels on the mixer always worked in terms of stereo pairs. In *Nuendo 2*,

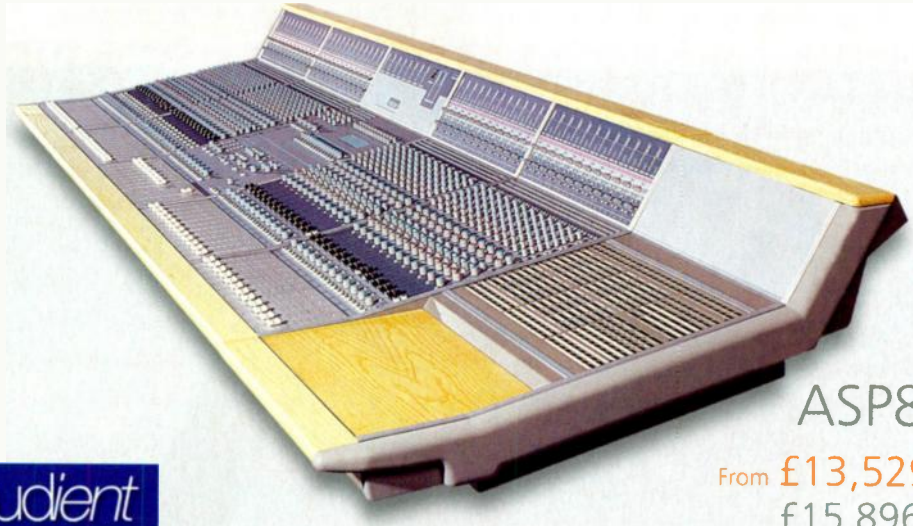
the input and output busses can support multiple channels, making it possible to work with a single stream of audio comprising more than two channels using just a single Track.

To make this operation possible, *Nuendo's* Audio Tracks now offer

Nuendo's audio-based Channels can now support up to 12 inputs for surround, making it possible for VST Instruments to buss their surround outputs to a single channel on the Mixer as show here with Steinberg's own *Halion 2* sampler.



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STEINBERG NUENDO 2



Nuendo 2's new Mixer is both functional and attractive, with many Extended Mixer views as illustrated from left to right: inserts, EQ faders, knobs and graph, eight sends, send one to four and five to eight, surround panner, channel overview, and the irresistible giant level meters.

- ▶ multi-channel support, rather than the mono or stereo option of previous versions. When you create a new Audio Track, Nuendo prompts you for the configuration of this track; the most common options (mono, stereo, LRCS, 5.0 and 5.1) are in easy reach of the main pop-up menu, with other setups ranging from three to 12 channels available in an extra submenu. Where Nuendo 1 offered support for eight-channel surround configurations (such as 7.1), Nuendo 2 now increases this support to 12 channels, enabling you to create mixes in 10.2 if required, for example.

Nuendo's new internal system for multi-channel input and output busses means that recording in surround is now incredibly simple. Once you've created 5.1 input and output busses, for example, and assigned each set of six channels to your audio hardware's physical I/O, you can now create a 5.1 Audio Track and select your 5.1 input and output busses as the input and output for that Track on the mixer.

Another particularly neat benefit of having Mixer Channels that can support multi-channel inputs is that it's possible for a VST Instrument to make use of this ability and supply a multi-channel output to a single Channel on the Mixer. The latest version of Steinberg's own Halion 2 software

sampler, for example, supports 5.1 operation, and rather than providing the 5.1 audio output as four separate Channels on the Mixer as with Cubase SX (two stereo Channels for front and rear left right, and two mono Channels for the LFE and front centre speaker), Halion 2's 5.1 output is represented by a single Channel on Nuendo 2's Mixer — very cool indeed! For surround work, Nuendo maintains its position as one of the best systems around.

Children Of The Buss

While the liberation from inputs and outputs having to be thought of in terms of stereo pairs is a great improvement, the subtle side-effect that input and output busses in Nuendo are no longer tied to physical I/O is also pretty important, since it's now possible for multiple output busses to share the same physical outputs on your audio hardware. However, this is where matters can become more complicated. Say you have a single 5.1 output buss and you want to route the output of a stereo Track to the L and R channels of this 5.1 output. The most obvious solution is simply to create an additional output buss configured for stereo and assign this to the same physical outputs on your soundcard to which the L and R channels of your 5.1 output buss are assigned. On playback, the stereo Track is assigned to the stereo output buss, which outputs to your L and R speakers, and everything sounds great — but there's a problem.

Previous versions of Nuendo featured

a dedicated master output channel on the mixer, and the Audio Mixdown always created its bounces based on whatever was routed to the master channel. However, because the concept of a master channel is rendered unnecessary by Nuendo's new routing system, the Audio Mixdown function now allows you to bounce the output of any output buss to a single audio file. This means that in our example, although the 5.1 and stereo output busses play through the same speakers, because Nuendo's Audio Mixdown function works in terms of logical output busses rather than physical output ports, you'd have to choose to bounce either the 5.1 or the stereo output buss — you couldn't bounce two output busses into one mixdown file.

Clearly, this situation would present a number of headaches to engineers, so Steinberg have also added the ability for Child Busses to be created in the VST Connections window. As the name implies, a Child Buss is an output buss created within the hierarchy of an existing output buss, and although you assign physical inputs or outputs to it in the same way you would a normal buss, a Child Buss shares the same channel strip as its parent. For our example, you could create a stereo Child Buss within a normal 5.1 buss, and any channels that were routed to the stereo Child Buss would be included in the mixdown of the 5.1 output buss.

The new routing system for dealing with inputs and outputs is infinitely more flexible than in previous incarnations of Nuendo and

Grouping Around In The Dark

One feature that's really started to frustrate me in *Nuendo* concerns the concept of Grouping objects on the Project window and Linking Channels on the Mixer. To begin with, both the Group and Ungroup commands, and the Link and Unlink commands, have the same keyboard shortcuts by default: Command/Control+G and Command/Control+U respectively. And while the Group commands show up in the Key Commands window and can be assigned to any keyboard shortcut you desire, the same cannot be said of the Link commands.

Linking Channels together is very useful, and since Tracks on the Project window and Channels on the Mixer are basically the same thing, Linked Channels are still active when you're working in the Project window. However, here's the rub: there's no way to Unlink Channels from the Project window, so you're forced to open the Mixer every time you want to Link and Unlink Channels. And if you have the Mixer window set to Always on Top, you can't use the keyboard shortcuts to Link and Unlink Channels because *Nuendo* thinks you're trying to Group and Ungroup objects! In this situation, you have to right/Control-click one of the Linked Channels and choose Unlink Channels from the pop-up menu to break them up again. There has to be a better way to separate the concepts of grouping and linking in *Nuendo*.

I think it's fair to say that *Pro Tools* handles the concept of Channel and Track linking (or grouping, in *Tools* speak) in a far more useful fashion, particularly the way you can have a list of Edit and Mix Groups available with the capability to be enabled and disabled without having to be deleted and recreated every time. It would be great if future versions of *Nuendo* could adopt a similar approach.

Cubase, but it's also more streamlined and far more logical once you understand how the system works. The only routing-related feature that's still on my wish list is the ability to route the output of a Group Channel to the input of an Audio Track, in the same way you can route internal busses to Audio Tracks in *Pro Tools*, which would add a great deal of flexibility to the way you record audio.

It's Not The Size Of Your Faders...

Nuendo 2's Mixer window is based on the Mixer Steinberg designed for *Cubase SX*, and features the Extended view *Nuendo* users have been craving for since the release of *SX* last year, where EQ, inserts and send effects settings for channels can be set in a row above the normal channel strip controls. In addition to the fader and knob modes for setting EQ in the Extended View, *Nuendo 2* adds a text and graph mode, where you can click on parameters and adjust them with a pop-up fader, while the graph is automatically redrawn to reflect the current EQ curve. Unlike the EQ graph in the Inspector, though, you can't adjust the EQ curve by clicking on the graph itself, which is a bit of a shame.

There are two new send views, allowing you to view the first and last four sends as separate views, in addition to an eight-in-one view, enabling the controls to be a little more spaced out, and providing a dB level reading for the amount of signal each send control is sending. For those working in surround, the option to have larger surround panners for each channel in the Extended view will be welcome, while everyone will surely love the new Meters Extended view, which displays giant level meters. While this might sound a little bit of a gimmick, it's actually incredibly useful, especially when you're recording and you might not be sat right in front of the monitor at a normal viewing distance. Oh, all right — they do look rather neat as well.

The final new Extended View is called Channel Overview,

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▶ which indicates the insert and send effects slots currently in use, along with the inbuilt EQ, on a given Channel; and this view is also incorporated into the Inspector's Channel Section. The Channel Overview is basically a vertical list of two sets of the numbers one to eight, for the inserts and send effects, with the words lo, lo mid, hi mid, and hi sandwiched in between for the inbuilt EQ. The numbers and words light up when the relevant effects or EQs are used on a Channel, and you can click on these indicators to toggle that effect or EQ's bypass button. The Channel Overview is useful, but I think it could be made even better if you were able to Control/Command-click the send or insert effect indicators to choose a new effect or send, and Alt/Option-click the sends to adjust the send amount via a pop-up fader.

In addition to the Extended mixer view layer, a further mixer row has been added for the input and output settings, which have been removed from their position in previous versions on the lower part of the channel strips. In addition to the basic input and output selectors, the Input and Output Settings strip also features two other useful and requested features: a polarity invert button, and a gain control, enabling you to trim the signal going into that channel strip.

More Mixer Magic

Nuendo 2's Mixer can also display Channels for the Input and Output busses that have been configured in the VST Connections window, which means that it's now very easy to monitor the level of incoming and outgoing signals, without confusing them with the outputs of playback Channels. Additionally, the Input and Output Channels also feature insert effects slots and built-in EQs, so that any insert effects or EQ that are used on the Input Channels get printed when a Track records from that Channel. And similarly, any insert effects used on an Output Channel are printed when that output is bounced to an audio file, which replaces the functionality and existence of

the Master Effects window from previous version of *Nuendo* and *Cubase*.

A smaller, but most welcome touch is that the pan control for each stereo audio-based Channel can now be set to one of three modes, including the default Stereo Balance Panner. The two new modes are Stereo Dual Panner, which gives you two dedicated pan controls for the left and right channels, and Stereo Combined Panner, where you can also adjust the left and right pan settings independently, but with the added flexibility of being able to drag the left and right pan controls at the same time while keeping the proportional distance between the Channel's pan settings intact. You can select different pan modes by right/Control-clicking a pan control, and while this is one of those small improvements that could easily get lost amongst more glamorous-sounding features, the new stereo pan modes are tremendously useful.

Since the emphasis in *Nuendo 2* is on configurability, it should come as no surprise that the Mixer is also fairly configurable in terms of what elements are visible at any one time. As with *Cubase SX*, you can hide and show different types of Channels and set the Mixer window to Always On Top, but you can also have four Mixer windows on screen at any one time (compared to the two available in *SX*) and configured in different ways. This is quite handy as it means you can set up a small floating Mixer for recording, which shows the input Channels and the Channel you're recording, for example, and a larger Mixer with playback and output Channels for mixing.

Personally, I love the look and feel of the new Mixer window, although I know some people have reservations about the design of a number of the icons. Firstly, a common complaint I've heard concerns the use of seemingly obscure icons for common buttons such as the bypass EQ, insert and send effects buttons rather than text labels like EQ, Ins and Aux. Getting used to the

Further Reading

- *Nuendo 1.0* review, *SOS* August 2000: www.soundonsound.com/sos/aug00/articles/steinberg.htm
- *Nuendo 1.5* review, *SOS* October 2001: www.soundonsound.com/sos/oct01/articles/nuendomac.asp
- *Cubase SX 1.0* review, *SOS* August 2002: www.soundonsound.com/sos/aug02/articles/cubasesx.asp

icons doesn't take long, and, as with *Cubase SX*, the pop-up labels that appear when you hover the mouse over an icon are incredibly useful; but maybe it would be good for Steinberg to provide a 'show icons as text' button.

A second complaint I've heard about the Mixer's interface is that certain features, such as accessing a Channel's View Options pop-up menu, are hidden behind relatively small and subtle icons that require a steady hand to click on with a mouse. Again, I didn't have a problem with the icons myself, but I can see how it might be an issue for those running high-resolution displays on smaller CRT screens.

Compensation For The Delay

Another significant change when it comes to the signal routing of *Nuendo* is that the Mixer now includes full plug-in delay compensation across the whole signal path, which is a big deal for anyone who mixes entirely within *Nuendo* and makes extensive use of plug-in effects. The idea of plug-in delay compensation stems from the fact that any digital process takes a certain amount of time to be carried out, so if you had two audio channels and put an insert effect on one them, the audio channel without the insert effect would have to be delayed by the same number of samples as it takes for the insert effect plug-in to complete its processing in order for the two channels to remain in sync.

This example of plug-in delay compensation is fairly straightforward and

Point Scoring

One feature in *Nuendo 2* that caused something of a stir amongst users in the run-up to release was the advanced Score Editor, originally developed for *Cubase Score*, and now included with *Cubase SX*. This had been announced as a feature of *Nuendo 2* at the AES show, but by this year's Frankfurt Musikmesse Steinberg had decided to remove it in order to emphasise the difference between the usage of *Cubase* for composition and *Nuendo* for production. However, influenced by some rather heated feedback from prospective users, the decision was reversed and *Nuendo 2* does, as originally announced, feature the advanced Score

Editor for basic editing and more complex layout tasks.

Originally, I wasn't too bothered about whether *Nuendo* featured a score editor or not, because while I prefer to work with musical notation rather than pitch/duration charts, the Key Editor is often more useful for sequencing tasks, and you could always use *Cubase* or *Sibelius* for score-printing. However, during the *Pirates* sessions, the usefulness of *Nuendo 2's* integrated Score Editor became apparent. Since a MIDI file of each cue had to be imported into the relevant *Nuendo* Project in order to get the correct tempo map, this meant that each

Project also ended up containing MIDI sequence data. Quite often, the musician being recorded would need a printout of a given melody or bass line from the cue, and rather than load it up on a different computer, all the required parts were already in the *Nuendo* Project and lined up with the reference playback. Using the layout features in the Score Editor, it was quick and easy to produce a legible part, and we could be sure the bar numbers would be correct. So while it could be argued that a score editor doesn't belong in an audio workstation, it's certainly convenient in some situations, allowing you to keep everything within one system.

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PA series mixers are designed to sound superb with the EQ flat, giving you full scope to use equalisation as a creative tool for sound shaping. Having 4 bands of EQ (rather than the 3 you find on most comparable consoles) gives you the power to accurately pinpoint the sounds that you want to lift or cut back. A bit of HM to brighten up a guitar, less LM and a bit more HM to get a snappy kick drum sound, some LF to add depth to the FX - a few subtle creative touches like these can make all the difference between a solid performance and a sparkling one.

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The traditional graphic EQs found on most powered mixers simply let you cut or boost 7 or 9 fixed frequency bands. With just a handful of bands available, each one needs to be very broad, making these EQs somewhat crude devices. This is why we decided to defy convention and design a semi-parametric output EQ for the PA series. Each of its 4 bands has a sweep as well as a cut / boost control, so the width of each band can be very tight (the Q (width) is 1.8 measured at +10dB), allowing you to identify and treat the problem frequency without all that unnecessary change to surrounding frequencies.

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► was already implemented in previous versions of *Nuendo* and *Cubase* — however, this was the only way in which a plug-in's processing overhead could be compensated for. If you submixed a drum kit through a Group Channel and put a particularly CPU-intensive insert on the Group Channel, there was no compensation for the amount of processing time the insert required, and so the Group Channel's output would often be delayed and out of sync. The same problem would also arise when using send effects, and the only solution in either situation was to manually delay the output of all the Channels not routed to the Group Channel to compensate for the processing time required.

Thankfully, the statement that *Nuendo*'s Mixer "now includes full plug-in delay compensation across the whole signal path" means that delays introduced by plug-ins on Group Channels or as send effects are now compensated for more intelligently, and this compensation will continue to improve as *Nuendo* and VST plug-ins support a future VST plug-in specification that allows VST plug-ins to report their latency more accurate to the host.

As part of the change in the *Nuendo 2* signal routing and approach to mixing, the use of send effects has completely changed and the VST Send Effects window has been dutifully retired from action. Instead, *Nuendo 2* implements send effects in much the same way as every other audio application does, notably *Pro Tools* and *Samplitude*, by offering a new Track and Channel type called an FX Channel. FX Channels get around several important limitations of the previous VST Send Effects window, in that the volume levels for send effects now appear on the Mixer itself, other mixing controls such as pan are available to FX Channels, and send effects busses can now consist of up to eight chained effects (the same as any other audio-based Track).

FX Channels exist as both Tracks on the Project window and as Channels on the Mixer, and when you create a new FX Channel, *Nuendo* prompts you for the channel configuration — both FX Channels and Groups can support up to 12 channels — and you can optionally specify the effect to be loaded into the first insert effects slot on the FX Channel. FX Channels, along with multi-channel Groups and the plug-in delay compensation, make mixing in *Nuendo* far more flexible and convenient than ever before, especially if you're using a third-party DSP card, and are among the most welcome improvements in *Nuendo 2*.

On the plug-in front, *Nuendo 2* now includes Steinberg's *Declicker* and *Denoiser* restoration plug-ins, and while these aren't the best available, they are certainly useful



Send effects in *Nuendo 2* are handled by dedicated FX Channels on the Mixer and Project windows, enabling you to stack up to eight effects per send effect buss.

and competent tools. *Magneto* is also included for those who like a bit of *X-Men*-inspired tape saturation, along with *Q*, a new four-band EQ plug-in that's fine for surgical EQ, and a handy collection of surround tools, such as the eight-channel *Surround Dither*. All the usual plug-in suspects are also there, along with the *A1*, *VB1* and *LM7* VST Instruments from *Cubase*.

Video In The Caribbean

One of Steinberg's target markets for *Nuendo* has always been anyone requiring a workstation to produce soundtracks for video, whether that's TV, film, computer games, or basically anything involving a moving picture. To this end, *Nuendo* has some of the finest features for working with video of any current application — show anyone who works in film *Nuendo*'s ability to have multiple video files in a single Project, for example, and they'll probably want to throw their knickers at Steinberg's developers. However, the love affair might still be short-lived because, as with *Nuendo 1.x* and *Cubase SX*, features required to manipulate tempo to the degree that was possible in *Cubase VST* are still sadly

absent. While Steinberg obviously couldn't put every feature on every user's wish list in the new version, there are so many Mac-based composers who rely on these features in *Cubase VST*, including some of the most high-profile composers in Hollywood, who are at a point where they need an OS X sequencer, that it seems very strange indeed for Steinberg not to respond to their needs.

On the plus side, though, *Nuendo 2*'s Beat Calculator window does contain a few more features. It's now possible to create a MIDI Part by tapping the tempo of a pre-recorded Track as MIDI notes and have Beat Calculator calculate the necessary tempo changes by interpreting this MIDI part, with the user specifying the resolution of the pulses: quarter notes, eighth notes, and so on. There's also a very useful Set Timecode at Cursor command that does what it says on the tin, enabling you to specify a timecode for the current position of the Project Cursor so that *Nuendo* automatically adjusts the Start Time of your Project to suit. Such a command is invaluable to anyone working with Projects requiring timecode, but what *Nuendo* really

needs now is a 'make this timecode position be bar one' command, because it's very rare indeed that, in a musical time line, the first frame of the video will also be your first bar.

As an example, when preparing Projects for each cue in the *Pirates* movie, the appropriate reel of film was imported into *Nuendo*, followed by time-stamped *SDII* files from Pro Tools for the stereo reference mix and a click, which *Nuendo* had no problem in spotting to the correct location. At this point, the Project is basically the length of the reel, with the cue I needed to record overdubs for floating around in the middle, and the next step is to tell *Nuendo* that the start time for the cue (where the first click sounds, rather than where the audio files start) is the first bar so I can import a MIDI file containing the required tempo and time signatures. And this is where the situation becomes complicated.

While I can import the MIDI file to the cue start time, this won't necessarily be a whole-bar position unless I play around with the Project's start tempo to make this happen, and I'd still have to manually adjust my Project's Bar Offset to get *Nuendo* to display this as bar one numerically. So my solution was to sample-accurately set the Project Cursor to the first click and create a Macro that deleted the time between the start of the Project and the position of the Project Cursor, discarding everything before the Project Cursor, and moving everything that followed to *Nuendo*'s first bar position. Although this Macro is undoubtedly useful, it still doesn't automatically set the Project's start timecode to the timecode at the Project Cursor's location before everything's been trimmed and moved back, so you'll have to do this manually yourself. This way, you can now import the MIDI file and all the elements of the Project should finally be intact.

The reason I'm making a big deal about a seemingly small feature is that it's stupidly easy to achieve this goal with *Pro Tools*, where you simply drag 'bar one' to whatever timecode value you like. And not only that, if you drag the 'bar one' marker around in a Session containing tempo and time signature changes, these events simply move relative to the location of your first bar. The only way I've found to move such events in *Nuendo* is by using the Delete, Cut and Paste Time commands, which obviously affect the entire contents of the Project, rather than allowing you to treat the bars and beats timeline as a flexible grid that can be laid over video and timecode in a Project.

This criticism isn't meant to be read as saying that *Pro Tools* is better than *Nuendo* for video work because such a statement would be incorrect, and we managed to get through our *Pirates* overdub work in *Nuendo*

with great success — the exported Broadcast Wave files (with their embedded time-stamps) spotted perfectly into the *Pro Tools* mix Sessions, incidentally. But while *Pro Tools* contains many little tools for helping with timecode-based work, which have been built in over 10 years' worth of development and professional use, *Nuendo* will need to learn these tricks rather more quickly if Steinberg hope to attract hardcore Pro Tools users to the other side.

Conclusion

When an application is designed for so many situations, coming to a single conclusion about it is incredibly difficult, and in some ways, I feel as if I've been very hard on *Nuendo* during the course of this review. It's basically an amazing piece of software engineering with many great features under the bonnet that put it far ahead of the competition in a number of areas, such as networking, video and native-based mixing. But for *Nuendo* to succeed in every professional environment, Steinberg need to make sure they understand how people need to work with the application, providing as many small and perhaps seemingly insignificant features as possible to make life easier, especially when it comes to working with video and media-based production. If they can do this, Steinberg might succeed in tempting more people to *Nuendo* because the interest is certain there, even among the most hard core Pro Tools-based professional users.

Nuendo 2 is already ideal for most audio production projects, but I think Steinberg face their biggest challenge in encouraging media-orientated professionals to take an interest in what *Nuendo* can offer. I find myself writing the conclusion to this review during some down time on a dubbing stage at Disney, and looking around provides a graphic illustration of the dominance Digidesign have in this industry. In the music preparation area in front of me are three Pro Tools rigs, while there are a further four systems on the main stage for music, effects, dialogue and ADR, plus a couple more systems for individual editors. (If you forget the missing tempo and timecode functionality for a moment, *Nuendo* actually has some features that a dub stage would find useful, most notably on the networking side.)

Each of the Pro Tools systems on the main stage is linked together with sync online so they play back all the elements of the final mix together, and often an editor will have to take a system offline to make some required changes. With *Nuendo 2*, a single system could probably be used for all the required playback Tracks, and instead of taking each

editor's system offline when changes needed to be made, *Nuendo*'s networking features could be employed so each editor's system shared the main Project and posted the relevant changes to the master Project when required. But this is the irony with *Nuendo*: some of the advanced features are outstanding, while some of the more basic features that even *Cubase VST* had are missing.

Aside from the feature set, another 'make or break' aspect to any professional system is stability, and my experience has been that the Windows version is pretty much rock-solid, while the Mac OS X version still has some issues to be resolved. The original release version of *Nuendo 2* on OS X tended to crash at least once an hour and seemed to demand unreasonable resources from the host computer, although I'm pleased to say that Steinberg really worked hard to optimise version 2.0.1 for Mac users and also managed to reduce the number of crashes to maybe one or two a day. However, looking at other users' experiences on the Internet, some people reported their Mac-based *Nuendo* system to be exceptionally stable, which makes me wonder about the quality of certain Core Audio drivers for use with *Nuendo*. ASIO on Windows is now a fairly mature technology, compared to the relative infancy of Core Audio on Mac OS X, so this might be a factor affecting Steinberg's ability to make *Nuendo* more resilient on certain Mac systems.

Overall, however, *Nuendo 2* is a tremendous achievement: it's the ideal system for surround work, great for general audio productions, but is currently handicapped in its aim to be a Media Production System by the lack of features to make working with bars and beats and timecode easier, and a competent system for handling multiple takes on multiple Tracks more conveniently. However, Steinberg have clearly put an enormous amount of effort into *Nuendo 2*, delaying the product's release to make last-minute improvements, and developing what is arguably the finest hardware-independent and cross-platform audio production software available.

Thanks to everyone at Media Ventures who helped with this review. **SSS**

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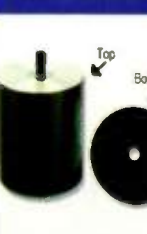
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People Power



Marillion: Doing Business With Their Fans

What would the rest of the Police or U2 have done if Sting had gone solo after 'Walking On The Moon', or Bono had jumped ship the day after 'New Year's Day'? Would the other members of these bands have stayed together, let alone gone on to carve out a truly Utopian situation within the music industry? Could they have found the freedom to record the songs they wanted, at the time that they wanted, in their own studio, making all their own decisions, and with a connection with their fans that is surely 'unique'?

Well that's exactly what happened to Marillion. Now at this stage, you will fall into one of three camps:

1. Didn't they split up after Fish left the band?
2. Who are Marillion?
3. Fantastic, at last, some press on the most untouched-by-commercial-pressures band on the planet!

The majority of acts that have made it past two decades are either bloated caricatures of their former selves, going through the motions whenever a property tax bill hits the doormat, or touring relentlessly banging out all the old hits in a cabaret style, or finding ever more unlikely collaborations to keep themselves fresh. Marillion, however, are as alive creatively as they have ever been. Only more so.

They started out in the early '80s. Yes, for all you purists out there, there were musical

Depending on your point of view, prog-rock survivors Marillion are the least cool band in the world — or the best kept secret in the music industry. They've certainly found a different way of doing music for a living...

Big George Webley

When it comes to a lasting career in the music industry, what are we talking about? A couple of instant hits, followed by obscurity for a couple of decades, until the opportunity to stand in a line-up on *Never Mind The Buzzcocks* comes along and your final 30 seconds of fame is acted out as the butt end of a Mark Lamarr joke.

Or do you desire something more substantial? Like what? The Rolling Stones, a band who have been around since before electricity was invented, and are still packing them to the rafters? Maybe Sting, who just seems able to keep going and going, right up there, without actually eclipsing his days in the Police? Or what about U2? They've gone

from a dodgy Dublin pub to a decade dominating the globe, armed only with a root note, a straight beat, an echo pedal and some sunglasses.

These artists seemingly do whatever they like, without having to kiss up to A&R departments or having to agree with stupid marketing strategies. For most signed acts it's most certainly not like that. Their every move is dictated by management teams, lawyers, record company executives, producers and promotion strategists. Every percentage, copyright claim and loophole is tied up for all eternity. As for musical vision, what's that?

Parallel Worlds

So imagine how the fortunes of the Rolling Stones would have differed if Mick Jagger had left the band after 'Honky Tonk Women'.

Introducing The Band

How best to describe Marillion's music? How long is a piece of string! It is certainly the most untouched-by-market-forces music with six-figure sales around. Some say it has "all the elements of Led Zeppelin orchestrated by Schubert in space", others might describe it as "beautifully crafted and exquisitely performed adult rock" and you wouldn't be far off saying that "it's reminiscent of Pink Floyd during their most creative period, without the

inflated pig". But as Billy Joel wrote so eloquently in his song 'It's Still Rock & Roll To Me', 'You can't get the sound from a story in a magazine.' So to introduce new fans to the music Marillion have been making over the past 15 years, they have a free CD. It's called *Crash Course: An Introduction To Marillion*. To receive the free CD all you have to do is send your full name, postal address and birth date to freecd@marillion.com.

There are numerous audio clips on their web site to check out too. It's probably the most user-friendly, honest and regularly updated web site any band has ever had. Apart from a comprehensive look at what they're up to, what they've been up to, and who they are, they have their own shop selling records, DVDs, T-shirts, books and bottle openers.

W www.marillion.com



The huge live area in Marillion's Racket Club Studios.

incarnations featuring one or more members of the band making a racket in the late '70s, but their first record was released in 1982 (for those wishing to know more about Marillion's past, every sordid detail is superbly exposed in the Jon Collins tome *Separated Out 1979-2002*, published by Helter Skelter).

The secret of their early success was, as it always should be, a lot of practice to hone their musical skills, single-minded determination and unquestioning belief in their destiny, against all the odds. Keyboard player Mark Kelly says "I had no doubt we were going to become famous. All my memories of those early times were of [original lead singer] Fish on the phone badgering promoters for gigs and general plans for world domination." So successful were they at hustling that they sold out what was then the Hammersmith Odeon before they'd released their first album.

They saw promotion as being crucial to their development, so much so that apart from their own concentrated efforts, they employed publicity agent Keith Goodwin before getting signed to a label — common practice nowadays, but as unlikely at the beginning of the '80s as a local band playing live on Radio One in prime-time. Yet it was on Tommy Vance's *Friday Rock Show* that they

got their first national break, shortly before EMI signed them up for a five-album deal. The good side of the deal was that they retained artistic control; the bad side was a poor royalty rate and the total loss of ownership of all their work for ever and ever. But who cares? They had a deal with a major label and top-line studios and big-shot producers awaited!

Despite the fact they were totally out of step with the British music scene at the time, their first couple of albums sold moderately

well and the follow-up live album not only consolidated their position, but increased their unit-shifting potential. But it wasn't until their third studio album *Misplaced Childhood* that they exploded, thanks to the power of a hit single. 'Kayeigh' became their golden egg, raising albums sales more than 10 times, stimulating a rush on their back catalogue and hastening the end of part one for the band.

The reasons for Fish leaving Marillion are well documented, but in short it was the old



The control room at Racket Club Studios.

USING FAN POWER

► chestnut of musical differences — which, in reality, meant he no longer saw himself as 20 percent of a band.

Neither Fish Nor Flesh

The job of replacing one of the most recognisable singers in rock was a task and a half. For the direct approach, they put an ad in the classifieds of *Melody Maker*: "Singer wanted by Marillion, send tape to...". From gravel-voiced rock wailers to people who dressed up like the album sleeves, every conceivable type of vocalist applied; but as it turned out, it was an industry insider who solved their dilemma. Darryl Way from Curved Air knew the singer/keyboard player from the Europeans, who had just split. The singer's next venture, a typical two-poofs-and-a-synthesizer band, hadn't worked out, which, coupled with becoming a father, had led him to consider packing it all in to become a milkman, which was a steady job at the time.

Of course, getting a milk round isn't the easiest thing to do, especially around Christmas time (when the tips can be tremendous) and at the same time as Marillion were courting him, there was an offer of an American tour with The The as keyboard player. What should he do: try another dairy, learn 18 songs on the keyboards and have a pressure-free trip around the better hotels of America, or step into a very large pair of shoes?

He decided that honesty was the best policy and told them he didn't think joining Marillion would be right for either party. But it niggled him for a while, and the band were sure he was the right man for the job. So with Darryl Way again acting as the go-between, they got together. They took themselves off to one of those middle-of-nowhere type places for a few weeks to see whether the chemistry was right. The band weren't looking for a Fish-a-like singer, and they knew they weren't going to get one.

Musically, it was all they dreamed it could be, but the band liking the direction their new singer was leading them was one thing. How would the fans take it? After a low-key, unannounced gig in a pub, their first real performance was in front of the Dutch fan club secretary and a bunch of hardcore fans. They loved him, and he fell in love with them and all they and the band stood for. He brought a new poetry to the band, a deeper commitment, a sense of loyalty and a contemporary approach to their music. His name was Steve Hogarth, aka H.

At this point in history (1988), the contract with EMI still had a couple of albums to go (plus as many compilations as you can package, but we'll come to them in a moment). Both Marillion as a unit with their

new singer, and their old singer Fish, relaunching himself as a solo act, were now two pieces of EMI property. Another way of seeing this was hedging bets, but it did mean there was an album to be delivered by the band, namely the highly acclaimed and massive-selling *Season's End*.

Tough At The Top

Having a hardcore fan base is a guarantee of healthy first-week sales, but it also means the promotion machine of a label can go to sleep. Why bother promoting a Marillion album or tour, when all you need to do is put a free ad in the fanzine?

Immediately there are hundreds of thousands of sales and every tour date is sold out. No need to place adverts in the likes of *Mojo*, *Q*, and the *NME*, or get teams of fly-poster monkeys to blitz every city and town in the country.

The problem with this policy of saving money (which comes out of the record company's cut) is that you only reach the dedicated fans and don't stimulate any new ones. When the EMI deal ran out, despite shifting over 10 million albums, Marillion were in debt — and no, they hadn't blown it on private jets and worldwide housing portfolios. They decided to make future albums themselves and licence them through Castle, which seemed a good idea at the time as they would get a much bigger cut of the profits. After a couple of albums and a different set of frustrations, however, the band decided to take care of business themselves. Quite literally, they manage



Marillion's fan-turned-manager Lucy Jordache.

themselves, with each individual member taking care of a specific area of business: web site, accounts, and so on. They also have an outlet for any musical differences they might have in the guise of solo projects, which are released through their label Racket Records.

At around the same time the band took control of their destiny, EMI were looking to release a best of Marillion. Enter Lucy Jordache, a fan from the very beginning. The first single she ever bought was the band's debut 'Market Square Heroes', although she admits it was mainly to annoy her brother who hated it. She may have been a schoolgirl



Kebab Vans One and Two, home of the Marillion business empire.

Duran Duran fan, but Marillion were always her favourites. On leaving school she got a job with Saatchi & Saatchi in their marketing department and spent the next eight years climbing the ladder to success. Only trouble was, it wasn't what she wanted to do, so she took a lower-paid job at EMI in back catalogue.

When she heard the idea of doing a double album called the *Best Of Both Worlds*, one from the Fish era and the other with the line-up that has been tight for the past decade and a half, she insisted on being involved. *Best Of's* usually see all the hits crammed onto a CD with a single-sheet fold-over sleeve containing a one-sided potted history. Lucy got onto Steve Hogarth and the guys about doing sleeve notes, saying that she'd got Fish to do them for the songs he'd written, whilst at the same time spinning Fish the same story. The upshot was a beautifully packaged, lovingly compiled and essential-to-the-fans best-of, featuring genuinely interesting song-by-song notes by the band. The upshot was that it sold way above expectations.

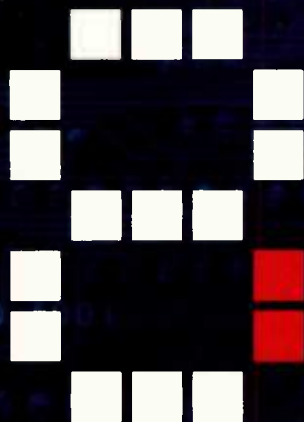
It also spurred on the remastering of all their original albums, which cleared their debt to EMI. Now we all know that major record companies have a tendency to do as little as possible to earn as much money as they can for themselves, particularly when it comes to reissues. But Lucy was determined that the Marillion catalogue would offer more

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Engineer and producer Dave Meegan has worked with the band since 1983.

▶ than than just running a dodgy copy of the master tapes through a compressor. She went on a pilgrimage to find demos, alternative mixes and writing tapes for bonus tracks. One of them was the title track for the album *Afraid Of Sunlight*. The version she dug up featured Steve Hogarth alone in the studio late one night actually composing the song on the piano, going over different bits again and again for about 20 minutes. She took the tape into Abbey Road and, with Peter Mew, spent six hours editing together a version that didn't actually exist, but was the birth of the song. It blew the band away so much they gave her a credit. She also was able to ensure that all the reissues were accompanied by beautifully compiled and illustrated 24-page sleeve-note booklets. This level of dedication did not go unnoticed by the band and they offered her a full-time job. Although it meant a massive drop in pay, not

for the first time, she accepted and a new ear in the music industry was born.

Making A Racket

Their offices are lovingly described as Kebab Van One and Kebab Van Two (which in truth are a pair a substantial Portacabins, one for boys, one for girls), and sit opposite the heart of Racket Records, the band's studio and their comprehensive merchandising warehouse. Situated on a trading estate in Buckinghamshire, the Marillion operation is a model of 21st century efficiency. Inside the unit is a fully functioning state-of-the-art studio which is decorated to the taste and comfort of the band. The hub of the system is a 32-input Pro Tools HD system, with Emagic's *Logic* as a front end, "as it's more musical and instant". Using an Apple G4, they are able to record all their rehearsals, jams, and live gigs in great detail. It gives

them the flexibility to cut and paste any performance or section, either as a band or an individual solo or ad lib, and use it wherever they want.

After more than two decades suffering the injustice of record advances and the loss of ownership of their work, in perpetuity (that's one of those terms that lawyers use in order to buy a new Porsche every year, it means 'forever') Marillion came up with a revolutionary concept. They asked their fans to buy their next record in advance. For £16, a fan would receive a deluxe copy of the CD with an additional bonus CD, and their name printed in the sleeve notes. Tens of thousands agreed, paid up front and left Marillion in the enviable position of having a massive advance to record the album they wanted, with guaranteed sales and no A&R/promotions executives demanding a more Noel Gallagher sound on the guitar.

The result, *Anoraknophobia*, was produced by Dave Meegan, whose relationship with the band goes back as far as 1983 when Meegan was the tape-op on Marillion's second album *Fugazi*, with Nick Tauber producing. Meegan didn't start his producing duties until eight years later, on the *Brave* album, although it's worth pointing out that between those times he had helped to engineer and mix U2's *The Joshua Tree*, been Trevor Horn's engineer and worked with the Pet Shop Boys.

Apart from his bionic ear for getting quality sounds committed to record, his job is sifting through thousands of hours of jams and writing sessions in order to focus the five individuals into a coherent direction. A Marillion album is not just a dozen pop songs, all sounding similar to the single. As Meegan describes it, "they make epic soundscapes which people can go back to for years and find something they haven't heard previously".

Their recording setup may not be a luxurious penthouse suite in the West Indies, but it's theirs, meaning they aren't paying 10 grand a week to sit by the pool drinking Pimm's. It's permanently set up for the band to work on material. A typical day starts at 1pm and ends around 6pm, then after dinner one of them will do overdubs until 10pm.

After the success of fans pre-ordering *Anoraknophobia*, which went onto sell 100,000 copies, mainly in high street shops, with a next-to-zero marketing budget, Marillion are proposing to do the same with their next album, only more so. This time it will go on sale at £30 in advance, for which the buyer gets a bonus album (which won't be available anywhere else, ever) totalling over two hours of new songs. It will also contribute to a highly creative marketing strategy, which will see Marillion come

Mix & Match

Part of Marillion's new deal for fans involves letting them get their hands dirty, by choosing set lists and even joining the band on stage. Taking this one step further, they're now inviting anyone to have a go at remixing a song from their most recent studio album, *Anoraknophobia*. For the modest fee of £10 or £60 for all nine, they will send you compiled tracks as WAV files, meaning stereo drums, individual guitar/keyboard/bass tracks, a stereo mix of the vocals with fairy dust sprinkled over, and dry versions of the individual vocal tracks for you to immerse in your own brand of reverb. As far as they're concerned, the more radical you get the

better.

An album of the best remixes will be released and the lucky dozen or so remixers will receive £500 (and more importantly, the opportunity to have their own artistically pure, full-blown reworking heard by the world). Of course, if you're just a fan who has no interest in looping, cutting, splicing, and track mashing, but would simply like to play along with the band minus the guitar, bass, vocals, or you want to listen to just the bass on its own, all you have to do is line all the tracks up on your computer at the same start point, press Play, then mute or fade at your leisure.



Marillion's second convention at Butlins in Minehead saw over 2000 fans from all over the world converge for a weekend of band-related fun.

bursting out of their cult anonymity and into mainstream consciousness. They will also be promoting it by embarking on their biggest tour in years.


Hi De Hi

And it's live where the band really show their class. Now, a weekend at Butlins in Minehead in the middle of March might not be everyone's dream break, but for 2500 fans from across the entire planet it was a pilgrimage not to be missed. From Friday to Sunday Marillion held the second of what

looks like becoming an annual convention. They premiered new material, played their top 10 songs of all time as chosen by the fans, and did a band swap, where musically inclined fans replaced one of the band on stage to play a song to an audience of thousands. But the highlight of the convention was when the band set a world record for filming, manufacturing and selling a live concert DVD (recorded Friday night, on sale, fully packaged at Sunday lunchtime).

Apart from the band playing three full, but distinctive sets, there was a full supporting

cast, including Cordisto, Kid Galahad, Martin Gretch, John Otway, Aziz Ibrahim, White Buffalo, Gazpacho and the odd all-star jam. Whereas most headline acts would charge a band a buy-on fee to support them in front of a capacity audience, everyone involved was paid and well looked after. During the day there were numerous Marillion quizzes, a football tournament, kids' painting competitions, a question and answer session where punters could ask the band whatever they liked, and mammoth signing sessions lasting around four hours a day. Five percent of the band's database — about one percent of their current record-buying audience — got a weekend to remember.

The way Marillion go about the business of making their music and the way they service their audience is totally unique. With virtually no radio play or media exposure of any kind, they have managed to sustain a huge fan base, sell hundreds of thousands of copies of every album they release and continue to attract fans who weren't born when they started out. As they approach their silver jubilee, they have more relevance in today's music industry than all the boy/girl bands laying end to end across the Atlantic Ocean (although that doesn't seem a bad idea). In these days where major labels have an increasing stranglehold on retail, whilst at the same time investing in short-term celebrity with no thought to musical integrity and longevity, Marillion are market leaders in Internet marketing and forward thinking. 



As well as undertaking guitar tech duties for the band, Colin Price manages their Racket Records label.

Kenton Spin Doctor

MIDI Controller

Kenton's affordable MIDI controllers continue to come down in price — the new entry-level rotary-control Spin Doctor offers a lot of control (and controls) for a mere £125!

Paul White

Kenton's Spin Doctor is their new new entry-level, user-configurable MIDI hardware controller, with 16 control knobs that can be used with virtually any piece of MIDI equipment (actual or virtual) to provide real-time, hands-on control. Where MIDI Controller data is being used, all the knobs can be programmed from the front panel, though where SysEx or NRPNs are involved, the included PC and Mac editors are required (at the time of this review, the Mac editor had to be downloaded from the Kenton web site). The Mac editor is in fact the same as used for Kenton's earlier Control Freak Studio/Live controllers and profiles can be exchanged between the two platforms, albeit with the limitation that buttons not present on the Spin Doctor are ignored when a Control Freak profile is loaded. There are numerous 'profiles' available for free download via the Kenton web site (of which more in a moment), so you probably won't need to do any programming if what you're controlling is in fairly common usage.

Powered by the inevitable adaptor, the Spin Doctor is packaged in a plum-coloured steel box with 16 programmable rotary knobs on the top, in addition to a further Data Entry knob, Edit and 'F Key' buttons and a power switch. A four-digit, seven-segment display provides user feedback when editing or operating the unit. The rear panel houses MIDI In and MIDI Out sockets, and the Out features a merging Soft-Thru function, enabling the Spin Doctor to be used at the same time as a controlling keyboard or other MIDI device.

The unit provides 25 user memories, in which the knobs can be set up to send any MIDI message, including multiple and

inverted messages. Stored profiles may be sent to or from external devices using SysEx and a simple but useful Snapshot function outputs the values of all the current knob positions. The Spin Doctor also includes a basic MIDI analyser mode that can be useful when tracing faults.

While the Spin Doctor has obvious applications controlling hardware and software synths, it may also be used to control the virtual mixer faders (or other controls) of the mainstream sequencer packages, including Steinberg's *Cubase VST* and *SX*, Emagic's *Logic Audio*, Cakewalk's *Sonar* and *Cakewalk Pro Audio*, and so on. It also doubles as a budget expander for users of the existing Kenton Control Freak models (see the review of the Control Freak Live in *SOS* December 2002, or point your browser at: www.soundonsound.com/sos/dec02/articles/controlfreaklive.asp).

Used with the appropriate editing software, the Spin Doctor supports all

types of MIDI messages. While editing from the front panel is restricted to controller data only, the Spin Doctor is compatible with profiles already developed for the more expensive Control Freak Studio Edition and Control Freak Live units and many are available for free download from the Kenton web site (a full, frequently updated list can be found at: www.kentonuk.com/download/cfrk_full_prof_list.pdf, and is less than 20K in size).

Spinning the Wheels

Because the Spin Doctor has a merge function, it can be inserted between a controller keyboard and a sequencer. In this configuration, the Spin Doctor automatically relays whatever it sees at its MIDI In port to the MIDI Out along with any control data it generates.

On power up, the display scrolls the name Spin Doctor, and then loads Program 0, a factory default that controls MIDI volume (controller 7) on MIDI channels 1-16. Five other memory slots are also pre-loaded with useful factory configurations where Program 1 accesses Pans on MIDI channels 1-16, Program 2 sends Controllers 1-16 on the globally set MIDI channel and Programs 3, 4 and 5



send Controllers 17 to 32, 33 to 48 and 49 to 64. The remaining memory locations are unfilled and in normal use, the data-entry knob switches between patches. Note that only the data-entry knob is a continuous controller, so in most applications, the

physical knob positions may not be the same as the stored values unless you've just changed the value. This is especially true when using different patch locations to control say, the pan, levels and aux sends of a sequencer's mixer. Every time you change function, the knobs don't match up with what the mixer is doing until you make a change. This is very frustrating if you've already got used to working with a moving-fader interface, but you have to remember that the Spin Doctor is a budget solution.



whereupon the data-entry knob changes the currently selected parameter value. The various edit modes are 'PSEL' (the normal 'in use' mode where you can select patches using the data knob), 'chAn' (Global MIDI channel), 'butn' (the different options for the 'F Key' function in the main level, of which more in a moment), 'PSnd' (which sends MIDI program change messages from 0-127 selected using the data-entry knob), 'Scrl' (text scrolling speed), 'MAP' (with which profiles can be mapped to a desired patch location), 'dMP' (which dumps a Spin Doctor profile as SysEx data), and Edit (which selects the MIDI controller number to be sent by the knob being edited). It's worth noting, though, that the global MIDI channel

SOUND ON SOUND

Kenton Spin Doctor £125

pros

- Affordable.
- Simple to use (for MIDI controller data).
- Software allows any kind of MIDI control message to be programmed.

cons

- Use of standard pots gives little positional feedback to the user — a limitation of all such budget controllers.
- Adjustment can be a little over-sensitive when you're trying to input specific values.

summary

Kenton have succeeded in producing a hardware controller that most people can afford and that few will find difficult to use. It can also be used in a much more sophisticated way via the included editing software.

Doctoring The Spin

Pressing and then releasing the Edit button after switching on the unit causes 'PSEL' or 'Program Select' to appear in the display window, after which the name of the current program is scrolled across the four display characters. Once this little routine is over, the display reverts back to the current patch number. To get into Edit mode, it is necessary to hold down the Edit button while turning the data-entry dial and then use this to scroll through the edit modes until you find the one you wish to use. At this point you release the Edit button

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KENTO SPIN DOCTOR

► can be overridden by MIDI channels defined within specific patches or knob setups created using the editor software.

Whenever a knob is turned during operation, its MIDI value is shown in the display and the MIDI Out indicator confirms that MIDI data is being sent. A useful feature is that pressing the Edit button mutes the MIDI Output until the button is released again.

At initial power-up, the 'F Key' button sends a 'snapshot' of all 16 knob position values to the MIDI out, although as with the Edit button, this can have multiple functions that you can select using the 'butn' page while in Edit mode. The alternative 'F Key' modes are Snapshot, Reset all controllers, All notes off, GM reset, XG reset, and VST Mixer (useful when employing the Spin Doctor with *Cubase VST/SX* profiles). If the Spin Doctor gets its brains scrambled for any reason, you can initiate a factory reset, but any user programs will be lost and so will need reloading. Factory patches are not lost during this process.

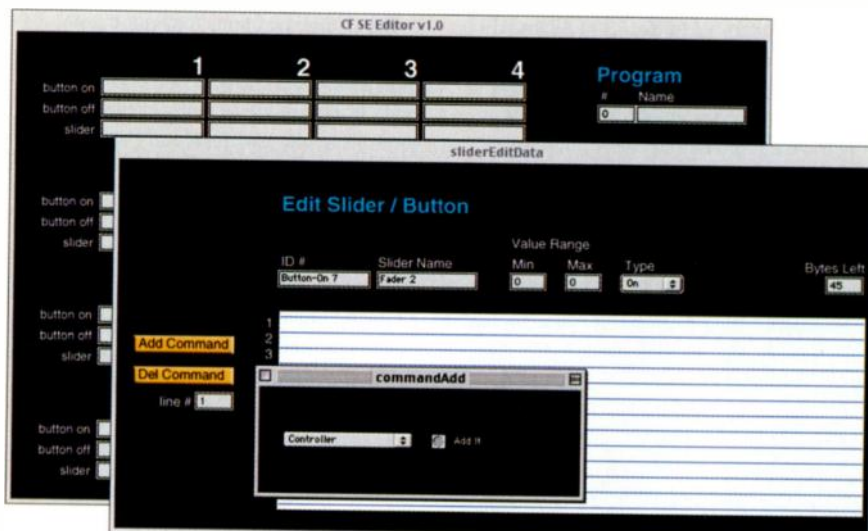
Although you can program virtually anything using the software editor, I suspect most users will either use simple controller data or try to find existing profiles where possible. These are loaded into the Spin Doctor as MIDI files played from within any sequencer (provided it is capable of sending SysEx data). Profiles are loaded one at a time, but note that Spin Doctor is not compatible with the profiles from the original 1998 Control Freak, only the more recent Live and Studio versions.

To call up the MIDI Analyser Mode, power up while holding down the 'F Key' button, then use the data-entry knob to choose the type of MIDI message you want to monitor. You can choose to look at note

numbers, velocities, controller numbers, program change numbers, pitch-bend and aftertouch data. The unit can also monitor SysEx activity, MIDI Clock (with Start and Stop) and MIDI data byte values. A lookup table is included in the manual to translate the Hexadecimal display values into MIDI message types.

Spinning Around

For most basic applications, you can set up Spin Doctor from its front panel to send controller data, and once you've set the basic MIDI channel, it's a simple matter to pick an empty or unwanted preset, enter edit mode,



The Spin Doctor's Mac-based software editor.

select the last of the edit functions, 'Edit', then use the data-entry knob to define which of the 16 knobs you want to program. Once you've chosen one, you use the knob to dial in the correct controller number, then press 'F Key' to store your change, then move on to the next knob. When all 16 knobs are programmed, leave edit mode and you have yourself a custom preset. Mostly this is no more difficult than looking up the controller numbers in the manual of the piece of gear concerned, though you have to be careful when adjusting the knobs as they tend to jump between digits rather too easily, so when you're trying to enter, for example, 15, you may find the display hopping to 14 or 16.

As explained, the included editor is

as a generator of controller data — a job it does perfectly well within the obvious limitations of using pots rather than continuous encoders or motorised faders. However, it's rather encouraging that on such a budget product, Kenton have also provided a means for the more ambitious programmer to use a software editor to create more complex MIDI control systems involving SysEx, NRPNs and so on. You can even set different MIDI channels for different knobs where necessary, so Spin Doctor isn't limited in what it can control. In reality, many software-based instruments and mixers can be controlled using simple MIDI controllers, and if there isn't a profile

already set up for you, creating your own is trivially easy.

Any budget controller is a compromise, especially when it comes to providing positional feedback for the controls, but Kenton have done a fine job in designing a simple,



needed for anything more elaborate than controller assignments, and although the data-inputting interface on the Mac version is fairly straightforward-looking (see screenshot above), you have to know a fair bit about MIDI protocols in order to provide data that makes sense. It's a bit like filling in a tax return, and once it is completed, it can be sent to the Spin Doctor as a program dump. Mac OS 9 users must of course use OMS to establish MIDI communication.

Conclusions

Conceptually the Spin Doctor is very simple, and is probably intended to be used mainly

affordable controller that performs as well as its design budget could possibly allow. Anyone wrestling with a software mixer or virtual instruments and who wants to get hands-on control without spending too much money should take a closer look at Spin Doctor. **EOS**

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Going For Distance

Martin Walker

Computers are now hugely powerful recording tools, but their user interfaces often leave something to be desired when it comes to running MIDI + Audio sequencing applications. Many musicians thus use MIDI or other controller interfaces, which provide dedicated knobs, sliders, and buttons with a more satisfying tactile response, plus the possibility of changing several parameters simultaneously. Moreover, while the humble keyboard, mouse and monitor screen combination is amazingly versatile, it's often tricky to find the best place for these devices in a studio environment.

If you're mixing you'll want to see your software's Arrange page in front of you between the monitor speakers, and also have your PC keyboard and mouse within easy reach for editing purposes. When recording MIDI parts, however, most keyboard players want their music keyboard placed between the speakers to hear the best stereo image. It can be difficult to find a suitable place for the computer keyboard and mouse without compromising one keyboard or the other, even when using slide-out shelves. Vocalists, guitarists and acoustic instrument players, meanwhile, usually want to get further away from the PC to avoid possible acoustic and electrical interference from computer and monitor during recording, but still want to control their sequencer easily. The ideal answer to all these problems is remote control — a way to move the user interface from place to place so you can control the PC from multiple locations.

Longer Cables

Perhaps the most obvious way to provide a PC with remote control is to extend its monitor, keyboard and mouse cables. Since the information they carry is low-speed digital, you should be able to extend mouse and keyboard cables to tens of metres without any problems due to signal



If you want to control your entire PC from a distance, lengthening your cables is one option, using a KVM (Keyboard, Video, Mouse) extension cable set.

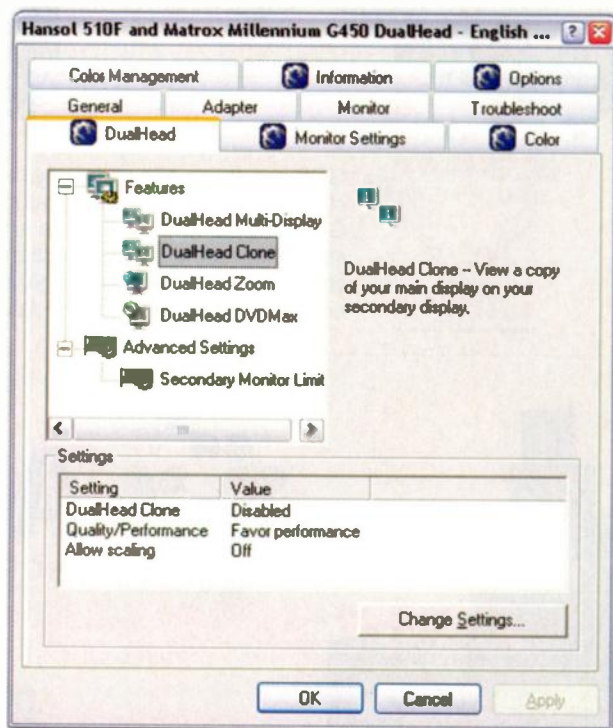
Remote Control Options For Music PCs

Recording with a computer doesn't mean you're tied to sitting right in front of it. Choose the most suitable remote control possibility and you could regain the freedom of your studio.

degradation, and even USB cables can officially be up to five metres long. Some flat-screen monitors provide a digital input, and if your graphics card supports this then a compatible extension cable should work well. However, you should take a little more care before extending analogue video monitor cables, since this can affect their picture quality.

Belkin products (www.belkin.co.uk) always get good reviews, and there are high-quality extension cables in their range for monitors, keyboards, and mice, of up to 15 metres in length. If you want to extend all three cables simultaneously, the generic name to look for is a KVM (Keyboard Video Mouse) extender.

Extenders give you more choice over where you site your PC — if it's noisy, you can install it in a custom cabinet or cupboard, or even place it in the next room. Longer cables may also provide more options for siting your monitor screen. Most



Instead of splitting a dual-head display across two or more screens, most dual-head drivers let you clone the first, giving you the option of two identical displays in different locations.

musicians put this in between their speakers, but doing so invariably compromises the stereo image, especially with the huge footprint of a CRT monitor. Flat-screen TFT monitors are considerably better in this respect, but an even better alternative is often to hang a larger flat-screen monitor on the wall behind your monitor speakers.

KVM switchers allow you to connect two or more PCs to one keyboard, mouse, and monitor, which is useful if you run one main

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PC REMOTE CONTROL OPTIONS

► machine and additional PCs for soft synths or soft samplers. Although I've not seen many people doing this, it's perfectly possible to take the opposite approach: to connect multiple keyboards and mice to a single PC, so you can have one set by your mixing position, and the other atop your music keyboard. As long as you don't operate both simultaneously your PC will be perfectly happy. After all, this is no different from laptops that provide external mouse and monitor sockets to supplement the internal trackpad and flat-screen display. You don't have to use a full-sized second keyboard either — it's possible to buy stand-alone laptop-sized models that may prove more convenient, as well as keyboards with integral trackpads or trackballs. Similarly, if you have a dual-head graphics card, you don't have to use it to provide split-screen viewing: you can normally also use them in Clone mode to provide two identical displays at different places in your studio.

Wireless Keyboards & Mice

Many musicians are investigating ways to free themselves up from being permanently wired to the PC, so it's hardly surprising that wireless keyboards and mice are becoming increasingly popular, because you can pick them up and operate your MIDI + Audio sequencer from a distance of several metres (assuming you can still see the monitor screen clearly).

Two main technologies are used in wireless remotes: IR (infra-red) and RF (radio-frequency). IR devices are often slightly cheaper, but their range tends to be limited to a couple of metres, and like most TV remotes, they have to be aiming in the general direction of the receiver (line-of-sight) to provide reliable performance. This is mostly fine for mice and keyboards, but for more reliable use at greater range, RF is the more robust solution, since an RF remote doesn't need to be aimed at its receiver to operate reliably.

I've now had the opportunity to test out several RF wireless key/mouse combos in review PCs from Digital Village and Red Submarine, and didn't have any problems with interference (always a possibility where RF is involved close to digital gear such as synths, CD players, and so on). Wireless mice are always significantly heavier than their corded cousins due to internal batteries, which may take a little getting used to, and you will have to replace these periodically unless you buy a model featuring batteries that can be recharged by plugging the mouse into a USB port. However, their speed of response shouldn't be any different, despite what you may hear

from games players.

The increased weight of wireless keyboards is largely irrelevant, but to save battery power most dispense with the normal trio of Num Lock, Caps Lock and Scroll Lock indicators, which anyone who does a lot of typing may miss. As with standard keyboards and mice, wireless keyboards are also available with integral trackpads or trackballs, which makes even more sense when you're frequently moving them from one place to another.

Wired Remotes

Many hardware MIDI controllers include dedicated transport controls as well as faders and/or synth editing controls. There are various other ways to achieve the same end. For instance, *Cubase VST* and *SX* users could just plug in a USB numeric keypad, which duplicates the cluster of buttons normally found on the right-hand side of a standard PC keyboard. Primarily intended for use with laptops that lack these functions, they can also be extremely useful on the end of a long cable placed next to your music keyboard, to provide transport, marker and other controls. The keypad just



There are various options if you want some dedicated hardwired transport controls, such as the Syntrium Red Rover and Contour Space Shuttle shown here.

appears to Windows as another standard keyboard, and shouldn't require any special drivers. Other sequencer users could also use this device if their application provides configurable keyboard shortcuts — I've seen postings from *Cool Edit Pro* users who have done this — and even if this isn't possible there's Windows software that can help, as we'll see shortly.

Cool Edit Pro 2 users also have the option of the Red Rover, which is a small hardware box connected via USB that incorporates a cluster of transport controls among others. There are also various other USB devices that promise similar or enhanced control possibilities, such as the Videonics

Network Remotes

It's also possible to go further than a dedicated remote and control one PC from another, connected using some sort of network. While many industry professionals are extremely familiar with networks, most musicians are still novices, so here are some basic facts. PC laptops often need to have their contents updated or downloaded to a desktop machine, so nearly all have featured integral network sockets for some years. Many PC desktop motherboards now incorporate integrated LAN functions as well, but if yours doesn't already feature an RJ45 jack socket, you can now buy suitable 10/100 PCI network cards for around £10 per PC, although you will of course need a spare expansion slot.

If you only want to connect two PCs, you just need a 'crossover' cable between them, which is wired differently from a standard one. However, a more ambitious setup with three or more PCs will need some sort of hub. If you don't expect to be moving huge files and are therefore happy with slower transfer speeds, there are now special USB cables that let you connect two PCs and transfer data between them without any additional hardware. Typical transfer rates are only 750 kilobytes/second (or 45MB/minute), but for the majority of data files apart from audio and video this should be quite sufficient.

If it's inconvenient to attach your various PCs with cables then a range of wireless options exist, just like the remote controls I describe in the main text. Belkin have a USB infra-red Smartbeam device for about £50, which plugs into a USB port and can then receive data from a nearby (up to one metre) IrDA device such as a laptop at up to 115kbps, although its range isn't nearly enough for our purposes. In general I suspect that an RF wireless option is once again the most suitable for our purposes, and here there are a lot of options.

Bluetooth (www.bluetooth.com) technology only works over a short range of up to 10 metres and only transfers data at up to 1.2 megabits per second, which would still be quite fast enough for remote control, but probably not for full-on music editing. WiFi can manage a rather speedier 11Mbps per second (see *SOS* October 2002 for more details on these two technologies), and you could use this in conjunction with a Pocket PC as a remote control, although it does seem overkill compared to the dedicated RF remote I describe in the main text. As for software, both Windows XP Home and Professional already include the Remote Desktop, although unfortunately only the Professional version can act as a remote host, which is what you need to take control of the other PC.

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Model shown, SM6P pro nearfield monitor

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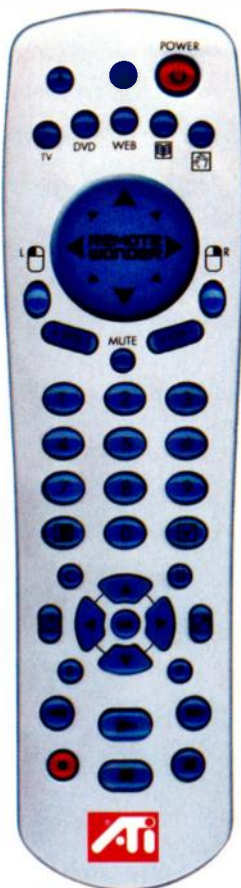
Infra-red Remote Controls

Of course, many musicians will already have wireless remotes offering dedicated transport controls, numeric keys, function keys and quite probably up/down volume buttons, for controlling hi-fis, TVs and DVD players. Wouldn't it be nice to be able to use these to control your MIDI + Audio sequencer? Well, it might be possible. A few consumer soundcards, notably Creative's Audigy and Audigy 2 Platinum models, are provided with their own infra-red remote handsets for use with the Creative *Remote Center* software.

Most modern PC laptops also now have built-in infra-red receivers, and many standard PC motherboards already have connectors for an IR receiver, although few PC desktop or tower cases make provision in their front panels for the receiving device itself. Unfortunately, both types nearly always comply with IrDA (Infrared Data Association) specs, which are rather different from those of the standard remote control handsets that you already have lying about the house, and were never designed to decode their signals. So, in most cases you will still need a suitable IR receiver, even if you already have a remote to hand.

The IRa (infra-red adaptor) from Home Electronics (www.home-electro.com) is one example of a PC receiver that overcomes this problem; it's an IR receiver on a four-foot-long cable that plugs into any spare serial port, and costs around \$20. Using this, it's possible to use an existing TV or video remote control to send commands to your PC. Judging by my research, it should work with most TV, video and hi-fi remotes, as well as with Creative's soundcard remote handset.

You could also build a serial-port IR receiver yourself — it's possible to do this with just six components including the serial port connector. After all, all it needs to do is respond to incoming pulses of infra-red from an existing remote control —



ATI's Remote Wonder is the holy grail for the PC musician — an RF remote control that can (with suitable software) control your MIDI + Audio sequencer from up to 30 feet away, even through walls and ceilings!

each model will emit different streams of pulses for each button, and it's the software that decodes these. More complex receivers use small processors to decode incoming pulses, which will save your main CPU having to do the work, but these also restrict which transmitter devices they can use.

For a more generic solution, you can buy a dedicated IR remote and PC receiver combination. Streamzap (www.streamzap.com) seems to be one of the most popular in the US at around \$40, with an IR receiver that plugs into a USB port, plus a hand-held remote featuring a good selection of controls including a set of transport controls, numeric keys, a cursor cluster with a central OK button, and four user-definable coloured buttons across the bottom. It comes with software that runs on Windows 98, ME, 2000 and XP, but this mainly supports a wide range of player applications including *Winamp* and Microsoft's Media Player, and not any MIDI + Audio sequencer applications. Streamzap sadly has no UK distribution at present.

RF Remotes

As I've explained, RF provides far greater range and penetration than IR, as well as having no line-of-sight requirement. This makes it potentially far more useful in the studio, and RF remotes may also be applicable for use in a live situation where a full computer keyboard might be too fiddly to use in the heat of the moment.

During my research for this feature I discovered a prime candidate for the job in the shape of the ATI Remote Wonder. This is bundled with some ATI graphics cards such as the Radeon 7500, but you can also buy it separately either direct from the ATI web site for \$49, or through various other outlets. In the UK, Blisware (www.blisware.com) are the exclusive sellers of this product, and you can order it direct from them for £29.36 inclusive of VAT and P&P. They kindly sent me one to try out, and I'm very glad they did.

Its RF receiver is smaller than a box of matches, and plugs into any USB port. In combination with the remote handset itself, which uses four AAA alkaline batteries, it's effective up to about 30 feet, and can even work through walls. Like Streamzap, the Remote Wonder features transport controls, numeric keypad, a cluster of cursor keys and an OK button that emulates the Enter key, plus six user-definable keys labelled A to F, and volume +/- and channel +/- rocker controls. However, it also has a thumb pad that acts like an eight-directional mouse, plus dedicated left and right 'mouse' buttons, minimise/restore key, drag function in conjunction with the thumb pad, and various other keys to launch specific applications such as Media Player and Browser. There's even a Power button to provide Alt+F4 close application duties. You don't have to have an associated ATI graphics card either — the only limitation when using it 'stand-alone' is that a few of the dedicated buttons such as TV and DVD won't be available.

Its polished silver casing, sky blue and occasional red buttons are certainly smart, and there's an integral red LED that indicates each button push, while the buttons themselves have a very positive feel. However, at eight inches long and around two inches wide it's larger than any other remote I've ever used, so it's a shame that the transport controls are right at the bottom, since this makes it more difficult to operate them 'one-handed'.

The supplied Remote Control software was only version 1.1, but the enhanced version 1.4 Remote Control I downloaded let you adjust the thumb pad speed and acceleration, and once tweaked I found it no more difficult to operate than a trackpad. This software also lets you assign a keyboard shortcut to each of the A to F user-definable buttons, or to launch an application from them, and to import plug-ins to control a variety of applications. Sadly these don't include any MIDI + Audio sequencers, and the user-defined buttons aren't sufficiently versatile in themselves for our purposes. There is an SDK (Software Development Kit) to write your own DLL plug-ins, but this is really the realm of the programmer, since it requires a suitable C compiler.

Remote Software

All of the remote devices mentioned so far are primarily designed to control specific software applications such as those used for playing CDs, DVDs, MP3 files, or changing TV channels with a suitable TV tuner graphics card, and while some do support their own format of plug-ins, you are still

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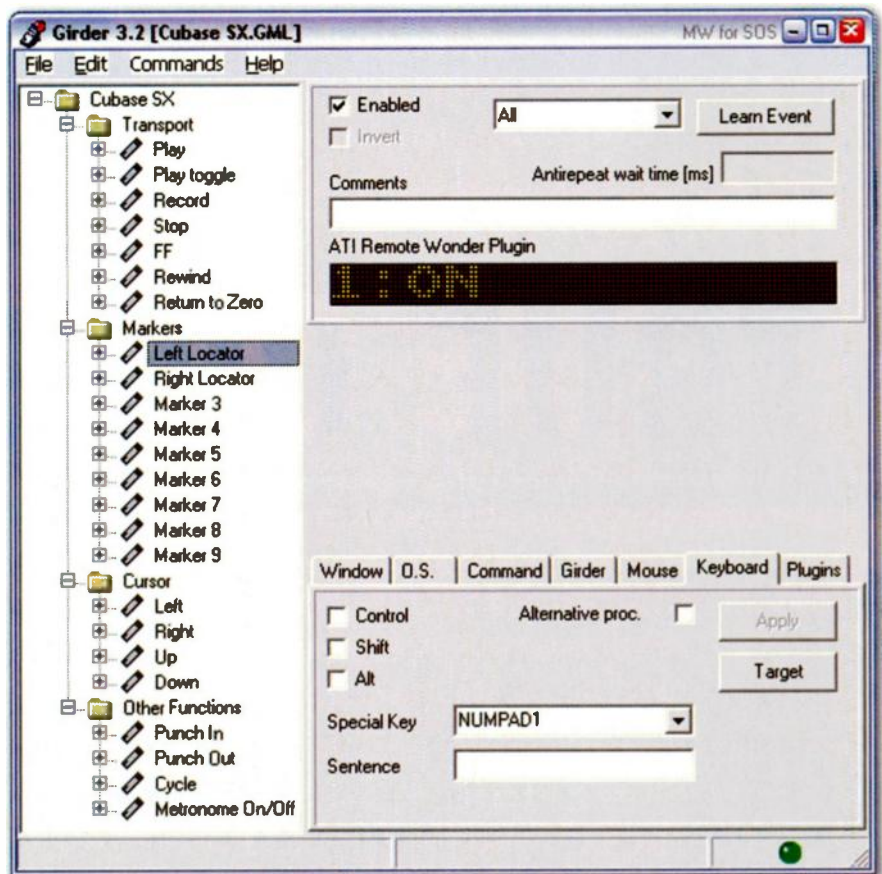
► largely dependent on programmers to write something suitable for other applications. Sometimes, as in the case of the Remote Wonder, the transport controls may also transmit standard commands to Windows. However, these functions may only be supported by Windows applications that respond to WM_APPCOMMAND, and no music applications do to my knowledge. Apparently these commands are also issued by the additional 'multimedia' keys on various PC keyboards.

So, whether you opt for infra-red or RF, or are trying to map multimedia keys, most bundled software is restricted in the software applications it can control, and we still need another way to convert the remote signals being received into commands suitable for operating music software. Thankfully there are various PC utilities that aim to do this, and one of the most comprehensive seems to be *Girder* (www.girder.nl). The fact that it's also freeware makes it extremely popular.

Girder will run with Windows 95, 98, SE, Me, NT 4.0, 2000 and XP, and can control any input or output device with a suitable plug-in. For example, it can translate the various incoming instructions from a remote handset into suitable Windows or keyboard commands, but in addition to this, *Girder* is also capable of translating standard PC keyboard input into other actions on your PC, which could mean you can finally make use of those redundant keys on your multimedia PC keyboard to control your sequencer. It can also translate mouse actions and movements into commands, and perform most common Windows tasks, such as closing windows, switching between them, and powering down the PC.

It's totally user-configurable and is bundled with quite a few plug-ins to control different devices, including one for IRa, while there is also a wide range of user 'plug-ins' for you to download separately, including one to make Streamzap more versatile, and several for ATI's Remote Wonder. Essentially you first load a plug-in that recognises your particular input device, whether it's a remote control, computer key press, timer, and so on. Multiple plug-ins can be loaded if required, and then *Girder* can receive real-time 'Events' from them all (its taskbar icon flashes whenever a remote message is received).

To configure your own setups, you then use the Add Command function in the Explorer-like tree structure on the left hand side of *Girder's* interface, choose an action from one of the various tabbed windows on the lower right, and then activate Learn Event and press one of the buttons on your



Girder may not look very exciting, but this item of freeware can be configured to provide full control of the majority of sequencers using an infra-red or RF remote control.

remote device to attach the command to it. These include various Windows actions such as maximise, minimise and set focus, OS commands including shut down and Play WAV, commands that Windows sends to its dialogues plus mouse clicks and their position on screen, a selection of *Girder* actions to reconfigure your setups in real time, along with actions that simulate the various mouse movements and series of key-presses, and further plug-ins that can perform more complex tasks.

Another advantage for our purposes is that it can pass commands to specific windows, whether they are currently active or inactive. This means, for instance, that you could still have transport control of your sequencer while working in a stand-alone synth editor. The commands can also be given States, so that they perform one action on the first press, another on the second, and so on. You could use this to open and then close a window, for instance, or to sequentially select between various on-screen options. Yet another option is to designate one two-state toggled button as Shift or Control to double or treble the effective number of other buttons on your remote.

It would take a few hours' work to create

a preset file to control an audio application like *Cool Edit Pro*, *Cubase*, *Logic Audio*, *Sonar*, *Wavelab*, and so on, but you should find few restrictions once you get your head round all the options, and *Girder* also has an active user forum if you get confused by the many options. My own feeling is that ATI's Remote Wonder is the remote package for the musician to go for in conjunction with *Girder*, although I'd be interested to hear from any musician who has got encouraging results from infra-red hardware.

During the course of writing this feature I created a *Girder Remote Wonder/Cubase SX* preset that provides control over the transport buttons, markers, cursor cluster and various other functions, while the thumb pad and its buttons are perfectly usable as an emergency mouse. It's still evolving, but drop me an email (pcnotes@soundonsound.com) if you would like a copy, or if there's sufficient demand I'll post it on the SOS web site. Even two floors away from my studio the Remote Wonder is still reliably controlling *Cubase*, and now that I've experienced the total freedom that RF control offers, I'm hooked!

Many thanks to Blisware, who supplied the ATI Remote Wonder described in this feature. SOS

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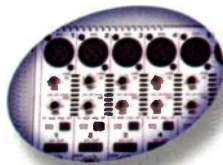
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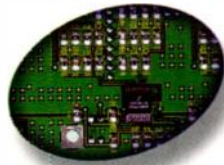
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Preparing Your CD & Artwork For Duplication



The CD booklet artwork proofs for Cheltenham College band Jig, and the finished product fresh from the pressing plant.

requirement was for a standard jewel-case presentation. This common format requires three sets of artwork: the rear inlay card (with spines); the front cover booklet; and the disc on-body design. The text for the booklet was supplied by

the college, along with front-cover graphics and a couple of photographs of the band in their stage costumes. I had taken some session photos which were also included. The photos and graphics were scanned using a good-quality and properly calibrated scanner, with sufficient resolution to ensure at least 300dpi (dots per inch) at the size they would appear on the printed artwork. Most scanners generate artwork in RGB (red, green and blue) format, but for printing, each scan needs to be converted to the four-colour CMYK (cyan,

magenta, yellow and black) format — and life is much easier if this is done before you start importing pictures into page layouts.

With all the text and artwork loaded into the computer, it's time to start designing the layouts. The simplest booklet for a CD jewel case is a four-page design — basically a single piece of paper folded in the middle. Larger booklets can be produced in multiples of four pages by inserting additional folded sheets and fixing them together with staples, a process known as stitching in the printing trade. Alternatively, you can design the artwork onto one large piece of paper which folds up, usually in a concertina fashion. The pressing plant will be able to advise you of the various options.

The most important first step in designing the artwork is to set the page size correctly in your DTP program — and different replication houses have slightly

Once your record is mixed, edited and mastered, you may want to get it pressed professionally with proper artwork. But what's the best way to go about it?

Hugh Robjohns

While the audio is one aspect of producing a CD, if you're wanting a finished product then there's also the artwork to consider — the booklet, the inlay card and the CD graphics. I enjoy producing the artwork almost as much as the recording and mastering, but if this isn't your cup of tea, then most pressing plants have a reprographics department which can do it all for you, for a fee. I routinely use the professional Adobe *Photoshop*, *Quark Xpress*, and *Acrobat* graphics and DTP (desktop publishing) software for my

authoring work, and files produced using these programs are universally accepted by printing houses. However, I have also produced equally competent artwork in the past using the far more affordable Corel *Coreldraw* and Microsoft *Publisher* suites, but the number of pressing plants that can accept material supplied in these forms is rather more limited, so check before you start.

Preparing The Artwork

In many cases, and certainly in the case of the production I've been writing about over the past couple of months (a recording for the band Jig from Cheltenham College) the

The CD Pressing Process

The CD pressing process is very simple in principle, but complex in the detail. The first stage is to use the data on the CD-R audio master to control a laser beam recorder which copies the data to a photo-sensitive layer on an optically flat glass disc — this is the 'glass mastering' process. This special disc is then developed in much the same way as camera film to leave an etched surface carrying the microscopic pits of data. These glass discs are expensive to produce, the recorder is an expensive precision instrument, and the whole process has to be performed under scrupulously clean conditions, hence glass mastering is an expensive element of CD replication.

The etched glass master is not used to stamp discs itself, but is used

to create a metal stamper through a process called electroforming. A layer of nickel is effectively grown onto the disc, transferring the etched pits on the glass into bumps in the metal disc to produce a 'father' disc. For very short CD pressing runs, this father can be used as the direct stamper, but it is more common to produce one or more 'mother' discs from the father, and then several 'sons' from each mother. The sons are used as stampers to produce the raw plastic CD discs. The stamped raw plastic CDs are first metalised to produce a reflective layer, and this is then protected with a lacquer. The lacquer layer is then printed over and the finished discs are loaded into jewel cases, wrapped and boxed.

The father disc is usually stored

for up to five years at the pressing plant to avoid having to create a new glass master should a second pressing run be required — although it

may still be necessary to produce new mother and son stampers from the archived father, a process which is usually chargeable.



differing requirements so always check before you start. A lot of pressing plants publish their print sizes and templates on their web sites, but if not then a quick phone call will supply the necessary dimensions. I used a company called SFH in Wembley for this particular project, and its web site specifies a booklet size of 242 x 119.5mm, plus a 3mm 'bleed'. If you want pictures or graphics to go right to the edge of the paper it is necessary to allow the picture to 'bleed' over the edge (by at least 3mm in this case), so that when the printed booklets are cut to size, any inaccuracy in the trimming process doesn't reveal unprinted white edges.

For a four-page booklet you need to design two sheets: the first carries the front and back page and the second carries the two inside pages. An eight-page booklet requires four sheets: front and back; pages two and seven; pages six and three; and pages four and five. The SFH website has templates of the necessary page pairings for booklets up to 24 pages. A lot of CD pressing plants specify the cheapest booklet option as a '4/1 booklet'. This refers to the number of colours on each side of the booklet paper. Full-colour artwork requires the four CMYK colours, that means that the 4/1 booklet's front and back covers are printed in colour, while the inside pages are printed in a single colour only — usually plain black. For this project I required a '4/4 booklet', with full colour on both sides, because of the session photos were placed on the inner pages.

The inlay card, which is trapped inside the back of the jewel case, requires another bespoke page size, in this case 151 x 118mm with the 3mm bleed again. It is also important to mark a folding line for the

spines 6.5mm in from the left and right edges. Most plants will automatically specify the inlay card in full colour, although some may print in monochrome at reduced cost. A lot of companies specify the spine labels to be arranged in a mirror image of each other, the base line of each label being towards the inside of the paper. However, I prefer to have

both spine labels with their base lines facing the left-hand side, which seems to be the way most commercial CDs are printed.

The labelling on the CD disc itself is referred to as 'on-body printing', and the dimensions and colour options vary considerably between pressing plants. Most can now offer four-colour printing, usually



The artwork proof for the on-body CD printing — the size of the hole at the centre of the image is critical, and each pressing plant will have its own tolerances depending on the printing technology used.



The artwork proof for the jewel case's rear inlay card — note that fold lines have been indicated, and that the image has been allowed to bleed over the crop marks to avoid any white edges when the cover is cut to size.

inappropriate. Without a paper proof copy to check, the error may not be discovered until 1000 discs turn up at your front door, by which time it is far too late! Some plants will accept a PDF proof copy, but I would always recommend sending paper proofs as the universal safety format.

The colorimetry of inkjet printers is not usually that accurate, so if any print colours are critical — perhaps a logo, for example — it pays to specify them in terms of the standard Pantone colour sheet. Art shops can supply a Pantone Colour Formula Guide swatch, which, although quite expensive, is a very handy reference if you do a lot of accurate colour work.

Finally, pack the two audio master discs, the two artwork master discs, the colour proof printouts, and a letter detailing what you are expecting the pressing plant to supply, along with any special instructions, a cheque, and your contact details, into a plastic wallet to keep everything together. You may also need to include a copy of the MCPS licence. Some plants will ask you to sign an MCPS waiver form for short print runs if you have not applied for an MCPS licence, but it is worth noting that the pressing plant is obliged to supply the MCPS with details of every disc or tape it produces, regardless of the size of the print run, along with the contact details of every customer. So the MCPS has the information to track you down very easily if you are having discs produced

without the appropriate licence. You have been warned! In the case of the Jig project, where we were only producing 500 discs for sale to parents of the Cheltenham College students, we were able to use the MCPS Limited Product Availability Licence, which is very easy to complete and costs just £70.50.

After All The Hard Work...

About ten days after shipping all the paperwork and discs off to the pressing plant, a courier will hopefully bang on the door with several boxes full of CDs for you. Most plants pack CDs in boxes of 25, with four of these boxes contained in a larger case for more convenient shipping. Hopefully, when you open the boxes you'll find everything in perfect order, with crystal-clear printing exactly as you expected, and with a fantastic-sounding CD inside.

You may also find an invoice for a small number of extra CDs. This will be because it is not possible to stop the CD pressing machines after producing a precise number — discs are produced on an automated line which takes a certain amount of time (and discs) to run up to full speed and then run down at the end. These surplus discs will be shipped to the customer and have to be paid for — in the case of this project, I ended up with 24 extra discs. **SOS**

My thanks to SFH UK Limited for their assistance with this article.

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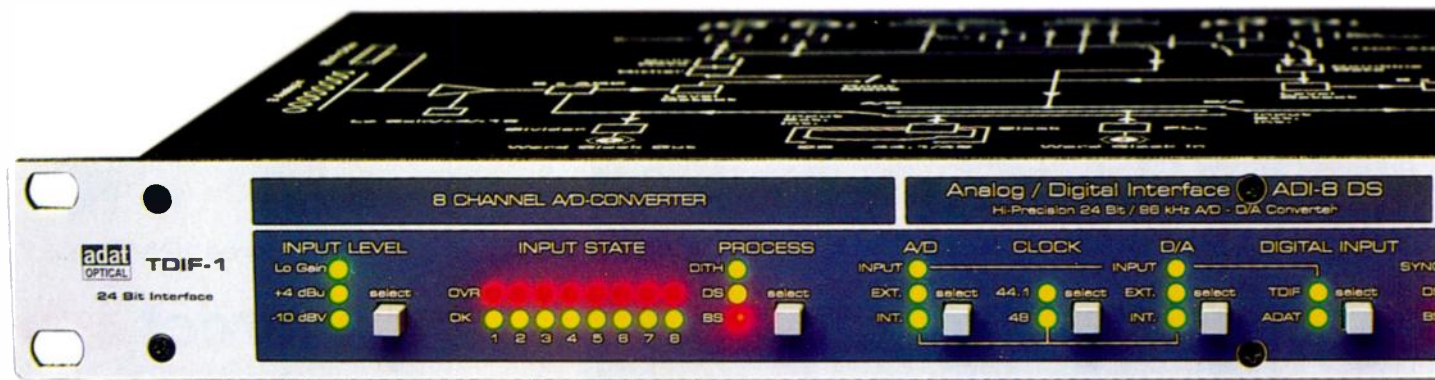
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RME ADI8 DS

Eight-channel 24-bit/96kHz A-D/D-A Interface

German manufacturer RME maintain their high reputation for quality A-D/D-A interfacing with this eight-channel device, which may be run at 24-bit, 96kHz operation if desired.

Hugh Robjohns

RME have built up a good reputation and strong following for their range of converters over the last few years, and many of the company's products have appeared before in the pages of *Sound On Sound*. The latest addition to the product range is the ADI8 DS, which is part of the burgeoning ADI range and also a development of the ADI8 Pro. In short, this is an eight-channel bi-directional converter with a host of additional functionality thrown in, and all housed in a 1U rackmount case. The most obvious difference compared with the ADI8 Pro is the fact that the 8 DS supports 24-bit, 96kHz operation — the DS stands for Double Speed!

Like its predecessor, the new unit provides both ADAT- and TDIF-formatted outputs and inputs, with dual interfaces for each to allow bit-splitting as before, enabling 24-bit data to be recorded on 16-bit media. However, a further extension to this idea is the Double Speed option, enabling the transmission of high-sample-rate data via the ADAT lightpipe interface using the S/MUX format, which sends one channel's high sample-rate signals via two ADAT channels in much the same way as the original bit-splitting technique.

A full range of clocking modes is also

incorporated, and there is a digital copy facility to enable data presented on one of the digital inputs to be routed directly to all the digital outputs, complete with any required format conversion along the way.

Round The Back

Usually, a quick look around the back of a product like this often saves hours of

reading through translated manuals, because the main functionality becomes immediately obvious. In the case of the ADI8 DS, the top panel is printed with a large block diagram showing the various signal paths available within the unit, and the rear panel is well laid out and surprisingly uncluttered given the amount of interfacing provided. In fact, the interconnectivity of the ADI8 DS is identical to that of the ADI8 Pro.

To the extreme left we have the ubiquitous IEC mains inlet for a switched-mode power supply accepting voltages from 100 to 240V. The analogue I/O is all arranged along the bottom row of connectors on the unit, while the digital I/O is arranged across the top.

Analogue inputs to the A-D are catered for in two formats: a 25-pin 'D'-sub wired to the familiar Tascam standard in the centre of the unit and an octet of TRS quarter-inch jack sockets — both are electronically balanced, adjusts for balanced and unbalanced inputs automatically, and can be switched for three different input sensitivities from the front panel. The balanced analogue outputs from the D-A converters are similarly equipped with a 25-pin 'D'-sub and eight TRS sockets and both may be used simultaneously if required. Again, the servo-balancing circuitry adjusts the level automatically for balanced or unbalanced destinations, and once again the maximum output level can be determined by a front-panel switch.

The digital I/O comprises a further pair of 25-pin 'D'-sub sockets to provide a main and auxiliary TDIF I/O, plus four Toslink ADAT optical ports, each fitted with the usual, removable dust cap. Of these, two provide the

SOUND ON SOUND

RME ADI8 Pro £1280

pros

- Compact eight-channel interface.
- Very good quality/price balance.
- ADAT and TDIF outputs available simultaneously.
- 24/96 performance.
- S/MUX and 'Double Wire' compatibility.
- Digital copy mode.
- Configurable analogue levels.
- Clocking options.

cons

- Manual translation is confusing in places.

summary

An eight-channel A-D and D-A converter using ADAT optical and TDIF interfaces, with bit and sample-splitting facilities to support 16- or 24-bit resolution and standard or elevated sample rates. Sophisticated clocking arrangements and a digital copy mode complete the spec sheet.



main and aux inputs, and two the main and aux outputs. The slightly odd thing, to my way of thinking anyway, is that the digital inputs are grouped with the analogue inputs, and the digital outputs with the analogue outputs, rather than in a logical A-D section (analogue ins, digital outs) and D-A section (digital ins, analogue outs). It's a small point and one which will be largely irrelevant when the unit is plugged up and bolted in a rack, but it confused me when I first started to hook the box up.

The ADAT optical inputs employ RME's

bespoke 'Bitclock PLL' to extract the embedded word clock, while the TDIF boasts a 'low jitter PLL' circuit to help extract its word clock signal. The TDIF interface incorporates support for automatic decoding of pre-emphasised tapes, but the emphasis flag is not passed through to the output in copy mode.

Word-clock input and output are provided on BNC connectors, and near the input socket is a recessed button which activates a 75Ω termination. Normally, the word-clock input presents a high impedance, suitable for

bridging or daisy-chain clock termination. The sophisticated clock recovery circuitry can cope with a wide range of signal distortions including overshoots, and asymmetrical or misshaped clock pulses. The word-clock output can be used to distribute clock signal to other units, to act as the clock master for an entire system. This output clock is derived from that used by the A-D, and if an external input is selected, the output clock is phase-locked with a zero degree offset to the input clock. It is also required to synchronise slave DTRS machines such as the DA88.


The front panel is styled in the same way as most other RME equipment — a brushed metal panel with screen-printed grey boxes and white lettering to identify the various control sections and functions.

The mains power rocker switch is at the right-hand side, and the operational controls are arranged logically from left to right, with the A-D facilities on the left, the clocking and digital I/O format selection in the centre, and the D-A facilities on the right.

A-D Section







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RME AD18 DS

► which achieve a claimed 117dB dynamic range, and the analogue circuitry is completely symmetrical and DC-coupled throughout. In fact, the published specifications are slightly better than those for the AD18 Pro, and that was no slouch either.

The input level is adjusted for all eight channels simultaneously via a single push button which cycles around three input sensitivity options. The current mode is shown on one of three LEDs labelled 'Lo Gain', '+4dBu', and '-10dBV' and these correspond to maximum input levels (ie. 0dBFS) of +19dBu, +13dBu and +2dBV (+4dBu).

Each channel's input level is metered with two LEDs, the first being a green 'OK' light, the brightness of which is proportional to signal level and this starts to illuminate when the input signal exceeds -40dBu. A red 'Over' LED

sample-rate option is not included as part of the clock section on the front panel.

In the double speed mode, each channel occupies two tracks of the recording device, so channel 1 is dispatched to tracks 1 and 2 of the recorder, channel 2 to tracks 3 and 4, and so on. Channels 5-8 are output via the second 'aux' digital output: channel 8 being allocated to tracks 7 and 8 of this second machine.

The third option is the bit-split mode, and this is used to accommodate 24-bit data on a 16-bit medium. There are several different ways of doing this, and the method chosen by RME is the same as that provided as an option by Yamaha on some of its digital desks, for example the O2R. This arrangement requires two recorder tracks per channel, with the first channel being routed to tracks 1 and 5, the second to 2 and 6, and so on. To record all

aux input is synchronous with the main input the LED remains lit.

The last button is labelled 'Copy' and this is used to route the digital inputs through to the corresponding digital outputs, thus enabling digital cloning of data between machines.

Clocking Section

The final, central control section of this unit is concerned with the clocking and digital source selections. Only one of the two digital formats can be accepted as the input to the D-A at a time, so a push button allows either the ADAT or TDIF input to be selected.

The clocking arrangements are quite sophisticated, with three more buttons to determine what is going on. The clocks for the A-D and D-A can be selected independently from one of three sources:



If you weren't certain from looking at the front panel, the back panel makes it clear just how versatile the AD18 DS is, with all eight outputs available on the left (on jacks, analogue 25-pin 'D'-sub connector, Main and Aux ADAT optical connectors), all the inputs available on the right in the same formats, and the bi-directional TDIF-format digital Main and Aux connectors on 25-pin 'D'-sub connectors in the centre. A word-clock in and out (the input with recessed 75Ω termination button) complete the picture.

illuminates at -2dBFS — so it's more a peak warning light than a true over LED — but I'd rather be warned when peak levels are close but below clipping than when they're over!

The A-D converter outputs are made available via both output formats simultaneously, and to all ports — both main and aux — unless one of the bit-splitting modes is in use (more on these in a moment).

The last facility in the A-D section is a button labelled 'Process' which is associated with three more LEDs. Again, pressing this button cycles through three options: dither, double-speed and bit-split. The dither mode reduces the word length of the output and re-dithers it using triangular dither (TPDF) at 16-bit resolution, for use with 16-bit ADAT or DTRS recorders, for example. The double speed mode causes the A-D converter to operate at double the selected sample rate, but because the ADAT lightpipe port does not support high sample rates, the unit automatically engages a sample-splitting mode, known as 'double wire' to Tascam owners and S/MUX to ADAT users.

It is worth noting that the word clock output from the BNC terminal remains at 48kHz (or 44.1) to provide a valid clock reference to DTRS recorders, even though the audio data contains 96kHz (or 88.2) samples — and this is the reason why the high

eight channels, two recorders are required, and channels 5-8 are output through the aux interface. Needless to say, it is not possible to use both double speed and bit-splitting modes simultaneously, as both require the aux output, but use it in different ways.

D-A Section

The D-A section is fractionally more complex than the A-D since there are three buttons instead of just two. The maximum output level can be selected using one of these buttons to cycle through the three options: 'Hi Gain', +4dBu and -10dBV. These three modes correspond precisely to the input sensitivities, providing peak output levels of +19, +13 and +4dBu respectively. Like the A-D, a row of eight green LEDs illuminates progressively as the signal level rises above -40dBFS.

The button to the left of the section provides one of two data recombining modes corresponding to the Double Speed, and Bit Split configurations of the A-D section. Clearly, it is vital that when more than four channels are involved, the two multi-channel digital inputs carry synchronous data, and a green LED labelled Sync is provided to indicate the clocking status. If data is not present on the second aux input port the LED is off, while present but unsynchronised data is shown by a flashing LED. If the data on the

either the selected digital input (ADAT or TDIF), the external word-clock input socket, or the internal crystal clock. If the latter, sample rates of 44.1 or 48kHz can be selected via a third button.

The logic of the clock-source switching initially seems slightly obscure. For instance, changing the D-A clock source also changes the A-D clock source under certain conditions, and sometimes the A-D clock can not be changed at all unless the D-A is changed first! For example, if both A-D and D-A are set to the external input, and then the D-A clock is changed to internal, the A-D also changes to internal, and if the D-A is set to internal, the A-D cannot be changed until the D-A is selected to something else. If you think about it, the automatic clock selections and barred modes are actually perfectly sensible and logical — it can just be a little frustrating when you want to change the A-D clock source and the machine won't let you!

In Use

The AD18 DS is a very simple product to use, and I had the unit hooked up and running in just a few minutes. Configuration is simply a case of deciding on the best operating levels in and out, which doesn't require much thought really, and what the clock source(s) should be.

I started by hooking the AD18 DS up to my usual Apogee PSX100 converter, using both the lightpipe and TDIF interfaces to pass just a stereo pair over two channels at first. I was then able to feed the output from the Apogee A-D, acting as a reference source, through either the RME or the Apogee D-A to compare the differences. Equally, I was able to reconfigure the system to compare the two A-Ds, this time using the Apogee D-A as the reference decoder.

In both cases, I was impressed with the sound quality provided by this unit. Stereo imaging seemed very stable, with good depth and width — indicating low jitter — and the resolution of both the A-D and D-A converter was to a high standard.

Hooking up the unit in a more conventional way, it proved to be very easy to use the AD18 DS — it simply got on and did all that was asked of it. The 16-bit dither mode worked exactly as it should, with a smooth noise floor at -93dBs, entirely characteristic of the TPDF dither function used.

The difference in sound quality between standard and double sample rates was subtle, but noticeable — the latter being slightly more open-sounding when running from its internal crystals. However, connecting the word-clock input to an external 96kHz word clock source caused no end of confusion! It seems odd to provide an external word clock input on a 96kHz converter, but not include the ability to lock to an external 96kHz reference clock! Standard clock rates were accepted without problem, though.

Both the bit splitting (enabling 24-bit data to be recorded on 16-bit media), and the Double Speed modes (using the S/MUX format) worked well and without any problems at all, although it is obviously vital to ensure that if two eight-track recorders are being used they are correctly synchronised together to sample accuracy on replay. Any loss or drift in sync is highlighted by the flashing of the Sync LED, but even if the Aux side of the link is lost completely the audio continues with no interruption (only reduced quality, and the reduction is pretty subtle). Losing the main side of the link quickly causes both Combine modes to give up in disgust!

I liked the clocking facilities — in particular the ability to slave the D-A converter's clock directly to the same clock as the A-D — ideally the internal crystal. This arrangement can help to reduce jitter, noise and distortion considerably, since the D-A clock will be the same one as used for the original A-D conversion, and which will also usually be the clock master for the entire recording chain. The advantage as far as the D-A goes is that, rather than having to extract the word clock from the incoming digital audio signals — and thus potentially suffer from cable-induced jitter artefacts — the local word clock is guaranteed clean and accurate.

Overall, then, this is a fine eight-channel dual-converter offering a useful range of facilities and functionality at an attractive price, making it an ideal partner for a wide variety of project studio systems. It is ideal for use with 'legacy' ADAT and DTRS recorders — helping to extend their useful life by enabling them to become high-resolution recorders, albeit with

only half the number of tracks per machine. It can also act as an interface for eight-channel soundcards equipped with ADAT interfaces, providing a no-fuss means of getting analogue signals in and out. **SOS**

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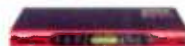
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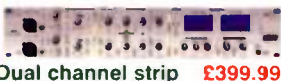
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VIRSYN CUBE

► envelope editor below it can be used to display either the volume envelope or one of the X or Y morphing envelopes. Yellow dots mark the breaks between different segments in the envelopes, and are consistent across all three envelopes — so, for instance, if you want to have the end of a decay phase at a particular point in time, you'll also get a breakpoint on the X and Y morphing envelopes, whether or not you choose to have the morphing path change direction at that point.

The 2D editor provides a clear representation of the way your sound's timbre changes, and a very neat and fast way of editing it, but it doesn't convey any information about the timing of each stage — the length of a segment in this view simply indicates a more or less radical change in the sound, not whether that segment takes more or less time to enact. Unless you press a key, all that appears in the 2D window is a series of straight lines joined by yellow blobs, with no indication of direction. All of these are identical, and the only way to tell whether the one at the end of a line represents the beginning or the end is to select it and see where it appears on the conventional envelope editor at the bottom of the screen. Things get confusing even with fairly simple X-Y morphing envelopes, especially if they return to the place where they started, and more complex envelopes can make your brain hurt. Adding to the complication is the ability to assign both vertical and horizontal morphing to controllers such as mod wheel, velocity, key track and aftertouch. If you do this, the controllers then interact with the X and Y morphing envelopes in a way that isn't explained at all well in the manual.

In the initial version 1.0 of *Cube* there was no indication of the current morph position or direction at all. As I was writing this review, however, an update to version 1.01 was posted on the Virsyn web site, and went some way towards making the 2D envelope editor clearer by adding an animated blob, which moves around to show you the current position of the morph. Nevertheless, I still feel that more could be done: it would be very helpful to have the direction of the envelope indicated permanently by arrows along the lines, and perhaps by a gradual change in their colour. For some reason, the update file seemed to work only on the stand-alone version of *Cube*, so I never got the animated blob to work in the VST version.

Test Spec

- Virsyn *Cube* v1.0 and v1.01.
- Apple G4 700MHz iMac with 256MB RAM, running Mac OS 10.2.
- Tested with Steinberg *Cubase SX* v1.04.

Fortunately, the conventional envelope editor below the 2D matrix is a model example. It shows the volume, X or Y morphing position clearly plotted against time. A particularly neat touch is the time ruler along the bottom: it's sensibly calibrated in real-world units (ie. seconds), and clicking in it and dragging horizontally slides it left or right, while dragging vertically allows you to zoom in or out. Better still, clicking the Sync button changes the ruler units from seconds to beats, and allows you to synchronise all the segments of your envelopes with the tempo of the host sequencer in a completely natural and intuitive way. Full marks. *Cube* also features extensive use of context-sensitive menus, and Control-clicking in the envelope editor brings up a selection of useful preset envelopes as starting points for your editing.

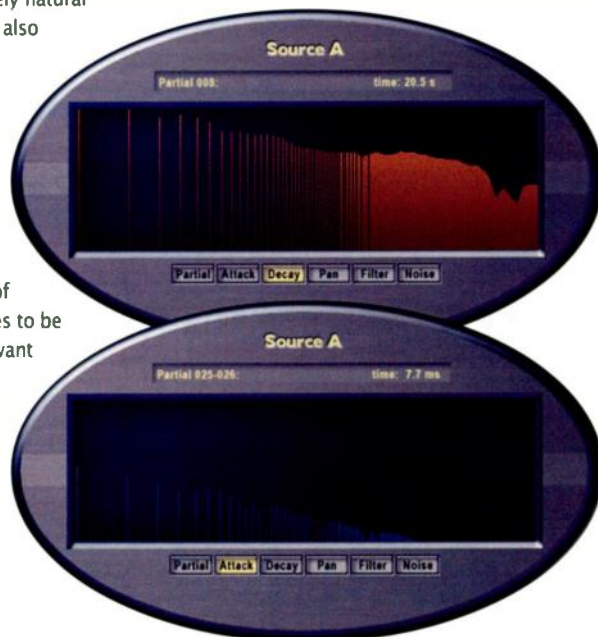
Envelopes can include a looped section, a facility which is exploited very effectively in some of the sequence-like presets. *Cube* tries to be helpful by anticipating where you want your loop points to fall and automatically creating them, but this gets confusing, and I would definitely have preferred to turn looping on and off and set the loop points manually. Another minor irritation is that you can't create new breakpoints by shift-clicking in the 2D editor; you have to do this in the conventional envelope editor. This means that when they appear on the 2D editor, they're often hidden underneath existing breakpoints.

Partial To Some Noise?

Clicking the Edit button adjacent to any of the four additive oscillators causes the 2D envelope display to be replaced with the editing screen for that source. Again, a number of templates are supplied for use as starting points, and are accessed from a drop-down menu next to the Edit button. These presets include human vowel formants, bowed and plucked strings, brass and bell tones, as well as typical 'analogue' oscillator tones such as sawtooth and square waves, and different flavours of noise. You can also save and load your own settings for the oscillators, independently of *Cube* patches.

The editing screen for each oscillator boasts six pages, the most fundamental allowing you to define an overall level for each partial or group of partials (for the higher frequencies, where they are closer together) in the sound. Editing is easy: you simply click and drag, and the vertical lines representing the level of each partial change height. The

same editing approach is applied on the other five pages. Attack and Decay are used to define simple two-stage envelopes for each partial, while Pan allows you to place them within the stereo field. These are all simple to use and valuable in practice. If you're trying to recreate a realistic plucked-string sound, for example, you'll want the high-frequency components of the sound to decay faster than the lower ones, and having individual control over the decay time of each partial makes this easy to achieve. The AD envelopes for all the partials of all the oscillators are triggered at



Each partial or group of partials can be given its own simple AD envelope.

the same time when you play a note, even when the oscillator is not brought into the sound until later in the morphing phase.

The ability to pan the partials individually allows you to use the stereo field in much more creative and subtle ways than in almost any other synth. For instance, if you set up oscillator A so that alternate partials are panned hard left and hard right, and oscillator B with all partials panned centrally, morphing from A to B dramatically alters the stereo presentation of the sound without changing its overall pan position.

One of the limitations of the implementation of additive synthesis in the Kawai K5000 was that you could introduce unpitched or inharmonic elements into the sound only by adding a PCM component to it. There are no sample-based oscillators in *Cube*, however, and it tackles the problem in two ways. One is the Spread control mentioned earlier, which pushes the oscillator's upper partials into increasing degrees of inharmonicity. The other is accessed via the Noise editing panel. As well as generating

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EVOLUTION

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The UC-33 is your computer music setup materialised.

VIRSYN CUBE



Some unusual stereo effects can be created by panning the different partials within a sound.

▶ individual sine waves for each partial, a *Cube* oscillator also generates noise in proportion to each partial's level. You can then add elements of this noise to your sound by drawing them in on a separate frequency plot. The effect is much more subtle than the noise generators you'll find in any conventional synth, and you need to introduce quite a lot of noise if you want it to be heard above the pitched partials, but it's a very useful resource. Quite a lot of real pitched instruments, for instance, include a component that's unpitched (like the attack of a guitar pick or the 'chiff' of a flute), and morphing quickly between a noisy and a pitched oscillator can be an effective way of reproducing this. Because the noise shape is derived from the partials, moreover, the noise generated tends to follow the pitch of each note, in a way that's a lot more musical than the noise generators found in most synths.

Filter Fun

Among the staple elements of subtractive synthesis that are missing from *Cube* is a conventional resonant filter. Instead, each oscillator boasts a Filter panel where you can draw in your own filter shape, which can be as simple or as complicated as you like. Drawing with the Shift or Option keys held down provides a simple way of creating comb filter patterns, while Control-clicking allows



Cube's oscillators generate noise by modulating the partials used in the sound. This can then be introduced into the oscillator's output by drawing a noise transfer function across the frequency spectrum.

you to copy and paste filter shapes. What you can do with this filter is create complex structures that mimic the formant peaks in the human voice, or the resonant characteristics of a violin body. What you can't do is create a screaming resonant low-pass Moog diode ladder with enough self-oscillation to kill a cow at 20 paces.

It's in the filter panel that the heart of *Cube's* morphing ability lies. For each oscillator, you can specify up to eight morph points at particularly significant places along the filter curve, and when *Cube* morphs between two oscillators, it will use these significant points as the basis

to a modulation source. This meant that LFOs, envelopes and so on could be brought to bear on the filter. It is possible to achieve most of the same results (and a whole lot more) with *Cube's* filter morphing, but not in quite such an immediate way.

Effects & Arpeggiator

Cube's signal path is topped off with a two-band EQ and a basic effects section. Each of *Cube's* eight multitimbral parts can access its own distortion, delay and modulation effects, and there's also a global reverb, to which each part can send in different amounts. Most of the effects are usable, but I think it's fair to say that anyone using *Cube*



Cube's filters can generate complex responses, which can be used to mimic the resonances of real-world sources such as a bowed string (shown).

for a smooth change in filter response. For instance, if you want to morph between two human vowel sounds, you can define morph points at the formant peaks in each, and *Cube* will smoothly slide the formants up or down as appropriate. The update to version 1.01 adds a neat animation feature to the filter editing window, so when you press a key, you can see the filter shape changing.

Filter morphing is a hugely powerful tool, and I'm not aware of any other synth that offers a comparable feature, but I sometimes missed the ability to apply dynamic changes to the filter response in other ways. The Kawai K5000 provided a rather similar formant filter, which couldn't be morphed, but did allow you to introduce an offset in its transfer function — what would appear in *Cube* as shifting the filter curve to the left or right without changing its shape — and assign this

within a MIDI + Audio sequencer will prefer to apply separate effects to the clean output.

Finally, mention should be made of the basic arpeggiator, which features the usual Up, Down, Alternate and Random modes. It works, but again, most MIDI + Audio sequencers will have more flexible features for generating MIDI notes from a chord.

On Balance

Although it's only Virsyn's second product, and it's brand new, *Cube* is full of thoughtful design touches that make it seem very finished. In almost every area, the interface has been created in such a way as to combine swift editing with detailed control. There's a lot of power at your fingertips here, but it's managed in such a way that it seldom becomes overwhelming. Clever use of context-sensitive menus and modifier keys means that you're always encountering new possibilities and rarely running into

frustration. It's interesting, and refreshing, to encounter a synth front end that really makes use of the mouse as an editing tool: this is one soft synth that wouldn't be more satisfying to use in hardware form. My only serious quibble about the interface concerns the 2D envelope editor, which really needs additional graphic touches to make the direction of the morphing path clear.

So what of the sound? Well, given that Virsyn have chosen not to include basic subtractive synthesis elements like a resonant filter or a modulation matrix, it's surprisingly versatile, and can reproduce a fair range of more or less 'analogue' sounds. Nevertheless, *Cube's* real strengths lie elsewhere. Perhaps its two greatest features are its morphing capabilities and its ability to accurately reproduce filter shapes modelled on real-world systems like the formants of the human voice. Combining the two

There are individual distortion, modulation and delay effects for each *Cube* part, and a global reverb.



can produce sounds that really demand the listener's attention, morphing seamlessly from a startlingly realistic vocal sound to something completely different. With up to 64 stages available in the morphing envelope, plus the ability to sync these to the host sequencer's tempo, you can create lengthy evolving sounds with dramatic or subtle changes in timbre. *Cube's* noise components and Spread controls provide effective ways of introducing the grit and

Processor Power & Partials

As you might expect, *Cube* is a fairly processor-intensive plug-in, but the relationship between CPU load and polyphony is not as straightforward as it is in other soft synths. CPU load is dependent not on the total number of notes being played, but on the total number of partials that are sounding, so patches with a rich high-frequency content are more processor-intensive than those that use only a few partials. Each patch provides a global

Partials control, which can be used to limit the number of partials sounding and hence the CPU load. A small display at the top right of the screen shows the number of partials sounding at the current time, and the percentage of the computer's CPU power being consumed. With no notes sounding, the CPU meter settled at 6 percent on my 700MHz G4 iMac, while a note that used 56 partials doubled this load.

dissonance that pure additive synthesis lacks, while the ability to assign a pan position to individual partials also allows you to do things with the stereo presentation of a sound that I've not heard from other synths.

Virsyn could have found a way to do this without making *Cube* impossibly complicated to use, it would have been a real achievement — but since no-one else really seems to have cracked the problem of resynthesis yet, this is more of a wish than a whinge.

Cube takes the additive component that lifted Virsyn's first synth, *Tera*, out of the ordinary, and develops it into a comprehensive sound-generating system. The result is a synth that is capable of unique results, and which should be on every sound designer's kit list. Unlike *Tera*, you probably wouldn't want to use *Cube* for every element in a mix — you won't find the same excellent 909-style drums here, for instance — but if you're looking for that one sound to make your tune stand out from the rest, a demo of *Cube* would be a very good place to start. **SES**

Since *Cube* has the power to reproduce complex sounds, it's perhaps a shame there's no way to use it for true resynthesis. The supplied oscillator presets have been carefully modelled on human vowel sounds, bowed strings and the like, but there's no system for importing and analysing your own sources. If

Information

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Rinse

Steve Gibson & Dave Walters: Recreating Samples



Steve Gibson (left)
and Dave Walters.

Sam Inglis

Two words that can strike fear into the heart of any dance producer are 'sample' and 'clearance'. Fall foul of copyright law, and you can top the singles charts all over Europe without receiving a penny in return — just ask Richard Ashcroft of the Verve. If you use a musically significant sample in your track, the chances are you'll be forced to give up most of the publishing royalties, but the real killer blows can come from the owners of the mechanical copyright. Record labels will often demand astronomical sums up front for the rights to use something as basic as a one-bar loop taken from one of their tracks, even assuming you can track down the owner and reach an agreement without

The process of clearing samples can be financially crippling, as well as causing havoc with release schedules. Rinse Productions specialise in helping producers and labels by recreating problematic samples to order.

delaying your release until it's gone off the boil. Add to that equation the potential nightmares that await over international licensing, and you could be forgiven for giving up and writing an original song instead.

Alternatively, you could contact Steve Gibson and Dave Walters of Rinse Productions. Their speciality is recreating samples to order, and so far they've helped secure legitimate releases for over 120

records which had originally been created with uncleared samples. Notable examples include their version of Busta Rhymes' version of the *Knight Rider* theme, which was featured in Panjabi MC's hit 'Mundian To Bach Ke', a number of vintage samples for Lemon Jelly's album *Lost Horizons*, and the central drum loop from Rob Dougan's 'Clubbed To Death' — while Richard Ashcroft is obviously being a bit more careful these days, having hired Rinse to recreate the

Sammy Davis Jr samples for his 'Check The Meaning'.

Clearing A Path

Perhaps surprisingly, excessive clearance fees are not the principal reason why most producers and labels turn to Steve and Dave. "Sometimes it's cost, but only about 10 percent of the time," says Dave. "Ninety percent of the time it's speed. Most of the jobs we get are people 'phoning on a Thursday night and saying 'I need something doing by Friday.' They've got a release on Monday and they've just been told by their artist that they've got an illegal sample on it. The record company's in America somewhere with a request to clear a sample, sitting on the paperwork for six months, by which time the record's gone completely out of fashion and there's no point in doing it any more. With us, we can do it in a week's time, you can have a usable sample in your track in a week's time. When you pay us, you buy the copyright of our cover from us, so go and sort out your publishing and you've got a legal record. If you've got promos out there and interest, you sometimes need to do it as quickly as a week to keep the interest there."

Nevertheless, cost is an issue, and the availability of producers like Steve and Dave who are willing to meticulously recreate samples seems to be reining in the demands of some copyright owners. "We've noticed that the original record companies that hold the mechanical copyright are starting to drop their prices," says Dave. "I think there

was a point where they held the monopoly, and certain old disco labels and so on would charge ridiculous amounts for a four-bar loop — 30 or 40 grand — and it makes the record that that's going into completely unviable. If you've got overheads of 40 grand before you start it's ridiculous unless you're Fat Boy Slim. We know that our quotes are being used in bartering situations. When somebody comes and approaches us for a sample, we give them our quote, and a lot of the time they'll return to a clearance house somewhere and say 'Look, I can get it remade for this,' and a lot of the time the clearance people have priced themselves out of it."

"There's a bit of confusion about the process," acknowledges Steve. "It's basically the same as doing a mini-cover version in legal terms. The publishing's got to be cleared, and the writers are not affected at all — it's purely the mechanical copyright that's affected."

There are also occasions where the reasons for having a sample recreated are technical or musical, rather than purely legal. "Sometimes they love the sample, but want to be able to drop the guitar out," says Dave by way of example. "And obviously they can't do that if they've just sampled a record. We can give them several passes of different mixes — just the drums, just the music, just drums and bass — especially for funky house and stuff, they love that. You can break it down into certain areas, and they start getting really excited. It's as if they can pull apart an old record. You can



There's no longer an analogue mixing desk in the Rinse setup, but hands-on control is provided by an Emagic Logic Control surface.

also help with the quantising if they're having trouble with the timing. A lot of the European clients want English or American-sounding vocals but they can't find singers over there, and they want to engineer an *a cappella* — they love the track but they can't lift the vocal because they haven't got the multitracks. So it opens it up artistically, as well as the legal side of things. But that's only when we get involved early in the production, while they're still making the record."

All Ears

Unsurprisingly, the process of recreating a sample begins with an intensive listening session. "A lot of people ring up and say 'How are you getting on?' and a lot of the time we'll say 'Well, to tell you the truth, we're still listening to it after two days,'" says Dave. "But you need to do it, you need to sit down and pull it apart. We use centre cancelling and phasing to try to hear what's

The Full Range

The samples that Rinse Productions get asked to recreate are many and various. Perhaps the most prominent this year has been a loop from Busta Rhymes' 'Fire It Up', which itself sampled Glen Larson's theme from the TV series *Knight Rider*. Busta Rhymes' track was in turn sampled by Panjabi MC for the hit 'Mundian To Bach Ke', before Rinse's note-for-note cover was substituted.

"It's happened quite a lot that somebody's sampled a sample, and it often helps to hear the original and then hear what Busta Rhymes has done to it," says Dave. "It gives you a head start on the original sound. That's all completely programmed using the internal synths in *Logic*. When we gave them that they said 'Bloody hell, you've even done all the wind noises in the background.' Well, it's part of the sample! We've got about 50GB of sounds that we've collected on our drive, and I think we had wind and bell trees on that to create the sweeping sound. I looped the bell tree, and the wind coming up was a *GRM Tools* filter, the top end opening up. We layered loads of different sounds to try to get the effect."

Rinse are usually asked to recreate only small sections of a track, since producers often use only a two- or four-bar loop in their sampling exploits, and if

so, they'll only record the necessary number of bars. Occasionally, however, they're called upon to reproduce an entire track, as was the case with two recent jobs for the BBC.

"The BBC wanted a version of the *Only Fools And Horses* theme without vocals, but they couldn't find an instrumental mix — so it wasn't for clearance purposes, just to make it usable," explains Dave. "The strange thing about this was how dull-sounding the original mix was. We copied it exactly and it was really weird mixing it, because you're used to trying to make everything nice and open and bright, and for this I was screwing compressors on the mix, screwing it to hell, and chopping all the top off — really doing a bad mastering job on it, because that's how it sounded. Obviously someone had done a bad mastering job on the original!"

Similarly, they were asked to recreate the memorable theme from *Grange Hill*: "I think they'd lost the multitrack for it and they wanted to use certain parts, so they had to have it recreated. There's actually a drummer playing the drum part through a Linn kit on our version. It's MIDI triggered drums, but it's played live."

When I visit, Dave and Steve are working on recreating a loop from an old Freda Payne soul

ballad for a new artist, Michelle Lawson. It's an epic affair featuring a trumpet melody and a dense backing track, and the key here, according to Dave, is to isolate the details: "If you listen to the piano, you can hear the effect we put on it, it's chorus on the reverb return, which I put on to recreate a swirling effect I could hear on the original. We actually effect the effects return sometimes. You can't immediately hear that in a sample, but it helps. Steve heard a tremolo guitar, right in the background of the mix, that I didn't hear at the start. You have to sit there for a day and pull it apart."

"The drums are from *Vinylistics*, and it's a live bass. We couldn't decide whether the chord stabs were guitar, piano, electric piano, or whatever, so we did guitar and piano together, and it got exactly the sound we wanted. Then there's a baritone sax line that Steve heard at the end. There's little things like that that are almost subconscious, but when they are looped in a track, it becomes a major part, and you think 'What is that sound that's repeated every four beats?' It's got to be there to fill it out."

There's a fuller discography on Rinse's web site: www.rinseprods.com.

RECREATING SAMPLES

► in the mix."

"We split the samples, as well," adds Steve. "A lot of old records have all the reverb on one side."

"You can have drums on one side and all the reverb return on some mixes coming back on the left-hand side," agrees Dave. "We use the left and right balance on our amp loads, we end up listening to the left-hand side only, and if you can hear all the effects returns that's really helpful. On the right side you've got almost dry instruments and that's really helpful too. We filter as well, filter everything out from the top and bottom and listen to guitars in the middle. That's more for musical aspects, to find out what they're playing. You can push an instrument out just to hear what it's playing and get the notes more accurately. We use tempo maps, we use *Recycle* on the original sample and find out where all the hits are. You can use that from sight to stretch."

Although Steve and Dave often get sent samples without even any indication of who performed the original track, any information they can obtain about the original sample is valuable. "Some people are very clued-in and they'll send you information that they've got," says Steve. "Adamski sent one in, and sent a complete interview with the original band about how they'd recorded it."

"That stuff's very valuable, especially when they've used the recording chain to change the sound," agrees Dave. "That's where you really have to listen to how it was recorded, what era it was from, what machines they used. Every new job seems like a bit of a challenge. Some of them you put on and think 'How the hell are we going to do this?' Then you start listening to it and thinking 'They've done this, they've done that.' We get on the Internet and make a few 'phone calls and try to find out what amps people were using and so on. If you can't find the information on the Internet, you just have to experiment with mic positioning on guitar amps and stuff — position the mics as you think they were, and then tweak it to get the closest result. When we're recording vocals and so on, we obviously take proximity into account. If it sounds like they're standing 10 feet back when they're singing, we stand the singer 10 feet back."

Plug-in Power

When they've listened in detail to the original sample, isolated the musical elements and worked out what production techniques have been used, it's time to decide how best to recreate what they're hearing. "Sometimes it's just obvious that you need to get session players in," says Dave. "With broadband now, we MP3 the



The duo's mobile rack contains (from top) Emu E4X sampler, Roland JV2080 sound module, TLA Ivory voice channel, Digidesign 882 I/O interfaces (x3), Emagic AMT8 MIDI interface and Apple G4 Mac computer.

whole idea was to keep everything as portable as possible, because we do need to get around to do things, and then as an experiment we decided to try mixing everything internally," explains Dave. "We bought the Mix Cube system, and I said 'Let's give it a go mixing internally instead of using desks and outboard.' If anything it's easier, and the plug-ins available are absolutely brilliant these days.

Anything becomes possible with the amount of plug-ins that you've got. If you're in a studio with a certain amount of rackmount gear, there's only so much you can do, but with plug-ins it's great, because you can very

quickly bounce things and tweak things and try different ideas, and automate all the plug-ins."

"For the first two years we were using an analogue desk, and since we've had this it's been miles easier, thanks to the instant recall," agrees Steve. "The only stand-alone things we've got are the Emu and the JV2080, and they just go straight into the computer."

Using plug-in effects also allows more flexibility for fine-tuning at the mixing stage. "We'd try and do as much as possible on the day, and you get to the stage where you're confident — 'Yeah, I'll be able to do that in the mix, or tweak it with plug-ins,'" explains Dave. "If it's not close enough, we keep going with the mics and amps and try to get it as close as possible. *Mic Modeler* has been a good help. I've never actually sat and tested mics against it, but we use it as a tool to get what we can hear on the sample. A lot of the time we'll use it to dirty vocals up. We're getting a lot of old '60s and '70s samples with guitar on them, and *Amp Farm* really helps us tweak it at the end — you can do a lot in the mix, as opposed to doing a lot with the mics and the amps when you record. Sometimes it's safer to take a decent signal from an amp and then really mess with it in *Amp Farm*. You can do a lot with the plug-in reverbs to actually create the space where you can hear things recorded. ►

original sample to all the musicians, and they come in and they know their parts. It's almost a necessity, because sometimes the timing's not straightforward, and exactly what they're playing can sometimes be clouded by the rest of the mix, so we basically send them the sample and what we think they're playing — Steve will often work out the chords and say 'We think it's this.' We always listen to the musicians, and they often say 'No, it wouldn't be like that, it would be like this.' We do a lot of recording in Cycle Record mode — we get them to play to the original that we're recreating so that we can check the timing and the sound immediately. It makes it easier to get into it and concentrate on it, and we comp it all up from there.

"If it needs to be recorded in a studio we just slam the lids on our portable rack and take it down and record it, or if they've got Pro Tools we'll use it there. We've been around a fair few studios now, and we know which places are best for strings or pianos or whatever. We can do vocals here, guitar and bass and so on. We run tie-lines through to the living room, there's a lovely sound in there which is perfect for vocals and instruments."

Portability was one of the main aims behind Dave and Steve's choice of equipment, a Mac-based Pro Tools system running *Logic* and a lot of plug-ins. "The



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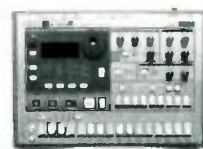
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RECREATING SAMPLES

- ▶ You really have to listen to the lengths of the decay and whatever on reverbs, to try to match them exactly.

"There's sometimes I wish I had a nice stereo valve EQ, and if I do, we get one in. We can add to our system at any point by hiring things, but I do most of the stuff with plug-ins, just the basic ones in *Logic*, or if I want something a bit more special we've got the *Fairchild* and other stuff in the TDM system. Anything that's just basic EQ or compression, I'll throw it straight on from the *Logic* bank of stuff. With sample recreation you have to match every mix you're given, and since we've run this system, we've matched every single sample we've been given. If you want to use a nice 1176 from years ago you probably do get a bit more warmth, but the plug-ins are so close now that it's splitting hairs. I used to be a vintage gear nut, but I've been a bit converted by all the new stuff coming out."

Getting Away With It

Some jobs, such as recreating a *cappella* vocals, are simply a matter of finding the right session musicians and having them play or sing along to the original, before using plug-ins to tweak the mix. More often than not, however, the basis of the recreated sample is detailed programming in *Logic* by Dave and Steve, where their main sound sources are the *EXS24* soft sampler and the *JV2080*. "We often surprise ourselves with how far we can go," says Dave. "Sometimes we cost up prices for jobs and reduce the price at the end, because

we've thought we'd need a real bass or a real drummer, we've had a crack at programming it and thought 'That sounds fine.' We can record any live stuff straight away without having done any programming at all, so things like trumpet or live bass are often just recorded to the original loop. Then we start building from the drums."

"There are certain sounds where you can't get away with it, and maybe it's because I'm a trumpet player, but I think brass is one," says Steve. "You can't program brass stuff unless it's hidden in the mix. You can't get away with strings either. We get certain samples to remake, and you can't get the articulation of what the strings are doing unless you get a string section in."

"What we've found is that if we do some programming of strings or brass and create a base or a pad, then we can get players in to play over the top," adds Dave. "You marry the stuff that we've programmed with the live stuff and it sounds like you've got a full live section. It's down to experience to know how far to go with the programming and how far we need to go with the live to balance it exactly. Often if you program a few strings and then get a live quartet in over the top and track them loads and loads of times, you can build up huge orchestral-sounding strings."

Final Touches

The classic problem for record producers is knowing when something is finished. Steve and Dave, at least, have a pretty good

benchmark: it's finished when it sounds like the original. "There is a stage when you start thinking 'Is that ours, or theirs?'," says Steve. "That's when you know that you're nearly there."

"If you're confusing yourself, then you're in the right area!" agrees Dave. "It's nice when they come together. Sometimes you hear a sample and you think it's going to be a bit of a bitch, and you get the musicians in, and by the end of the day it's already sounding pretty close. Sometimes I've sat there for days because there's things that need to be done in the mix. Each one's different. We've done over 120 samples now, and we've only ever given up on two or three, and I think we've only ever had one person come back and say 'No, it's not usable.'"

When Dave and Steve do turn down a job, it's more often because the record company are being unrealistic about what they want than because it's technically impossible. "There are some that we've had a go at and not been able to do, and some we've not attempted because we didn't think we'd be able to do them," says Steve. "For instance, the other week we got one through from Italy which was an Alice Cooper sample, and we could have done it, but it would have cost them a lot of money because we wouldn't have been able to do it with programming. We'd have had to hire a band and completely emulate the original conditions, which we can do, but it's expensive."

"They often don't understand that we're hiring a band to do it, and it costs the same money as if you were recording a whole song," adds Dave. "The band still want their session fees and we still want our fee. The record company think 'Well, it's only four bars of music,' but not everybody's going to do it cheap because it's just four bars. A lot of the time, four bars takes us a week to mix."

"The ones that technically we can't do is if it's a very, very characterised vocal that's right out front. The chances are we know somebody who can do it, but not always."

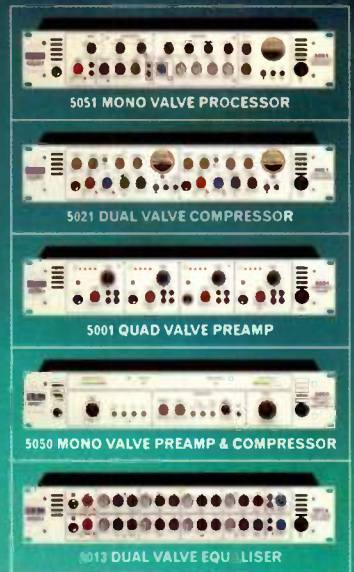
"There have been a few where there's samples within samples, and you get a mush of different ambiances and you can't pinpoint what is what," says Steve. "You could spend at least three weeks working those out."

"When you've got several generations of samples on top of each other from different eras and stuff, sometimes there's just too much to pull apart," agrees Dave. "We're not often beaten, but for the time it would take, if we've got a lot of jobs on, we're better just getting on with the ones that you know 100 percent we can do." **ES**



Steve and Dave do most of their programming and mixing in Steve's London flat, but often need to take their setup to studios to record, so it is kept in a mobile rack. The core of the system is a G4 Mac with a Pro Tools Mix Cube system running *Logic* as a front end.

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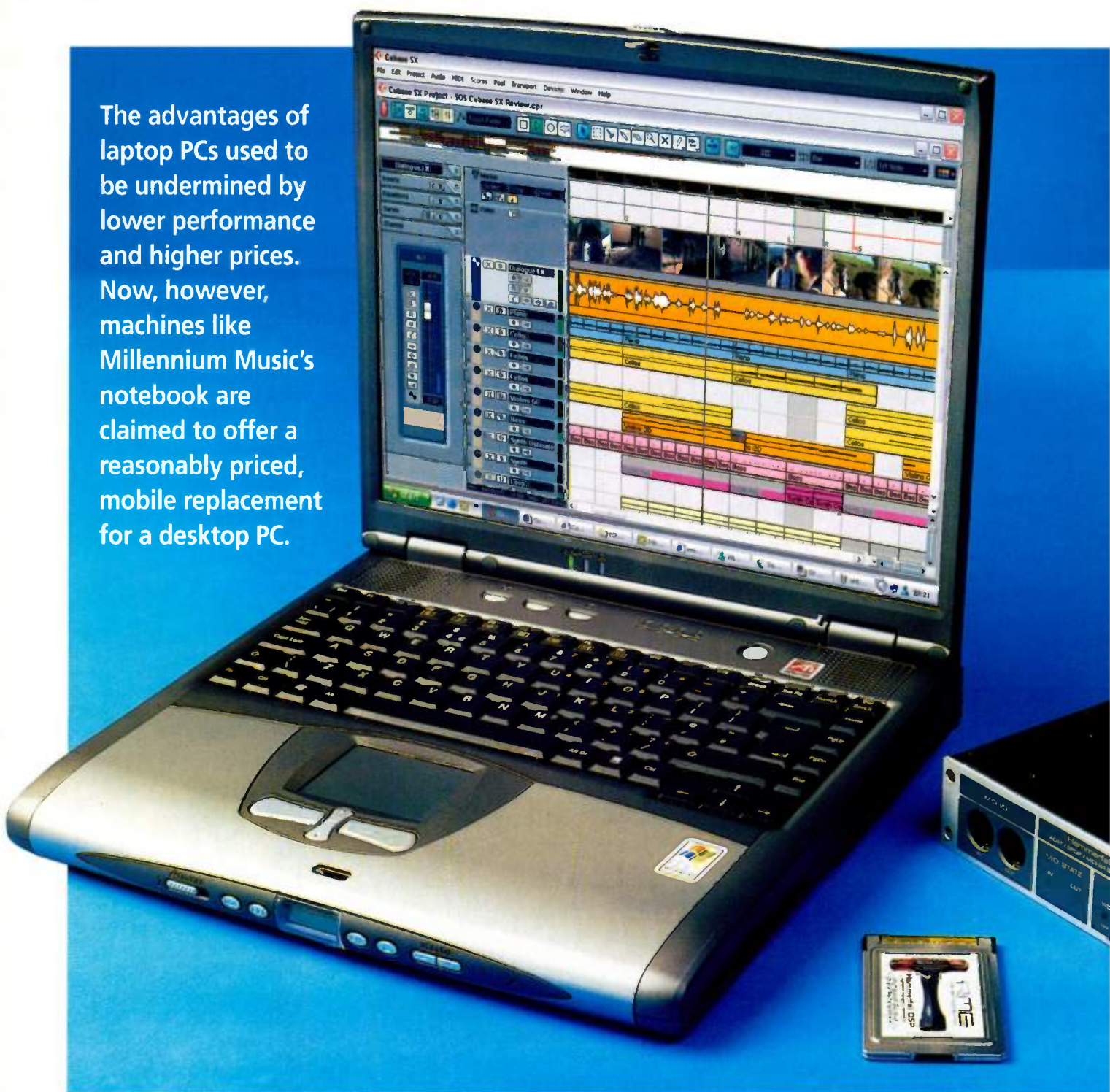
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The advantages of laptop PCs used to be undermined by lower performance and higher prices. Now, however, machines like Millennium Music's notebook are claimed to offer a reasonably priced, mobile replacement for a desktop PC.



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pros

- High-quality 15-inch SXGA+ display with resolutions up to 1400 by 1050 pixels.
- Media bays offer the option of a second battery or drive.
- Faster-than-average 5400rpm hard drive fitted.
- Dedicated graphics RAM.
- Four USB 2.0 ports.

cons

- Custom-built high-performance notebooks are more expensive than standard models.
- Thermostatically controlled cooling fan occasionally cuts in, and could be audible on recordings made in the same room.

summary

This Millennium notebook PC combines a powerful processor, plenty of RAM, and a faster-than-average hard drive to provide a machine that really can replace a desktop PC with few compromises, and all for a competitive price.



Martin Walker

Plenty of musicians have bought PC laptop computers over the years with a view to using them for recording and playing back music, but as I explained in *SOS* January 2001, there are many potential pitfalls, largely because there is no such thing as a standard PC laptop. Then, as now, the only ways to find out how a particular laptop would perform with music software and hardware were to enter the lottery of

buying one and finding out for yourself, or to source one that had been custom-built or modified with the musician in mind. In the following issue I reviewed just such a beast — a 700MHz Pentium III laptop from Red Submarine — and was impressed by its performance, but at £2100 it was still beyond the reach of many musicians.

However, during the last two years processor speeds have rocketed, such that you can now entertain the idea of abandoning your desktop PC and creating a portable software studio in a laptop, and prices seem to be in free fall. After the latest round of processor price cuts by Intel, Millennium Music have managed to assemble the custom-built laptop under review here, which incorporates a 2.53GHz Pentium 4 processor, 512MB of RAM, a 15-inch screen and a 40GB hard drive, for a very reasonable £1299.

Guided Tour

As with all all notebooks, the vast majority of the action is on the outside, although there are some internal options that I'll come to shortly. Apart from the LCD latch, the front-panel controls are devoted to an audio 'DJ' CD player, which lets you play CDs even when the computer is shut down. On the right-hand side there's an infra-red transceiver window, plus storage device bays one and two, which can house a variety of hardware peripherals. Millennium normally fit bay one with a floppy drive, but it can instead hold a secondary battery pack to double the operating life, or a CD-ROM, CD-RW, DVD-ROM, or CD-RW/DVD-ROM combo drive, or a second hard drive. These devices are interchangeable, and make the laptop incredibly versatile. Drive bay two holds a fixed CD device from the selection already quoted for bay one, and the review model housed a TEAC DW224E which can play DVDs as well as read and write CDs (see spec list for full list of options).

Millennium supplied me with a second battery to try out, and a second 40GB hard drive which had been assigned drive letter F within Windows. The TEAC optical drive had been assigned the letter G, so that it didn't change whether you had one drive or two installed — a nice touch.

The laptop's left side houses a Type II PC card slot, a DC input socket for the supplied AC adaptor, and a cooling vent. There is an internal cooling fan, but this only operates in times of need. As usual, the majority of I/O is at the back. There are four USB 2.0 ports, parallel and PS/2 ports for a printer and external keyboard or mouse, a mini IEEE 1394 port for external Firewire devices, an RJ11 phone jack to connect the internal modem, and an RJ45 jack for LAN

Technical Support

All Millennium laptops carry a one-year collect-and-return warranty, with the option of an extended three-year collect-and-return warranty for an extra £150. Unlike most other extended guarantees, those for laptops are well worth considering, since if something does go wrong it's likely to be an expensive repair. Technical support is also available on a dedicated number between Monday and Friday during the hours of 10am to 4pm, plus email contact via support@millennium-music.biz.

connection. There's also an S-Video connector for TV output, and an external monitor port supported by the dual-head graphics. These are provided by an integrated ATI Mobility Radeon 9000 graphics device with 64MB of dedicated video DDR SGRAM on board — this is a huge improvement over notebooks whose displays share the system RAM, as this can hamstring overall performance. This display provides good 3D as well as 2D performance for those who need it, as well as advanced hardware acceleration for DVD playback, with a resolution of up to 2048 by 1536 pixels and TV resolution of up to 1024 by 768 pixels.

Once the LCD panel has been opened, the traditional laptop arrangement of compact keyboard and trackpad is also revealed, plus various hot-key buttons, LED status indicators, stereo mini-speakers, and main Power button. The 15-inch Super XGA+ screen display arrived with a 1400 by 1050 pixel resolution with 32-bit colour depth, although it's possible to increase this up to 2048 by 1536 virtual pixels if you're prepared to scroll around it. At first I reduced the resolution to the 1024 by 768 I use on the Hansol flat-screen display connected to my desktop PC, but I soon returned to 1400 by 1050 for use with *Cubase SX*, since the Millennium screen was of such high quality.

All in all this is an impressive array of socketry, and the four USB 2.0 ports are especially welcome. To complete the system, Millennium supply a black carrying case, while bundled software includes Windows XP Home Edition, *Nero 5.5*, *Win DVD 4*, and Norton's *Ghost*, plus a four-CD-R set of image files to restore your laptop to its shipped state after a catastrophe.

Powering Up

A quick trip to the BIOS showed that like those of most laptops, it doesn't offer a huge range of user options, but I was able to confirm that the internal hard drive had been connected as Primary Master, and the

MILLENNIUM MUSIC LAPTOP PC

► DVD/CD-ROM drive as Secondary Master. Millennium had set up the laptop in a dual-boot configuration, offering both General and Music partitions. To this end the 40GB Toshiba hard drive had been split into three partitions: a 10GB one for General and another 10GB for Music, with the remaining 18GB or so for Audio purposes. It's worth noting that this is a 5400rpm drive, whereas most notebook drives tend to be the slower and cheaper 4200rpm versions that won't give you as many simultaneous tracks. I've noticed quite a few musicians purchasing additional Firewire drives for serious audio work, but you may well not need to do this with the Millennium notebook.

At startup there was almost no acoustic noise, with the drive's fluid dynamic bearing providing scarcely audible idle noise, and head-seeking a gentle background tapping — overall, it was quieter than my heavily treated desktop PC. However, a standard 2.53GHz Pentium 4 processor generates a significant amount of heat, and a thermostatically controlled cooling fan cut in periodically to disturb the tranquillity, and switched itself back off a few minutes later as soon as things had cooled down. Thankfully a quiet fan unit had been

Specifications Of Review PC

- Processor: Intel Pentium 4 2.53GHz 512kb cache (Northwood B), 4x133MHz front side buss.
- Core logic: Intel 845E chipset running 400/533MHz system buss.
- System RAM: 512MB PC266 DDR SO-DIMM (expandable to 1024MB).
- Hard drive: Toshiba MK4019GAX, 40GB, 2.5-inch, 5400rpm, ATA-5, 16MB cache.
- Graphics: Mobility Radeon 9000 with 64MB non-shared DDR SGRAM, dual-view, supporting up to 2048 by 1536 pixel display, plus S-Video and CRT monitor output sockets.
- Screen: 15-inch TFT LCD display, SXGA+, resolution up to 1400 by 1050 pixels.
- Floppy drive: 3.5-inch 1.44MB, fitted into interchangeable drive bay one.
- CD-RW drive: TEAC DW224E, IDE/ATAPI interface, 2MB buffer, with 24x CD-R and 10x CD-RW writing speeds, 8x speed reading DVD-ROM, DVD-R, and DVD-RW, and 5x speed reading DVD-RAM, plus buffer under-run protection, fitted into drive bay two.
- Modem: Smartlink 5600 MDC.
- Keyboard: Win Key with embedded numeric keypad, Synaptics PS/2 port touchpad, left & right buttons, and central rocker switch.
- Other ports: four USB 2.0, RJ11 phone, RJ45 LAN, mini Firewire, parallel, PS/2 (mouse or keyboard).
- AC adaptor: input 100 to 240 V, 50 to 60 Hz, DC output 20V, 6.0A, 120W.
- Battery: smart Li-Ion 59W (removable), optional secondary battery pack.
- Physical dimensions: 329 x 290 x 44mm (width, depth, height).
- Weight: 4.4kg wth battery.
- Installed operating system: Windows XP Home Edition with Service Pack 1.
- Review system audio hardware: RME Hammerfall DSP Cardbus PCMCIA Type II interface, Multiface I/O box.
- Review system audio software: Steinberg Cubase SX version 1.0.5.61.

switching to Standard mode. However, Processor Scheduling had been changed to favour Background Services (the most important alteration), and most visual effects had been disabled, as had System Restore, Automatic Updates, Remote

difference in performance. The DVD/CD-ROM drive had been correctly set up to use Ultra DMA Mode 2, while the internal hard drive had been checked for Ultra DMA Mode 5 transfer mode, and its transfer rate tested. I did the same using *Dskbench*, and



Connectivity includes four USB 2 ports and a mini-Firewire socket.

specified that made less noise than those of many other laptops I've used — it was certainly quieter than the TEAC CD-ROM drive when a data CD was being read.

Windows Performance

It's now generally accepted that Windows XP doesn't need as much tweaking as its predecessors, and Millennium had wisely left the machine in ACPI mode rather than

Assistance and System Sounds. The desktop and search had also been switched to Classic view. Power Management had been set to leave all hardware permanently on when mains powered, but to turn off the monitor after 15 minutes' non-use when operating on batteries, and Hibernation had been disabled.

Both the internal and optional drive bay two drive had been formatted with NTFS and 4k clusters — Millennium say that using larger clusters makes less than 1 percent

measured both read and write speeds at close to 25MB/second on the Music partition, and the multitrack audio file tests showing 97 16-bit/44.1kHz tracks with a block size of 128k, 82 at 64k, and 75 at 32k. The General and Audio partitions were slightly slower, but personally I'd use *Partition Magic* to reduce the Music and General partition sizes to 3GB, which would bring the Audio partition performance close to that of the Music partition.

Memory bandwidth measured with SiSoftware's *Sandra 2002 Standard* measured 1992MB/second for integer calculations, and 1993MB/second for floating-point — very close to the figures I have measured for desktop PCs using DDR SDRAM from Digital Systems, Digital Village and Red Submarine in previous reviews. The 2.53GHz Northwood B processor of this system gave loads of clout for plug-ins and soft synths, running even Waves' *Renaissance Reverb* at just 5.5 percent CPU

System Options

Millennium also offer a slightly cheaper 14-inch laptop, plus plenty of other system options. The laptop 'carcass' supports a range of Intel Pentium 4 processors from 2.4GHz up to 3.06GHz (the only one that currently supports hyperthreading), and a choice of 128, 256 or 512 MB of PC266 DDR SO-DIMM memory. Hard drives can be 20, 30, 40 or 60 GB in size, and you can if

you wish upgrade from Windows XP Home Laptop to XP Pro or 2000 Pro. There are also plenty of choices for both MIDI and audio interfaces if you want to buy a complete audio system. The easiest way to examine all the latest options is to visit the Millennium web site, where you can select from drop-down lists to configure your own machine.

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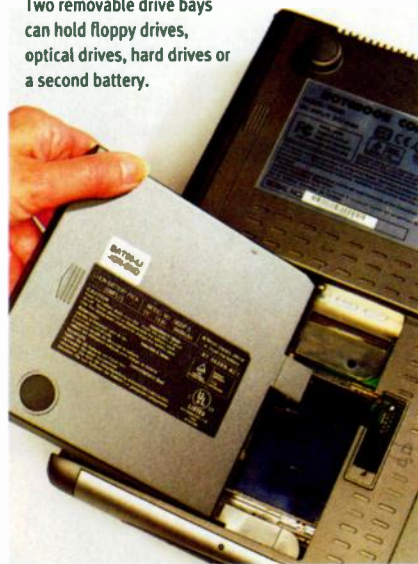
► overhead, while their C4 multi-band parametric processor took just 4.5 percent.

Audio Performance

If you want a laptop for occasional music dabbling use you may be able to get away with a mobile processor (see box) and stereo audio I/O, but it's a measure of how seriously Millennium take their machine that they supplied the review model with an RME Cardbus interface and Multiface I/O box providing eight analogue inputs and outputs, S/PDIF co-axial and optical in and out (with ADAT digital I/O as an option on the Toslink optical sockets), plus ADAT Sync, word clock in and out, and MIDI I/O. These are part of the well-known Hammerfall DSP range, and I'm pleased to report that playback quality was excellent, with a -108dBa background noise level at 24-bit/96kHz, proving that this Millennium notebook is well suited to audio use, with none of the ground loop hums, buzzes, or noise problems from its switching-mode power supply that plague some other systems. Moreover, if you want a totally mobile solution, the Multiface can also be powered from a 12V battery (a suitable adaptor cable is supplied).

The integral Intel 82801CA/CAM sound chip has a mic in, headphone out, and S/PDIF out socket. Millennium had disabled this AC97 audio device individually in both the General and Music partitions in favour of the supplied RME Cardbus and Multiface combo, but you could reactivate it whenever

Two removable drive bays can hold floppy drives, optical drives, hard drives or a second battery.



you like from the System applet of either if you want to use the mini-speakers or headphone output while travelling. I managed to run this 16-bit chip using the *Cubase SX* ASIO Multimedia driver with 93ms latency, which is not much use for

Desktop Replacement Or Maximum Portability?

The standard Pentium 4 processor is designed for maximum performance, but with no great emphasis on low power consumption, since after all it's normally to be found in mains-powered desktop PCs. The Pentium 4-M processor uses the same production process, but is optimised for lower energy consumption, and incorporates technologies such as Enhanced Speedstep, Deeper Sleep, and IMVP (Intel Mobile Voltage Positioning). All three technologies are designed to reduce energy consumption by switching between different power states or running at lower voltages.

Just to confuse us still further, the new Pentium-M processor range (codenamed Banias) used in conjunction with an Intel 855 chipset and a WLAN adaptor called Calexico becomes a Centrino notebook — Intel's much-advertised mobile solution, which offers more power and a longer battery life. Battery life always depends on what sort of application you're running (typically, office applications will run twice as long as games), but in the comparisons I've studied, a Pentium-M Centrino system is likely to give you another hour or so beyond a Pentium 4-M with an equivalent spec before conking out.

If you mainly want a notebook to run office applications, and to view the occasional DVD, a 1GHz processor will probably be quite sufficient, and one of the two Intel mobile processor options may well be a sensible option. However,

musicians wanting to stream audio tracks and run multiple soft synths need the fastest CPU they can afford, and the special power-saving features of a mobile processor are largely irrelevant when your CPU overhead is always high, which is nearly always the case when running a MIDI + Audio sequencer. At the time of writing, notebooks featuring a standard P4 2.53GHz processor were generally retailing at about £200 less than those with a Mobile P4 1.9GHz CPU, which is another attraction.

So, for maximum performance, musicians would do well to opt for a notebook aimed at 'desktop replacement' rather than maximum mobility, and this is the route Millennium have taken. Their notebook uses the Intel 845E chipset, which supports standard Intel Pentium 4 Northwood B processors running at up to 3.06GHz with a 533MHz front side bus, including support for hyperthreading. Most laptops featuring a mobile chipset run with a slower 400MHz front side bus, and don't currently support processor speeds much beyond 2GHz.

Unless you want the lightest laptop available, or the longest battery life, and are prepared to pay a few hundred pounds more, buying a desktop replacement design like this Millennium model makes far more sense. The only down side is that a standard P4 generates more heat, and will therefore require more cooling.

real-time soft synths but perfectly adequate for mixing purposes.

Final Thoughts

Choosing a PC notebook for music making has never been easy, given the number of basic component choices you have to make, plus the number of further processor options you now have to consider, and for many musicians it's turned into a nightmare, judging by the number who plead on the *SOS* Forums for help deciding on which make and model of notebook to buy. Buying a standard model can be a very expensive gamble unless you get to try it out with music hardware and software, which isn't very easy to do in most cases. On the other hand, although buying a bespoke custom-built model specifically assembled with the musician in mind does completely remove such worries, it does tend to be a more expensive solution.

At £1299, this Millennium model has a spec that, on the surface, you might think you could track down elsewhere for perhaps £1000. However, most off-the-peg laptops have 4200rpm hard drives that will manage considerably fewer audio tracks than the 5400rpm model in the Millennium range (spindle speed is the parameter most closely connected to sustained transfer rate). Of course you could buy an external 7200rpm Lacie Firewire drive for your audio recordings (Millennium offer the 120GB model for just £169), but for many

musicians, adding yet another box defeats the whole point of a notebook PC.

Moreover, the £1000 models that I found during my researches mostly offered a significantly lower 1024 by 768 resolution, fewer USB ports and no integral floppy drive. Millennium also install their 512MB RAM as a single stick into one of the two available slots, whereas many other suppliers will give you two 256MB sticks — again a cheaper option for them, but one that means you have to discard the existing RAM if you ever want to upgrade to 1GB. Overall, Millennium have assembled a powerful replacement for a desktop PC without cutting any corners, guaranteeing high-quality audio results with a suitable interface, and at a price that's still cheaper than some other specialist systems of equivalent performance. I was so impressed that I'm seriously considering buying the review model. **ES**

Information

£ Basic system as reviewed without music hardware or software, £1299; as reviewed, including Steinberg *Cubase SX* sequencer and RME Cardbus/Multiface £2369. Prices include VAT.

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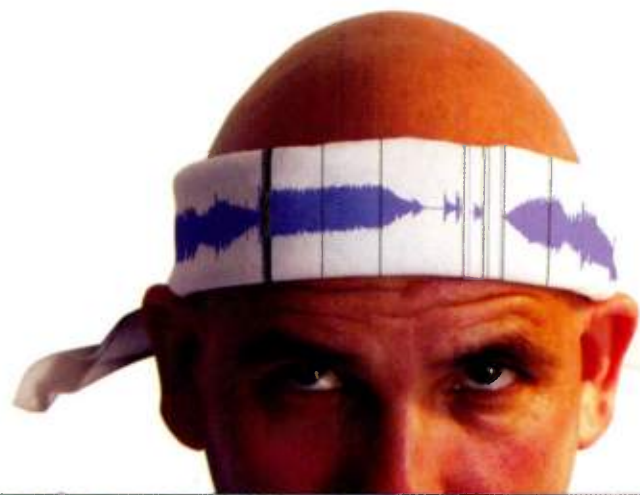
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The **ULTIMATE** Reason ReFill! Over 7 Gb, over 9000 samples. Zero-G's award winning Creative Essentials Series of 31 CD volumes have been expertly converted into ReFill format to take full advantage of the incredible power and flexibility of REASON. This highly acclaimed library, originally two years in the making, is surely the largest single title available in ReFill format today - yes there really are over 7 Gigabytes of quality inspiration packed into refills in this multi-disc package!



"I was impressed with the overall quality of the sounds and I feel that the sampling technique behind both the single sampled and multisampled instruments is of a very high standard.....While the sheer number of loops provided is already impressive, the ability to re-program them further via MIDI just makes the collection that much more versatile...The huge variety of styles covered ought to appeal to any Reason user who is looking to cover all the musical bases.....simply excellent value for money." - Sound on Sound
REASON REFILL - £99.95

PLANET OF THE BREAKS FOR REASON (ZERO-G)

The entire Planet of the Breaks series (almost 1Gb of samples) has been expertly converted into ReFill format for your convenience. The Planet of the Breaks series has become a phenomenon with all 4 titles sweeping the board with top awards from every major music magazine. Planet Of The Breaks introduces a new generation of 'Raw-funkin-dirty-ass-boogiebeats' to sample. Original loops that mix old school style and sound with the sonic science of the new school. Drums recorded through vintage analogue and valve gear then digitised, speed, tweaked and freaked. High-fi, lo-fi, & mid-fi drums, wah drums, sound effects, long loops, short loops, composite tracks, Psychedelia, Funk, R&B, Hip Hop, Jazz, Trance, Trip Hop, Dance, Metal & general madness in one slamin' package



Future Music Platinum Award: "... some of the most imaginative drumming and production you'll hear on a sample CD". Sound on Sound 5 STAR Award: "...an outstanding series..." (Review comments for the original CD)
REASON REFILL - £79.95

WIRED (ZERO-G)

Featuring over 1.2 Gigabytes of samples, this massive and exclusive sound archive from Nigel Anderson (**TOTAL TRANCE**) provides every constituent you need to make the perfect trance track in Propellerheads' REASON software studio, including just about every 4/4 percussion combination that you can imagine. There are also great acid lines, full of energy and vibe and easy to edit and make your own. The pads, pad loops, synth lines and bass loops will help you muster your last ounce of euphoria. There are also loads of effect stabs and snare rolls plus a huge selection of vital drumkit sounds. **NOTE:** the Total Trance library is incorporated into this library free of charge. However, the majority (about 60%) of WIRED is totally new material!



"It does what it promises and even more. You will find a huge collection of sounds suited to create dance, trance, techno and house. The sound quality is just great. Some of the sounds really are very fat and analog sounding. A great sound collection at an affordable price." - www.reasonfreaks.com
REASON REFILL - £79.95

AMBIENT TEXTURES (ZERO-G)

Ambient Textures is a huge new Refill for REASON with 1000 brand new patches created in Reason 2.0, including 300 Subtractor patches, 201 Malstrom patches, 259 NN-19 Sampler patches, and 240 NN-XT Sampler patches.



The Producer, Jonathan Heslop, has been creating electronic music for the past eight years. He has composed music for various independent films, computer games and even some patches for the Reason 2 Soundbank. During that time he has created a large number of synth patches, the best of which are on this superb Refill CD.

"A very detailed and great sounding collection of strings, pads, atmospheres etc. The sounds are all very usable. It doesn't really matter which kind of music you make. Everybody can use some of these sounds. The patches are built with great care and prove that the creator is very musical and creative. A great collection of sounds. Great stuff!" - www.reasonfreaks.com
REASON REFILL - £39.95

JUNGLE WARFARE FOR REASON (ZERO-G)

All three of the original Zero-G Jungle Warfare volumes are now combined into this monster Reason Refill for your convenience! Over 1600 DREX Loops, Over 1000 patches/samples for NN19/NNXT. Over 1.6 Gb of data (raw). Drum & Bass loops, Massive drum rolls & mega rhythm fills, Jungle percussion loops and kits of component samples, Intense Jungle pads & chords, aggressive digital synth pads, Jungle chords and hits, In-yr-face Bass notes, Manic Jungle FX, Nasty vocals.



Hardcore guerilla dancefloor ammo for spec freaks. A massive collection of ultra-fast techno & funk grooves, construction kits & samples - lethal dance production weapons in the right hands. If you need the RIGHT material to produce Drum & Bass this blinding collection has to be on your unmissable list.

"For anyone into the sounds of drum n bass this represents an invaluable resource." - Future Music Platinum Award
REASON REFILL - £79.95

CHEMICAL BEATS FOR REASON (ZERO-G)

This new REASON version of the classic Zero-G Chemical Beats library features over 400 REX2 loops, & over 1000 samples. 'Chemical' beats are loops with masses of attitude, huge drum sounds and FX crunched through advanced signal processors, and massive grooves to kick start your imagination. Years of playing, programming and engineering expertise at your fingertips! To complete this awesome package, there are extra mad percussion loops, thunderous basses, radio loops, cutting edge synth & guitar FX, plus a vast collection of drum & cymbal bits. The original audio version of this library was awarded 5 Stars by Sound On Sound UK and a Keybuy Award by Keyboard USA. If you use Reason and you're into BIG beats, this is the collection you've been waiting for! This library is also available as Akai, Audio, Giga & ProSamples formats - please call for pricing.



"A truly fantastic collection. Very inspiring loops and sounds. The quality is outstanding." - www.reasonfreaks.com
REASON REFILL - £59.95

CELTIC (ZERO-G)

The first choice in Celtic Sample CDs! Zero-G's Celtic features great performances and multisamples on a wide range of instruments including Fiddle, Uilleann Pipes, Mandolin, Accordion, various Bagpipes, Whistles, Flutes, Bodhran, Breton Bombarde, Overton, Banjo, 12 string, 5 string, Marching Snare, Pipe & Snare, Skittish Snare, Celtic Snare, and more - you get four CDs of material (2 audio & 2 WAV)! This is an absolute must-have collection for film composers or anyone looking for a true Celtic flavour. These samples will inspire you and prove very effective in setting the mood of a track as their authenticity shines through. Add the captivating essence of the Celtic tradition to your music!



"Celtic lives up to its promise of providing composers with a true Celtic flavour for their productions.... really could prove extremely valuable to any media composer, but with Celtic influences creeping into all areas of music, this set could prove interesting to a wider range of musicians." - Sound on Sound
AUDIO+WAV - £59.95 OR GIGA CD-ROM - £199.00

BEATS WORKING (ZERO-G)

Zero-G, in association with DAT Productions and Digidesign®, are proud to bring you the world's first professional drum sample library recorded in 10 channels specifically for mixing to 5.1 surround sound and beyond. These recordings were made at the legendary Abbey Road Studio 2 in London. Beats Working offers an indispensable toolbox of immaculately recorded, highly usable drum performances, with Intro, Verse, Bridge, Chorus, Drop and Fills of every performance, covering a diverse selection of musical styles from classic pop to big band. In addition, multiple kicks, snares (both modern and vintage), toms, cymbals and hats were recorded at multiple velocities, giving you the ultimate flexibility to design your own kit.



"This is one of the most impressive drum loop collections I've heard from a tone, taste, and recording quality point of view. Throw in the innovation of 5.1 surround, and its utility even in plain ol' stereo applications, and it's a Key Buy winner." - Keyboard Magazine Key Buy Award
AUDIO+WAV - £79.95 OR PRO TOOLS VERSION - £329.00

PRODUCERS FOCUS



A FUNKY FUTURE (PRIMESOUNDS)

These loops are set to capture the essence of funk, and bring it into the next millennium. Featuring a wide range of fingerlickin' beats, bass lines and rhythms, all played in a laid-back style. The drum- and percussion loops have been filtered and modulated beyond recognition, but the funk still lurks underneath. The live played bass loops have been left unpolished and untamed for that real deal feel.

Audio+Wav+Rex2 - £59.95

VIRTUOSO - ORCHESTRAL BRASS (ILIO)

An extremely flexible multi-sample collection (no riffs or phrases) containing around 1500 brass instrument programs! Includes some popular and useful performances. If you want to get that big, cinematic sound out of your French Horns, Trumpets, Trombones and Tuba, this library excels! These are dramatic recordings, recorded in

two different concert halls to capture the true power of orchestral brass. 30Gb on 10 DVDs! GIGA DVD Set - £312.00

SMOKERS DELIGHT (E-LAB)

Turntable Jazz & Loungin' HipHop from e-Lab.

This massive 3CD set contains over 1Gb of loops and samples in Wav, Rex2 and Audio format! You get loungin' loops & phrases, loads of funky & dubby basses, jazzy horns & flutes, mellow guitars, vintage wurlitzers & rhodes, hip hop beats & cracklin' breakz. Possibly all you need to create that weed smokin', head-spinning, chill-out monster you always dreamed of.

Audio+Wav+Rex2 - £59.95

ULTIMATE URBAN BREAKZ (TEKNIKS)

Over 1.2Gb of sample material including the entire content of the award-winning titles 'Underground Garage' and 'Nu Skool Breaks' plus brand-new loops. Tons of construction kits filled with the toughest beats, pulsating basses, sizzling keys, FX and all the single synth sounds you'll need. Inspired by Stanton Warriors, DJ Zinc & Plump

DJ's, this is a must for those serious about breakz! REASON REFILL - £79.95

FLUM (PRIMESOUNDS)

Flum; Trips and transformations consists of sounds in two categories: the Beats section are hi-fidelity technoid drum loops with all the low end you can ask for. The Flum section provides you with a lifetime of pulsating, vibrating background rhythms. Beautiful, creepy and futuristic. These electrifying loops will trip you out, trance you up, and add new sonic dimensions to your music.

Audio+Wav+Rex2 - £59.95

WORLD TRAVELER (ILIO / SONIC REALITY)

From the far corners of the globe comes one of the most diverse collections of ethnic instrument samples ever. Rare playable multisampled instruments that can be used in many different styles of music. You'll get a lot of instruments not available together on any other sample library, including sounds from the Middle East, Africa, East Asia, Australia, Native America, and Europe.

Akai CD-Rom - £132.95

DIRT KEEPS THE FUNK (PRIMESOUNDS)

Inspired by Parliament, Funkadelic and other P-funk pioneers, the live played loops and grooves on this unique CD are sure to shake any booty. Packed with bubbling, Bootsyfink bass guitar lines, laid-back drum beats, wah-wah rhythm guitars, go-go style percussion and psychedelic synth riffs, all waiting to tear the roof off your sampler.

Audio+Wav+Rex2 - £59.95

DRUMKIT FROM HELL - ADD ON (TOONTRACK)

If you own Drumkit from Hell, you'll love this add on pack! If you don't own it, get the bundle now! Featuring new formats: Reason NN-XT & Kontakt, new instruments and new mappings for: Gigasampler, EXS-24, LM-4, Battery, Kontakt, HALion, DR-008 & Reason NN-XT. Loops also provided in Audio + Wav format. For DFH users only!

Add-On - £19.95 OR DFH BUNDLE - £85.90

LA DRUM SESSIONS (BIG FISH AUDIO)

Prepare yourself for the ultimate collection of drum performances to date. LA Drum Sessions is just that: session drummers laying down phat, thick, luscious beats, in about every style you can think of, with so much variation, you can't need anything else for a long while! Over 80 styles and over 6000 loops.

Audio+Wav+Acid - £62.95

ALIEN GUITARS 2 (BIG FISH AUDIO)

Alien Guitars 2 picks up right where Vol 1 stops. The goal? To utilize every gadget and technique available to mutilate any recognizable sound of a guitar. Conjured from the guitar by way of hardware, software and demented wetware you will find melodic patterns, supernatural environments, glistening textures and much more.

Audio+Wav+Acid - £62.95

WORLD WINDS (ILIO)

Acclaimed composer and multi-instrumentalist Dirk Campbell has sampled every instrument in his extensive ethnic wind collection. A must-have for film, TV and media composers, World Music, Classical composers and performers, keyboardists, and anyone with an ear for great instrumental sounds!

Akai S3000 CD-ROM - £133.00

FUTURE TRANCE ANTHEMS (BEST SERVICE)

The power package for your trance anthems - with multisamples, single sounds, loops and construction kits. Huge selection of drums & percussions, basses, whooshes, reversed FX, break-downs, pads, dub noises, booms & hits, arpeggios, sample accurate drum-, bass-, riff-, lead- and FX-loops / plus drum & music construction kits

Audio+Wav - £56.95

SAM TROMBONES (PROJECT SAM)

After the success of SAM Horns, Project SAM worked hard to create this sequel: a dedicated orchestral trombone section for GIGA. The most powerful, expressive, dedicated and affordable collection of trombone section samples. "A big, punchy, cinematic orchestral brass sound." Sound on Sound 5 Stars

GIGA CD-ROM - £117 GIGA Lite - £69.95

HOUSE MUSIQUE (BEST SERVICE/IEBERSCHALL)

Fresh & funky disco and french house material for your pleasure! Inspiring construction kits plus extra lick & loop material: e-bass, funk & wah guitars, flutes, clavinetts, organs, acoustic pianos, e-pianos; plus useful drum & percussion collections for exs24, halion & kontakt; all sounds also in .wav format on CD2.

Audio+Wav - £56.95 (2 CDs)

METRIAM (PRIME SOUNDS)

Stacked with tribal drum beats, rhythmical mood loops, shimmering backgrounds, walls of noise, ethnic-electric percussion sounds and more. Ideal for soundtrack composers, perfect for technoheads and dance music producers, and indispensable for makers of ambient and lush chillout music.

Audio+Wav+Rex2 - £59.95

ACOUSTIC SWING & SHUFFLE GROOVES (GFORCE)

Acoustic Swing & Shuffle Grooves provides you with a treasure trove of drum loops, grooves and fills, combining a warm, vintage sound with a feel that only a world-class drummer can impart. The CD covers a variety of styles and tempos from 70's style Glam Rock to NuSkool R&B grooves. Laid back grooves in the style of Barry White!

Wav+AIFF+Midi+SoundFont - £29.95

ON THE RHODES (GFORCE)

On The Rhodes contains riffs and licks from the Rhodes Stage 73, played by Arden Hart - a genuinely gifted musician. Unbelievable is the phrase often used to describe his ability. Arden sits at the top of this category and his credits, to name but a few, include Brand New Heavies, Chaka Khan, Pasadena and James Mason.

Wav+AIFF+Midi+SoundFont - £29.95

HIT ZONE (BIG FISH AUDIO)

From Neptunes to Jimmy Jarr & Terry Lewis, that clean RnB/Pop sound is everywhere and this is a true RnB assault. These loops will find their way into your mexas and into your head. Basses, beats, keys licks, guitars, fx, etc! Grab these grooves and lay down some cover fire. 'Hit Zone' will bring it in for the kill!

Audio+Wav+Acid - £59.95 (4 CDs)

VIRTUOSOS SOUND FX (TEKNIKS)

New from Tekniks comes this brand new sound FX library featuring: animals, atmospheres, bells and alarms, chaos, coins, communications, computer vox, domestic, elements, futuristic, glass, human, sport, transport, weapons and much more. Prepare yourself for the SFX experience of a lifetime!

Audio+Wav - £29.95 (2 CDs)

BIG ROCKIN BEATS 2 (CHRONIC MUSIC)

The LA Riot squad is so serious about rock they had to do it again with BRB2!!! 3CDs jam packed with awesome drumming in short song format; intro, verse, chorus, breakdown and chorus out. This short form makes it a breeze to cut and paste an entire song structure in seconds. For anyone who wants to rock!

Audio - £59.95 (3 CDs)

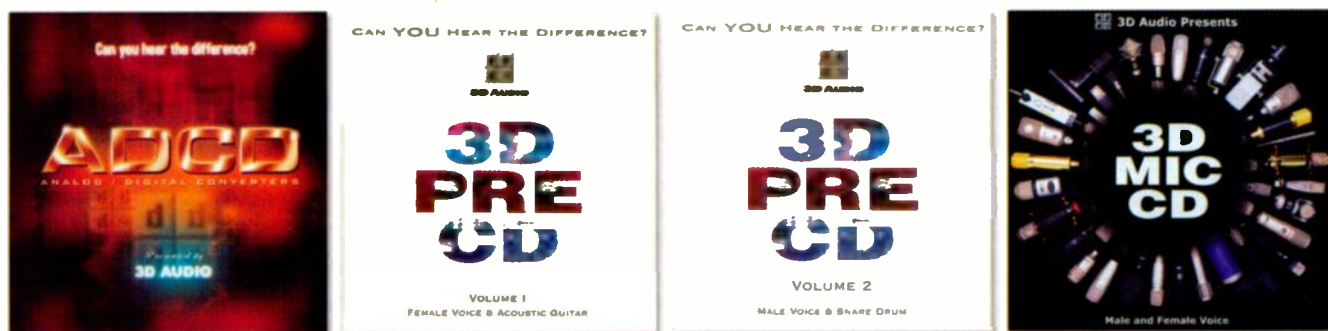
LA RIOT 5 (CHRONIC MUSIC)

Just when you thought it was all over, the L.A. Riot producers are back! Hundreds of beats, five drum breaks, scratches, scads of vocals including Ghetto vocals, hooks, Diva vocals, Ghetto talk vocals, raps, Gospel organ riffs, guitar licks, funky and bizarre guitar, scratches, basslines, individual drum hits, FX and so much more!

Audio - £59.95 (4 CDs)

3D Audio Equipment Comparison Audio CDs

AD, Pre, & Mic CDs



Hugh Robjohns

Most of us rarely enjoy the opportunity to compare lots of similar pieces of audio equipment side by side, let alone audition serious high-end equipment against more affordable products, in order to judge just how diminishing the 'law of diminishing returns' really is. The process has now been made much easier by Lynn Fuston of 3D Audio, a digital audio editing and mastering facility located in Franklin, Tennessee. The story of 3D Audio's series of comparison CDs begins with Lynn having the simple idea one day of getting a bunch of his fellow recording engineers together for a listening party to try to identify the 'best-sounding' preamp — each engineer bringing their own favourites.

However, this simple plan quickly grew, and in April 2000 Lynn ended up with a stack of 33 different mic preamps ranging in price from about \$62 (the approximate proportional cost of a single mic channel in a Mackie 1604 VLZ Pro mixer) up to \$8000 for a vintage Neve 1081. Such an impressive array of preamps gathered in one place is not an everyday occurrence, and so as well as hosting his listening party in the studio, Lynn also arranged to record the output from each preamp being auditioned. This material was subsequently collated to produce a pair of CDs enabling the rest of us to listen and make our own minds up individually as to which preamp sounds best, and what the sonic differences are

Are you paralysed with indecision as to what gear to buy? What if you could try out 49 mics, 33 preamps and 29 A-D converters, all within the comfort of your own home? Well, we can all dream, but here's the next best thing for those unrelated to King Croesus...

between them.

Obviously, in comparisons of this kind there are a lot of possible sources of error or unfairness, but Lynn and his colleagues have gone to considerable lengths to try to make these tests as consistent as possible: an acoustic noise source positioned a precise distance from the microphone was used to ensure consistent gains through each preamp being tested; the recording chain was identical throughout (a Mytek 8X96 A-D converter, an Audiomeia II soundcard and *Sound Designer II* software); and the only processing between the original recording and the production CD was some editing and word-length reduction from the 24-bit/44.1kHz sources to the 16-bit/44.1kHz CD format.

Mic Preamp Shoot-out: The Pre CD

The signal sources for these auditions comprise individual performances by vocalists Marabeth Jordon and Shane McConnell, acoustic guitarist David Cleveland, and drummer John Wheeler (playing only a snare drum). The testing starts with the female vocal tracks (using a

Manley reference mic), and moves on to a stereo acoustic guitar (McPherson redwood guitar captured with a Neumann KM84 towards the base of the guitar and an Audio-Technica AT4033 looking at the

SOUND ON SOUND

3D Audio AD, Pre, & Mic CDs

pros

- A useful aid in short-listing potential purchases.
- Superb tool for 'ear training'.
- Consistent testing parameters.
- Includes both budget and high-end equipment.
- A very cost-effective way to audition a lot of expensive and rare gear.

cons

- The track listings are not always as clear as they could be.
- Consistent parameters not optimal for every microphone.
- Expensive for a one-off listening experience.

summary

An intriguing and very informative collection of CDs enabling sonic comparisons to be made between a broad range of preamps, vocal mics and A-D converters.

neck). The second disc of the pair contains the male vocal test tracks (first on an AKG C414B ULS, and then using a few of the preamps again with the Manley reference mic), and finally snare drum strikes (using a Shure SM57).

The list of tested preamps (see The Preamps Tested box) is not exhaustive, but does cover a very interesting range. The majority are relatively costly high-end designs but there are several mid-range and budget units thrown in too, and the comparisons are often quite illuminating. A large proportion of these preamps have graced the review pages of *Sound On Sound* over the years, and every common circuit topology is represented here. Both vintage and modern valve designs are included along with discrete transistor and FET circuits, plus all-IC (integrated circuit) and hybrid implementations, with some using transformers and some not.

This pair of CDs makes fascinating listening in a number of different ways. Obviously, the first point of interest is the straight A/B comparison of preamps, which may be useful in creating a shortlist for potential upgrades, or in highlighting the strengths and weaknesses of your current favourite preamp in comparison with some aspirational high-end unit. But a second, and arguably more relevant use of these discs is to help in training your hearing — learning to recognise the sonic characteristics of different kinds of preamps with different sources. In many cases the sonic differences are pretty obvious and predictable, but I found there were a few surprises too — I won't spoil your fun by spilling the beans here, though!

For me, while the preamps on test here certainly exhibit some very different characteristics, I wouldn't like to have to identify just one as an overall winner. Personal preferences play too big a part, and any decision would depend on what kind of microphone is being used and what kind of tonal flavour is necessary to enhance the source in the desired way. Having said that, I found that there was a very clear subset of preamps which stood out as being special in various ways — and they certainly weren't all megabucks designs.

To make the listening tests as unbiased as possible, the preamps are tested in a random order which changes for each set of auditioning material. Spoken slates are appended to the end of the preceding track so that if you're accessing tracks directly you can audition the test material immediately, which makes A/B comparisons far easier to do. The sleeve notes identify each preamp with a letter code to maintain the 'blind listening' aspect of auditioning

“All of these CD sets should be considered an essential tool for use on every Music Technology course across the land!”

these preamps. The idea is that listeners simply note the comments for each preamp against the appropriate letter code. The sleeve notes can then be consulted after the auditions are complete to find out which models were rated highly and which may have been given a thumbs down.

The sleeve notes not only document each preamp with its identifying letter code, but also with a nominal retail price, the number of channels, any additional facilities (such as built-in EQ, dynamics, digital outputs and so on), and a company web site address. However, there is no information at all about the circuit topology or type of active devices used in each design. This is a shame, because it weakens the training aspect of these discs: unless the listener is

already familiar with the preamps on test they will have to do quite a bit of web surfing to find out just what they have been listening to. I realise that ear training is not the *raison d'être* of these discs, but I feel it is certainly an additional strength that has not been fully realised.

49 Vocal Mics Head To Head: The Mic CD

A logical follow-up to the preamp tests was to provide a similar comparison disc for microphones, and Lynn has chosen to compare popular vocal microphones on this disc. A selection of 49 mics are presented and comprise mainly large-diaphragm, side-address condenser mics, including not only a very wide range of modern mics, but also classic vintage designs. However, there is also one small-diaphragm condenser mic and a handful of dynamics, including some ribbons (both vintage and modern) — see The Mics Tested box on the following page for a complete list.

As with the preamp disc, the auditioning material comprises simple unaccompanied hymns from two vocalists: Marabeth Jordan again, and Chris Rodriguez. The female vocals were captured through a Great River MP2 MH preamp and the male vocals with

The Preamps Tested

SOLID-STATE PREAMPS

- Amek 9098 Dual Mic Amp.
- Audio Upgrades High Speed Preamp.
- Buzz Audio MA2.
- Cranesong Flamingo.
- Daking 52270.
- Dbx 786.
- Earthworks Lab 102.
- Focusrite ISA430.
- Focusrite Red 1.
- GML 8300.
- Grace Design 201.
- Great River MP2MH.

• Hardy M1.

- Langevin Dual Mono.
- Mackie 1604 VLZ Pro.
- Martech MSS10.
- Millennia HV3B.
- Oram MWS.
- Presonus MP20.
- Sytek MPX4a.
- Inward Connections Vac Rac.
- Vintech Dual 72.

VALVE PREAMPS

- Aphex 1100.
- ART Tube Channel.
- Avalon VT737SP.
- Dbx 386.
- DW Fearn VT2.
- Manley Dual Mono.
- Millennia M2b.

VINTAGE PREAMPS

- API 512.
- Focusrite ISA110.
- Neve 1081.
- Telefunken V76



The Mics Tested

MODERN SOLID-STATE CONDENSER MICS

- ADK A51 Type III.
- AKG C414B ULS.
- AKG C3000B.
- Audio-Technica 4033A/SM.
- Audio-Technica 4047SV.
- Audio-Technica 4050/CM5.
- Blue Dragonfly.
- Blue Mouse.
- Earthworks QTC1.
- Microtech Gefell M930.
- Neumann TLM103.
- Neumann U87ai.
- Sanken CU41.
- Sennheiser MKH800.
- Shure KSM32/SL.
- Shure KSM44/SL.

MODERN VALVE CONDENSER MICS

- AKG Solitube.
- Audio Technica 4060.
- Blue Bottle (with B6 capsule).
- Brauner VM1.
- CAD VSM.
- DPA 3541 (with tube preamp body).
- GT Electronics AM62.
- Lawson L251.
- Lawson L47MP.
- Lucid-by-Stayne MM2000.

- Manley Reference Cardioid.
- Manley Reference Gold.
- Neumann M147.
- Neumann M149.
- Rode Classic.
- Sony C800G.
- Soundelux U95S.
- Soundelux U99.
- Soundelux Elux 251.

VINTAGE CONDENSER MICS

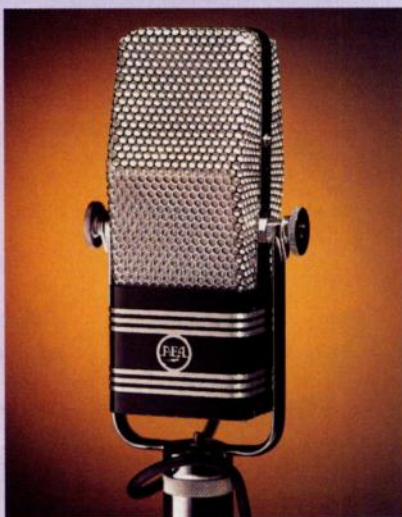
- AKG C12 (valve).
- AKG C414.
- Neumann M49 (valve).
- Neumann U47 (valve).
- Neumann U67 (valve).
- Sheffield Labs Tube Mic (valve).
- Telefunken ELAM 251 (valve).

DYNAMIC MICS

- Electrovoice RE20.
- Sennheiser MD441.
- Shure SM7A.
- Shure SM57.

RIBBON MICS

- AEA R44C.
- Coles 4038.
- Royer R121



▶ a Grace 801 preamp, feeding a Prism AD2 A-D converter with 24-bit, 88.2kHz resolution. I guess the preamp choices reveal which units Lynn and his colleagues felt delivered the best performances for male and female vocals following the preamp testing sessions! The digital output from the converter was recorded directly into a SADiE Artemis DAW and the format conversion for CD mastering was performed internally using POW-R SRC and word-length reduction algorithms.

As with the preamp discs, each mic was positioned identically relative to the vocalist, (eight inches away for Marabeth and 12 inches for Chris) and with carefully calibrated gains to make the comparisons as consistent as possible. However, the chosen positioning — while absolutely consistent — may not have been optimal for every mic. Proximity and angle of a mic relative to the source can affect performance quite dramatically, so while the audition material makes for interesting comparisons, it doesn't necessarily always show off a mic to its best possible capabilities. An obvious example is that of the Coles 4038 ribbon mic, which sounded to me as if it was placed a little too close, resulting in rather more proximity tip-up effect than would have been ideal — this mic, being a pure pressure gradient design, suffers far more proximity effect than most tested here.

Another important issue to consider is that these examples are only of on-axis vocals captured in a quiet and well-treated acoustic environment, so consequently the off-axis characteristics of the mics are not revealed at all. This latter aspect is often the determining factor when multiple microphones are used with multiple simultaneous sound sources, of course, but is of little relevance in the context of comparing vocal mics with typical studio applications in mind.

So, this disc, like the previous set, provides some very useful comparisons of a broad range of popular vocal microphones, as well as some of their clones and updated models. Again, it serves both to help create a shortlist of possible microphone purchases or selections, as well as being another excellent ear-training aid, and it is extremely instructive to hear the different tonal characteristics of such a variety of microphones.

Battle Of The Converters: The AD CD

The final instalment in this collection — so far, at least — concerns A-D converters. The products presented for audition here comprise 29 different converters spanning prices from \$700 up to \$10,000, lining up

stand-alone A-D converters alongside a couple of high-end computer soundcards and a few integrated digital recording systems too.

As you would expect, the converter inputs were all carefully calibrated for level, polarity and correct channel orientation, and the test tracks recorded directly to a SADiE Artemis DAW at 24-bit/44.1kHz resolution. The sleeve notes state that no dithering, noise-shaping or filtering was employed in any of the converters, but this is rather misleading, since a converter operating without dither is extremely non-linear and of little use in recording applications! What is meant, I believe, is that all the units were operated in their standard 24-bit configurations, without any internal word-length reduction or alternative anti-alias filter options.

The details of the format conversion to 16-bit/44.1kHz to produce this two-CD compilation are not given in the sleeve notes, but the same POW-R algorithm was used as in the mic comparison disc. Inevitably, auditioning A-D converters through a CD in this way is somewhat harder than comparing the outputs of the actual

Other 3D Audio CDs

In addition to the CDs reviewed here, there are two further titles which *SOS* readers might like to check out. The first of these is *Neve Versus Pro Tools*, which allows you to compare two mixes of a 60-piece orchestra recording performed by Lynn Fuston himself and recorded through a Neve console to RADAR II. The first of these mixes was done on an 80-input Neve 8058 console at Ocean Way studios in Nashville, and the second was done within a Digidesign Pro Tools system. The CD contains not only 16-bit/44.1kHz Red Book audio for playback on normal CD players, but also includes 24-bit/48kHz AIFF files for more critical comparisons. Both mixes can also be compared to a simple recording of the group through the two vintage Neumann M50 mics that were used as

overhead mics on the recording session.

The other CD available is the *Awesome DAWSUM Sampler*, which tackles the thorny issue of whether the summing busses of different mixing systems really make a difference to the sound. The same multitrack session was mixed through 29 different mixing platforms, both analogue and digital, and the results were recorded as 24-bit/48kHz WAV files, which lets you load them into your audio editor of choice for comparison.

All of the 3D Audio CDs tend to spark lively debate, and probably the best place to catch some of the different views is on the web board at 3D Audio's own web site (www.3daudioinc.com) — if nothing else, it's worth the trip to read Lynn's own views at first hand. *Mike Senior*

converters live against the analogue input signal, since the inherent format conversion and D-A converters used in the CD monitoring chain will reduce the transparency or even colour the tests to some degree. Nevertheless, the differences between converters can still be heard and the ability to compare their sonic characteristics in this way is quite fascinating.

There are three different auditioning tracks provided for each converter, starting with a short bluegrass track performed by Hayseed Dixie (3D Audio are based in Tennessee after all). This multitrack recording was replayed with a completely static mix from a 24-bit/48kHz RADAR session through a DDA AMR24 console. The second test track is of a pair of stereo acoustic guitars plus a female vocal replayed

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3D AUDIO AD, PRE, & MIC CDS

▶ from an analogue two-inch tape source through the same console. The final test track is of a live-to-DSD stereo recording, made by DMP, of the Bob Mintzer Big Band, replayed from a Sony SCD555ES SACD player, presumably straight into the converters.

For the majority of the auditioning tracks the converters were all running on their internal crystal word clocks. However, a fourth test track (using the Big Band recording once again) is also included for those converters with facilities for external clocking. A Lucid SSG192 master clock was used to supply either a x256 Super Clock reference (for those devices that accepted it) or standard 44.1kHz word clock.

Overall Impressions

It wouldn't be appropriate to comment here on my own impressions of and preferences for the specific equipment and microphones

presented for audition on these discs. However, I can say that I found these discs to be extremely interesting and informative, and I would thoroughly recommend them for anyone interested in creating equipment purchasing shortlists, or anyone wanting to expand and hone their listening skills. All of these sets should be considered an essential tool for use on every Music Technology course across the land! Although these discs may be considered a little expensive and specialised for the casual listener, the costs

could be reduced and the benefits enhanced by clubbing together with a small group of interested friends to share both the purchase costs and the listening experiences.

Critical listening can be both tiring and time-consuming, so I would recommend auditioning these discs when you are feeling fresh and able to guarantee a period free from interruptions — each disc took me a couple of hours to work through. Obviously, the better your monitoring equipment and listening room, the clearer the sound characteristics of each preamp, mic or converter will be, but in many cases significant quality and tonal differences can be heard even on lo-fi equipment.

Of course, whereas the overall range between the best and worst of the preamps and microphones is quite broad, the sonic differences between some units can still be very small and subtle. Interestingly, in the converter comparisons CD I found the overall range between best and worst to be very much smaller — the consistency and similarity between devices seemed much greater. In real life, I know that converter differences are generally more obvious than this CD suggests, and I can only put that down to the processes involved in producing this disc, combined with any audible signature that may be imposed by the D-A converters used in the replay system.

Whatever the reasons, these discs certainly make it very clear that there are far greater quality improvements to be obtained through the correct selection of microphone and preamplifier than A-D converter, although the very best converters can help to capture a little more sonic magic if the rest of the chain is up to the challenge. **SOS**

Win A Lucid Audio Master Clock!

If you're interested in buying the 3D Audio AD CD, it would be in your interests to get your skates on, because there's the opportunity to win a Lucid Audio GenX696 master clock unit if you get your order in before the prize draw in October — the same clock source is used at 3D Audio, so it must be good! The unit offers six word clock outputs on BNCs, operating at up to 96kHz, with the option of switching them individually from the front panel to Super Clock at up to 48kHz. The unit can also lock to word clock, Super Clock or AES-EBU digital signals, allowing it to act as a clock distributor. **W** www.lucidaudio.com.

The A-D Converters Tested

STAND-ALONE A-D CONVERTERS

- Apogee AD16.
- Apogee PSX100.
- Apogee Trak 2.
- DB Technologies (now Lavry Engineering) AD12296 MkII.
- DCS 904.
- Drawmer DC2496.
- Lucid Technology AD9624.
- Mytek 8x96.
- Presonus Digimax.
- Prism AD2.
- Sonifex Redbox ADDA.
- Troisi Design DC22496 ADC.
- Weiss ADC1 MkII.

COMPUTER AUDIO INTERFACES

- Digidesign 001.
- Digidesign 888/24.

- Digidesign Audiomedia II.
- Digidesign HD192.
- Lynx Studio Technology Lynx Two.
- M Audio Delta 1010.

STAND-ALONE RECORDERS

- Alesis HD24.
- Alesis ADAT XT.
- Alesis Masterlink.
- iZ Technology RADAR 24 Nyquist.
- iZ Technology RADAR 24 S-Nyquist.
- Panasonic SV3800.
- Tascam MX2424.

PROCESSORS

- Cranesong HEDD 192.
- Manley SLAM1.
- Waves L2 Ultramaximiser.

Information

E AD CD, \$44.95; Pre CD Volume 1, \$34.95; Pre CD Volume 2, \$34.95; Mic CD, \$49.95; 3D comparison three-CD package (including both Pre CD volumes and the Mic CD), \$119.85. Add \$5 per order for international p&p.

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21 AUG MARSHALL

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Sequencer Creative Effects Masterclass

Using Your Sequencer's Creative Modifiers

Paul White & Martin Walker

In our occasional series exploring the plug-ins bundled with MIDI + Audio sequencers, we've covered all the mainstream processors and effects, but that still leaves quite a lot of plug-ins unexplained. This month we're going to consider all the plug-ins that fall into a category I'll call Creative Modifiers. By this I mean processors that transform the entire signal in some dramatic way, rather than effects which work by adding a delayed, reverbed or pitch-modulated signal to the original. That's not to say that some Creative Modifiers don't give you the opportunity to mix in some of the dry signal, but in the main this would be done within the plug-in itself rather than via a send/return loop. In terms of signal path, Creative Modifiers are therefore treated in the same way as processors like compressors or gates, which means using them in insert points rather than aux send/return loops. A prime example of a Creative Modifier is distortion, but the term also encompasses pitch-shifters, various kinds of enhancers, and amplitude modulation devices. All right — as we thought up the term, it can cover whatever we want it to! It could also cover dramatic filters used for effect, but since there are so many of these we'll be covering them separately in another article.

Distortion Plug-ins

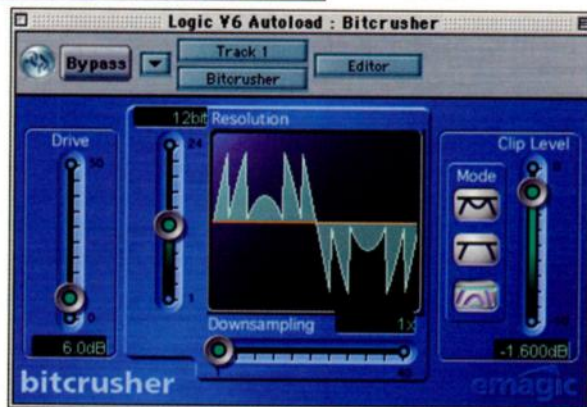
At one time, distortion simply meant overdriving an analogue circuit to create

As well as the standard complement of equalisers, reverbs and delay-based effects, sequencers these days are bundled with an ever-increasing array of plug-ins designed to alter your sound in new and interesting ways. We explain how to use these effects in the forms in which they're bundled with the Big Five sequencers.



Logic boasts a good selection of distortion plug-ins.

hard or soft clipping, but in the digital domain, there are more mechanisms that can be brought to bear. Clipping distortion is the easiest to create: you simply increase the level of the signal so that it reaches the maximum level (digital full scale or DFS) for a significant amount of the time, at which point the waveform gets its top and bottom flattened. This usually sounds pretty gritty and nasty unless some serious filtering is applied afterwards. When a plug-in is called *Distortion* or *Overdrive*, it normally means that it 'rounds off' the tops of the waveforms by means of a non-linear characteristic intended to emulate the way analogue circuitry tends to behave when overdriven. Though much smoother-sounding than clipping, this can still sound somewhat ugly when used heavily unless top cut filtering is applied,



and many plug-ins include some form of filtering for this purpose. Overdrive and distortion effects are similar in character to the distortion that occurs within a guitar amplifier, though in the case of the guitar amplifier, the necessary top cut filtering is provided by the speaker, which is designed to have a limited high-end response.

Another type of distortion made possible by digital processing is simply to 'miss out' some of the bits so that a 16-bit resolution signal can be reduced to 8 or even 4-bit

resolution. This introduces a lot of ugly quantisation distortion and quantisation noise, and is reminiscent of the sounds that used to accompany very early video games. By selectively turning off bits, the distortion pattern can be made even more complex so that a sine wave input produces a complex-shaped output — something you can see graphically represented when you try the different distortion modes in *Logic's Bit Crusher*. It's also possible to reduce the sample rate of a signal (usually by dividing the sample rate by 2, 4 or 8) to produce nasty aliasing effects, should these be in any way desirable!

Loud Bit, Quiet Bit

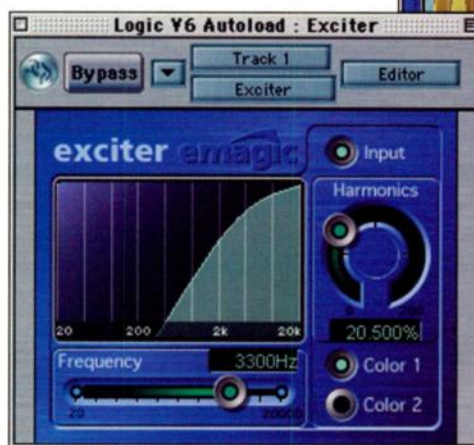
Amplitude modulation, in essence, means turning the volume up and down in a regular pattern. If you do this fast enough, you actually change the shape of the waveform and hence the tonal content of the sound, which is why you will sometimes find synths that offer amplitude modulation as a feature. If your modulation source is a low-frequency oscillator, however, you will get a tremolo effect similar to those found in some guitar amplifiers. More sophisticated tremolo plug-ins often offer a variety of modulation wave shapes and combine amplitude modulation with auto-panning to create movement in the stereo field.

Shifting Pitches

Pitch-shifting is sometimes thought of just as a means of rescuing out-of-tune singers, but it can also be used as a creative effect, as all pitch-shifting algorithms tend to introduce side-effects into the sound. The reason is that all simple pitch-shifters work by slicing the audio into very short sections and, when increasing the pitch, these short sections are looped and then spliced back together after being sped up. When the pitch is being dropped there's no need to loop, but the slowed-down sections still need to be cross-faded into each other as they're now longer than they were originally. Inevitably there's an audible modulation, the rate of which corresponds to the length of these short audio sections (which are usually only a few milliseconds long) and this has the effect of making the shifted sound appear out of tune. When small amounts of shift are being applied for detuning purposes, this modulation may be negligible, but when shifts of multiple semitones are used, it becomes glaringly obvious. I don't tend to use pitch-shifting as an effect myself, because I don't find the side-effects at all musical, but others do, and the pitch-shifting algorithms in Akai samplers, for instance, have been widely used (or abused!) in jungle and drum & bass

productions.

Another pitch-related effect is the sub-octave generator, which works by taking a narrow section of the existing bass end and then halving its frequency using a 'flip-flop' similar to those used for creating sub-octaves in early electric organs. The crudest octave dividers use the flip-flop's square wave output (usually heavily filtered) as the sub-bass signal, but better designs use this square wave to control a phase switcher that works on the original piece of filtered low-end audio. What comes out is best explained in terms of a sine wave. A sine wave has alternative positive and negative-going cycles, but after being treated via a phase inverter triggered from the original sine wave via a flip-flop, what you get out are two consecutive positive peaks followed by two consecutive negative peaks. This has a sub-octave component and the signal level follows the amplitude of the original sound. Heard without



Logic's *Exciter* and *Sub Bass* plug-ins synthesize additional harmonics at the top and bottom of the frequency range respectively.

filtering, it is pretty distorted and nasty, but by filtering out all the high frequencies and then summing the synthesized sub-bass signal back in with the dry signal, the impression of added deep bass can be quite convincing. The sound quality also improves if there are two or more divider circuits operating at the same time, each one fed from a slightly different region of the original signal's bass end. The widely used Dbx Boom Box, which works on this principle, operates on four frequency bands at once.

Enhancers

At the other end of the frequency spectrum, some kinds of enhancer add high-frequency content to a signal to create artificial brightness and 'air'. The most popular type of enhancer is based on a principle discovered by Aphex, where artificially generated harmonics are added back into a signal to create high frequencies that were

never present in the original signal. This can be done quite simply by using a high-pass filter to feed a side-chain that uses a combination of compression and distortion to generate the new high harmonics. A high-pass filter is needed to restrict the input to the side-chain, because if low frequencies are allowed into the distortion generator, the added harmonics fall in the audio mid-range where they are perceived as distortion. By limiting the added harmonics to above 5kHz or so, they are perceived as natural providing they are not

added at too high a level.

While the previously described enhancer works on the frequency content of the signal, other types work on the stereo width. A simple system that inverts the phase of the left channel and then feeds some of this into the right channel, and *vice versa*, can increase the sense of stereo width without compromising mono compatibility as the added out-of-phase components disappear when the two channels are summed to mono. It is also possible to process a mono signal to give it a sense of stereo spread (or to widen an existing stereo signal) by using filters to place peaks and troughs in one channel and the exact inverse in the other channel. Often this is achieved using comb filters as these are easy to design digitally and can have lots of frequency bands. Because the processing in the left channel is the exact opposite of that in the right channel, the signal sounds unchanged when summed to

▶ mono, but when the two artificially created (filtered) outputs are panned hard left and right, the signal appears very wide. This type of process doesn't provide independent positional information for the different components in a processed mono mix but it can produce a general impression of space and width. The process is particularly effective on synth sounds that have a high harmonic content.

Logic's Creative Plug-ins

I can't promise to have covered absolutely every *Logic* plug-in, though I hope this series has cast light on the most important ones. The simplest *Logic* distortion-type plug-in is *Clip Distortion*, which like the other distortion devices in the series, features a visual display intended to show how much the signal is being processed. A variable Drive slider determines how heavily the input is clipped, but the strength of this particular plug-in comes from a comprehensive set of filtering tools that allow the signal to be low-pass filtered prior to clipping and again after clipping using the Tone and Filter sliders. The symmetry of the clipping process can also be changed using the Symmetry slider. A Mix control allows the dry and distorted signals to be combined if required, after which the signal passes through yet another low-pass filter (just 6dB/octave this time) controlled by the Sum Filter knob, before encountering a tunable shelving filter with a massive ± 30 dB range. The idea of all this filtering is to allow the user to control the severity of the added harmonics.

Overdrive is a little simpler, having only Drive, Output Level and Tone controls. This attempts to emulate the overdrive characteristics of an FET (Field Effect Transistor), which isn't dissimilar to the way a tube 'soft limits'. The Tone control cuts the higher harmonics to take the rough edge out of the sound, though it isn't as sophisticated as using a speaker simulator. *Distortion* offers a similar set of controls but the distortion characteristics are modelled on those of a standard bipolar transistor rather than an FET.

While the previous two plug-ins try to capture something of an 'analogue' feel, *Bit Crusher* has no such pretensions. You can reduce the bit rate and the sample rate to create horrendous quantisation distortion and aliasing, while Drive just piles on more distortion. Clip determines at what level clipping should occur, though the Mode buttons allow a choice of outcomes when the signal reaches clipping level as can be clearly seen in the display where you may notice the peak of the waveform 'folding back' on itself rather than being clipped flat. ▶

Creative Modifiers In MOTU's Digital Performer

The simplest of *DP*'s Creative Modifiers is *Quan Jr*, which is really just the bit-depth-reduction section of the *Masterworks Limiter* plug-in. As well as providing dithering and noise shaping options for sensible bit-depth reduction, *Quan Jr* can do those trendy 'digital grunge' effects as well. Simply lower the Bits value to

something below 16 — and get ready for some real dirt with values of eight or lower. Remember to turn off dither to keep the plug-in 'quiet', and exercise caution when reducing bit depth to 3 or less, as then even the quietest input signals are quantised to high amplitudes.

Preamp 1 has a number of different modules, including a single-band compressor which was discussed back in March's *Sequencer Dynamics Masterclass* (www.soundonsound.com/sos/mar03/articles/sequencedynamics.asp). It's the Pre-EQ and Coloration sections, though, that do most to radically alter a signal's harmonic structure. Pre-EQ by itself is nothing special — just two parametric bands plus a simple low-shelf or high-pass type — but its interaction with the Coloration controls makes it interesting. Basically, there are two Coloration modes: Subtle, for valve warmth, and Drastic for overt distortion. The exact functions of the Drive, Timbre and Push buttons are a little mysterious — Drive seems to be an 'overdrive amount' control, introducing distortion, whilst Timbre alters the quality of the overdrive, from restrained to chaotic. However, for anything much to happen at all, you also need to turn up the Push control. Coloration can additionally be made to behave dynamically, coming into play when the input signal exceeds the threshold level of the compressor section, whether the compressor is enabled or not.

DP's *Ring Modulator* is a classic implementation of this kind of effect, and has a funky animated display to boot! The track on which you place the plug-in is used as one of the input sources (the carrier), and there are several options for the sourcing of the other (the modulator). One is to use the plug's built-in oscillator, which has a wide frequency range and selectable waveforms. You can even 'play' this oscillator via MIDI — in *DP4*, any active *Ring Modulator* should automatically show up in all MIDI output



popups. For more on configuring this in earlier versions see *Performer Notes* from way back in September 2001 (www.soundonsound.com/sos/sep01/articles/performernotes0901.asp). Other modulation sources include the carrier signal itself (Effect Input), and any other audio routed into the plug-in via one of *DP*'s internal busses — all this can be configured using the Modulation Source pop-up menu. Other controls include a gain for the modulation source, a low-pass filter for toning down the inevitable metallic harshness, and a wet/dry mix control.

Finally, *Sonic Modulator* could be *DP*'s least well-understood plug-in. Originally intended as a Leslie speaker simulator (hence the two-way crossover and Doppler-effect-capable pitch-shifters), *Sonic Modulator* can do all kinds of freaky things, albeit only on mono channels. See October 2002's *Performer Notes* (www.soundonsound.com/sos/oct02/articles/performernotes1002.asp) for a full explanation of this great plug-in.
Robin Bigwood



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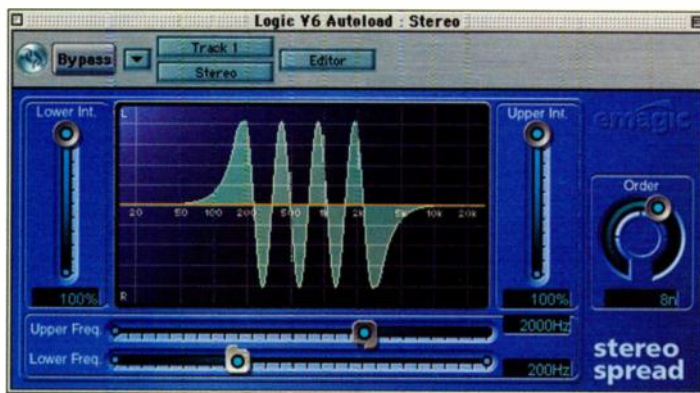
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► You have to listen to these sounds because they're hard to describe and, to be honest, even harder to like unless you're into hard industrial dance with a nasty edge! Nevertheless, I have used this plug-in with some success to liven up a soggy snare drum recording.

Phase Distortion is quite different again, as it uses a modulated delay line as its engine, where the modulation source is a resonant low-pass-filtered version of the input signal. In effect, the input modulates its own wave shape. The maximum delay time of the modulated delay is set using the Max Modulation control, while Intensity regulates the modulation depth. Mix allows the original signal to be blended in with the distorted signal. Used with care, this plug-in works particularly well on monophonic synth bass lines to warm, fatten and roughen. In combination with the Emagic *ESM* synth, you can create some very powerful dance bass sounds. Think of it as an easy way to add phase distortion synthesis in the style of the Casio CZ101 to your own sounds — but be warned that it sounds pretty nasty on polyphonic sounds.

Logic's Exciter is a fairly straightforward implementation of the 'added harmonics' enhancement process, where the two Colour settings correspond to different distortion mechanisms and hence different spectra of added harmonics. The Frequency control sets the low limit of what is fed into the side-chain, while Harmonics controls how much harmonically enriched signal is added into the dry signal. The Input button may be used to kill the dry signal either to check on what's being added or to enable *Exciter* to be used in a send/return loop. Though enhancers are not normally used in send/return loops, they can be used this way providing there is no delay between the dry and the enhanced signals. Activating plug-in delay compensation ensures timing accuracy for effects used in channel insert points but it doesn't work for *Logic's* busses (which is where you normally park your send/return effects), so you may have to insert a *Sample Delay* plug-in into the dry signal path and do the compensation manually if you wish to experiment with this mode. Personally I always stick to using this plug-in via individual channel insert points unless processing a whole mix.

Stereo Spread is a different type of enhancement intended to increase the apparent stereo width of an existing stereo signal or to simulate stereo from a mono



signal. It works on the principle of cutting and boosting frequency bands in one channel and doing the exact opposite in the other as described earlier, though to prevent the bass end from suffering, the processing affects mainly the mid and high frequencies. There are controls to adjust the upper and lower frequencies affected while the Order knob dictates how many frequency bands the signal is split into. It's safer not to enhance bass frequencies too much as it can sound odd, and can also make mixes impossible to cut onto vinyl.

Sub Bass is almost like an enhancer in reverse, inasmuch as it adds low-frequency components below those that existed in the original signal. In this implementation of the process, the added subharmonic is sinusoidal and two separate sub-bass components can be derived from two separate sections of the audio spectrum (typically 80Hz to 200Hz) in order to produce a smoother result. The system works with any material — monophonic or polyphonic parts, or entire mixes — and the bandwidth of the material being used as a source for subharmonic generation is user-adjustable. Though it is possible to set up different division ratios, it is usually best

to stick to a setting of 2 to produce single-octave subdivisions. Each of the two 'voices' has Ratio, Centre and Bandwidth controls and the amount each contributes may be adjusted using a Mix control. Further controls regulate the dry and sub components. In typical applications, the centre frequency for the higher band should be set at roughly 1.5 times that of the lower band

for the smoothest results. Used in small doses, *Sub Bass* is effective for adding weight to weak drum tracks or bass instruments, but used to excess it can shake loudspeakers to pieces, so use it carefully and sparingly.

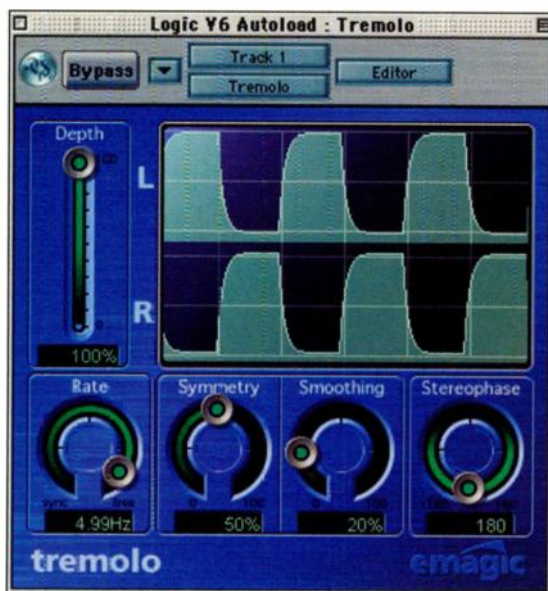
Tremolo is quite straightforward, but goes a lot further than the tremolo you find in your guitar amp as the modulation waveshape is continually adjustable both in width (Symmetry) and smoothness, so it can be a square wave, a pulse wave or a wave with a smooth attack. Mono or stereo signals can be processed and the two outputs of the plug-in can either work together to provide a conventional amplitude modulation tremolo effect, or they can be adjusted in phase so that they overlap or alternate, producing a panning tremolo effect. The depth of modulation is controlled via a single slider, but most exciting is the Rate control, which at one end of its travel sets the LFO speed in the usual way, but at the other offers a number of tempo-locked subdivisions. Set to modulate at 32 cycles to the bar, this produces a wonderful rhythmic gating effect that can be used to lock any pad or sustained part into the groove of a track.

This is one plug-in you shouldn't overlook.

Creative Plug-ins In Cubase VST & SX

Cubase also has a tremolo, again combined with a stereo/mono button so you can produce auto-pan effects. With the Sync button active, one unusual effect is to choose the square wave option with a slow speed setting, and use it to process a drum loop — you can gate specific beats, and with the stereo button active these will leap from speaker to speaker, perfectly locked to your song.

On the distortion side, the oldest and most subtle



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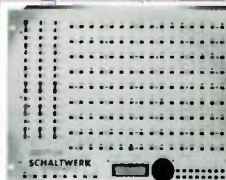


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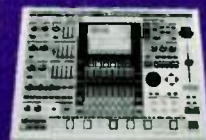
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Cubase SX also features an impressive range of distortion plug-ins, from the subtle to the extreme.



► contribution in the *Cubase* stable comes from *Fuzzbox* — a simulation of a transistor stompbox. This can run the signal into coarse clipping, but as long as you keep its Boost control to 25dB or less it's actually quite useful for thickening a sound without obvious distortion, while Clipback inverts the signal above clipping level to produce higher levels of second harmonics. Try 15dB Boost and vary the Clipback on a drum loop to taste.

Distortion is more comprehensive, providing a selection of five distortion algorithms that each generate a series of odd harmonics: Soft, Crunchy, Dirty, Wracky and Evil. Three Shapes determine the I/O transfer characteristic, while the Drive control determines the amount of distortion, and the Contour control is described as a high cut filter, although it also seems to cut low frequencies at settings below 50 percent. *Distortion* is capable of a wide range of effects from a soft crunch up to cone-bending overload, but I find the Soft, Crunchy, and Dirty algorithms (with Drive settings of 50 percent or less) more practical with most sounds than the Wracky and Evil algorithms, which tend to mangle things beyond recognition.

Datube is altogether more well mannered, offering valve emulation that (unusually) provides even as well as odd harmonics, as well as a Balance control to mix in the untreated signal for even more subtle results. With an input signal peaking at 0dBFS, its Drive control lets you dial in just a few percent of distortion to add a little warmth when it's down in the 10 to 20 percent region, rising to 10 percent distortion at around 40 percent Drive, while at 100 percent the distortion is only around 6dB down on the signal level. This is an enhancer plug-in that you can safely use on a complete mix as well as individual tracks.

Overdrive is a guitar amp emulator, with optional speaker simulation that rolls off the top end, and a three-band EQ providing ± 15 dB gain variation. It falls somewhere

between *Datube* and *Distortion* in severity, its six amp styles providing different basic algorithms that once again generate various amounts of both odd and even harmonics — the graphic window provides a rough but useful guide to the number and amount of generated harmonics. I find the suggested presets rather heavy-handed, and it's quite possible to generate a lot of useful amp models with Drive settings of 30 percent or less, where the various algorithms still add plenty of character without sounding shredded.

Quadrafuzz is a clever concept by SOS contributor Craig Anderton. The audio is split into four user-defined frequency bands, and then each is distorted individually and filtered once again before being finally mixed together. There are five distortion types, and the results are incredibly versatile, as demonstrated by the 32 presets — you can even use it to isolate and distort one drum in a groove with care!

Bitcrusher from FXpansion is very similar to its namesake in *Logic Audio*, providing four operating modes with subtly different amounts of grit and noise, plus a Sample Divider that further decimates the output — at its lowest setting all the signal gets through unscathed, while increasing it sounds rather like detuning a radio station, and at high settings the output signal can be almost unrecognisable. You can add some

grit with Depth settings ranging from 10 to seven bits, while lower settings sound more like blown loudspeakers and faulty amplifiers (should you desire them).

Grungelizer also adds noise and grunge to your sounds, but this time in a chronological manner, by emulating the historical limitations of audio devices. These encompass vinyl crackle, tape and amplifier hiss, large amounts of second-harmonic distortion to mimic stylus geometry, EQ limitations, and AC hum at either 50Hz (UK) or 60Hz (US) frequencies, plus control of the overall level of all five effects via a Timeline control labelled from 1900 to the present day. Although this has obvious uses for anyone working in period drama, the EQ provides a useful combination of LF roll-off and mid-range peaking that might prove useful elsewhere (perhaps to simulate yet more guitar amps), while at lower settings the Distort control is very useful as a second-harmonic enhancer — just turn all the knobs right down except Distort to add extra attack and thickness to drum sounds.

MDA's *Sub Bass* is altogether more versatile than its counterpart in *Logic Audio* (and if you're not a *Cubase* user, is available for free download from www.mda-vst.com along with other MDA plug-ins) with three completely different modes to add new low-frequency information. In all cases the easiest way to set up the controls is to first turn the Dry level down to zero so you can hear the generated bass component by itself. Once you've got something suitable, turn up the Dry level again, and then add some FX level to taste.

Boost mode simply warms up the bottom end with EQ, with the Tune control adjusting the turnover frequency, Drive adding some crunch at higher settings, and Tone adjusting the high-end response, while Threshold lets you set the trigger level. Trigger mode generates a drum synth sound triggered each time the input signal rises above the Threshold setting, with Tune now setting the oscillator frequency, Drive altering its waveform, and Tone its decay time, although I've found this mode prone to mistriggering, however carefully you set the Threshold control.

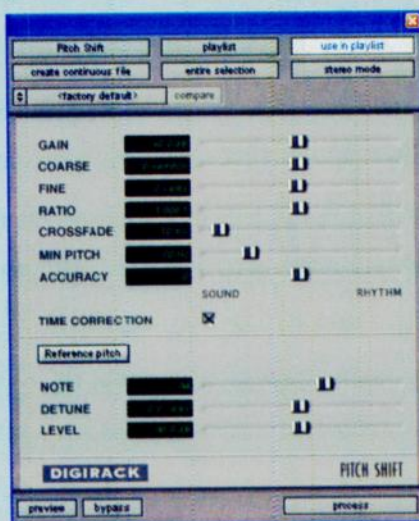
Divide mode is my favourite, generating a pitch-tracking signal an octave below the input signal, with the Drive control now affecting the waveform of the sub-octave component. This can generate some seriously low signals that may be felt (or on nearfield speakers just seen) rather than heard, so watch your speaker cones carefully for potentially dangerous subsonic movement. To enhance a bass drum, start with Tune and Tone settings of 50, Drive at zero, and then start the Threshold control at

Creative Modifiers In Digidesign's Pro Tools

The core set of *Digirack* plug-ins bundled with Pro Tools systems is relatively limited in scope when it comes to real-time Creative Modifiers, whether you buy a host-based LE system or a high-end HD rig. Digidesign's own *DPP1* pitch-shifter is now included as *Pitch*, but only with TDM and HD systems. There's usually some form of bundle deal going which will see these augmented by cool plug-ins from third-party manufacturers, but these tend to vary quite often, so there's no universal set of Pro Tools Creative Modifiers — at least not in the real-time TDM or RTAS realm.

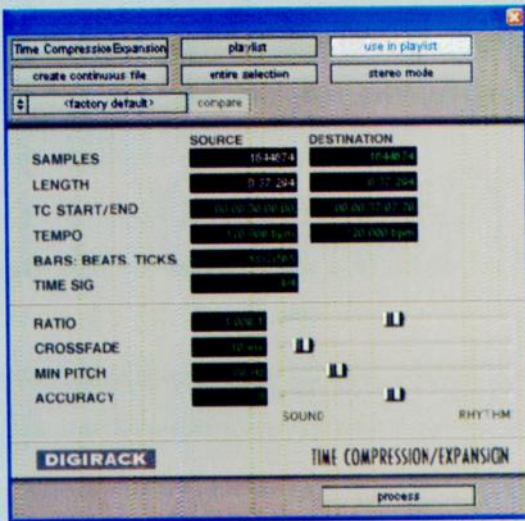
However, *Digirack* also includes a selection of Audiosuite off-line processing plug-ins, and some of these certainly allow you to modify your audio creatively. Although you can't use them in real time, they do include a preview function, and Pro Tools multi-level Undo means that you can safely mess around with them to get the effect you're after. Audiosuite plug-ins act on the currently selected section of audio in the Edit window.

Reverse does exactly what the



name suggests — take a section of audio and turn it back to front. Reversed cymbal hits or guitar chords are very useful for creating tension to mark the end of a dropped-out section in your song, for example.

Time Compression/Expansion and *Pitch-shift* are also self-explanatory. Both offer an Accuracy slider that



travels between Sound at one extreme and Rhythm at the other, the idea being that you can choose the least bad compromise between audible side-effects and tempo drift. In practice I find that this doesn't always make very much difference, and that even with the slider all the way to the right, long selections end

up out of time when pitch-shifted. Unlike Paul White (see main text) I use both of these effects all the time in a musical context — my favourite application is pitch-shifting a Di'd guitar part up or down by an octave before feeding it through an amp simulator.

Sam Inglis


0dB and move it down until the effect only cuts in where desired, to avoid unwanted continuous rumbling sounds.

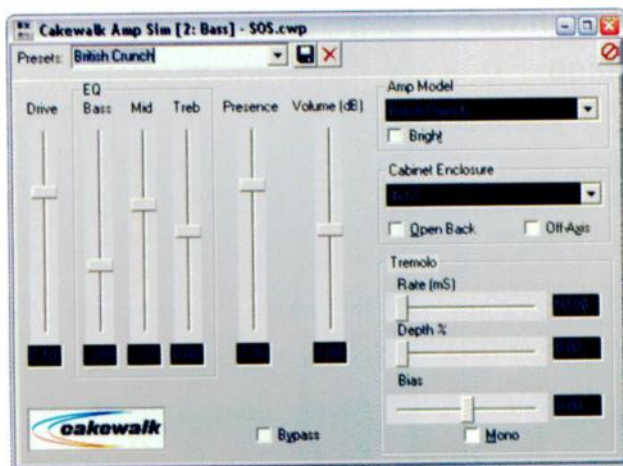
Creative Plug-ins In Sonar

I've heard it said by several enthusiastic *Sonar* users that one of the reasons that its price is less than that of many other MIDI + Audio sequencers is that you don't have to pay for a huge bundle of plug-in effects that you may or may not want. This is certainly true when it comes to the more creative effects, as there are just two — *Amp Sim* and *Tape Sim* — which together comprise Cakewalk's *Audio FX2* pack.

Amp Sim models the desirable effects of tube guitar amplifiers, along with various speaker cabinets and a virtual mic position. There are eight amp models covering American and British, tube, solid-state, clean to distorted, along with a No Amp option that simulates a DI box. All the amps have Drive, an EQ section comprising Bass, Middle, Treble, and Presence, a Bright switch, and output Volume, plus a Tremolo section with rate, depth, and bias controls. Together these options provide a huge range of sounds, and they then pass into a selection of speaker enclosures (1x12, 2x12, 4x10, or 4x12), with a choice of open or closed back, along with a Direct Out (no speaker) option, and on or off-axis mic position.

Of course, guitars are ideal candidates for *Amp Sim*, but I've also found it very useful for basses and drum loops.

Tape Sim simulates the effects of recording your audio on an analogue tape deck, including overload compression, saturation, and even tape hiss! It generates the complete range of odd harmonics (3, 5, 7, 9 and so on), at a level determined by the Rec Level control, and relative balance by the Warmth control. It also has a variety of other tape effects on offer, such as Tape Speed and EQ Curve to simulate the high end response of analogue recorders running at between 7.5 and 30 inches per second, and NAB bass boost. It works well with drums and loops, but I've always found it too heavy-handed to add life to an entire mix. 



Sonar's Creative Modifiers: the *Amp Sim* and *Tape Sim* plug-ins.

Access Virus Indigo TDM



The Oscillator screen of the *Virus Indigo TDM* plug-in — a familiar sight to anyone acquainted with the old *Virus TDM*, or indeed the hardware synth.

Analogue-Modelled Synth Plug-in For Pro Tools TDM & HD Systems

Just as Access's hardware Virus synth was followed by the snazzy Virus Indigo, so the TDM plug-in version for Pro Tools has benefited from an upgrade to Indigo status, making it more infectious than ever...

Sam Inglis

There are plenty of modern digital synths around that are claimed to provide authentic analogue sounds, and there's plenty of debate over whether any of them actually succeed. The Access Virus was among the first 'virtual analogues', and has gone through a number of incarnations over the years. Originally a desktop module, it's since sprouted

keyboards of varying dimensions, been shoehorned into a 1U rack, and painted any number of different colours. It's also been stuffed onto a CD-ROM and sold as a TDM plug-in for Mac and PC Pro Tools systems. And for all the arguments about whether the Virus really captures the analogue 'sound', there can be no question about the authenticity of its recreation in software. Digidesign's TDM cards use the same Motorola DSP chips as the hardware Virus, and the code behind the sound engine that

Test Spec

- Virus Indigo v1.0.
- Beige 300MHz Apple G3 desktop with 256MB RAM, running Mac OS 9.1.
- Digidesign Mix Plus system running *Pro Tools* v5.1.3.

runs on them is the same in each case. Indeed, if you happen to own a hardware Virus as well, you can transfer patches between the two, and use the knobs on the hardware version to manipulate the plug-in's controls.

If you want to know what the Virus sounds like, or learn about its synth spec, I suggest consulting previous *SOS* reviews of the hardware units (for example, the review of the latest hardware Virus, the Virus C, in *SOS* August 2002, and the latest review of the Virus Indigo, in *SOS* October 2002. These reviews can also be found at: www.soundonsound.com/sos/Aug02/articles/accessvirus.asp and www.soundonsound.com/sos/Oct02/articles/accessindigo2.asp respectively). The various upgrades that the hardware Viruses have received over the years have been more than cosmetic: new features and effects have been added in software updates — v6.0 of the Virus OS has been available since May — while the internal synth hardware is now on revision C. Until now, however, the TDM version has missed out on these improvements. The new *Virus Indigo* plug-in brings the software incarnation up to date with the latest hardware Viruses, and boasts more than 30 new functions and synthesis parameters compared to the original, along with a redesigned interface and support for Digidesign's new HD hardware, on which it will now work at sample rates up to 96kHz. Users of the software version are, however, still second-class citizens in the manual

SOUND ON SOUND

Access Virus Indigo TDM **£555**

pros

- It doesn't just sound like a Virus. It is one.
- Makes efficient and flexible use of DSP resources.
- Seamlessly replaces old Virus TDM in Pro Tools Sessions.

cons

- Some other software-synth interfaces provide better visual feedback by not sticking so closely to the hardware paradigm.

summary

The Access Virus is perhaps the most popular analogue-modelling synth around, and *Virus Indigo TDM* is a worthwhile update to the already excellent software implementation.

For The Record...

C1000 ▶
 "...available at an attractive price and with the provision of the acoustic converters for polar pattern and presence boost, is even more value for money."

Mike Skeet

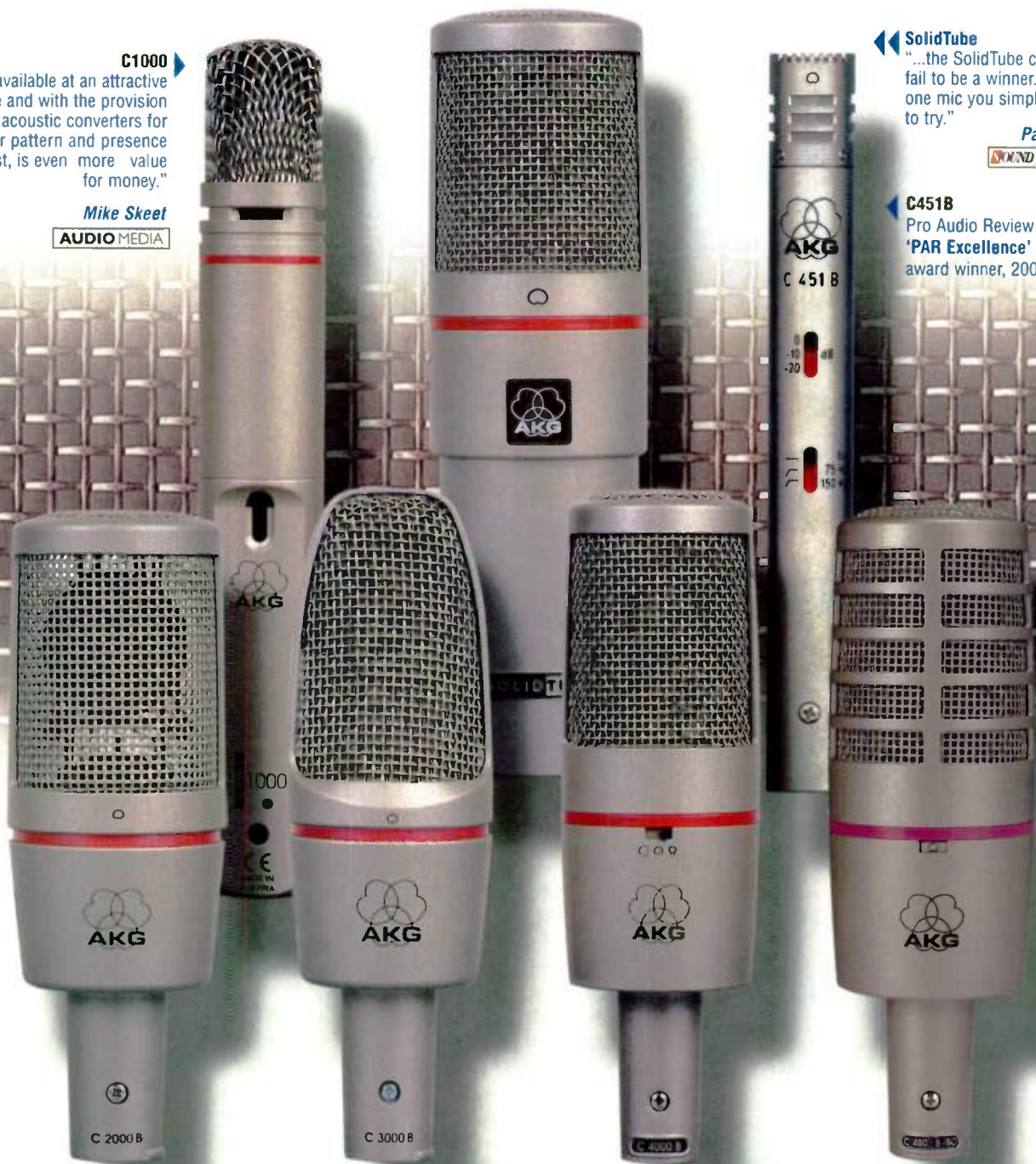
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◀ **SolidTube**
 "...the SolidTube can hardly fail to be a winner. This is one mic you simply have to try."

Paul White

SOUND BY SOUND

◀ **C451B**
 Pro Audio Review magazine 'PAR Excellence' award winner, 2001



C2000B

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Dave Faister

STUDIO SOUND

C3000B

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ACCESS VIRUS INDIGO TDM

► department, getting their documentation only in PDF format.

Point Of Infection

The first difference you're likely to notice between the old and new *Virus* plug-ins concerns the copy protection. The original used the then-standard floppy key, whereas *Virus Indigo* comes with a licence card for authorising an iLok dongle. If you had the original *Virus* plug-in installed on your system, *Virus Indigo* overwrites it, so you might as well uninstall the original and save your authorisation, in case you want to install it on another system. Having discovered this, I was a little nervous about what would happen when I loaded in a *Pro Tools* session that had used the old *Virus* plug-in — especially as I often don't bother to save its settings as a *Virus* patch, finding it simpler just to save the entire *Pro Tools* Session. I needn't have worried. The Session loaded without any problems, and with *Virus Indigo* automatically loaded in the inserts where the old version had been. When I pressed Play, everything sounded exactly as it had done before. Top marks (although a Readme file supplied with *Virus Indigo* warns that this may not work properly on the PC).

Easy Like *Virus Indigo*

Opening the plug-in's editing window highlights another change: the new Easy Page. Since the *Virus* has far more parameters than can comfortably be accommodated in a plug-in window at once, they've always been divided into six thematically arranged pages: Osc, Filter/Env, LFO, EFX, Misc and ModMatrix. The point of the Easy Page is to provide instant access to 10 of the most important parameters from

across the range, so that you can do 'quick-and-dirty' edits without having to jump around the pages looking for the right parameter. Some of the Easy Page controls actually manipulate several parameters



The new Easy Screen provides a quick way of getting to some of the main sound-generating parameters.

elsewhere; for instance, the Easy Page Filter Cutoff knob adjusts the cutoff frequency of both of *Virus Indigo*'s filters together. New parameters have been added to most of the individual editing pages, and the Misc page is now known as FX2/Global.

The Easy Page is a nice addition, but for anyone familiar with the basics of subtractive synthesis, the detailed editing pages shouldn't be too daunting. The interface is actually superior to that of the hardware synth in one respect, because there are no shifted functions — every parameter has its own dedicated control. However, Access haven't done too much to exploit the additional potential for visual feedback offered by a full-sized computer screen. For instance, the Wave Select and Shape controls for each oscillator allow you to choose a waveform from a preset list of 64, and then shape it to taste. This feature

would be so much more intuitive if you could actually see a visual representation of the waveform change shape as you move the controls; in fact, you can only find out what wave shape any number corresponds to by looking it up in the PDF manual. Likewise, there's no graphic display of envelope shape, and I also think it's a shame that virtually all *Virus Indigo*'s

parameters are still calibrated arbitrarily from 0 to 127, or -64 to +63. How about giving us values in seconds, Hertz and other real-world units?

Minor gripes aside, however, *Virus Indigo*'s interface is a model of clarity, and is easy to use. Like any good plug-in, moreover, it allows almost every parameter to be automated with a minimum of fuss. To my mind, this facility more than makes up for the lack of physical controllers to play with, and I often find myself drawing in automation curves for half-a-dozen *Virus* parameters or more. Setting *Virus* up as a vocoder, or using its filters to process another audio track in *Pro Tools*, is also trivially easy.

Spreading The Disease

The *Virus Indigo* plug-in is one of those products that does pretty much what it says on the tin. It is an Access *Virus* synth in software, and its integration into *Pro Tools* is exemplary, particularly with regard to its handling of DSP resources (see 'Voice Management' box below). In a 44.1kHz Session, *Pro Tools* reported *Indigo* as taking a mere 384 samples to do its thing. Add that to the laughably low latency of the Mix or HD hardware, and you get a number small enough for *Virus Indigo* to be indistinguishable from a hardware synth in terms of its responsiveness to keyboard input. It feels like the real thing and it sounds like the real thing.

Pro Tools TDM and HD users have always been able to call upon a wide range of high-quality plug-in effects that have not been available to users of native systems. When it comes to synths, however, the situation is reversed, and it would be easy for TDM users to become jealous of what's available on native platforms. For anyone in this position, I recommend a course of *Virus Indigo*. ☺

Voice Management

One aspect of the *Virus* plug-in that can be confusing at first is the design's way of maximising DSP resources. Once you've installed *Virus Indigo*, it appears within *Pro Tools* as eight separate plug-ins numbered Indigo 1 to Indigo 8, each available in mono, mono-to-stereo, multi-mono and stereo versions. Instances with the same number share a Mix or HD DSP chip, and appear in the MIDI Device/Channel Selector as Indigo 1a, Indigo 1b and so on. A Mix or HD DSP chip can host up to eight instances with the same number, each playing back a different patch, so you could theoretically create a 64-part multitimbral synth if you had eight DSP chips to play with. Maximum total polyphony from one DSP is 16 on a Mix system or 20 on an

HD card. Heavy use of *Virus Indigo*'s effects can bring down polyphony, but to my mind, built-in effects are much less useful anyway on a software synth than they are on a hardware device.



The system takes a little bit of getting used to, but works very well in practice, and gives you a flexible way of managing your DSP resources. You could, for instance, use one DSP chip to play back eight different monophonic parts such as snares and basses, and another for a single 16-voice organ or piano patch. *Virus Indigo* is certainly more DSP-efficient than its only major rival on the TDM platform, McDSP's *Synthesizer One*, which can deliver seven voices from a Mix card DSP and eight from an HD one.

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Robbie Moore

Robbie Moore standing in the doorway to his soundproofed live room.

Readerzone

Tom Flint

Consumer society teaches us that new things are cool and sexy, whereas anything old and used brings shame on its owner. That, of course, is what every high-street retailer would love us to think so that we continue purchasing their goods. But a salesman's worst nightmare is the person who keeps their 1966 Morris Traveller on the road instead of buying the latest VW Passat, or who use their old copies of *SOS* to make papier-mâché furniture instead of shopping at Ikea.

SOS reader Robbie Moore has found another way to make sales staff cry in their sleep: his studio is built almost entirely from salvaged materials, and it has cost Robbie nothing more than the price of his own labour. "You don't need lots of money to have a studio, just time and motivation," explains Robbie. "I found wood, rubber, paint, pipes,

glass, carpets, rugs, plugs, wire, bulbs, lamps, mirrors, electric heaters, picture frames, insulation, a fridge, a television and a kitchen sink. The only things I bought were screws and a few plumbing attachments. My studio has a shower, a kitchen and a soundproof room, and I have just started to record here."

There can't be many people who have the vision to build a studio out of junk, but Robbie comes from a pretty creative family.

Main Equipment

- Roland VS1680 hard disk recorder.
- Apple G3 running OS X.
- BIAS Peak v3.1 audio editing software.
- Native Instruments B4 Hammond emulator.
- Lexicon MPX500 effects processor.
- Focusrite Penta compressor.
- 2x Oktava MK319 condenser mics.
- 2x Rode NT1 condenser mics.
- Gibson GA-30RVS guitar amp.
- Gibson ES125TC electric guitar.

Robbie himself took an Arts Foundation Course in Brighton before seriously taking up music. "I had a nightmare time at college," admits Robbie, "I'd studied ceramics at school and I wanted to continue making pots and nice little sculptures but Art School wouldn't let me do that so I got more and more into music. My friends began telling me that I was better at writing songs than I was at art and I thought 'Maybe I am, it's more fun, and I don't need to go to college and have someone tell me what to do,' so I just left the art behind."

After college Robbie formed a writing and singing partnership with a girl called Charlotte, and the pair gigged and recorded as a duo for a while. Eventually they decided to expand the format and, having recruited a drummer, keyboardist and bassist, they became the The Mores. "We did a little tour in the South of France," continues Robbie, "but when you put a band on the road, if there are any cracks they really start to show. Our bassist and drummer hated it and decided they didn't want to be musicians any more. Some time after that Charlotte left too. I was left with three albums' worth of songs, all of which are very reliant on vocal harmonies. I'm very influenced by the vocal harmony stuff

from the '60s and '70s so I had the idea of having a female backing trio. I'm now rehearsing with three singers I've called The Three Graces. I've got 55 songs to teach these girls and I'm having to write new arrangements and add extra harmonies, but it's great fun. We're currently looking for a new bass player and drummer so we can start gigging."

Much More

Shortly after the band split up Robbie decided to concentrate on recording and writing new material, but at the time, he was living at his aunt's house where his ability to record was severely limited: his drum kit was stored in the loft and more of his equipment was languishing elsewhere in the home of his manager. Robbie needed somewhere more permanent to work, but his finances were limited, so he began to consider the possibility of building a studio himself. "One of my inspirations was a friend who gathers a lot of materials from skips to make sculptures. I wondered if I could do something like that and still make a place look really good. I also wanted a permanent setup so I could work all the time, and I wanted a soundproofed room where I could record bass, guitars and drums."

Robbie eventually found 370 square feet of floor space to rent in an East London studio complex which was once a huge sweet-making factory. Robbie: "As far as I could see, having looked at a few other places, this had the most character and was the cheapest studio complex in this part of London: it is only £85 a week including all the bills. It is very easy going because you just get left alone."

Like many similar industrial building conversions, the studio workspace offered nothing more than four walls, a door and window to begin with, so Robbie had the freedom to use the space in any way he wanted. Getting stuff in and out of the sweet factory was made easy by the building's industrial lift, and Robbie soon got hold of an old car to transport everything back and forth. However, he still had no idea where he would get the second-hand building materials he intended to use.

"You have to spend hours and hours driving around looking for materials," explains Robbie. "I ended up finding regular places to look. There is a wood yard in Tooting, and every Friday at six o'clock on the dot they have a big clearout of the week's offcuts. They just dump the wood

The studio's shower and kitchen, both built and furnished entirely from found materials.



For when software is not enough: the Hammond Cadette bought for just £40.

outside for whoever is there to take away. There were quite a few other people who knew about it — some turn up with hand-held circular saws ready to cut stuff up — so I had to get there early. There is a real sub-community of scavengers.

"Most of the other materials I've found have been in skips at the back of the big chain

stores. Habitat was a really good source — I guess it is because they are a chain and they can't be bothered to send faulty stuff back. The first thing I found was a sack full of little multi-coloured light bulbs, all in their boxes. I think they were from a window display but I guess the shop didn't want to store them so they chucked them out. There were about 300 of them, and that has got to be £100 worth of bulbs."

As Robbie found more and more good sources of recyclable materials he developed a circuit he could follow which included them all. "I tended not to go out when it was rush hour, although if I needed to go to the wood yard I had to be there at six, but other times I'd wait until about eight or nine and do a lap. First I'd head to the Maida Vale area, then I'd go down to Chelsea where there is a good Habitat store, then finally down to Earlsfield which has a good carpet place. It would take me a couple of hours but I'd usually end up with a car full of stuff. A lot of it I chucked away again but I gradually sifted out the good stuff.

"The rich areas of London are really good. I saw a woman putting a large colour TV out on the street. She told me it was in the way and she didn't need it any more, and yet it works fine. These people have a lot of money!"

The Drum Room

A major feature of Robbie's studio is the soundproofed drum room that takes up about a quarter of the studio. The design is based around a standard frame structure, clad in various bits of plasterboard and wooden panelling. The frame is filled with carpet underlay which has been tightly rolled and then stacked in the spaces.

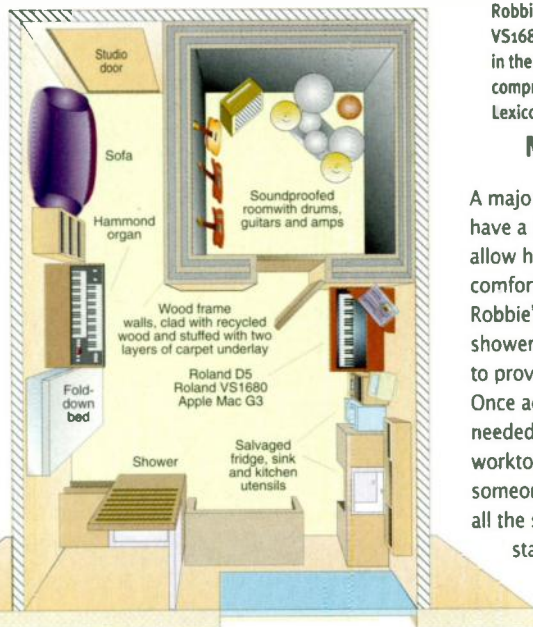




▶ The entire construction is double thickness so that there are two separate underlay-filled cavities within each wall. "The drum room is the only bit of this studio that is soundproofed properly," admits Robbie. "I thought about soundproofing the walls between me and next door but I would have lost quite a bit of space to do it properly. The artists who rent the spaces either side never make much noise and at night people go home so I decided I didn't need the rest of the room isolated.

"When I started constructing the walls I realised that there would have to be a cavity of some sort, but it was after I began work that I started finding rubbery underlay outside carpet warehouses. When carpet fitters return from a day's work they bring all the old underlay they have taken up and dump it in the bins back at the carpet shop, but it is often still in good condition. I'd read that rubber was good for soundproofing, so I started trying to ram the underlay into the cavities. I soon found that it gripped itself if I rolled it tightly and then I could board over it.

"All the wall panels are made from scraps of wood I've found and patched together, so inevitably there were some gaps, but I plugged those with loads of mastic filler, and I finished the whole thing off by painting it black.



"You can still tell that some of the panels are made from old cupboard doors, but I quite like the higgledy-piggledy way it looks, and recording studios should be inspiring places. From my experience at art school, I know that visual artists working with colour often prefer neutral walls, but for music you need to give your surroundings character, and when you build a studio out of salvaged materials it is always going to have character."

Robbie's well-organised work desk holds a Roland VS1680 recorder and Roland D5 keyboard. Above in the rack: ART FXP multi-effects, Alesis 3630 compressor, Focusrite Penta compressor and Lexicon MPX500 multi-effects processor.

Make Yourself At Home

A major aspect of Robbie's design brief was to have a studio which had enough facilities to allow him, and visiting musicians, to work comfortably for very long periods of time. Robbie's solution was to install a kitchen, a shower and a bed in the remaining area, and to provide adequate seating for all visitors. Once again, Robbie managed to find what he needed. "The sink was in a skip and the sink worktop was sitting outside the house of someone who was having a clearout. I made all the sink cupboards myself and the music station desk was cut from a wooden box I found in Earlsfield. The kitchen cutlery, bowls and plates all came from the Habitat skips."

To keep the central area free for band recording Robbie installed a fold-down bed that springs up against the wall when it is not used. "Originally I made a fold-down futon but a friend gave me this, which is much better. It's like something out of James Bond; you just tuck in the sheets and then flip it up out of the way. The sofa is another thing that I didn't find, it was actually made by my mum and dad: my dad did the carpentry and my mum

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► did the upholstery."

In the back corner of the studio Robbie constructed an enclosed shower fabricated from various bits of wood, perspex and shower parts. "The shower had been thrown in a skip but I took a chance that it would still work. It had to go in the back corner of the room because the building's hot water pipe runs along the back wall, but I also realised that it needed to be raised up so the waste water would drain down into the pipe underneath. I had to work out how to plumb and I had to work quickly because although there's a tap stop in the corner, it switches off the water for everyone else in this row too!

"I fixed the shower base up in a frame but then I needed some steps up to it. I found some drawer frames in the Habitat bins which were perfect because they were made from solid oak, so they became my steps.

"I cut strips of wood to make the lattice panel on the front wall of the shower so that I could grow a mass of ivy up the outside. I still might do that but I've been told that the hot water might kill the plants. I wanted a transparent wall on the other side, and although it took a couple of months, I eventually found the perspex to do that.

"I am proud that it has all been stuff that people have chucked out. The shower pipe is a little bit leaky and it's an easy thing to replace, but I'd like to stay faithful to the found material idea. I did buy a couple of plumbing elbows but they are something you can't really reuse. I started off trying to recycle nails and screws, too, but I soon realised that doing that was impossible because I've used about 10,000 screws. I would have spent the rest of my life trying to find them, plus the heads go on them after a while."

Everything But The Gear

After six months of hard work and skip rummaging, Robbie completed his studio and was able to start recording and rehearsing using some of his many instruments that now decorate the space. Hung on the walls of the



The soundproofed room is home to Robbie's Gibson GA-30RVS guitar amp, his drum kit, numerous guitars and other miscellaneous gear.



Robbie's work-in-progress photograph shows the soundproofed room under construction.

live room are several guitars and a banjo, whilst the floor space is occupied by guitar amps, a Leslie speaker cabinet and a drum kit. An XLR wall box allows audio connections from the live room through to Robbie's recording setup which is based around a

Roland VS1680 digital recorder hooked up to an Apple Mac G3 running BIAS Peak v3.1 editing software.

Robbie explains how he came to choose his gear. "I used to have a Yamaha NT8X cassette eight-track, which I used to record an album's worth of material. Although there was cassette noise, I realised that it was possible to do it all myself and still get it sounding good enough for a demo, so I decided that the VS1680 would be a good upgrade.

"Using the VS1680 is as frustrating as hell sometimes but once you know what you are doing it's pretty good. I did have a lot of trouble getting a compatible CD writer. My dad had an

old SCSI writer but that didn't work so I phoned Roland and they said they'd sell me one of the recommend Plextor ones for £400. I said 'no way' and carried on looking around. I found some for sale on various American web sites but they were out of stock. I guess Roland were buying them all up. I ended up paying the £400 to Roland, but when the Plextor arrived it didn't work. I discovered that I didn't have the right version of the software so I had to do a MIDI transfer. It felt like I was building a robot with all these MIDI leads hooked up, and getting it to work was touch and go. Why couldn't they just put a disk drive in? Now that it is working it is great and I have really fallen in love with it.

"Up until now I've been using the ART FXP multi-effects and Alesis 3630 compressor but they are not as good as my new Focusrite Penta and Lexicon MPX500. The built-in reverb on the VS1680 is still good on some material but I am still experimenting with the Lexicon and Penta.

"I don't have Logic or any audio sequencer like that, I mainly use the computer to run the Native Instruments B4 Hammond, but I also use BIAS Peak for editing because it is easier

Managing Junk

Robbie's method of studio building is a valid and practical approach for anyone wanting to create a small studio on a limited budget, yet it does require a certain mode of thinking. Robbie explains the mechanics of working with found materials. "The design changes all the time because you are working with what you can find, but that's part of the process. It's a really interesting way of doing things and you end up with very unusual, original results. It's important

to have patience but I found that whenever I needed something it seemed to turn up sooner or later. For example, I needed a new chair and then I found the swivel one by the bins downstairs where someone elsewhere in the studio had chucked it out. I also found a whole load of paint which was being thrown out by people clearing out their sheds. It often had a skin but it's usually still liquid underneath so once you've removed the skin it can be used. From collecting leftover paint

I managed to mix 10 litres of my own colour I named Monster Green.

"Some things get thrown out because they really are useless so you have to be careful. I found an amazing-looking sink in a skip which had really fancy taps looking like something out of Star Trek. I installed it here but the taps leaked everywhere. There was no way to replace them with conventional taps because it was all moulded as part of the design so I had to chuck it out."

to do than using the marker system on the Roland. A lot of things I've been doing with The Three Graces have involved taking old recordings, removing the vocals, mixing a non-vocal version in *Peak* and then putting that back onto the VS1680 where I can add the new vocal tracks. I can do all the editing I need to do with this gear."

When Robbie isn't using emulations of the Hammond organ on his Mac he makes use of the real Hammond Cadette he has in his studio. "It only cost me about £40. There aren't any drawbars so you are stuck with the sounds, but it sounds very cool. I also have a Leslie cabinet. I know a retired guy who used to work for Leslie, and he has made me a custom switch controller for £20. You can plug anything into it so you are not stuck with the Leslie's six-pin connector. I can put the Hammond through it but I can also plug in any instrument and use the fast, slow, on and off controls."

Guitar sounds are also an important element of Robbie's music. His pursuit of a retro sound to complement his '60s- and '70s-style vocal harmonies and compositions has led to a very particular amp and guitar combination. "I got the Rickenbacker because I wanted a guitar that would give me a crispy, jangly sound and would be good for rhythm and occasional lead, but it's not so good for lead. My Gibson ES125TC is much more of an all-rounder. I first saw one in Denmark Street for £1600 but from looking on the Internet I discovered that you can get them for £600 in the USA, so I went over and bought a 1962 model. It had a slight bend in the neck and there was a little crack on the back but I got all that fixed for £60 and it's as good as new now. So for the price of the same model on Denmark Street I bought the guitar, had it repaired and I paid for a flight to San Francisco with my girlfriend for Valentine's Day!

"My guitar amp is a Gibson GA-30RV5 which is basically designed to be just like a vintage Trace Elliot Velocette except that it has two speaker cones rather than one. It's only 30 Watts but it goes quite loud."

Tell Us Moore

Now that Robbie has more free time to spend on musical activities he plans to bring in some money by recording other bands and artists. For the moment, however, he has to continue generating an income from the carpentry work which has paid the rent for some time. "I build wardrobes, paint houses — anything really. I can earn enough money in a week to survive on for a month but I hate doing it because I have to work late and I'm usually covered in paint or have a nose full of dust and fumes. If I could bring in some money by recording other people then I'd stop doing the carpentry. It's not a huge place but I've had a few bands here so far and it's been OK for demos."

But Robbie's primary motive for building the studio is so that he can use it to further his own music with the new Mores line up. Robbie reflects on the success of his studio building and the future of his next recording: "I spend about 80 percent of my time here, I can immerse myself in the music, and if I miss the last train I can crash here. When I stopped singing with Charlotte, it was very frustrating because we had been negotiating with a lot of record companies, but I've still got a lot of contacts, and in this building there are several producers who have their own little studios, so when my next demo is done there are people I can take it to." **505**

A 360-degree interactive picture of Robbie's studio can be seen on his web site at www.themores.co.uk/multi.html

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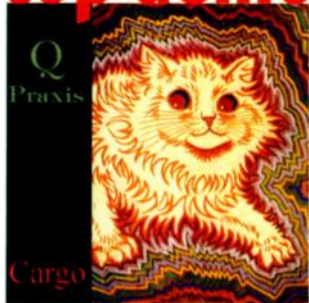
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Resident specialist John Harris offers his demo diagnosis and prescribes an appropriate remedy.

top demo



Q Praxis

Venue: Home

Equipment: Behringer DDX3216 digital mixer, Alesis HD24 multitrack recorder, PC running Steinberg Cubase VST, Opcode 64X MIDI interface, Alesis 3630 compressor, Lexicon MPX100, Zoom RFX2000, TC Electronic M300 and Alesis Microverb II effects, TL Audio Indigo EQ, Soundblaster Audigy soundcard, Rode NT1 and AKG D220 mics, Beyer DT100 phones, Musical Fidelity amp, KEF Q1 speakers.

Mainly interested in getting a publishing deal for his songs, Quin Rice hopes to get noticed via the Internet rather than knocking on doors. This sounds like a recipe for a quiet life to me, which is a shame because these songs are good enough to be performed by people like Victoria Wood and others on the MOR theatre circuit who occasionally appear on TV, or on Radio 4 programmes like *Loose Ends*. In my opinion, Quin should be targeting the people in this niche of the market and ignoring the rest. He should find out who their agents, management, publishers and even accountants are and send the CD to them.

The piano is the obviously the main writing tool for Quin but it's good to hear that he doesn't restrict himself to straightforward piano and voice arrangements. Electric piano is

also used effectively on some tracks and these overdubbed keyboard parts add texture. The keyboard solos are well constructed but would sound better on the instruments they were intended for (sax, guitar and so on) rather than the synthesized imitation.

One weakness is the choice of drum sounds, which are often inappropriately electronic when a decent-sounding set of jazz drum kit samples and some percussion would be more suitable for the style. Some more work on the drum programming to bring a human feel to the drum parts would also make these recordings more effective. For example, the percussion on the opening song has the same cabasa part running throughout. It would have been more interesting to alter this at different points in the arrangement, perhaps creating a section that has call and response parts from the left and right of stereo, for example. The introduction of a tambourine on the offbeat works well but the cabasa could easily have more accenting on the offbeat in the sections when it

How To Submit Your Demo

Demos should be sent on CD, DAT, Minidisc or Cassette to:
Demo Doctor, Sound On Sound, Media House, Trafalgar Way, Bar Hill, Cambridge, CB3 8SQ, UK. Please enclose a band/artist photograph and/or demo artwork (which we may

use here and on our web site to illustrate your demo review). Including contact information, such as a telephone number, web site URL or email address, will enable anyone who is interested in your material to contact you.

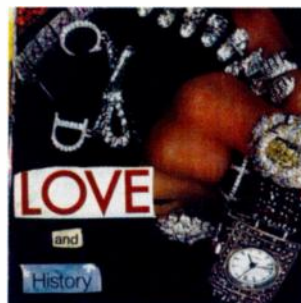
appears on its own, perhaps as a foretaste of the tambourine part before it comes in.

Track two features sampled bass and this would have sounded more realistic if it had been mixed a little louder and played in a less legato fashion on the introduction. Here the drums cry out for a brush hit snare during the verses rather than a standard stick hit snare. The bass drum too could afford to be less busy — a jazz drummer would only be using it for accenting certain beats, leaving the double bass to carry the rhythm.

But it's Quin's lyrics that will be of most interest to the listener. The words have to be clear and distinct as each song is telling a story. He manages well with the Rode NT1 and a good, but minimal choice of vocal effects which suit his relaxed vocal style. The vocals are treated with pre-delayed reverb with occasionally too much presence in the decay tail, presumably supplied by the Lexicon MPX100. A preset with a little more decay and a little less brightness, like the dark plate reverb used on track six of the

CD, could have been used more widely. ■

W www.qpraxis.com



Paul Griffiths

Venue: Home

Equipment: Korg D16 multitrack recorder, Lexicon MPX500 effects, Joemeek VC3 recording channel, Rode NT1 mic, Samson 260 amp and Tannoy Reveal monitors.

Paul's excellent, soulful voice is put to good use on this CD of self-penned songs. He's recorded the vocal using the popular (on the evidence of demo submissions at least) combination of a Rode NT1 condenser mic and a Joemeek

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mic channel. I'm impressed by the quality of the sound he's getting with the mic, and, once his vocals are in the mix, you'd be forgiven for thinking he'd recorded them using a certain German microphone costing ten times as much as the Rode. Undoubtedly, this has also got something to do with the calibre of his voice, a voice that would sound good on most microphones from the Shure SM58 upwards.

The songwriting is strong throughout, but nowhere more so than the ballads. With a nod towards Mick Hucknall and Simply Red in terms of

production, the third song opens with some nicely textured strings over an unusual chord progression. Paul resists the temptation to milk the progression too much, and the arrangement moves quickly on to the verse and the introduction of vocals. For the chorus, the strings are replaced by a very good Hammond patch on the Roland JV1010 sound module. This simple change in sound texture lifts the dynamic and maintains interest in the song. The strings then return to add melodic phrases between the vocal lines of the chorus. In terms of the overall sound of the

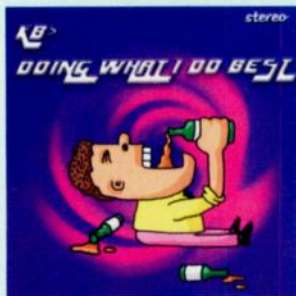
mix, the strings are really the only thing I could find fault with as they sound slightly muddy during the more complex string parts. Some lower-mid cut at around 300-400Hz, perhaps even applied to just the lower string parts, would improve the sound, but this really is just a minor issue.

This lower-mid area of the mix is problematic on some of the other songs too. The first track on the CD is generally lacking in presence, and it's a classic example of a mix which could be helped with the use of subtractive EQ, rather than presence boost or HF

enhancement. The problem is that the lower-mids are too dominant, giving the impression of an overall lack of clarity. Using a wide band EQ cut at 300Hz, even just a few decibels, allows the HF to seem louder and the bass to have added warmth. Conversely, the second song, which uses more guitar and less keyboard, has a hole in it at around 300Hz which could be filled using a pad synth playing chords in the right register.

Paul's 30 years of songwriting and recording experience have obviously not gone to waste. This is a good CD worthy of a wider audience. ■

QUICKIES



KB

Some scratchy guitar sounds are letting this demo down and more care should have been taken with the choice of patch used on the Line 6 Pod, especially as it's going directly into a PC running Steinberg Cubase VST. Digital to digital isn't a great combination for rock recording and it's possible that boosting the upper-mid frequency area using post-production software has made things worse. This overuse of EQ is really obvious on the acoustic guitar in the 'unplugged' version of the first song, which has plenty of string squeak and a rather vicious attack. It's an EQ treatment that works well on acoustic guitar when combined with other instruments, helping it to come through in a fuller mix where bass and electric guitar are also present. Here, however, the acoustic guitar is exposed and needs those lower frequencies to give it more body and punch. This demo also makes the mistake of featuring the best song second and, oddly, two different mixes of the inferior opening track.

Danny Hogan

Danny likes his Auto-Tune a bit too much if the opening cut on this CD is anything to go by. It works well in the chorus but is overused in the verses and it's a relief when the backing gets more involved and the effect is dropped. Other vocal treatments, like the pitched-down sampled vocal singing a 'bom bom' bass line, are fun, and I also like the telephonic vocal loop that comes and goes throughout the track. In fact, there are plenty of good ideas and the mix is nicely balanced. However, the song overstays its welcome by about thirty seconds and the arrangement could easily be tightened up with a bit of editing. Bringing the solo and breakdown in earlier and finishing on a chorus instead of introducing another verse would be an improvement. The second track doesn't exhibit the professionalism of the first, but there are some good elements on the recording which just need to be brought out. One weakness is that the drums are far too low in level to have any punch. Also, Danny's obvious talent for exciting and inventive backing vocals isn't being capitalised on. A suitable case for a remix, I think.

Son of Dog

With its contemporary sound and good arrangements, this CD successfully mixes the dance and rock genres without resorting to clichéd heavy guitar work. The aggression is instead derived from industrial synth sounds and

well-chosen drum loops. On some of the mixes, the bass is in danger of getting out of hand and it seems that the intention was to emulate the sound of a mighty club PA. Rolling off some of the lower frequencies around 40-60Hz will make sure the mixes sound good on most systems — domestic, car or club. There's some good use of effects, like the comb-filtered synth used to build up to a drum loop, but elsewhere the mixes seem to be drowning in reverb. Some more attention to detail would improve these tracks on a technical level. For example, on the second mix, there's some obvious noise as the vocal track fades in. This could have been avoided through a little bit of editing in Cubase, muting the vocal track or even using a plug-in noise gate.



Elation

This rather standard anthemic house has lots of the right sounds and ideas but is curiously lacking in punch, especially on the opening track. The answer lies not just in the mix, which is weighted too much towards the synth bass at

times, but also in the choice of kick drum sound and its level. The kick drum should be in the driving seat of this mix but it's a bit too lightweight for the job and is mixed too low. Even at high monitoring levels it's not providing that all-important punch. A straightforward remix replacing the bass drum sample with a heavier one is in order. The second track on the CD is much better and features a wonderfully fat detuned oscillator bass sound and excellent bass drum, making sure this one really kicks along. The arrangement and mix are excellent. There are some particularly impressive moments of tension and dynamic build-ups which are ideal for tracks intended for a club setting.

Mark Smith

On the soulful opening track, Mark not only performs well on lead vocals, but adds some decent harmonies too. However, the drum loop used is too low-bandwidth and muddies the sound of the mix. Giving a little HF boost to the drums at the mixing stage would have gone a long way — attempting to add it in post-production won't suit the rest of the arrangement. The problem has disappeared by the second track on the CD, a similarly slow-paced number which uses a backwards piano chord in the style of Moby. Echo and backwards effects are also applied to the vocals, and the sparse backing, which features some nice electric piano and string work, allows room for a large, textural sound.

Business End enables you to have your demo reviewed by a panel of producers, songwriters, musicians and managers. If you want your demo to be heard by them, please mark it 'Business End'. This month's industry panel is drawn from the MPG (Music Producer's Guild).



Freely Moving Observer



Dave Fowler (DF): "Finally I think I've found an English equivalent to The Ben Folds Five, although this is not as good. I

particularly like the melodies in the first two tracks and they could be really good songs if he hadn't whacked an appalling amount of keyboard strings over the top. He's also chosen the worst drum and piano sounds, so for a bloke who professes to have done a degree in sound engineering, this is a disappointing production.

"On the plus side, I love the sound of his voice and his style of piano playing, so he should keep those elements and combine them with a live drummer, live bass player and a real piano. Then he'd have an English equivalent of the Ben Folds Five with the potential to be massively popular.

"When you are working on your own you can just chuck stuff in, but it's embarrassing to bring weak ideas to a band practice. Interestingly, when Ben Folds did a solo album it sounded more like this demo because the music was one directional and that was because the other two in the band hadn't had any input. If he doesn't want to collaborate with a band then I think he

needs a producer to tell him what should and shouldn't be in the tracks.

"His cover art is nice and slick but it's ruined by the picture of him picking his nose on the back!"

Matt Ward (MW): "I think the songs have a lot of potential. He's quite talented but he hasn't

done himself any favours by using the poor-sounding instruments to express the songs. Nevertheless, you can tell that he's talented because it is one of those demos in which you hear lots of influences. The first track reminds me of Badly Drawn Boy, and the start of the second song is like The Manic Street Preachers, but because his influences are well mixed together it never sounds like a copy of just one band.

"In his letter he states that he has written some musicals for a college theatre production and I can hear a lot of musical-influenced stuff in there — particularly with all the strings and piano parts — and he needs to get away from that."

Jon-Paul Harper (JP): "Unfortunately this demo left me cold. The only thing I have noted down is The Beautiful South because it has the same sort of middle-of-the-road feel. The songs don't go anywhere and they don't seem to be designed to make you sit up and take notice: they are just mind-numbingly nice, and because of that

they don't challenge or excite me. I felt like I knew how each song was going to end before it was halfway through.

"If you are playing all the instruments yourself, a song can start to develop an inbred quality, and when that happens you can hear that one person is driving it in a particularly direction. The guy can clearly write and play, but he would have to be incredibly talented to play all the instruments, do the production and still come up with great tracks. So I think he needs to work with a band."

Sam Shemtob (SS): "In terms of its production, this demo sounds quite well finished in comparison to some of the other Business End demos. It reminds me of Squeeze in places, and I feel that I have heard this sort of thing before — probably back in the '80s. For me this doesn't seem to have moved on from those '80s tracks.

"I understand what Jon-Paul means about songs developing an incestuous sound as a symptom of one person working alone, so I also agree that some external input would almost certainly be beneficial. But as it stands, this is one of the more bland demos I've heard."

Byonik

JP: "It might just be the way the cookie has crumbled in this Business End session, but I've been struck by how safe all the demos have

This Month's MPG Panel

Dave Fowler is the Studio Manager and owner of Rogue Studios in South East London. At Rogue, Dave

acts as producer and engineer for bands and artists using the venue. He is also the singer and guitarist of the band Juice who have recently been touring Europe playing at festivals alongside Feeder and Coldplay. Dave currently runs the small band promotion company called Bandnet (www.bandnet.co.uk) which organises gigs in some of London's most respected venues.



Matt Ward worked for the MCPS as a music licensing consultant before moving to Kickin

Music in London, where he heads their publishing arm, Haripa Music Publishing, and works with their five labels. Kickin/Haripa's catalogue and writers include Chiller Twist, Solid Groove, Kings of Tomorrow, Deep Dish, Decoder, Blaze, Future Disciple and Black Grass.



Sam Shemtob is press officer for the Association of Independent Music (AIM), the trade body for UK

independent record labels. He does other press work, under the Name moniker, for Musicindie, Recordstore and MusicTank, and has recently begun a venture to license music for new media uses. He'd like to be in a position to send in a demo of his own one day.



Jon-Paul Harper was the owner and principal engineer of Rogue Studios for five years. Jon-Paul

now runs Rogue's rehearsal studios but continues working as an engineer. His other experience includes working as a roadie, seven years engineering front-of-house and 10 years playing guitar in a touring band around Europe.

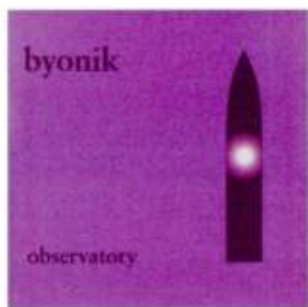
Jon-Paul has been both a record label owner and an artist signed to an independent label. He has a home studio running Emagic Logic Platinum.



Many thanks to Rogue Studios (www.roguestudios.co.uk) who hosted the session. The MPG's web site is at www.mpg.org.uk

been, and this submission is no exception. I get the distinct impression that this guy is trying to conform to what he feels the market wants. He clearly has a talent for writing but I just don't think he is helping himself by presenting his musical ideas in such a nice and safe way. He tells us that he wants to get into publishing so I am aware that we can't focus on the instrumentation too much but I'm sure that if you have the job of listening to demos all day then one CD must merge into the next one, so anything that makes a demo stand out is a good thing."

"Some of these songs definitely have potential and I would pick the second track in particular as one which could be developed further. The one thing that lets it down is the rock



guitar solo that comes in towards the end, which reminds me of the cheesy theme tune to a soap opera called *Riviera* from about 10 years ago!"

MW: "I don't think the cover really informs you of what the music is going to be like; it looks like some kind of rock album with the strange

obelisk on the cover, so the presentation could be improved. It has been suggested that if you are sending work to publishers then you should leave the artwork blank, apart from the track listings, but that is assuming that publishers don't have a particular emotion and, in practice, they still have to select the demo in the first place, so doing nothing is not a good suggestion.

"The first track is flat and bland. In the second and third songs there are some nice attempts to develop the song structures and they work much better than the first, but all the tracks need a little more power and emotion to catch people's attention. There are some nice variations in the musical tempo, but even when the music is changing, the vocalist's style tends to stay at much the same tempo all the way through. In the sleeve notes he talks about doing some collaboration which would probably be best done with an arranger.

"I want to pick up on the point about making music that doesn't conform: to a certain extent I agree that it is good to be adventurous but you do have to keep an eye on the market because the first thing a publisher will consider is how they can sell it as a product. These songs are not edgy or new enough to be of use to an up-and-coming artists; they are going to need quite big artists to sell them, so he should aim these songs at the main label publishers who have big artist rosters."

SS: "I enjoyed the second song which had a bit of funk mixed into the composition, but I wasn't taken by the first song at all. The lyrics were impressive throughout.

"Sadly, as a whole, I think this demo is too bland and neutral for publisher to take much interest. I know this is not intended to win a deal with a label but I would have thought that even a publisher would still prefer to hear work where the composer has put some of their own vision into the song production. That way it is not reliant on the Publisher's imagination.

"The cover design doesn't obviously fit the music but it has served its purpose in that we picked it from the pile and played it." **ES**

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Drumkit From Hell Add-ons

MULTI-FORMAT

You might recall that some months ago I wrote an enthusiastic review of a sample CD called *Drumkit From Hell*. This comprised a set of drum kit hits in both close-miked and room-miked versions and was distinguished by its extensive velocity multisampling and by the overall quality of the drum and cymbal sounds themselves. The kit also included many more hi-hat and cymbal variations than you would be able to accommodate in a GM-mapped kit, so a non-standard mapping was adopted. Despite the superb quality, there was little variety other than some alternative snares and kick drums, but now an add-on set of sounds promises to change all that.

The *DFH Add-on Pack* provides 10 new cymbals (including esoteric Chinese, crash and ride variants), all lavishly multisampled at numerous velocity levels and including mutes and crescendos on some samples. There's also an additional tom package that expands on the original set by also offering flams on the set of five Sonor light-shell toms ranging from a petite 10-inch to a solid 18-inch. A new snare, a 14 x 7-inch Pockenholtz from Haake, joins the original roster, and there are additional flams, hits and rolls on all the snares. As with the original, the quality of sampling is excellent, so if you're looking for a really solid set of rock drum sounds with enough velocity levels to add serious realism, then *DFH* and this add-on will certainly meet your needs.

Integrating the sounds with the original kits may take a few minutes of cutting and pasting, but the increased scope is well worth the effort. The samples are now provided in mappings for *Gigasampler*, *EXS24*, *LM4*, *Battery*, *Kontakt*, *Halion*, *DR008* and *Reason NN-XT*. *Paul White*

£ £19.95; *Drumkit From Hell*
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Nu Metal

AUDIO/ACIDISED WAV

If you need to conjure up something on the darker side of modern rock (think Korn or Papa Roach), then Ueberschall's *Nu Metal* might be just what you are looking for. The title is distributed by Time + Space and is supplied as a two-CD set, with CD1 in audio format and CD2 containing the same material as Acidised WAV files. I used the latter for the purposes of review. The material is organised into eight construction kits plus additional folders containing drum loops, drum breaks, bass guitars, distorted guitars, guitar FX, break kits and acoustic guitars. With some 650MB spread over nearly 600 loops, there is plenty to get your teeth into.

The construction kits contain A and B 'parts' that might be used for song construction, and a 'full mix' WAV is provided to demonstrate what can be done. Of course, all the component drum, guitar and bass parts are provided so you can mix and match as desired. The separate

'break kits' folder contains combinations of guitars, bass and drums intended to work as links between musical sections, and these can be added to material from the main construction kits to provide further variety. Most of the other folder titles listed above give a clear idea of their contents, but if you like your riffs low and loud, the highlight is probably the distorted guitars section.

Using the Acidised WAV files with *Acid Pro 4*, it was an absolute doddle to construct some very authentic-sounding backing tracks. All the material has been well recorded — the drums are generally powerful, the basses thunder and the majority of the guitars growl. And while the *Nu Metal* title suggests Limp Bizkit, there is plenty here that would work in a Metallica-type track. Mixing material between the various construction kits proved perfectly possible, as did working in additional material from the supplementary folders. The variations and break kit sections all helped embellish a piece to make its loop origins less obvious.

In terms of content, my only criticism would be the lack of a few more riffs based further up the neck — I know seven-string instruments are the weapon of choice for many nu-metal guitarists, but it would have made it easier to combine two guitar riffs as they would not be fighting for the same mid/low-frequency space. I could also have managed without the vocal samples. While it was perfectly possible to create complete backing tracks with just these loops, combining them with some electronica loops (for example, some drones or processed turntable scratching) added another dimension — instant Linkin Park. Just add some lead guitar/counterpoint riffs and suitable vocals and the final result is very convincing.

Most guitarists who play in this style would probably like to roll their own when it comes to nu-metal riff-making, but for non-guitarists looking for an authentic dollop of the heavy stuff, then this sample set has a

lot to offer. If you work in library or production music, however, note that the licence does not allow the samples to be used for this purpose. While this is not uncommon amongst loop libraries, it is a restriction to be aware of. *John Walden*

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The *Historic Keyboards* library sees a subtle departure from the world of grand pianos with which PMI are currently associated. This delightful collection steps back in time to an age of wigs, face powder and tastefully applied beauty spots — no, I refer not to Joan Collins, but to the 18th century. This single CD contains not one but four instruments: a Belgian harpsichord, a French harpsichord, a virginal and a fortepiano. The fact that three of these four instruments are not velocity-sensitive (meaning that there are no multiple velocity layers to take into account) allows the extra disc space to be used to fully document these wonderful instruments.

The two harpsichords on offer are distinctly different from each other. First off we have the

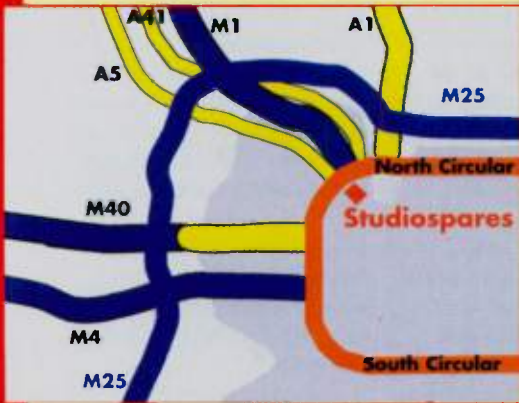
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► 'flagship' antique Belgian model, which sports two manuals, two 8-foot ranks of strings, one 4-foot rank, a coupler and a buff (damper) to the lower 8 rank. This is beautifully sampled (as are all these instruments) and quite simply sounds gorgeous. You really do hear every detail of the mechanism, from the thumping of the keys to the delicious 'clump' of the jacks returning when you release the keys. The patches cover several registrations, from single manuals to coupled upper and lower, Lute (muted) and 8- plus 4-foot registrations. The level of the release layer is adjustable via the mod wheel on some patches, which is useful for making a graceful exit at the end of a piece — but frankly, the release samples add so much



realism, I don't know why you would want to turn them off! The patches cover various voicings, from silvery and delicate single-manual settings perfect for gentle continuo parts to full, bright double-manual voicings, and even the Lute damped voicing mentioned earlier. The patches' titles are sometimes a little curious, and don't always reflect their true intentions — for example, 'Belgian Harp Upper & Lower' and 'Belgian Harpsichord Upper & Lower EQ' are in fact very different sounds, rather than differently equalised versions of the same sound as the titles suggest. Nevertheless, the semantics of the patch names do not detract from the playability of the sounds themselves.

The second harpsichord is a French double-manual. The original instrument sampled has two 8-foot and one 4-foot 'choirs' of strings, although the patches provided here do not cover as

many registration variations as the Belgian model. Tonally it is quite different from the Belgian, having a warmer, more delicate quality with noticeably less mechanical detailing. This is largely because it was sampled in an ambient room, miked at a greater distance than the Belgian, giving more of an 'audience' perspective. Although less of an intimate experience than the Belgian, it is still eminently playable. Eight-foot and 4-foot single-manual registrations form the basis of this instrument's patches, and these can be combined to produce a bigger sound that has definite '60s gothic horror movie overtones. A handful of 'synth' treatment patches are also included, although I feel that synth sounds are really best left to, er, synths.

The plucked-string theme is continued with the virginal patches. This single-manual instrument of unspecified origin has the fewest patch variations, although PMI have included some alternative patches with EQ and reverb. Like the Belgian harpsichord, this virginal has a highly detailed, intimate sound, although it is altogether very much more delicate in its nature — almost as fragile as I'd expect the real instrument to be. I actually found myself playing the keyboard very tentatively for fear I might break it! I tested the *Historic Keyboards* samples with *Kontakt* v1.2, and had some problems with these *Kontakt*-format patches concerning tuning discrepancies (which I'm sure are unintentional). A couple of the patches also had incorrect file paths which prevented them from loading successfully. However, PMI are fully aware of the problems, and corrected versions should be available for download by the time you read this.

Finally, there is one single patch devoted to reproducing a restored Walter fortepiano. Popular in the late 1700s, the fortepiano was the wooden-framed forerunner to the modern pianoforte. In contrast to the modern piano, its sound is characterised by a much shorter

sustain and a bright, resonant tone. This particular sampled fortepiano is reproduced using four velocity layers, with pedal-up, pedal-down and release layers. The real-time crossfading between pedal-up and pedal-down samples is particularly successful here, as the two sets of samples are very well matched, making the transition very transparent indeed. I found this instrument extremely evocative and delightful to play — just give it a spin with some Haydn or a few Mozart sonatas, and you'll get some idea of how they might have sounded 230 years ago!

Anyone interested in Baroque music will find this collection a joy, as indeed will those people who simply like to acquire unusual or offbeat instruments. In particular, it should appeal to anyone producing music for period drama, be it for stage or screen. We've all seen Jane Austen-type dramatisations where Lady Chiddingfold, eager to impress with her musical skills, entertains D'arcy at the fortepiano — to the somewhat incongruous strains of a Yamaha Clavinova. At least now the means to produce the correct sound is available to all. And at last those cheesy harpsichord patches found in almost every synth or digital piano can bow their heads in shame and consider themselves put firmly in their place.

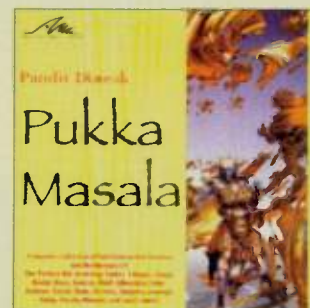
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Pukka Masala

REASON REFILL

Pukka Masala contains 411 REX2 files, presenting a fairly broad selection of musical flavours from the Indian subcontinent. As you'd expect, the tabla are well represented, as are other percussion instruments such as



the congas, jumbay and madal, to name but a few. Samples range from short rolls and fills to one-, two- and four-bar riffs and grooves, with a few pick-ups and big finishes thrown in for good measure. Tempos range from 75 to 130 bpm and above. There are ensemble percussion performances too, and a few samples (I'm thinking in particular of 'N Indian Festival' and 'Wedding Band' here) of what sounds like quite a party. Melodic instruments get a fairly brief look-in, with the sitar and sarod featuring most heavily, and there's even a few vocal samples of what can only be described as an Indian fusion of scat and rap.

The standard is high throughout and there are, with the odd exception, no problems with the way the samples have been sliced. The performances themselves are excellent — lively and interesting with plenty of authentic human 'feel'. However, I do think this collection is let down a little by its organisation, or rather, the lack of it. The REX files are simply collected in a single folder and some of the file names are rather oblique, especially to someone who doesn't know his duff from his dholak. Some form of subdivision, whether by tempo, instrumentation or style, would have been welcome. But this is a small blemish on an otherwise pleasing release — think of it as a Bollywood beauty who's forgotten to put on her make-up.

David Greeves

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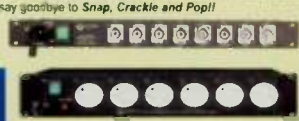
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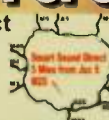
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Apple had plenty of surprises at their Developer Conference this year, including new hardware (the G5 Power Macs), and new software (Panther). In this specially extended Apple Notes, we consider the likely effects on the Mac-based musician...

Mark Wherry

At this year's Worldwide Developers' Conference (or WWDC for short), Apple promised to unveil Panther (or OS 10.3), the latest cat-themed release of OS X. And while the first preview of a major new update to Mac OS X would in itself have been something for Mac *aficionados* to get excited about, rumours were circulating for many months before the WWDC that Power Macs based around a new processor architecture would also be introduced at the conference.

The new Power Mac rumour was first given substance by Apple moving the original date of the 2003 WWDC from May to June, fuelling speculation that the man known for 'one last thing' in his keynote presentations, Apple CEO Steve Jobs, would have one big hardware-orientated thing to show. And days before the keynote (or Job-note, as such presentations have affectionately become known), the rumour was confirmed beyond the doubt of most Mac fans when specifications of a G5-based Power Mac were accidentally posted on the Power Mac G4 page of Apple's on-line store.

In many ways, Apple's WWDC announcements were exactly what the Mac world had been expecting: we got to see Panther, and new G5 Power Macs were indeed introduced, with Jobs confessing (with regard to the

Apple Store slip-up) that the specifications were true, but only scratched the surface. And he was right, although not just about the new Power Macs. The desktop-focussed 2003 WWDC keynote will perhaps turn out to be the most significant event for Apple this year, and, oddly for an occasion aimed primarily at developers, it was certainly one of the most significant events for Mac-based musicians in Apple's history. So, while the general news of the new Power Mac G5s will be old news by the time you read this column, we're going to take a more detailed look behind the WWDC announcements and investigate what the G5 will mean for the future of Mac-based music making.

The Struggle For Power

Cast your mind back to 1997: this was the year Apple released computers featuring a G3

processor, and host of cool advertising showing snails with Pentium II processors on their backs, steamrollers flattening Windows-based notebooks, and Intel's annoying dancing foil-wrapped fools being toasted. At that time, there was little doubt that Apple's machines were roughly twice as fast as the competition; in the Summer of 2000, I was using my then-ageing 266MHz Power Mac G3 desktop to produce music with *Logic 4.5* and the *EXS24* software sampler — something I probably couldn't have done with a 266MHz Pentium II-based system.

In 1999, Apple introduced the Power Mac G4 at Seybold, a conference for print and publishing professionals, and these were also great machines, but the company would later have problems maintaining the performance advantage with the Windows-based world. Part of this problem could be attributed to the operating system: while Microsoft gradually improved consumer versions of Windows with more advanced technologies, and had NT for more demanding users, the classic Mac operating system couldn't be scaled quite so easily to take full advantage of the latest hardware facilities. Apple solved this issue spectacularly with Mac OS X, but problems with Motorola, the manufacturer of the G4 processor, coupled with the difficulty in scaling the G4 to higher clock speeds while maintaining performance, saw Apple fall behind in the desktop market.

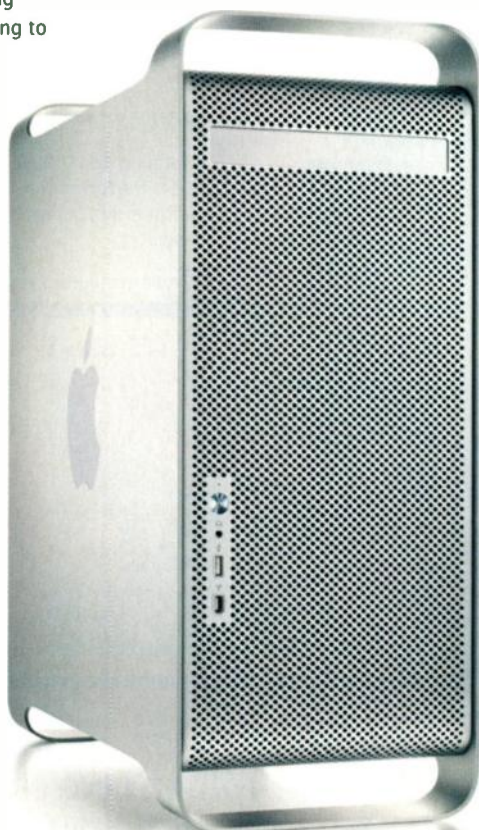
The later Power Mac

G4s weren't bad machines, especially the 'mirror door' models based on the architecture of Apple's flagship server, Xserve; but compared with Intel, who were now flying with later revisions of the Pentium 4 and Xeon processors, not to mention the high floating-point performance from AMD's offerings, Apple's desktops were not the greatest when, aesthetics aside, raw computing power was required. This mattered less in the general computing space, where processors had become fast enough for word-processing and Internet use, and Apple still had an advantage in the notebook world because G4s ran cooler and consumed less power than the competition; but for studio musicians who needed a powerful desktop to run virtual racks of synths and effects, even the dual-G4 systems became no real match for dual-Xeon monster machines.

However, Apple have never been known to rest on their laurels, and together with IBM, another member of the original Power PC processor alliance, Apple have spent the last couple of years developing the G5 processor (previously known as the Power PC 970) and a new Mac architecture that promises to place them in a position similar to that they enjoyed when the G3 chip appeared around six years ago.

Introducing The G5

The Power PC G5 processor, to use its full name, draws on previous Power PC processor designs and is based on the execution core of IBM's 64-bit POWER4 processor, designed for high-performance workstation and server products. For a detailed tour of the new processor's architecture, it



would be best for readers to check out Apple's web site), but features such as an enhanced Velocity Engine and two double-precision floating-point units are going to immediately raise the eyebrows of Mac-savvy musicians and engineers. Most Mac music software is already optimised for the G4's Velocity Engine, including intensive convolution-based reverb effects such as *Altiverb*, and native-based audio software makes heavy use of floating-point arithmetic. Already, the potential benefits should be forming in your mind...

Perhaps the most significant characteristic of the G5's design is that it is a 64-bit processor, making Apple the first company to ship a 64-bit processor with a desktop computer, although many people argue that the specifications of Apple's G5 Power Macs, which we'll investigate shortly, make it more of a workstation than a desktop. This technicality aside, a 64-bit processor is a huge step forward because of its ability to process 64 bits of data in a single cycle, which perhaps sounds a little obvious. But the point is that to process a 64-bit (or anything larger than 32-bit) value in a 32-bit processor requires two cycles, and even though it's well-known that most native audio software uses 32-bit floating-point processing, it's possible to exceed this data length when doing precise calculations. In addition to this, many plug-ins operate at higher internal resolutions, such as 48-bit, to offer even more precision in the processing, and these are some of the areas where a 64-bit processor is going to make a big difference to Mac-based musicians.

However, the ability to handle 64-bit wide data paths has a knock-on effect over the entire architecture of the system, and it's another big advantage of the Power PC G5; the amount of memory that it can address. The G5 supports 42 bits of physical memory address space, setting



The big news as it now appears on Apple's web site.

a theoretical memory limitation of four terabytes of RAM; and although it's impossible to put this amount of memory in a desktop computer at the moment, it does at least afford plenty of growing room.

One area in which a processor's performance can be crippled, no matter how brilliant the design, is when it comes to the buss that keeps the processor fed with data — and a fast buss speed is crucial in high-performance audio applications, especially virtual instruments such as software samplers. To this end the G5 communicates with the rest of the system via a 64-bit DDR (Double Data Rate), bi-directional frontside buss (FSB); quite a mouthful. What this means is that the G5 can send and receive 32-bit blocks simultaneously, rather than switch between send and receive modes with a single 64-bit block of data, and that the speed of this buss can be up to 1GHz, depending on the speed of the processor itself, giving a maximum bandwidth of 8GB/s, which is pretty impressive!

As one would expect from a company that has previously invested so much time in dual-processor systems, the G5

was designed to support symmetric multi-processing, which allows a multi-threaded application to carry out different tasks simultaneously on different processors, as discussed in our OS X for Musicians feature in April's SOS (see www.soundonsound.com/sos/apr03/articles/osx.asp).

However, dual-processor systems frequently share the same buss to communicate with the system, such as in dual-G4 and Xeon-based systems, whereas each processor in a G5 system is given its own independent buss. This means that the maximum bandwidth in the forthcoming range of G5 systems will be 16GB per second, and using a technique called cache intervention, it's possible to improve performance further, for one processor to access the data in the other's cache. The technology is undoubtedly impressive, but one of the most important questions about a new design of processor, even if it draws some heritage from the designs that came before, is how well existing applications, and, indeed, the operating system itself will perform. In this case, the question is: how well will

existing 32-bit code run on the new 64-bit G5 processor? Fortunately, Apple state that current 32-bit code — in other words, all your existing applications — will run natively on G5 systems and require no emulation modes to get in the way of performance. The reason for this is apparently because the Power PC architecture was designed with both 32-bit and 64-bit operations in mind, and the G5 also includes the same Velocity Engine instruction set from the G4 processor. This means that Velocity-Engine-optimised applications will immediately benefit from the G5's performance — a situation that will only improve as applications and Mac OS X itself are further enhanced for G5 systems. The G5s will ship with Mac OS 10.2.7, which includes support for 64-bit processors, and this is something that will probably be taken further in Mac OS 10.3. Incidentally, until the G5s are available in August, it's interesting to note that the most recent range of G4s are being 're-released', having been unavailable through distribution channels for a while. Particularly of note here is the slight tweak to the OS that once again allows you to boot into OS 9 (after the start of this year, this was no longer possible on new machines). This 'bridging manoeuvre' (or U-turn, if you prefer!) may well have been done for the benefit of the influential Mac-based *Quark Xpress* user community, but it's good news for those musicians who haven't yet made the switch to OS X.

Power Mac G5

And what of the computers themselves? Continuing in the tradition Apple have established since the G3-based Power Macs were introduced, the Power Mac G5 will be available in three different configurations, using a G5 processor at three different clock speeds: single 1.6 and 1.8GHz models, along with a high-end dual-2GHz model (and Steve Jobs has promised

► a three-Gigabyte version within 12 months). These clock speeds represent a pretty significant jump for Apple, and are actually in line with the clock speeds of other 64-bit processors from competing manufacturers, such as AMD and Intel.

The newly designed system architecture for the Power Mac G5 is based upon AMD's Hyper

Transport interface, which provides an efficient way of connecting the G5's PCI-X expansion slots and other I/O with the Apple-designed system controller. The new Power Mac architecture also supports an AGP 8x graphics buss, a 400MHz 128-bit memory buss that accommodates up to 8GB of PC3200 128-bit DDR memory,

Serial ATA for internal storage, and an array of other input and output connections. However, in pausing for breath, you might be wondering what some of these specifications mean: Serial ATA, PCI-X? Will your existing peripherals be compatible?

PCI-X is basically an advanced protocol for dealing with expansion cards that demand more bandwidth. Whereas a typical PCI slot operates at 33MHz, providing a maximum bandwidth of 266MB-per-second of bandwidth (enough, theoretically, for several thousand mono, CD-quality audio tracks, by the way!), a PCI-X slot operates at 133MHz, allowing for a maximum bandwidth of 2GB-per-seconds. While the bandwidth of your existing PCI slots should really be enough as it is, PCI doesn't always operate as efficiently as it should, and this issue has also been addressed in the PCI-X specification, which should really benefit high-bandwidth devices such as audio and DSP cards. Although most existing PCI cards should work in the newer PCI-X slots since backwards compatibility was one of the design goals, 100-percent compatibility cannot be guaranteed, so it will be worth checking with your audio or DSP card's manufacturer about this issue when Power Mac G5s become available.

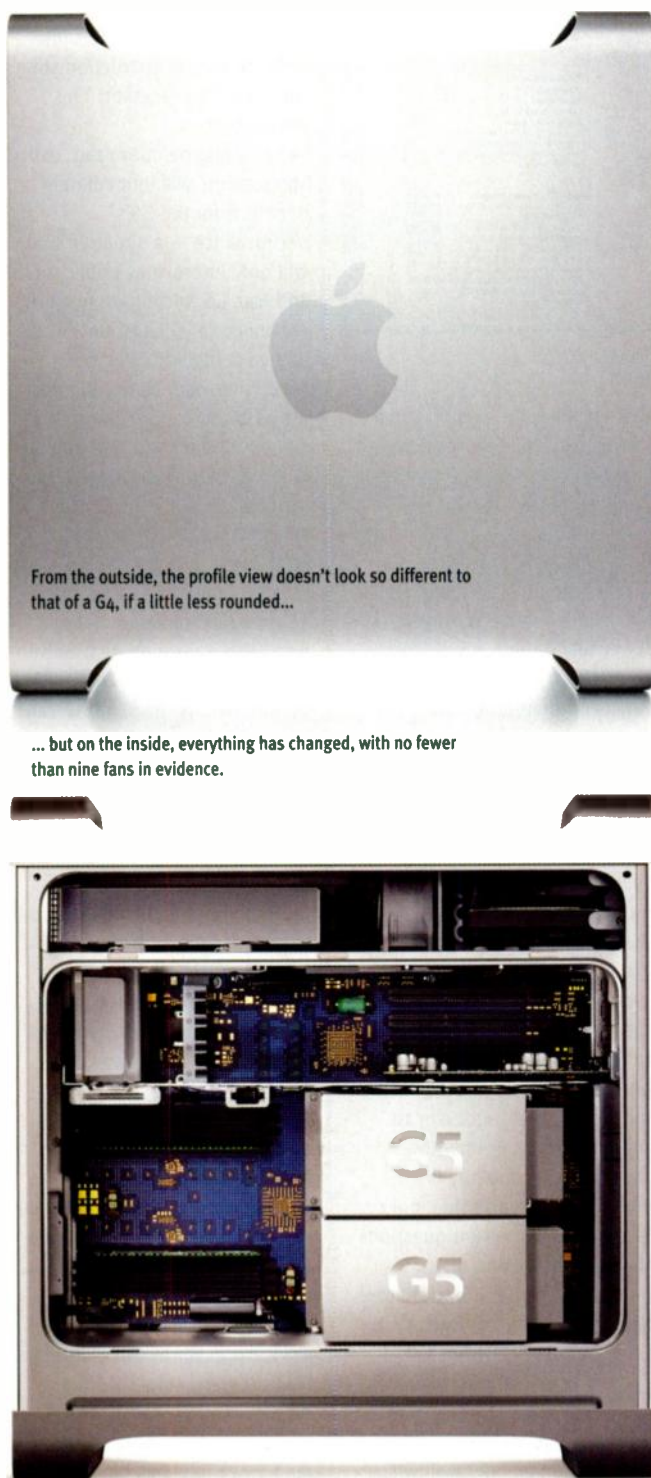
Serial ATA is an evolution of Parallel ATA, which is the interface used in current Power Mac G4s and, indeed, most desktop computers to connect internal hard drives. In a Parallel ATA configuration, the connected drives compete for data from the same 100MB-per-second buss, whereas with a Serial ATA interface, each drive is placed on an independent 150MB-per-second buss. One immediate benefit of these independent busses is that it will now be possible to see some serious performance enhancements when striping the two internal drives using Mac OS X's software RAID features,

which was found to be ineffective in last month's *SOS* feature on current Parallel ATA-based Macs. This is obviously ideal for audio and video work, and Power Mac G5s will be able to accommodate two internal Serial ATA drives for a maximum of 500GB storage capacity.

When Jobs asked his WWDC audience if they should fit the new Power Mac G5s in the existing Power Mac G4 enclosures, the answer was a unanimous "No". He didn't need their answer, though, and a new, sleek and beautiful aluminium enclosure — designed in the way only Apple can — was unveiled, which retains the the easy access and carrying handles of the previous design.

One of the biggest criticisms of the later Power Mac G4 models, especially the 'wind tunnel' — sorry, I mean 'mirror door' — models was the sheer noise they made when switched on. Although the Power Mac G5 requires nine fans, Apple have worked their magic (remember, this is the same company who made Cubes and later CRT iMacs silent!), and have designed an intelligent cooling system with low-speed fans. They claim an ambient noise level for the G5 of 35dBA. Part of this design means that the inside of the enclosure is divided into four separate areas, and Mac OS X is able to monitor the temperature of the internal components and dynamically adjust the fans as necessary. While everyone would like a quieter computer, musicians are a group of people whose lives will be made easier by this new and quieter case — especially if you find yourself needing to record in the same room as your subject — and only Apple could design something this intelligent that didn't require you to butcher your computer with a lining of acoustic foam.

The front panel mercifully features USB 2.0 and Firewire 400 connections, and every Power Mac G5 model also includes a Super Drive, which can now write DVD-R discs at 4x



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► speed, read DVDs at 8x speed, write CD-R and CD-RW discs at 16x and 10x speed respectively, and, finally, read CDs at 32x speed. On the back panel, you'll find three PCI-X slots, a dual-display capable graphics card with DVI and ADC connectors, additional Firewire 400 and USB 2.0 ports, a Firewire 800 connector, and Gigabit Ethernet and modem ports. For wireless connectivity, the Power Mac G5 can be fitted with additional Airport Extreme and Bluetooth modules.

Musical Theatrics

After demonstrating how a Power Mac G5 fared against a dual-Xeon PC by means of the kind of tests that have traditionally formed the mainstay of Apple keynotes (for example running *Photoshop* on both machines and comparing the time required for plug-in processing), Jobs broke with the past and invited his new colleague, Gerhard Lengeling, co-founder of Emagic, onto the stage to evangelise about what the G5 will mean for musicians and music-software developers alike. To begin with, Lengeling reported that the G5 (presumably the dual 2GHz model) was capable of playing back over 1000 stereo 24-bit voices, and that 1600 bands of EQ used only 25 percent of the machine's resources, which has certainly impressed some of the musicians I know. On the face of it, these are pretty amazing figures and could mean that it will be

possible for a Power Mac G5 running *Logic* to replace an entire rack of 12 GigaStudio-based computers, for example, although it's important to bear a couple of things in mind.

A high voice count is easier to obtain when the sampler's audio data is stored only in memory, as opposed to being streamed from disk, which is a method most musicians rely on to use today's most advanced libraries, such as the *Vienna Symphonic Library*. To get 1000 voices streamed from a disk without using all 8GB of the Power Mac's memory would be quite unlikely with most modern disk drives, using up all the available bandwidth of a Serial ATA channel, although Apple do have a potential answer with their XRAid storage system. It's an expensive solution, of course, but with Apple's fibre channel card in your Mac and an XRAid, which is capable of delivering up to 400MB/s of bandwidth, this should be more than adequate to stream enough voices to your software sampler — something I look forward to trying when G5s become available.

After the figures had been discussed, Apple's VP of Worldwide Product Marketing, Phil Schiller, conducted a demonstration that was almost certainly designed to send two fingers in the direction of another group of German music-software developers. In order to show the G5's alleged superiority for running music

software, and given that the latest version of *Logic* isn't available for Windows, an optimised version of *Logic v6* running on a G5 was pitted against *Cubase SX v1.051* running on the dual-Xeon Windows-powered Dell machine. The test material was a track Brian Transeau had produced for a *Matrix Reloaded* trailer, and while the Windows machine attempted to play the song back, it didn't take too long for everything to stutter and grind to a halt as the CPU performance meter, which Apple were only too happy to illustrate, was showing enough red lights to make it more useful for developing photos than playing back music. Schiller dryly commented that "I don't think that's how BT meant for it to sound." No kidding.

Lengeling was invited to press Play on the Mac, and, needless to say, the Mac/*Logic* combination performed the same song flawlessly with the CPU meter showing approximately 50 percent usage. And if this wasn't enough, just to rub salt in the wounds, the *Logic* song had been configured so that when it got to the point where the Windows machine tripped over its own shoelaces, a higher horizontal zoom factor was chosen, causing the Arrange window objects to gracefully fly past with little dent to CPU performance.

While this made for a great theatrical display, and I confess

to laughing, being taken back and impressed by what I was seeing, ultimately you have to take the technical point of such a comparison with a pinch of salt. At the time, there was no mention of what plug-in effects and instruments were being used, and how many tracks were playing back, plus it would be too easy to handicap the PC by using plug-ins that were known to adversely affect CPU usage, while sticking to *Logic's* lean-and-mean effects on the Mac. But it was a good show, it proved a point, and running *Logic* on a G5 is obviously going to provide a very powerful music production environment.

A Fair Test?

Taking a step back from the WWDC onstage theatrics, Apple later published actual figures and methods for the *Logic*/Mac setup versus *Cubase*/Windows tests carried out in the lab. Apple's G5 Performance White Paper states that projects were put together in both applications with 'multiple unique audio tracks', and that 'five default reverb plug-ins' were added to each of the audio tracks "to see which could play more plug-ins". However, the document continues to say that for *Logic*, the default settings for *Fat EQ*, *Autofilter*, *Chorus* and *Silver Compressor* were used, while for *Cubase*, an equaliser, along with the default settings for *Step Filter*, *Chorus* and *Compressor* effect plug-ins were used.

The results presented are based on the number of 'simultaneous audio tracks with five plug-ins' that various systems could play back, although it's not made clear whether the plug-ins are the five default reverbs mentioned, or are made up from the secondary lists. I suspect the mention of reverb is erroneous, and the five default plug-ins are made of from the list of application-specific effects, but the reason I'm writing about this fact in such tedious detail is to highlight the uncertainty of the information provided by Apple themselves with regard to the

Audio Goes In, Audio Comes Out

Given that Apple were, for a time, known as a company that had offered built-in audio connections as standard, but then began to phase them out, it's good to know that musicians are catered for better than ever with the audio I/O on the Power Mac G5. There's the usual 3.5mm mini-jack connections on the back for line-in and out analogue audio, with an additional headphone mini-jack output on the front panel, and the converters used are capable of handling 32, 44.1 and 48kHz sampling rates and 16- or 24-bit resolutions. However, the really good news is that the each Power Mac G5 also includes optical digital I/O with Toslink connectors delivering S/PDIF-format audio at either 16- or 24-bit resolution. When slaved to an external clock, 32, 44.1 and 48kHz sampling rates are supported, and using the Power Mac's internal clock mode rates between 16 and

96kHz can be used.

Digital audio I/O on a Mac is obviously a big step forward, and with the low-latency Core Audio functionality in the operating system, some musicians won't have to worry about purchasing additional audio hardware, which can only be a good thing. And musicians aren't the only group of users who will benefit from having a digital audio output on their Mac, since this port can also be used to drive 5.1 surround sound home entertainment systems as well for DVD playback. While sceptics might suggest that this is the true reason for Apple including a digital audio output on the new Power Mac, if that were true there would be little need to include a digital input as well, not to mention that Apple show a definite focus towards professional musicians in all of the product's technical literature.

tests carried out.

Aside from any confusion, the results published are that a dual-2GHz G5 system can play back 115 tracks under these conditions, the 1.8GHz G5 manages 59 (showing that Logic really does make use of two processors), and the 'low-end' 1.6GHz G5 still copes with 52 tracks. For the Windows machines, a Dell Precision 650 with dual 3.06GHz Xeon processors is capable of 81 tracks, while a 3GHz Pentium 4-based Dell Dimension 8300 managed only 35 tracks. Again, it's hard to know what to make of these figures because no other information is given for these tests, and as with the onstage demonstration, the lab test comparisons are largely unfair because while *Logic* has been optimised for the G5 processor, *Cubase* contains relatively few optimisations for the latest Pentium-based technologies other than the SSE instruction set. As the testers were probably aware, *Nuendo* is more finely tuned for the latest Intel technologies, such as hyper-threading, which will find its way into the latest version of *Cubase*; so in terms of a real-world performance test, it seems unfair to pit an optimised application against an unoptimised application.

Apples & Oranges

At this point, I might be in danger of offending some Mac fanatics by appearing to 'defend' the Windows platform here in Apple Notes, of all places, which isn't my intention. I'm incredibly excited by the Power Mac G5 and will be straight down to my local Apple Store to buy one when they're available; but tests such as the ones provided by Apple (and I'm talking purely about the music and audio tests here) don't provide any real comparison with the Windows platform. I think it's far more interesting to discard the Windows results altogether and just look at the Mac results on their own because, by current standards, they are impressive

Panther – Mac OS 10.3

Although the promised unveiling of the next major version of Mac OS X was somewhat overshadowed by the Power G5 announcement, Mac OS 10.3 (codenamed Panther) is nevertheless going to be a significant product for Apple. Among the many new features, one of the main highlights will be fast user-switching, which Steve Jobs confessed Microsoft had beaten them to implementing. This facility, already in Windows XP, allows users to instantly switch between accounts, keeping everyone's applications and documents open; and Apple have worked their visual magic so that the 'switch' is displayed by the desktop turning into a rotating cube — "because we can" said Jobs.

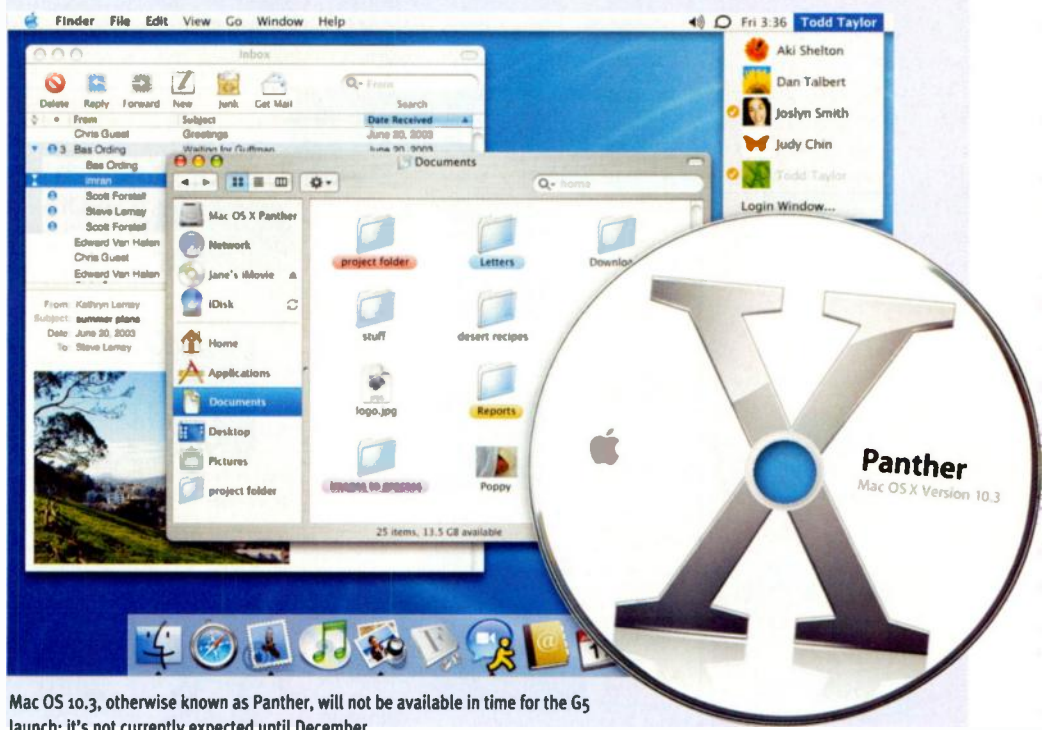
Panther also features an improved and redesigned Finder, giving you better access to the most commonly

used parts of the system, and there's an intriguing new Window management feature called Exposé. This allows all the windows on screen to be miniaturised into tiles and spread all over the desktop at the touch of a button, enabling you to select the window you want at the front, and restoring all the other windows to their original positions. Although this sounds like a bit of a gimmick when described, it becomes apparent how useful Exposé could be if you get chance to see it in action, and I think anyone who juggles a large number of windows, such as any Mac musician who uses a sequencer, will find themselves unable to live without Exposé once they've tried it.

Other 10.3 highlights include a more efficient Mail program, enhanced file security, inbuilt fax

support, an improved version of Preview, better synchronisation with an iDisk, and Pixlet, a new video codec that offers studio-grade compression without losing individual frames, enabling edits to be carried out on different workstations without having to worry about moving huge DV files around. And while there has been no mention yet of any improvement to Core MIDI or Audio, Panther will apparently fix an issue with OS 10.2 that prevents more than one mLAN device being used at a time, unless developers have written their own drivers to get around this problem.

Apple announced that Panther would ship publically later this year, and will cost the same as last year's Jaguar update, \$129 in the US and £99 in the UK. Until then, it's only available to Apple developers.



Mac OS 10.3, otherwise known as Panther, will not be available in time for the G5 launch; it's not currently expected until December.

and something to shout about.

Despite the arguments about the validity of many of the claims Apple have made for the G5 and the tests and performance data collected, and regardless of whether the Power Mac G5 is indeed the world's fastest desktop, if it's actually correct to refer to the Power Mac G5 as a desktop rather than workstation, and so on, it seems that Apple have produced the best Mac for professional

musicians and engineers in the company's history. They also have a new hardware platform that at least puts Apple in the same ballpark as the competition again, which is particularly important for an industry such as the music industry where Macs are still arguably the professional choice — a fact that is, admittedly, rarely based on technical merit.

With such a loyal user base, it often seemed strange why Apple

didn't cater more obviously to musicians in the past; but with the Power Mac G5, Apple have arguably designed the most musician-friendly computer on the planet. Considering Apple's purchase of Emagic, the high-performance audio and MIDI support in OS X, and not forgetting the recent launch and success of the iTunes Music Store, I can't wait to see what Apple are going to do for us next. **SO5**

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NEW EMU Xtreme Lead £359	NO DEPOSIT	12 x £29.92 = 0%	NEW Novation Remote £239	NO DEPOSIT	6 x £39.83 = 0%	NEW Yamaha AW4416	£1749	NO DEPOSIT	6 x £291.50 = 0%
NEW EMU Vintage Keys £499	NO DEPOSIT	12 x £41.58 = 0%	NEW Novation KS £699	NO DEPOSIT	6 x £116.50 = 0%	NEW Yamaha O1V96	£1699	NO DEPOSIT	24 x £70.99 = 0%
NEW EMU Vintage Pro £359	NO DEPOSIT	12 x £29.91 = 0%	NEW Roland VS2480cd £2999	NO DEPOSIT	36 x £83.31 = 0%	NEW Yamaha P60 Piano	£549	NO DEPOSIT	6 x £91.50 = 0%

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Roland EF303	£199	Roland VKB Organ	£1275
Roland PC100	£89	Boss DR660	£199
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		Roland VG5	£499
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Digital studio workstation. All the best bits of the awesome 2480 and more - without the price! 24 trk playback, 16 trk simultaneous record, 384 v. trks, RS5 3D mixing, 2+2 F/x, VGA output.
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Upgraded XV1010 with USB connection, more sounds plus 2 x SRX card slots
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Digital Percussionist. 300 sounds, sequencer, d-beam controller and loads more.
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BOSS BR532
Digital 4 trk workstation with f/x - 32 virtual tracks
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The first ever 24 track digital workstation with 64 channel digital mixer and 17 motorized faders. Can connect directly to VCA monitor for information display and editing. 2 onboard FX processors and room for expansion for more cards!
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Roland's acclaimed virtual tone wheel organ in a desktop box with COSM amplifier and rotary speaker modelling, multi-timbral for dual manual performance.
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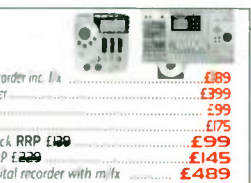
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This month, using markers for navigation, getting the most from the piano roll view, and undertaking pseudo-mastering in *Sonar*.

Craig Anderton

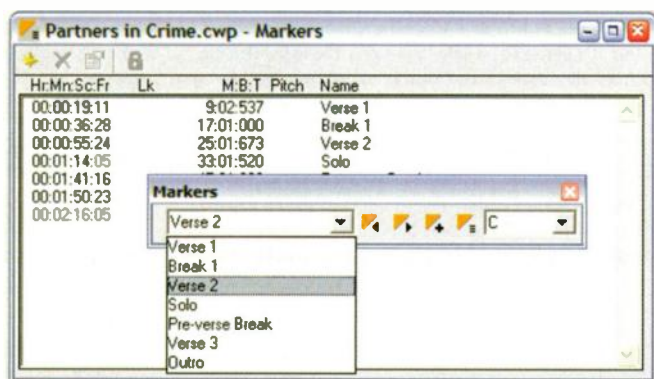
Recently I was reading an *SOS Cubase Notes* column by Mark Wherry in which he discussed using markers in Cubase, and realised that despite their usefulness, this column has never covered the use of markers in *Sonar*. So let's remedy that oversight immediately.

The main purpose for markers is to simplify navigation around a piece of music, as you can jump to a particular marker without having to set the 'Now' time or use the transport controls. It's important to strike a balance between having too many markers, which can be confusing, and too few, which makes it difficult to go to exactly where you want. Markers can also identify sections of a song, or lock to SMPTE time so that they always indicate a certain position in time, even if the song tempo changes.

Marker Basics

The centre for marker action is the Markers toolbar — go View / Toolbars and tick 'Markers'. The toolbar can be floated or docked, but power users will probably use key commands as often as possible, rather than clicking on the toolbar icons.

To add markers in real time while the tune is playing, press F11 or click on the toolbar's Add Marker icon (the marker symbol with the + sign). You can also go Insert / New Marker, right-click on the ruler and select Insert Marker, or Ctrl-Click on the space above the time ruler, where the markers hang out... but those options seem like more effort. (Note that in the latter two cases, the marker goes not where you clicked, but at the Now Time position when you select Insert Marker.) Markers are placed without regard to the Snap grid, but if you move or



The Markers List and Toolbar.

copy them, they will snap to the selected grid value.

Hitting F11 or selecting the Add Marker icon while the transport is stopped causes a dialogue box to appear, where you can name the marker, choose whether to lock it to SMPTE, adjust its placement, or assign it a pitch to which groove clips will transpose automatically. You can also call up this dialogue box for a previously-placed marker, regardless of whether or not the transport is running, by right-clicking on the marker.

In the accompanying screen, the Markers List is in the background, while the front window shows the Markers toolbar. Selecting a marker from the drop-down list toward the left jumps the Now Time to that point; the icons (from left to right) are 'go to Previous Marker', 'go to Next Marker', 'Add Marker', and 'Open Markers List'.

Now that the markers are placed, it's time for navigation! You can jump around markers in several ways, and all of these are functional while the tune is playing:

- Click on the toolbar's Next Marker or Previous Marker icon.
- Use the menu — Go / Previous Marker or Go / Next Marker.
- Use Sonar's key equivalents (Previous Marker = Ctrl+Shift+Page Up, Next Marker

= Ctrl+Shift+Page Down).

- Use the Key Bindings function (under the Options menu) to assign what I think are more logical equivalents: Previous Marker = Shift+F11, Next Marker

= Shift+F12.

- Select a marker from the drop-down list toward the left of the markers toolbar.

If you hit F5 twice, a Markers View appears, showing not just the markers you placed, but also default markers for beginning, end, punch in, punch out, loop start, loop end, etc. To jump to one of these markers, double-click on the desired marker, then click

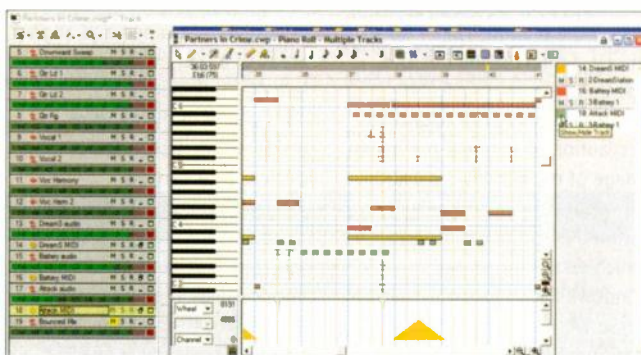
music, but would be great for documenting where sound effects fall in an audio-for-video project.

In addition to navigation, markers serve one other purpose: clicking between any two markers in the strip just above the timeline causes them to define a time range. You can, of course, also set this to loop by clicking on the Set Loop to Selection icon.

Secrets Of The Piano Roll

Features with a lot of power can be confusing if not fully understood. An example of such a feature is the way in which Cakewalk lets you see as many or as few MIDI tracks as you want, simultaneously, within a single Piano Roll view. Actually, this is one of the reasons I use *Sonar* — MIDI remains a big part of what I do, and I like this sort of 'big MIDI workspace' approach.

The piano roll view is nothing really new: it has the usual piano keys for pitch reference, the grid for lining up notes, and a controller strip along the bottom for viewing velocity, pitch bend, modulation, and so on. The



The Piano Roll editor.

on OK when the 'Go' box appears.

One final marker feature is the Markers List. This manages markers and compiles a list of all the markers you've created. Here you can delete or add markers (the Add Marker dialogue box comes up when you click on the New Marker icon), or lock a marker or group of markers by clicking on the Lock icon. It's also possible to print this list, which doesn't seem terribly useful for

unusual aspect is the Track Pane strip toward the left, which lists each selected track and has selection boxes for Show/Hide Track and Enable/Disable Editing. Additional buttons let you enable Solo, Mute, and Record from within the piano roll view.

As I mentioned earlier, the piano roll view can show multiple tracks simultaneously; the Track Pane strip toward the right-hand side lets you choose which tracks

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► to show or hide, and which will be affected by editing operations. Additional icons provide shortcuts for showing all tracks, hiding all tracks, and inverting tracks (ie. showing ones that are hidden, and hiding ones that are showing).

To see multiple tracks, select them in the Track View (Ctrl-click on the Track numbers you want to select) and go View / Piano roll or type Alt-5. If you simply double-click on a clip (and Piano Roll is selected in the Track View Options as the default result of double-clicking), only that clip will appear in the piano roll view.

Now you can choose which tracks to work on and view. Click on a coloured Show/Hide box to hide a track's notes and controllers, and click on the same box when white to view the track again. The box to the right of the Show/Hide box controls whether editing operations are enabled or not. When this is grey, editing operations will not affect the associated track; when it's white, they will.

I find the ability to choose to view multiple tracks and edit only selected ones particularly handy with drum parts, as despite the fact that Sonar has a dedicated drum editing view, I still record each drum on its own MIDI track. Being able to see as many or as few as I want in the piano roll view is great: for example, I can see the kick, snare, and hi-hat simultaneously, but quantise only the kick, or lag only the snare... or quantise pairs of tracks. It's also convenient to be able to see kick and bass, left and right hands of a split keyboard part, or particular combinations of guitar strings with a MIDI guitar part, together at the same time

There are a few fine points to bear in mind involving the piano roll screen. The scrubbing function (check it out if you haven't discovered it yet) works only with tracks that are both shown and enabled for editing. If you disable a track or hide it, it will not be scrubbed. Also, you may recall from an earlier Sonar Notes column that there's a difference between the active

track with the focus (the background of the Track View track name is tan) and a selected track (the background of the Track View track number is blue). When showing multiple tracks in the piano roll view, if you hide the active track no editing is possible.

I'd also like to draw your attention to four useful shortcut icons, as mentioned briefly above. The seventh icon from the right (with the arrow that points left) shows/hides the piano roll's Track Pane. The icon to its right shows all tracks, and the next icon to the right hides all tracks. Continuing to the right, the Invert Tracks icon hides all tracks that are shown and shows all tracks that are hidden. This is useful when you're alternating your edits between two groups of tracks — for example, kick/snare/hats and high/mid/low toms.

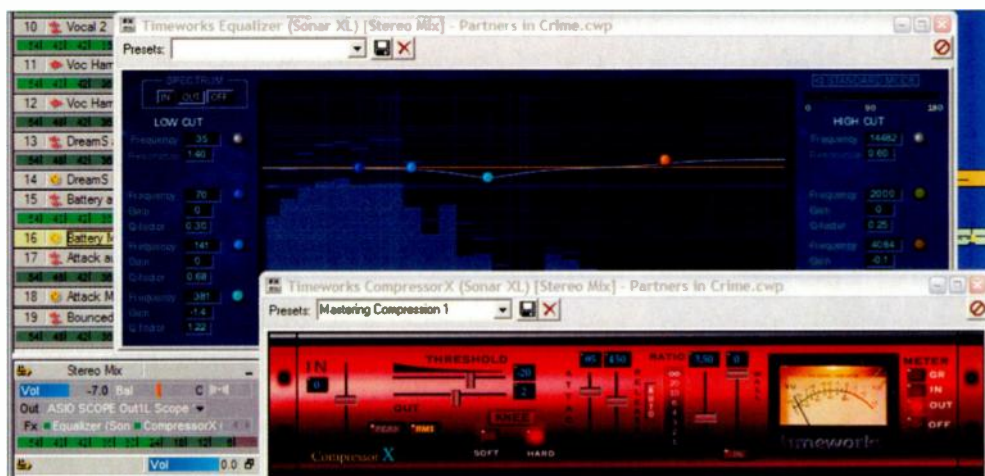
Ask Mr Science!

"I've been working with Cakewalk software since *Pro Audio 9* and on to *Sonar*, and everything is recorded just as I want, with

The issue here is mastering, which we discussed a bit in my fifth *Sonar Notes* column, back in May 2002. I can't distill mastering down to a paragraph (although I did distill it down to a book, *Audio Mastering*, in Wozoo's QuickStart series), but in most cases you will add a bit of EQ and compression, in that order, to even out the frequency response and dynamic range of your track.

Inserting EQ and compression in the stereo master buss can make your tunes sound a bit more like commercial releases. The Timeworks *Equaliser* has a convenient spectrum analyser view superimposed on the response curve; it can monitor the signal entering or exiting the EQ, so you can see the results of any changes. Use very light amounts of EQ and compression to start, as these processes have more apparent effect on programme material than on individual tracks.

If you have *Sonar 2.x XL*, it includes two fine mastering plugins, the Timeworks *Equaliser* (as mentioned above) and Timeworks *CompressorX*. Insert



The Sonar mastering processors.

perfect reproduction. But on playback, it just does not sound the same as recordings I hear on, radio, CDs, etc. — something is missing. I define what I hear from radio or from commercial quality CDs as more 'polished' — a sound that has depth without reverber, presence without volume, solid bass and treble without having to adjust the tone controls...can you help? Thanks, Tom"

these in the FX bin for the master stereo buss. Regarding the EQ, I often add a little bit of high-end shelving boost starting at around 2-5kHz, and a bit of mid-range cut in the 300-450Hz range. Sometimes a slight boost at around 100Hz can make a kick-shy tune more dancefloor friendly, while a cut can reduce muddiness, if that's a problem.

The *CompressorX* has two

Sonar Shorts

- To select all notes of a particular pitch in the piano roll view, click on the corresponding keyboard key toward the left of the window.
- If any MIDI notes are stuck, go Transport / Reset or hit the Reset icon (exclamation mark) on the Transport toolbar.
- Bundle files (.cwb suffix) are limited to 2GB due to limitations in the Windows operating system. To back up a project with more than 2GB of data, place all audio data in a per-project audio folder and back that up.
- Networked with a Mac? Although *Sonar* can import AIFF files, you can also just drag them into the Clips pane.

mastering-orientated presets that serve as good points of departure. But note that professional mastering almost always uses multi-band compression and/or loudness maximisers to get that obscenely loud CD effect, where dynamic range is squashed faster than a cockroach at a fancy restaurant.

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Your computer screen really doesn't need to be cluttered when you're working with *Cubase's* many windows, because Steinberg have provided handy window-management features.

Mark Wherry

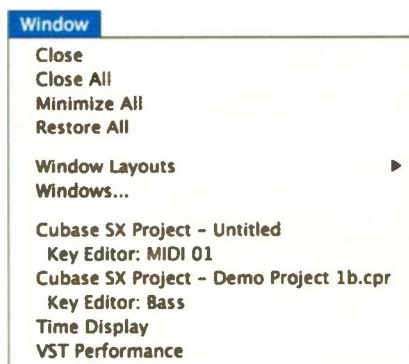
Cubase SX is certainly better than previous versions at keeping the number of windows you need onscreen at any one time to a minimum. However, it's inevitable, with an application featuring many different windows, that you'll end up spending time opening, closing and moving different windows around, especially if you don't have large or multiple monitors. So while you might be thinking "Mark, I'd love to read a *Cubase* Notes about window management, but I have to go and pluck my eyeballs out just now", knowing about these less-than-glamorous features of an application like *Cubase* can actually save you the greatest amount of time in the long run. The commands for window management are stored away neatly in the Windows menu, and the basic four (Close, Close All, Minimize All, Restore All) are pretty self-explanatory.

- Close literally closes the window you're currently working with.
- Close All, unsurprisingly, closes all the currently open windows. If you use these two commands, though, bear in mind that closing a Project window closes that Project, in addition to simply closing the window. So if you have many Projects open in *Cubase* and you select Close All, all the open Projects will be closed, along with any other open windows in *Cubase*.
- Minimize All minimises all the open windows in *Cubase* to either the Taskbar or Dock (depending on whether you're using Windows or Mac OS).
- Restore All restores all minimised windows to their former glory. It's good to note

that when you restore the windows, they appear in the exact same arrangement on screen as they did before being minimised.

Open All Hours

A list of all the open windows in *Cubase* is always detailed at the bottom of the Windows menu, and you'll notice that this list is arranged hierarchically, based on which of the open Projects each window belongs to. You can bring any window to the front by selecting it from the Windows menu; and if you have many different windows for many different Projects open at the same time, you can maintain absolute control over them in the Windows window, which can be



When you're working with multiple Projects, the Windows menu and window both provide a hierarchical list that makes it clear which Project the open windows belong to, in addition to providing many other useful features.

opened by selecting Windows / Windows.

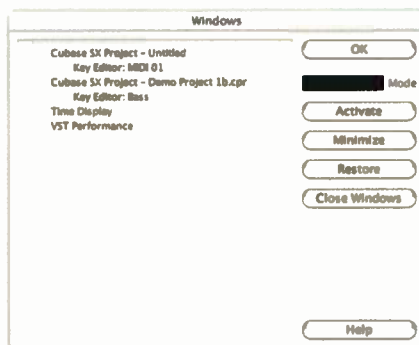
As with the Windows menu, you'll notice that the left part of the Windows window contains a hierarchical list showing the list of open windows based on which Project they belong to. You can bring any Window to the front

(and close the Windows window) by double-clicking one of the window entries in the list. However, you'll notice that there are many other buttons in this window, for managing the windows you currently have open in *Cubase*. The exact effect of these buttons is set by the Mode parameter, located beneath the OK button at the top right of the Windows window, and you can toggle between the Selected, All, and Cascaded Modes by clicking in the black parameter box next to the Mode label.

- With Mode set to Selected, only the selected window in the Windows list is affected by clicking the Activate, Minimize, Restore, or Close Windows buttons, although it's worth

noting that you can select multiple windows in the Windows list by Shift-clicking. So, for example, clicking Close Windows with only one window selected (other than the Project window) will close only that window.

- When Mode is set to



All, every window open in *Cubase* is affected by the four 'action' buttons in the Windows menu.

- If Mode is set to Cascaded, only the selected window and the 'children' of the selected window are affected. For example, if you

Tips & Tricks

- *Cubase SX/SL 1.06* is a minor revision that fixes many of the bugs and problems people were experiencing with the previous two v1.05 releases. Download your copy today from www.steinberg.net.
- While this isn't a *Cubase* tip, here's a handy Window-management related tip for Mac users: you can drag a window that's in the background without it having to be the currently selected window by dragging on an empty part of the window's title bar with the Apple key held down.

wanted to minimise all the windows in only one Project, simply set Mode to 'Cascaded', select the Project window for the Project whose windows you want to minimise, and click Minimize. You could restore all the minimised windows for the Project by keeping its Project window selected and clicking 'Restore'.

It's probably worth spending a few moments in the Windows window with a few Projects open, just to get a feel for exactly what's possible. When you've finished, you can close this window without making any more changes by clicking OK or pressing the Escape key.

Using Window Layouts

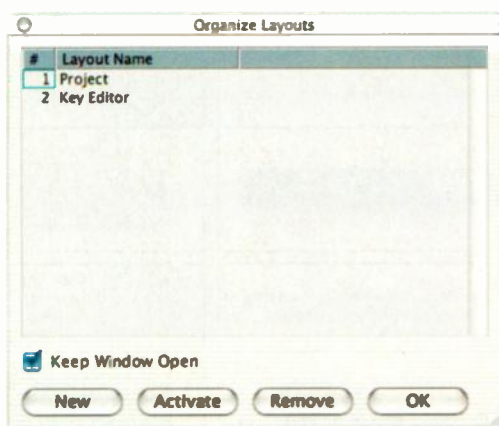
In the grand tradition of saving the best until last, *Cubase's* most useful feature for window management allows you to store various snapshots, which are known as Window Layouts, containing the state and positions of the windows currently visible on screen. These can later be recalled via the Windows menu or with a Key Command, enabling you to define a series of layouts for the most common situations in a given Project, and cut down on the time you spend arranging windows. However, it's important to remember that Window Layouts are Project independent, meaning that any you define are available to any Project you load into *Cubase*.

To define a new Window

Layout, arrange the Windows on screen to suit a particular working method, such as mixing or editing, select Window / Window Layouts / New (or press Control/Apple+0 on the numeric keypad), and in the New Window Layout window, type in a name for your Layout and click OK. Once the Window Layout has been defined, it can be recalled by selecting the name from the Window / Window Layouts sub-menu, or by pressing the relevant Key Command. By default, you can recall the first nine Window Layouts by pressing Alt/Option+1-9 on the numeric keypad, although it's possible to customise this in the Key Commands window.

To help you manage your Window Layouts, *Cubase* provides the Organize Layouts window, which can be opened by selecting Window / Window Layouts / Organize, or simply by pressing 'W'. You can use this window to create new Window Layouts, or remove or recall existing Layouts. By default, the Keep Window Open option is disabled, so when you recall an existing Window Layout by selecting the Layout and clicking Activate, the Organize Layouts window will close automatically. As you might expect, activating the Keep Window Open option does exactly that and keeps the Organize Layouts window open after you recall an existing Window Layout.

New Window Layouts can be created by clicking New, typing in a name and pressing the Return key. It's important to note that the Organize Layouts window cannot be included in a Window Layout, whether the Keep Window Open option is enabled or not. Removing Window Layouts is, as you can imagine, a simple matter of selecting the Layout you want to delete from the list and clicking Remove — and you might be interested to know that you can't undo this operation.



The only function you can't carry out in the Organize Layouts window is redefining (or, as *Cubase* puts it, recapturing) an existing Window Layout. To do this, simply recall a Window Layout (using the Window menu, the keyboard shortcut or the Organize Layouts window), and rearrange the display as you like. Redefine the Window Layout by selecting Window / Window Layouts / Recapture or pressing Alt/Option+0 on the numeric keypad. Note that the Recapture command in the Window menu

The Organize Layouts window makes it easy to define window arrangements that suit your particular working methods.

should display the name of the Layout you're going to redefine — if it doesn't, the Window Layout to be redefined wasn't recalled properly, so go back to the first step and try again.

Window Layouts In The Real World

The problem with many user-definable features such as Window Layouts is that they sound great but often leave you wondering exactly what you'd want to do with them. So to get you started with Window Sets, here's an example that can help to speed up editing when using a single-monitor system.

First, make sure the Link Editors option is enabled in the Editing panel of the Preferences

window, and arrange the screen so the Project window appears as the main focus. Select Window / Window Layouts / New (or press Control/Apple+0 on the numeric keypad) to define a new Window Layout, and in the New Window Layout window, type in a name, such as 'Project' and click OK. Now, arrange the screen so that the Project window takes up only the top half, open the Key Editor and resize it so that it takes up the lower half, and define another Window Layout as before. In the New Window Layout window, type in a name, such as 'Key Editor' and click OK.

Assuming these are the first two Window Sets that have been defined you can switch between the Project window and the split-screen Project window and Key Editor Layouts by pressing Alt/Option+1 and 2 on the numeric keypad respectively. Because the Link Editors feature is active, the Key Editor will always display the current MIDI selection in the Project window when you switch to the Key Editor Window Layout. **ES**

Macros In Action: El Cheapo Jog Wheel

I have to confess that when I first saw Griffin's Power Mate, I really couldn't understand the attraction — while a silver knob with a blue light looks rather neat, would I want to pay money to have what is effectively a glorified volume control on my desk? But after having played around with one, and reading Griffin's web site (www.griffintechnology.com) more thoroughly, I realised that the device is actually fully programmable in terms of the actions it transmits to your computer. In addition to being able to work as a volume control or scroll wheel, the Power Mate can also send keyboard shortcuts, and using the supplied software you can set it up so that each application on your computer makes use of the wheel in a different way.

For a *Cubase* user, the most obvious use for the Power Mate is, of course, as a jog wheel. And while I didn't have much success when assigning its 'rotate right' and 'rotate left' commands to *Cubase*'s Forward and Rewind Key Commands, the Power Mate's wheel came to life when triggering the Nudge Up 24



In addition to looking rather pretty, Griffin's Power Mate can be configured to work as a jog wheel in *Cubase* by way of smoke and mirrors — well, Key Commands and Macros actually.

and Nudge Down 24 Macros, as described in last month's *Cubase* Notes. For anyone who missed it, these Macros consist of 24 Nudge Up or Down Key Commands respectively.


However, the Power Mate's wheel can also act as a button to provide four additional actions: pressing the button, pressing and holding the button for a brief moment, and pressing and holding the button down while turning the wheel either left or right. You could

set these actions to any commands you like, but my choices were to assign the button press to be Play/Pause, 'press and hold' to be Return To Zero, and the press, hold and turn actions to trigger the Nudge Up and Down Commands, which is great for moving the Project Cursor by a single frame when working with a frame-based Display Format.

The Power Mate is a handy little device that can be used with either Mac OS 9 and X or Windows, and for \$45/£40, you can't go wrong!

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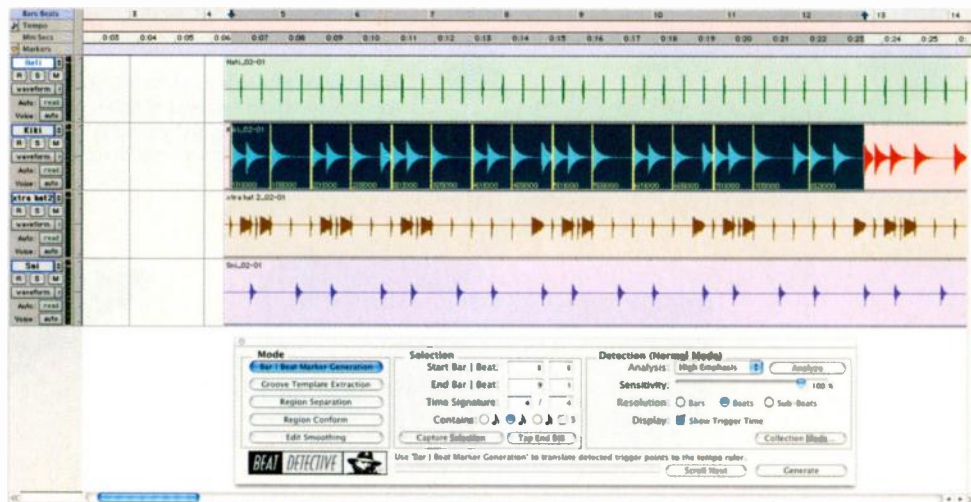
pro audio systems

Simon Price

In common with most music recording and sequencing packages, a *Pro Tools* song contains a tempo map, or bars-and-beats scale that measures musical time from left to right across your display. When you create a new song, the tempo map starts off as a steady 120bpm 4/4 grid. Typically, when starting a song from scratch, you'll manually set these values to what you want, then start recording MIDI and audio. When quantising MIDI, the notes are moved closer to the Bars/Beats grid, and last month we saw how the TDM/HD-only Beat Detective tool is used to quantise audio by moving individual drum hits with respect to the grid. However, Beat Detective can also be used the other way around: for taking existing audio and conforming a song's tempo map to the recorded performance.

There are a number of reasons why you might want to do this. For a start, you might have a multitrack song that's been recorded as audio without any absolute timing reference (maybe from tape), and you want to bring it into *Pro Tools*. Constructing a Bars/Beats grid around the audio will make it possible to add extra MIDI tracks, and speed up editing and arranging. More subtly, you might wish to take the 'feel' of a good performance, and imprint the timing variations into the tempo map so that other tracks can be quantised with a similar

Last month we looked at using *Pro Tools'* Beat Detective tool for chopping up and quantising drum recordings. Now it's time to look at the other side of the coin: extracting and using the tempo and timing of a recording.



Selecting a kick drum track from which to derive a tempo map.

groove. Beat Detective can also achieve this latter result by storing tempo-map snapshots as Groove Templates for later use, leaving the song's grid alone.

Pro Tools' tempo map consists of anchor points marked out along the tempo and meter rulers in Edit Window signifying changes in these parameters. A simple way of creating anchor points (and the only way in non-TDM systems) is to use the Edit Menu's Identify Beat command. This lets you specify the bar number at the current cursor position. Alternatively, you can drag out a selection in the Edit Window, and tell Identify Beat which bars lie at the start and end of this selection. Additionally, you can create a

tempo change at the cursor position by clicking the small note icon next to the name of the tempo ruler, and *Pro Tools* will automatically shift the time scale accordingly. In these ways a tempo map can manually be built up against audio in a track, becoming more accurate as more bar markers are identified. Beat Detective can be used to automate this process, using its transient detection facility to quickly identify where Bar, Beat, and even 'Sub Beat' points lie. And because anchor points can be laid for all of these events throughout a selection, the tempo map is very detailed and accurate, representing even the most subtle timing variations.

Mapping Audio

Last month we used Beat Detective to detect transients in an audio track, and cut the recording into individual chunks. This time we'll be using the same first step, but instead of making cuts at the detected beats, Beat Detective will write anchor markers into the tempo track. The screen above shows some drum tracks that have been imported into a fresh *Pro Tools* Session. The Bars and Beats ruler bears no relation to the actual

music at this point. I've decided to use the second track (the kick) with Beat Detective to align the time scale. I've made a selection that starts exactly where I want a bar to start (in this case bar one), and encompasses a known number of bars of the recording. This contrasts with last month, where the selection was made in Grid mode and was made using the existing bar scale in the session. Next I've opened Beat Detective and selected Bar/Beat

Quick Tips

PTD You can quickly change a track's automation graph view by Control+Command (Mac)/Control+Start (Windows)-clicking on any parameter control.

PTD It can be pretty tedious having to 'bounce' to free up the DSP/CPU power used by a plug-in on the track, but often you can save the time it takes bussing and re-recording by using Audiosuite. Most plug-ins have an Audiosuite version, and any settings you save in the real-time version can be used in that. So save the settings in the real-time plug-in and open them up in Audiosuite. You can now process much faster than in real time, and without messing about with recording to a track.

Rewire In *Pro Tools* 6.1

Digidesign have announced the release of *Pro Tools* version 6.1, and I'm hoping to get my hands on an update CD to check it out for next month's Notes. This version is a particularly big deal for those using the Windows platform, as you now get all the features that came to OS X with v6.0, including the Groove Template stuff we're looking at this month. The other big story is the inclusion of Rewire — the Propellerhead Software technology that integrates different music applications. Rewire is built into *Pro Tools* 6.1, and will mean that you can route audio from other Rewire programs (like *Reason*, and the new beta version of *Live*) straight into the PT mixer. Rewire also provides MIDI communication, and automatically takes care of sync and bi-directional transport linking between your programs. In terms of *Pro Tools* keeping up with the competition, this is easily the most important thing that's happened in ages.

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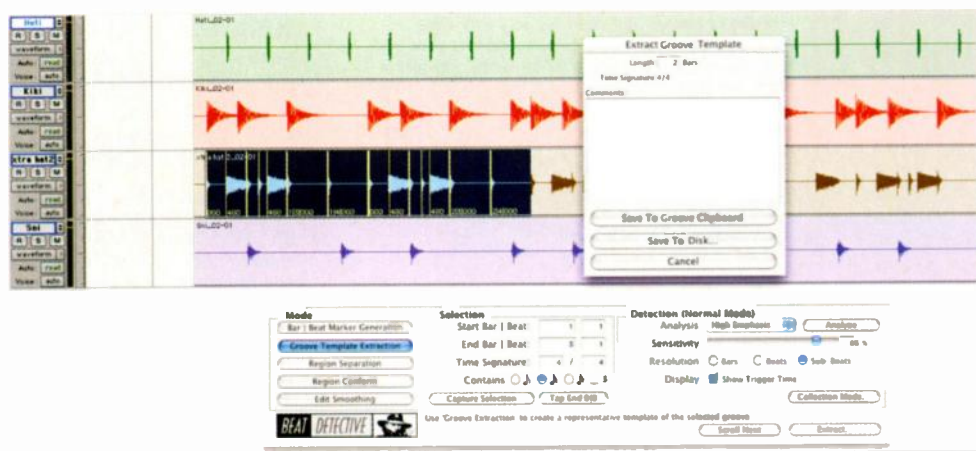
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► Marker Generation mode. I've told Beat Detective how many bars my selection represents by manually entering the start and end bar numbers in the central Selection area of the Beat Detective window. This is crucial, as it gives *Pro Tools* the ability to work out which beat (or sub-beat) each waveform transient falls on. Finally, I've used the Detection section to analyse the waveform and display the transients and the beats they represent. I've not chosen to detect sub-beats as I'm not that concerned with subtle timing in this case — I just want to get a working grid.

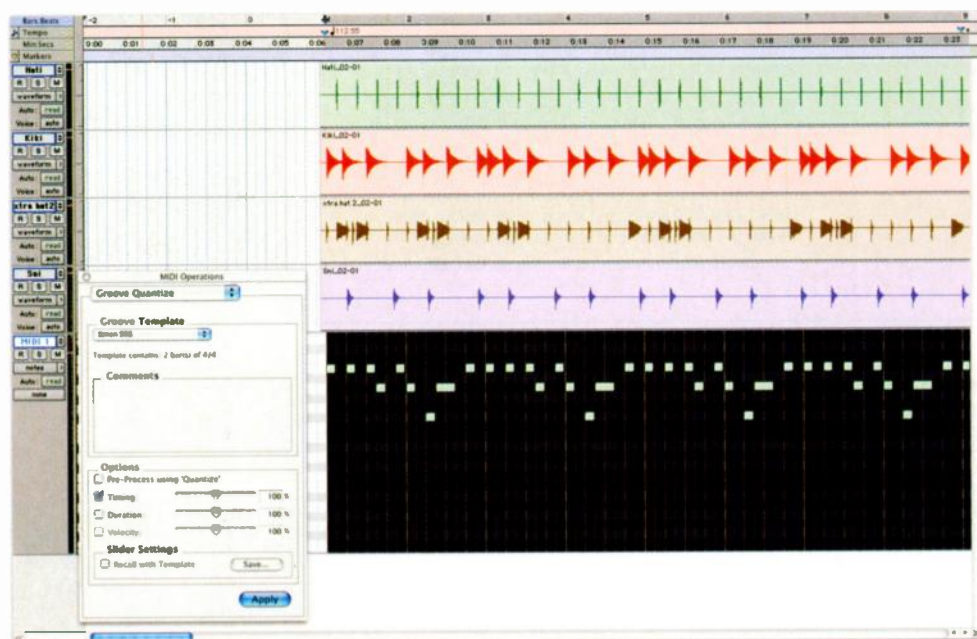
The last step will be to hit Generate, which will re-scale the Bars and Beats ruler, and leave tempo change markers at each 'hit point' calculated from the distance between the beats. In my example I've used an eight-bar section, but I probably want to line up the whole song. If there's a clear rhythmic track like in my example, and a pretty steady tempo, you could analyse much larger selections (you'd have to count the bars, of course). However, in reality you'd probably have to take the song in several sections, using different analysis settings, to get the right results. Sections with definite intentional tempo changes should also be treated separately.

Groove Templates

The beat-detection method described above imprints the timing of your recording into the song's time scale. This means that when you quantise MIDI or audio tracks, they will pick up the 'feel' of the track(s) you initially 'Beat Detected'. While this is an effective and practical way of groove quantising, it lacks



Extracting a Groove Template from a two-bar piece of recorded audio (top) and applying it to a MIDI part (bottom).



flexibility. This is where Groove Template Extraction mode comes into play. Just like before, this detects the transients in the waveform and figures out which beats they fall on — but instead of writing markers into the Bars/Beats ruler and warping the song's time scale, this mode simply makes note of how the recording varies from a straight 'no-feel' performance and saves the information as a template. This template can be used as a quantisation map at any other point in the song, regardless of the master tempo map at that point.

The second and third screens (above) show an example of extracting and using a Groove Template. Firstly I've selected two bars of a hi-hat track that's been

played with some swing that I want to capture. As before, the start and end bars of the selection are entered into the Selection area of Beat Detective. I've increased the Detection settings to include Sub-Beats (essential when extracting a groove) and set the sensitivity to pick up all the hits. At this point Extract brings up the options to save this template to disk (where it can be used later in any song), or just store it temporarily for immediate use. In the last screen there's now a MIDI track with a looping two-bar phrase. I've opened up the Groove Quantise page from the MIDI menu, selected my new template from the pop-up and applied it at 100 percent strength to the MIDI selection. The template is 'looped'

throughout the selection, so even though I only extracted two bars of performance data, the whole track is being quantised with the desired feel.

I've used a MIDI example here, but it's also possible to use the new groove template on other audio. The process is the same as that described last month: use Beat Detective to Separate all the individual components of the recording, then Conform the individual regions. The only difference is that instead of using a flat quantise for the Conform you choose your newly created Groove Template.

Next month, we'll look at some examples of tempo changing and loop matching, and check out the Rewrite functionality in *Pro Tools* 6.1. **ES**

Current Versions

Mac OS X & Windows XP
 • Pro Tools HD, Mix, 24, 002, 001, M
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Mac OS 9
 • Pro Tools HD: 5.3.1f2.
 • Pro Tools Mix, 24: 5.1.3.
 • LE systems: 5.1.1 32T.
 • LE systems with Digistudio: 5.2.1.

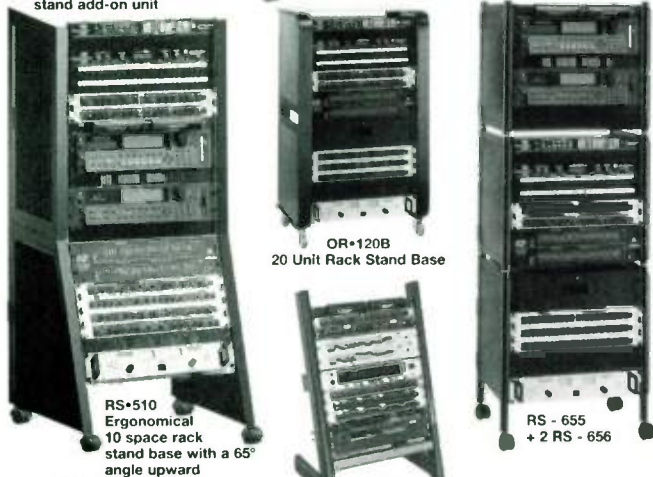
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DP v4.1 is available, and it looks like MOTU can provide a viable alternative to DP3 under OS 9 at last. Plus a look at VST plug-in support in DP under OS X...

Robin Bigwood

MOTU have been criticised in the past for being somewhat secretive about release dates for their hardware and software, so their mid-July press release, coinciding with the MacWorld Creative Pro show, was particularly welcome. It announced the release of *DP4.1*, which will become available to registered user of *DP4* on August 8th. If you're not already running it, get over to www.motu.com and start downloading now!

DP4.1 adds the keenly-awaited Audio Units support that for many was a prerequisite for serious use of *DP* in OS X. But owners of Pro Tools hardware are also rewarded, with full support of HD and Mix systems at all sample rates up to 192kHz. As in *DP3.1* there's support for volume and pan automation (though not for TDM plug-ins) when running under DAE, but for Pro Tools people who like to use *DP* for its far superior MIDI features, this development is very good news.

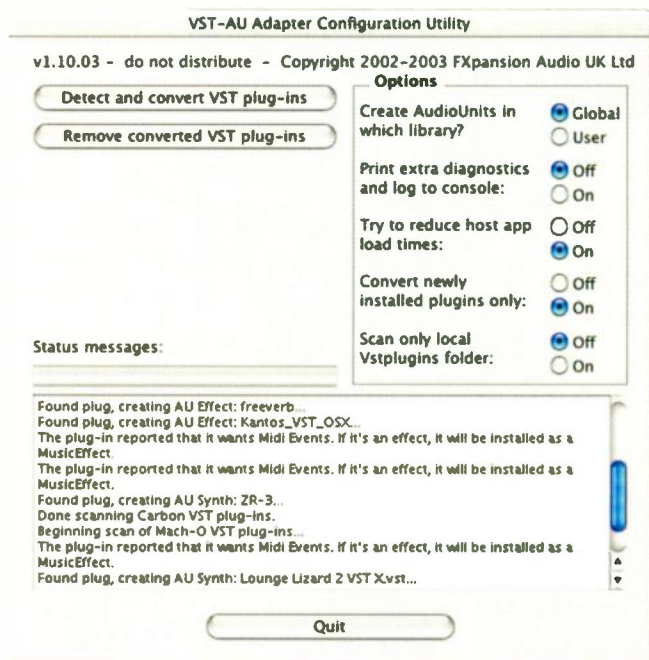
AU and DAE support was widely expected, but *DP4.1*'s new virtual instrument (VI) tracks definitely weren't. This new track type significantly cuts the number of steps required to set up a MAS or AU software synth or other virtual instrument plug-in, and should mean that

they no longer require separate MIDI and voice tracks. Best of all, much tighter timing is promised so that, according to MOTU, 'in most circumstances (with typical buffer size settings), notes play no more than a sample earlier or later than the MIDI note that triggers them.' Not sample-accurate, then — but if you can hear worst-case timing errors of ± 0.00002 seconds, your ears are better than mine.

A number of other enhancements should be delivered in v4.1, including ready-made New Document templates, a Recent Documents submenu, better OMF compatibility, new marker functions, and an option to have input and output assignments for each track displayed in the mixer. These might not shake your world, but they'll all make *DP4* an even nicer environment to work in.

VST Support In *DP4.1*

With its new Audio Units compatibility, users of *DP4.1* can benefit from what may well become the plug-in format in OS X, in addition to MOTU's own MAS format, which will almost certainly continue to be used for *DP*'s bundled plug-ins as well as a few manufacturers such as Bomb Factory. But what of VST? Though not quite as dominant as it once was, especially with companies like Native Instruments embracing Audio Units, VST is still an important format, often associated with



The no-nonsense face of VST hosting in *DP4.1* — FXpansion's *VST to AU Adaptor*.

smaller developers of those quirky but fun freeware and shareware plug-ins. And if you want to use anything by Steinberg (or Antares for that matter) VST is pretty much your only choice.

Under OS 9, *DP* users were spoilt for choice with VST host plug-ins, or 'wrappers' as they're often known. Audio Ease's VST Wrapper was widely considered the most robust of these, but Cycling 74's *Pluggo* did a good job as well, along with *Spark FX Machine* by TC Works. None of these is available yet for OS X, but with the release of *DP4.1* a new solution has appeared — the *VST to AU Adaptor* by the British software developer FXpansion. For anyone who cut their teeth on VST hosts in OS 9 versions of *DP*, the *VST to AU Adaptor* will seem unfamiliar, as its operation is fundamentally different to something like *VST Wrapper*. Rather than a plug-in

which provides 'real-time' translation of VSTs inside the *DP* environment, *VST to AU Adaptor* is a separate application, and it performs 'off-line' conversions of your OS X VST plug-ins, producing individual AU versions of each. This is an ingenious approach, since it allows each VST plug-in to be wrapped in an optimum way, according to custom profiles worked out by FXpansion, and keeps the 'thickness' of the wrapping to a minimum, with consequent gains in efficiency and stability and preservation of all automation features. From *DP*'s point of view your VSTs appear to be additional AUs, and because each converted VST plug-in is represented by its own .component package in ~/Library/Audio/Plug-Ins/Components, it's not just *DP* that can make use of them, but indeed any AU host on your Mac. What's more it should be possible to



A 'wrapped' Audio Unit version of PSP Audioware's *PSP42* VST plug-in, made using FXpansion's *VST to AU Adaptor*.

This month we offer help getting to grips with *Logic's* much misunderstood Hyper Editor, and tell you how to reduce sibilance without using a de-esser plug-in.

Len Sasso

The Hyper Editor is probably the least used and least well understood of *Logic's* MIDI editors. It features a time-synchronised, bar chart-style display with individual lanes for different types of MIDI data. As such, it is the only way to view and edit different types of MIDI data along a common timeline. Each Hyper Editor lane has its own display parameters, called its Hyper Definition. Complete Hyper Editor setups are called Hyper Sets. *Logic* provides some standard Hyper Sets, but the real power of the Hyper Editor is that you can create and customise Hyper Sets as you need them.

Two things are important to keep in mind when using the Hyper Editor. Hyper Sets do not themselves contain MIDI data — they are templates for selecting what MIDI data is displayed. In other words, the same Hyper Set can be used to view the data in any MIDI Region. Unlike the Matrix and Score Editors, but like the Event Editor, the Hyper Editor shows the data in a single MIDI Region. For example, if you want to use the Hyper Editor as a drum editor (one of its main uses), you need to combine all the drums in a single MIDI Region. If you want to use the Hyper Editor to view MIDI automation for several controllers at once, all that automation data needs to be in the same MIDI Region. That can cause confusion, because it's common to split individual drum sounds into separate MIDI Regions or to create automation for individual controllers in separate MIDI Regions.

Each Hyper Editor lane is a bar chart with an individual

bar for each MIDI event. For notes the bar height indicates MIDI velocity and for all other MIDI messages it indicates the data value. What data is displayed as well as how it is displayed is controlled by the Hyper Definition, which you set in the Parameter Box at the left side of the Hyper Editor window. You can only display one Status of MIDI message — notes or MIDI Continuous Controllers, for example — in each lane, but within that message Status, you can choose to show all messages on all MIDI channels, or limit yourself to a single message type or a single MIDI channel, or both. For example, you could display notes of all pitches on all channels or only the MIDI kick drum note on MIDI channel 10. Likewise, you could choose to display all MIDI Controllers or only Controller number 7 (which corresponds to MIDI volume). The usual strategy is to view one message type such as a single pitch or Controller number per

lane. That makes it much easier to see what you're doing and avoid affecting MIDI data unintentionally.

Hyper Activity

Each Hyper Definition has three

critical things to remember are that all bars between two grid lines are linked for purposes of selecting and editing, and new events will always be created at the grid lines. Linking between gridlines can drive you nuts



The Hyper Editor window shows each MIDI data type in a separate lane. Each lane has its own parameters, called a Hyper Definition, which appears in the Parameter Box at the left when the lane is selected. Lanes linked by a vertical line with dots, as are the Closed HH and Open HH lanes here, are grouped.

view parameters: Grid, Penwidth, and Style. Penwidth and Style control how the bars appear in the lane and are straightforward to set up — choose what looks best to you. Grid, on the other hand, radically affects data entry and editing and works differently from the way of *Logic's* other editors. The two

when using the Selection tool (arrow icon) until you get used to it, but it is one of the Hyper Editor's best features. Here's how to take advantage of it.

Normally, when you click-drag the Selection tool over some bars in a lane, their height will snap to the cursor position. Fortunately, that effect is limited

Logic Tips

Logic maintains a navigation history for the last 30 zoom and scroll position settings for each open window. Use the key commands Navigation: Back and Navigation: Forward to move through the history. Using the magnifier tool or a navigation key command automatically updates the history, but you can also force the current settings into the history with the Store Navigation Snapshot key command. Finally, there are key commands to store and recall three independent zoom and scroll settings.

If you create Track Based Automation of a grouped parameter on a track for one member of a group, automation will be written on tracks for other members of the group, if they are in the same automation mode. If you want to ensure that all members of a group are always in the same automation mode, enable Automation Mode in the Group Settings window.

When you're using *Logic* to play software instruments from another Rewire application running in slave mode, you need to set Rewire behavior to Live mode in the Audio Driver Preferences to achieve low real-time latency. On the other hand, for MIDI sequence playback, that is not necessary and uses extra CPU cycles. *Len Sasso*



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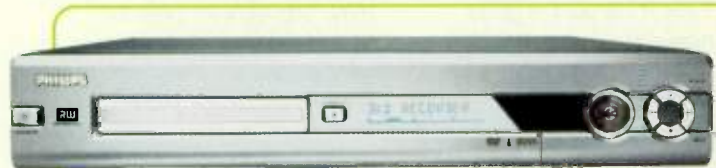
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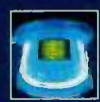
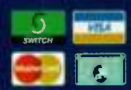
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► to the lane you click in, but it can still be disconcerting if you're intending to just select the bars, not change them. There are several ways to avoid changing values with the Selection tool. If you Shift-click between grid lines that contain no bar, you can then drag to select a range of bars to the right or left. You can Shift-click individual bars to add and remove them from the current selection. You can tick the Fix Value box to prevent the Selection tool from ever changing a bar's height. (The key command 'Protect Values toggle' toggles that tick box.)

Another disconcerting aspect of the Selection tool is that Shift-click-dragging between grid lines where a bar is already selected will move all selected bars instead of extending the selection. Bars can be moved horizontally and vertically, and horizontal motion is quantised to the grid. For drum editing, that's a great way to move or copy (using the Option key) notes from one drum to another, but it's an unwelcome surprise when you're not intending it. In short, watch where you click, set each lane's grid size small enough to separate all bars, and know the rules for selecting and dragging.

Applications

As you've probably gathered, the Hyper Editor shines as both a drum and MIDI Controller editor. For drums, it allows you to quickly create quantised drum parts, move or copy hits between different drum sounds, and edit the velocities of multiple hits at the same time. You can do all those things in other editors, but not nearly as easily. The Hyper Editor has a default Hyper Set for GM drums, but setting up your own with lanes only for selected drums is a simple process, and fewer lanes are easier to view and work with. The trick is to start with an empty Hyper Set, open another editor (the Event Editor is a good choice) to display the drum part you want to Hyper Edit, select at least one

Sorting Sibilance Without De-essing

In the age of modern audio sequencers where plugging in an extra compressor or two doesn't cost the Earth in terms of processing power, it is often regarded as good practice to record to disk as clean as possible and without compression. This gives the maximum range of options for mixdown and prevents audio being recorded that is over-compressed. Having said this, old habits die hard, and harking back to the days of limited processing I still tend to compress to disk when I record almost anything. This comes out of knowing my vocalists and compression settings very well, and having the vocals under control at the tracking stage makes the mix stage that much simpler.

However, one common problem with this approach is sibilance: the resulting recordings sometimes suffer disproportionately high level on high-frequency phonemes such as 's' and 't' sounds, as these don't carry much low-frequency energy and hence the compressor lets them through. There are many plug-in de-essers available, but none of them do the job accurately enough for my liking, as they seem to degrade the rest of the audio slightly.

Using Logic's

Reducing the level of a sibilant consonant in Logic's Sample Edit window.

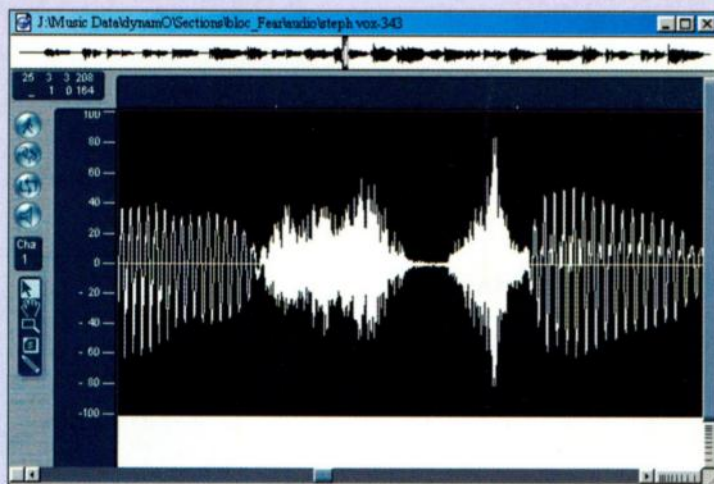
sample editor, you can tackle this sibilance manually. It is a time-consuming process but does allow absolute control over the problem without having a detrimental effect on the rest of the audio. In the sample editor, go to a closer horizontal view than the default by zooming in one or two times. This will reveal what I refer to as the 'furry sausages'. At this zoom level the high-frequency components are clearly distinguishable from the rest of the audio. The screen shot is of the transition between the words 'chance' and 'to'.

With a highly sibilant vocal line these 'sausages' will often be greater in amplitude than the rest of the line, but don't rely on this — use your ears first and foremost. If it isn't broke then don't fix it. Just highlight the problem region, being careful to grab only the area with the

strong high-frequency component. (If you have the Search Zero Crossings option ticked in the Sample Edit window's Edit menu, Logic will find the zero crossings by default to prevent clicks where the level is changed.) Then use the 'change gain' feature to drop the level. I find settings between -3 and -6dB to work well. Be careful, though, as the more severe the alteration, the greater the likelihood of some adverse effects.

By following this process a perfect vocal take can be created that has all of the control of a compressed sound whilst not being at all sibilant. This will then drop into your mix without needing any extra processing which can in turn free up valuable processing power for the quality reverb you'll now want to use!

Steve Knee



note for each drum sound you want to include in the Hyper Set, then choose Multi Create Event Definition... from the Hyper Editor's Hyper menu. That will add a lane for each of the selected drums. You can also automatically add Hyper Definitions one at a time by ticking the Auto Define box and selecting events in another editor. (Don't forget to untick the box when you've finished.)

When editing drum parts, keep in mind that you can group adjacent Hyper Definitions in what is called Hi-hat mode by clicking to the left of the Hyper Definition name in the track list. You can have as many groups as

you want as long as there is a non-grouped lane separating them. If you want to group non-adjacent lanes, first drag one of them next to the other. Hi-hat mode prevents you from entering notes of different group members at the same time position, but it does not automatically delete duplicates that already exist.

The main advantages of the Hyper Editor for MIDI Controller data are the time-synchronised display of different controllers, the ease of moving or copying data from one controller to another, and the ability to quickly draw in Controller data at the Hyper Definition's grid

spacing. The same Hyper Set setup tricks described for drum Hyper Sets work for Controller Hyper Sets. In addition, selecting a MIDI Region and choosing Create Hyper Set For Current Events from the Hyper menu will automatically create a Hyper Set with Hyper Definitions for all and only the Controller events in the Region. That's a much easier way to quickly find all the MIDI Controller automation in a Region than looking for it in the Event editor.

There's no need to get hyper about the Hyper Editor. A little time getting to know it will save you lots of MIDI editing tedium. **505**

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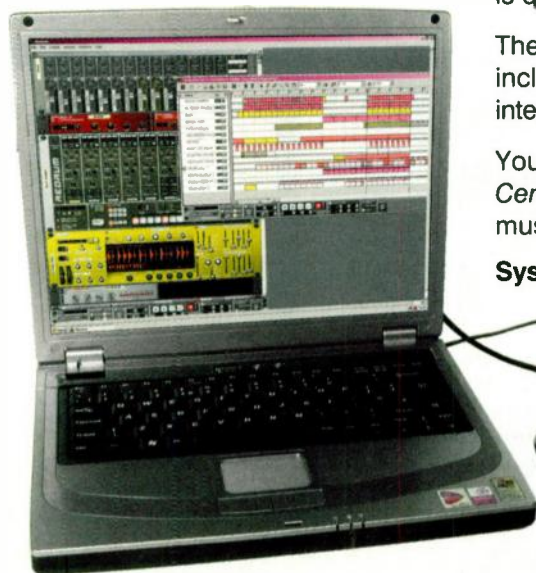
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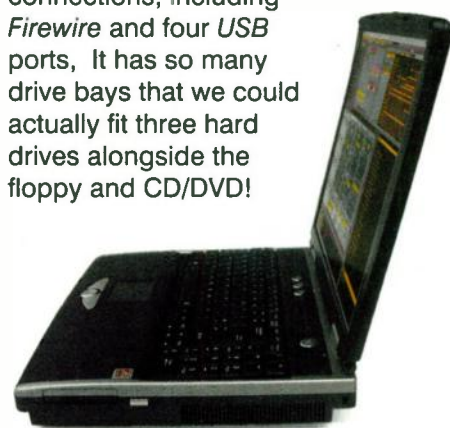
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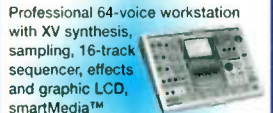
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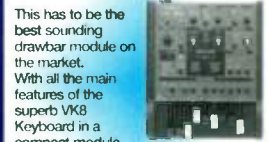
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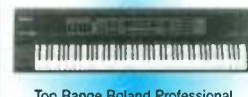
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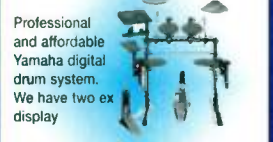
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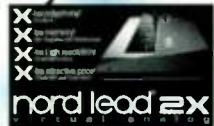
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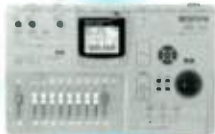
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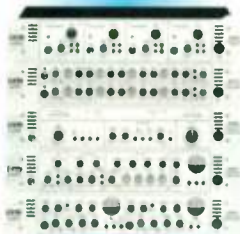
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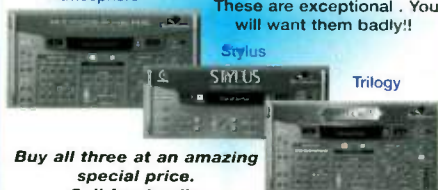
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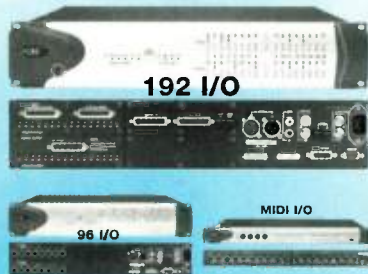
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DM2000

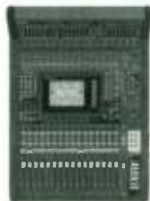
With nine times the processing power of the 02R, capable of mixing upto 96 channels and a feature set that outclasses desks at twice the price, the DM2000 is a formidable digital console.



02R96

With the exact same footprint as the 01V, the 01V96 will be familiar to 01V users, whilst also offering some nice surprises. Up to 40 channels.

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Designed with film, video and post production in mind, the DM1000 offers 48 channels and many of the DM2000 features in a compact format

The 02R96, with its 56 channels, is a natural progression from the ground-breaking and extremely popular 02R. Retaining much of the original desk's functionality, but taking it's performance to the next level.



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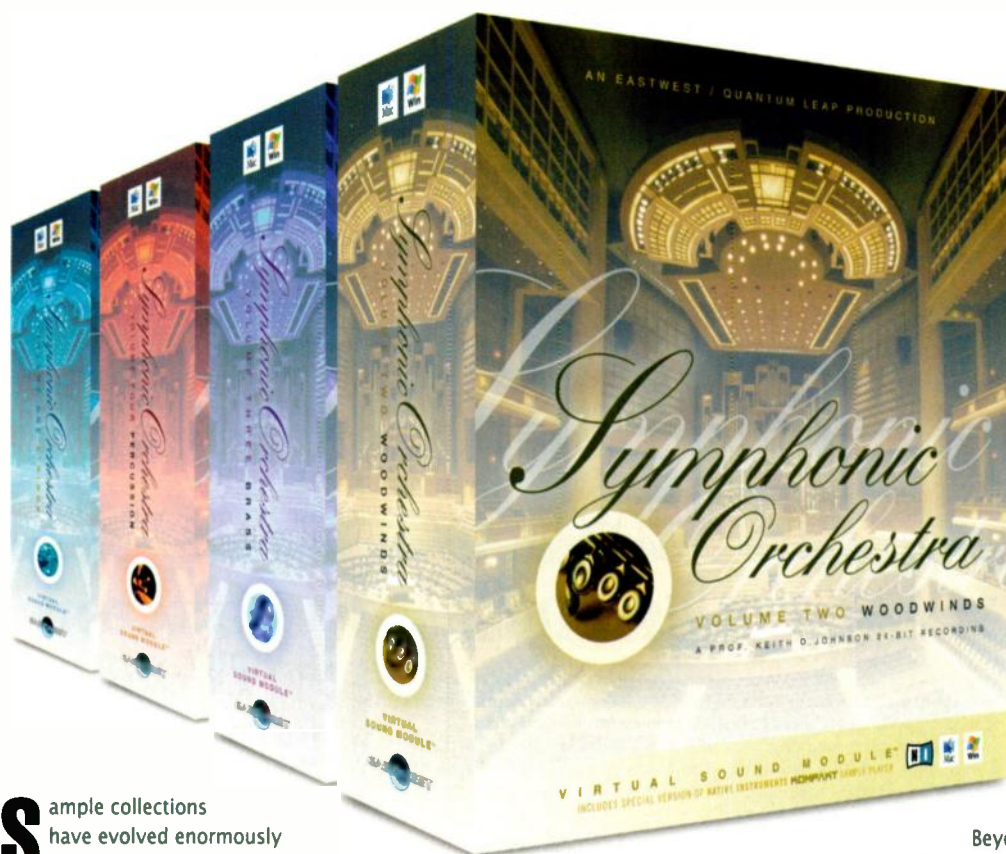
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Eastwest/QL Orchestral Libraries



Sample collections have evolved enormously over the last few years, thanks mainly to the ability of faster computers with larger hard drives to cope with bigger sound files. These days, large ensemble arrangements of high-quality sampled instruments can be run without overloading computer CPUs, and that has encouraged producers to raise their recording standards. On top of that, sample library producers are now, through software interfaces, developing ways to make their samples more playable so that the articulations and variations of a performance are automatically integrated into programmed material, as required. For the main orchestral sample producers, the race is now on to release a collection that is a perfect recreation of the real thing.

To get a lead on their competitors, Doug Rogers from Eastwest and Nick Phoenix from Quantum Leap have combined their collective might to produce a professional sample collection which includes all the instruments of a Symphonic Orchestra. There are four volumes which can be bought individually: Strings, Woodwinds, Brass and Percussion. The Strings, Brass and Woodwind each sell for £649 including VAT whereas the Percussion volume is a mere £329 including VAT. This month, UK distributors Arbiter have kindly offered SOS all four volumes to give away as a single competition prize worth £2,279.

Each sample collection ships with a copy of *Kompakt* — a custom sample player

interface based on Native Instrument's *Kontakt* software sampler. When run through *Kompakt* software, each volume effectively acts as a virtual instrument rather than a passive sample collection. For example, sample encoding enables *Kompakt* to perform automatic sample switching between up and down strokes on stringed instruments.

The articulations for each instrument, or each set of instruments, in the libraries make a very long list which we won't print here. Suffice to say that Eastwest and Quantum Leap have thought long and hard about how to ensure that almost any orchestral composition can be accurately produced using the resources of the library.

Beyond the standard controls required for manipulating orchestral samples, many sound shaping tools, more typically found in synthesizers, have been built into the *Kompakt* interface. Multi-mode filters, envelopes, and LFOs provide creative options, and effects such as reverb, chorus, and delay are also available, should they be required.

When recording the samples, the production team's first priority was to ensure that recording quality was as good as possible so a state-of-the-art concert hall was hired together with audio expert, Professor Keith O. Johnson, who was set the task of capturing near-perfect samples with his custom-built recording equipment. Johnson seemed like the perfect person to take charge of the project having produced

over 90 classical recordings, two of which have won Grammy awards, with eight others receiving Grammy nominations. Johnson is also jointly responsible for the development of the High Definition Compatible Digital (HDCD) encoding process which is said to be extremely accurate. All of the players were recorded in position and all of the instruments and sections were chromatically sampled with multiple dynamics and articulations.

Creating great samples is one thing, but one of the perennial problems faced by the makers of sample collections is how to provide samples that can be adjusted by the end user to suit their compositions. Eastwest/QL's solution to this conundrum was to make each recording using three stereo mic setups placed in different positions. The first set were close, the second were at a stage position and the third were at a distance in the hall. When using *Kompakt* as a control interface for the samples, the three mic position recordings can be mixed using an audio zoom control: by zooming in to the close mics or out to the distant mics, the tonality and ambience of any instrument or section can be changed. The three mic position setup used in this way virtually eliminates the need for artificial reverb.

Each library in the collection functions as a plug-in instrument in host applications such as Steinberg *Cubase VST*, MOTU *Digital Performer*, *Emagic Logic Audio*, Steinberg *Nuendo*, *Digidesign Pro Tools*, and Cakewalk *Sonar*.



The Minimum requirements to run the Native Instruments software are Windows XP/ME/98 OS, a Pentium III or Athlon 500MHz processor, and at least 256MB RAM. For Mac, a G3 running OS 9.2 or higher is needed, together with a 500MHz processor and 256MB RAM. The recommended system for PCs includes Windows XP, PIII or Athlon 700MHz processor with 512MB RAM. For Mac an OS 9.2 or higher running on a G4 733 is advised, also with 512MB of RAM.

To get the most from the sound library Eastwest recommend you have 1.5GB of free RAM. Compatible Windows drivers are VST2.0, DXi2, ASIO, MME, Direct Sound and RTAS. For Mac the list includes VST2.0,

ASIO, Sound Manager, FreeMIDI, OMS, Audio Units, Core Audio and RTAS.

To win yourself this huge and impressive library you need to fill in the entry form on this page and post it to the address on the coupon. (Alternatively, you may enter via the electronic form on the *SOS* web site.) Please make sure you answer all the questions and complete the tie-breaker. We also require your full address and **daytime** telephone number. Your entry must arrive with us by the closing date of **24th October 2003**. **SOS**

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questions

Which one of the following is not a Volume in this collection?

- a. Brass
- b. Strings
- c. Banjos
- d. Drums

What is the name of the custom software that ships with the four libraries?

- a. Komlacked
- b. Kontrakt
- c. Kompakt
- d. Kombat

Which one of the following is not a mic position used to record the orchestras?

- a. Hall
- b. Close
- c. Stage
- d. Subterranean

Eastwest/Quantum Leap tie-breaker

There might come a day when sample collections put most orchestras out of business. What new services can orchestral musicians provide to ensure employment in the future? Answers in 30 words or fewer please.

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Name Would you like to receive more information on Arbitr products?
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Post your completed entry to: Eastwest/Quantum Leap Symphonic Orchestra competition September 2003, Sound On Sound, Media House, Trafalgar Way, Bar Hill, Cambridge CB3 8SQ, England.

the small print

1. Only one entry per person is permitted.
2. Employees of SOS Publications Ltd, Arbitr Music Technology, Eastwest, Quantum Leap and their immediate families are ineligible for entry.
3. No cash alternative is available in lieu of the stated prize.
4. The competition organisers reserve the right to change the specification of the prize offered.
5. The judges' decision is final and legally binding, and no correspondence will be entered into.
6. No other correspondence is to be included with competition entries.
7. Please ensure that you give your DAYTIME telephone number on your entry form.
8. Prize winners must be prepared to make themselves available in the event that the competition organisers wish to make a personal presentation.

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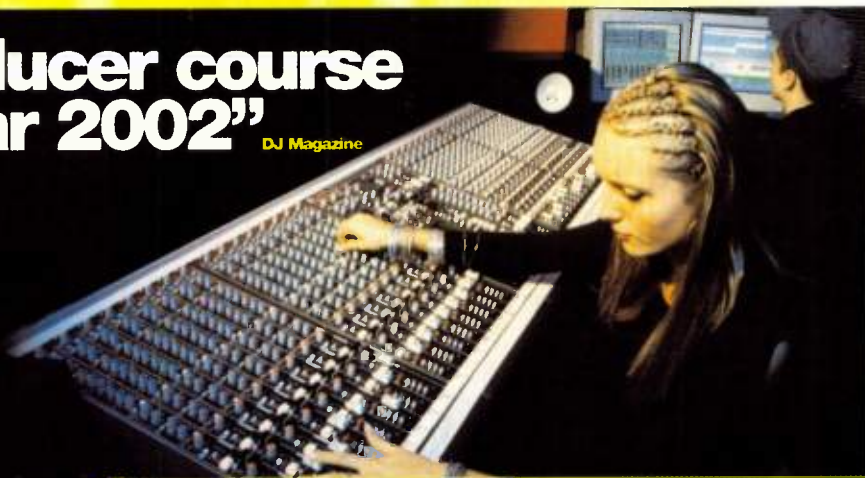
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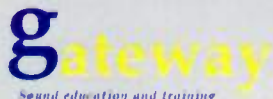
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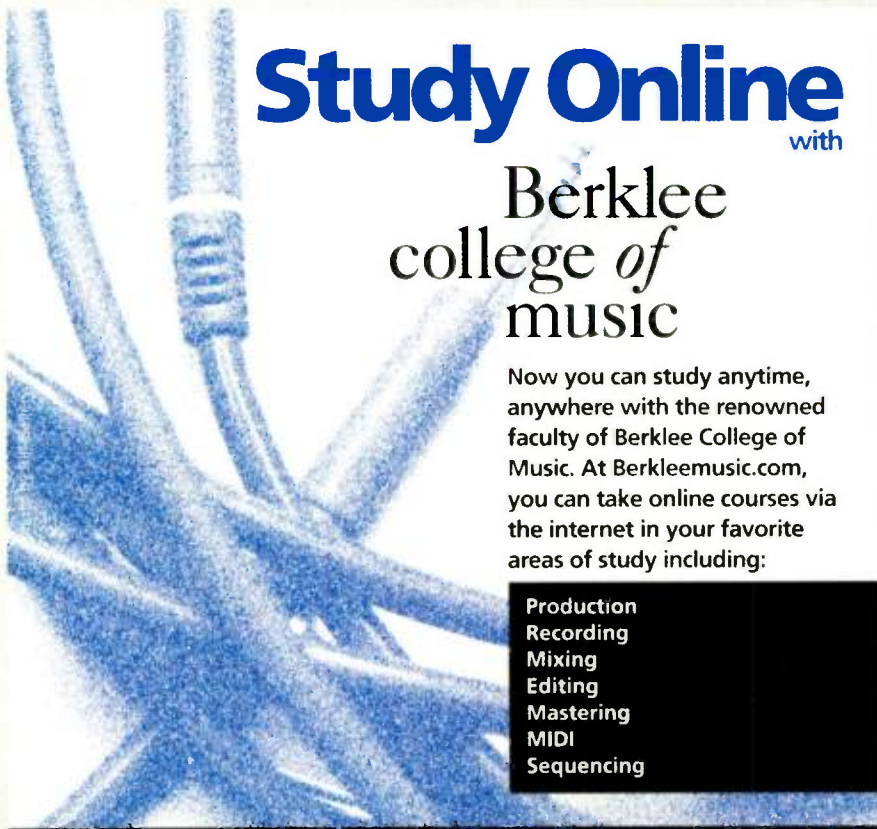
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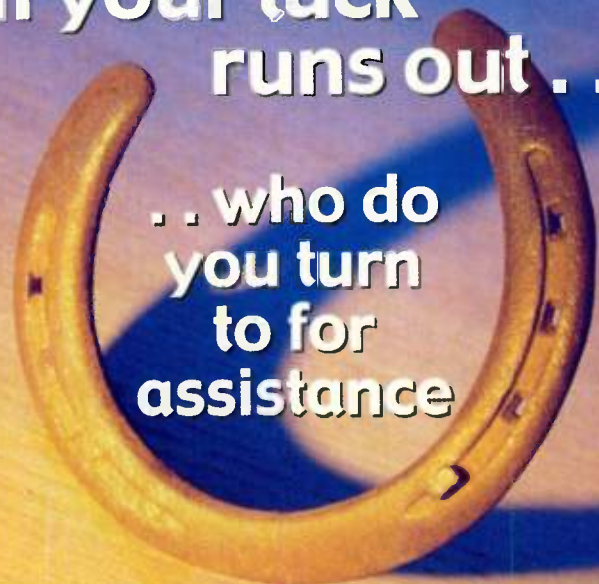
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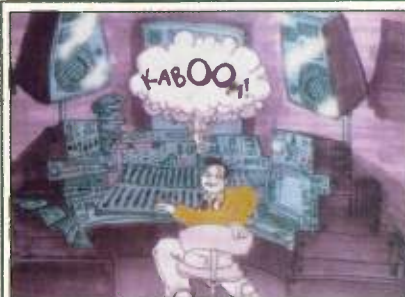
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RME Hammerfall	£399	£319.99	Quested F11	£1149	£999.99
Seagate ELIDE 80G	£289	£74.99	Samson Servo 170	£199	£109.99
Soundscape Mixtreme 2000 Pak	£699	£599.99	Soundcraft Absolute Zero	£209	£109.99
Soundscape Mixtreme PCI	£449	£359.99	Tannoy Reveal Active	£549	£299.99
Steinberg Houston	£999	£539.99	Tannoy Reveal X (Each)	£179	£134.99
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DJ			DBX 1066	£499	£359.99
American DJ XDM250T	£89	£64.99	DBX Provoval	£349	£219.99
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Numarik TT1650 Turntable	£179	£119.99	Lexicon MPX100	£239	£169.99
Drums & Digital Percussion			Line 6 Bod Pro Bass Preamp	£579	£449.99
Boss DR202	£299	£209.99	Red Sound XSF9	£329	£89.99
Roland SPD202 Percussion Pad	£549	£394.99	Samson S-COM 2Ch Comp	£129	£59.99
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Integrated Controllers			Digidesign Samplecell II	£1139	£799.99
Boss BR1180 HD	£649	£449.99	Ik Multimedia Sampletank	£239	£159.99
Roland CDX1 Disclab	£1199	£799.99	Playpro Bass Deluxe	£99	£24.99
Roland VS1824 Recorder No CD	£1499	£849.99	Steinberg Cubase Score PC Educational 5 Pack	£1199	£799.99
Roland VS2480 40GIG Drive	£199	£44.99	Steinberg Plex Mac/PC	£179	£119.99
Tascam 424 Mk3	£349	£219.99	Steinberg Virtual GTR Electric	£179	£119.99
Keyboards			Steinberg Virtual Guitarist 1	£169	£119.99
Access Virus C	£1429	£1149.99	Symtium Lib Real Edit Pro	£329	£209.99
Casio CT811 Welcome Pack	£9	£1.99	Technics Librarian	£29	£4.99
Clavia Electro 61	£1299	£919.99	Samplers		
Clavia Nord Lead 3	£1699	£1174.99	Akai Z8A Sampler & Analogue I/O	£799	£699.99
Edirol PC160	£79	£54.99	Emu E6400 Ultra Sampler	£1399	£649.99
Edirol PC300	£139	£99.99	Emu ES12000 Turbo	£999	£299.99
Ensoniq Halo	£999	£399.99	Emu ES14000	£1199	£199.99
Evolution MK225C	£99	£69.99	Red Sound Cycloops	£279	£119.99
Evolution MK249	£129	£79.99	Smart Media Flash RAM 32MB	£19	£9.99
Fatar Studio 61	£199	£149.99	Software Mac		
Korg Micro	£399	£299.99	Bitheadz Voodoo Mac	£129	£69.99
Novation Remote USB	£249	£209.99	Celemony Metodyne Studio Mac	£679	£549.99
Oberheim OB12	£799	£449.99	Emagic Logic Gold	£479	£354.99
Roland VA7	£2199	£1349.99	PG Music Mega Band in a Box Mac	£219	£139.99
			Steinberg Cubase SL Mac	£349	£229.99

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personnel

CO PRODUCERS/FEMALE singers for music production, dance, R&B and pop remixes of an ethnic nature, must be in the West Yorks area. ☎ 079 3203 8538 (Leeds, West Yorkshire)

DEP GUITARIST needed by Guildford-based function band, must be experienced, mature and a fast learner, material includes soul, funk, disco and rock. ☎ John 01483 568914 (Guildford, Surrey)

FEMALE VOCALIST required; Sinead O'Connor, Tracy Thorn, Liz Frazier, where are you? Successful studio needs a world-class singer to add to our portfolio. ☎ Pip 020 8998 3797 (London)

FRONTMAN/VOCALIST wanted a charismatic vocalist needed for '80s and '90s synth covers act, good prospects for paid live work, no timewasters, dedication essential. ☎ Al 079 0064 8330 (New Malden, Surrey)

KEYBOARD PLAYER needed for Pink Floyd tribute band called Us And Them, to replace our sequenced keyboard parts. ☎ Jason 01935 443000 (Sherborne, Dorset)

PRO TOOLS HD studio and producer, new North London studio and record label with a large live area, well-known producer and team of session musicians, perfect for songwriters. ☎ Tim 077 1170 6505 (Wood Green, London)

STUDIO SPACE AVAILABLE in London NW2, approximately 40 metres square, separate control room and live room, own toilet, available immediately, £400 per month. ☎ 020 7782 8156 (London)

miscellaneous

KENTON CONTROL FREAK Studio Edition, 16 fader MIDI control box, immaculate, hardly used, boxed as new with manuals, can post, £165. ☎ 078 0827 4112 (Newcastle Upon Tyne)

LUGGING HEAVY equipment around? Stair climbing trolley, 2x3 wheels, clever design, makes lugging heavy equipment around easy, industrial strength but light, as new, cost £180 pounds but I will sell this for £90. ☎ Adam 020 8449 9160 (Barnet, Hertfordshire)

OPCODE STUDIO 4, eight in and eight out MIDI interface, £75. ☎ 01223 861463 (Chittering, Cambridgeshire)

YAMAHA MEP4 MIDI processors, two for sale, an ideal way of controlling all your primitive MIDI gear, £75 each. ☎ 028 2568 5833 (Ballymena, Antrim)

wanted

DRAWNER DL251 spectral compressor urgently required, must be in good condition, cash waiting or will swap for DL241. ☎ 077 7580 2929 (Leeds, West Yorkshire)

EMU PK6 keyboard wanted, I will swap my JP8000, Yamaha AN1X or DX7 for one, but in the Edinburgh area only. I will not post. ☎ Keith 077 4008 4466 (Edinburgh)

FOCUSRITE RED 3 compressor wanted, must be in good condition, will pay up to £1100, cash waiting, possible part-exchange for Akai MPC2000XL with SCSI CD drive. ☎ Rick 01725 517204 (Wimborne, Dorset)

FOCUSRITE RED 7, will pay up to £700 if in excellent condition and is delivered; Red 3 also wanted, will pay up to £1000, and other Focusrite Red and Blue units wanted. ☎ 01482 448767 (Hull)

ROLAND MT200 sequencer with built-in Sound Canvas wanted, cash waiting. ☎ Lee 02476 327354 (Warwickshire)

ROLAND TNSC1 style cards wanted. ☎ Colin 01626 770063 or email jane.hurley@virgin.net (Devon)

STUDIOLOGIC CONTROLLER keyboard wanted, I have an Emu Emax SE which I would like to swap. ☎ Carl 079 5662 9686 (Weymouth, Dorset)

QUASIMIDI 309 with rack ears, manual and power supply, £300, Emagic EMI 2/6, still boxed, £195, MTR DI2, £50, offers welcome, all items in good condition. ☎ 01978 869411 or email bet@epoch.worx.fsnet.co.uk (North Wales)

YAMAHA RM1X, powerful sequencer and MIDI controller with fat on-board sounds and effects, excellent condition, manual and PSU, £200. ☎ 078 1332 7242 (London)

samplers

AKAI S1000, fully expanded memory, classic rack sampler, £190. ☎ 077 9962 5303 (London)

AKAI S3000XL, 32MB memory, great condition, £295. ☎ 077 9962 5303 (London)

AKAI S3200, 32MB, internal hard drive, Zip drive, disks, both filter boards and effects board, manual, £350. ☎ 0151 734 4213 (Liverpool)

AKAI S5000 with EB20FX board, USB board, AKsys software, sample CDs, boxed, manuals, 8U desk rack, light home use only, £620 ono. ☎ 0161 7902954 (Manchester)

EMU E4XT, 128 voices, 128MB RAM, 1.2GB hard drive, effects, SCSI, AES digital, boxed, manuals, £750 ono. ☎ 01270 872167 (Stoke-On-Trent)

EMU E6400 64-voice sampler, 72MB RAM, with SCSI Zip drive, manual and approximately 15 Zip disks, needs its data wheel repaired, £220. ☎ 079 6734 9607 (London)

EMU ES132 Turbo, 32MB memory, effects card, extra filters, extra outputs, SCSI Zip drive and disks, £250. ☎ 0151 734 4213 (Liverpool)

KORG ES1 Electrice rhythm sampler, many effects plus re-sampling, 32MB Smart Media card, mint condition, boxed, manual, PSU, £175 ono. ☎ Neil 077 5251 4523 (Kent)

ROLAND SP808EX, four months old, as new, boxed, manuals, has a three-year manufacturers warranty, IDE Zip 250 also available for sample transfer/back-up, £400. ☎ James 079 3963 5220 (Cramlington, Northumberland)

YAMAHA A3000 v2, 128MB expansion, multiple analogue and digital I/O expansion, manuals, £295 ono. ☎ Jamie 01273 607413 (Brighton, East Sussex)

computers/software

APPLE G4 Powerbook 15-inch screen, eight months old, very good condition, 1GHz, 1GB SDRAM, 60GB Ultra ATA drive, DVD-R/CD-RW, extra battery, £1500. ☎ 078 8405 3740 (London)

APPLE MAC 7100 with Digidesign Audiomedia and Samplecell cards for powerful audio editing and sampling, £400, Apple G3 450MHz, 768MB RAM, SCSI, 10GB drive, £450. ☎ 079 0348 2181 (London)

APPLE MAC G4, 1.42GHz, 17-inch display, Emagic Logic 6, EMI 6/2M, AMT8, Korg Triton keyboard, Roland XV5080, Mackie 1604 desk, Mackie HR624 monitors, only two months old. ☎ Jon 077 3947 3481 or email jkendal@hendy-group.com (Southampton)

DAW INTEL Pentium 4, 2GHz recording system, 512MB, DDR, 80GB Barracuda hard drive, 17-inch Sony monitor CD-ROM and CD-RW, Audigy 5 card, Firewire port, aluminium case, fast and stable, Windows XP, Cubase SX, Reason, documentation and receipt, will demo, £680. ☎ Mark 079 2993 2001/020 8203 5276 (London)

DIGITAL VILLAGE rackmount PC, 2.4GHz, 512DDR, 80GB Seagate Barracuda, M-Audio Delta 410, five months old, seven months warranty remaining, selling due to new laptop, £750 ono. ☎ 079 7079 7153 (Frodsham, Cheshire)

MAGMA 13 slot PCI expansion chassis, useful bit of kit if you've run out of room in your G3, £550. ☎ Andy Rance 01752 843570 (Saltash, Cornwall)

PRO AUDIO PC 2200XP, Coolmaster HSF and quiet PSU, 1024MB DDR RAM, 80GB Seagate Barracuda hard drive, 32MB graphics card, various pieces of software including Steinberg Cubase SX, £599. ☎ Ciaran 077 2934 0470 (Northern Ireland)

A lecturer writes: 'If you need to be taught music technology, then you shouldn't be doing a music-technology course.' What can he mean?

Steve Knee

There has been much talk in the pages of *SOS* over the last few months on the subject of education for the music industry. Paul White summed up the debate with February's Leader column, pointing out that at any one time there could be as many as ten thousand people looking for jobs in a studio, whatever that term has come to mean. It paints a very bleak picture for the average music-technology student.

I often find myself agreeing with this rather pessimistic view. Just how realistic is it to think that a course will lead to a job in the industry? Surely the tea boy (or girl) route is the proven path to the top? Put all these thoughts together and you might as well tear up your degree now.

I came to the conclusion put forward at the top of the page a few years back. If I remember correctly, it developed during the first year of my degree. Yes, you read correctly, I studied for a degree in Music, Acoustics and Recording. But I didn't enrol on a recording course to be taught, but rather to learn, and I knew already that a degree in one hand would not automatically allow me to use the other to open the door to a job at my nearest studio. I chose to go to University to have access to the knowledge, equipment and experience that I needed to stand any chance of forging a career in the industry. I was in the studio from day one and started to teach myself. Six

months in, I left the studio alone and returned to my home setup armed with the knowledge that I had gained.

It was the other people on my course that led me to my perhaps controversial statement. Without blowing my own wind-based synthesizer too much, I was one of a few who actually had some idea of what was going on. I could immediately pick up on why things were being done the way they were, how signals were being routed and so on. If I didn't, then I questioned the life out of the people around me.

It was clear that most of the people around me just weren't cut out for working in a studio. You need initiative and a certain aptitude which can't really be taught. If you have the initiative to get into a studio then chances are you are the kind of person the industry needs — pushy yet polite, with a thirst for knowledge.

So, once armed with six months of studio experience, I expect you think I left to pursue my career. Not quite. I stuck at my degree. I had some experience of working in a studio but I knew it wouldn't be long before my limited technical knowledge started to halt my ascent up the ladder. What University gave me was the theory to back up the practice. I carefully chose my course knowing that I would spend time in a lecture theatre, not learning about studios, but instead learning the additional theory that would back me up in the future. The word 'acoustics' in the title of my degree should give you a clue. This is a valid

scientific subject that can lead to many well-paid careers outside the studio as well as in it.

So, where am I now, top-class studio engineer or highly paid acoustic consultant? Well, I'm neither, and this is what makes my initial statement even more odd: now I'm a lecturer in music technology. "Those that can't, teach", I hear you cry. Maybe, but whilst at University I used the initiative that I've spoken so much about and started freelancing as a multimedia operator, sound engineer, cameraman, in fact anything I could get my hands on. This freelancing has continued and I currently run a multimedia production company that employs quite a few of my current and ex-students on a freelance basis.

What we're finding in the industry is that there are so many people out there who are being paid good money to 'blag it'. They have the initiative, and many of them learn well on the job, but still they lack a solid foundation in theory.

So do I offer employment to all? No — I know what I'm looking for. I need people who have that knowledge (which I know they're getting as part of the course) but I'm also looking for those polite yet pushy individuals that have a thirst for experience. They're not all that hard to spot — I was one of them.

So if you're thinking about doing a degree or banging on a studio door looking for a job, think carefully. If you have the aptitude for the work then you can make it whether you do a degree or not. But University provides a seriously good back-up plan, especially if you choose a course that gives you the knowledge to do well in your chosen career, be it in a studio or the much wider range of related industries that a good, balanced degree can lead to. **SOS**



About The Author

Steve Knee is a Lecturer in Music Technology at the University of Derby and also MD of Cloudbass Multimedia (www.cloudbass.com).

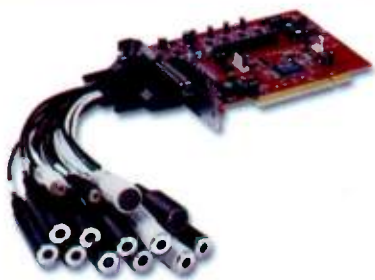
If you'd like to air your views in this column, please send your ideas to: Sounding Off, *Sound On Sound*, Media House, Trafalgar Way, Bar Hill, Cambridge, CB3 8SQ, UK. Any comments on the contents of previous columns are also welcome, and should be sent to the Editor at the same address.

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